Oregon State College

CATALOG

1942-43

List of students 1941-42

P. 29
Bul Degrees
+ Students

Corvallis, Oregon

Oregon State System of Higher Education

B U L L E T I N

Issued Monthly

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State Board of Higher Education

	Term expires
C. A. BRAND, Roseburg	1943
E. C. SAMMONS, Portland	1944
ROBERT W. RUHL, Medford	1945
EDGAR W. SMITH, Portland	1946
WILLARD L. MARKS, Albany	1947
R. C. GROESBECK, Klamath Falls	1948
MAC HOKE, Pendleton	1949
R. E. KLEINSORGE, Silverton	1950
BEATRICE WALTON SACKETT, Marshfield	1951

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BEATRICE WALTON SACKETT

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CHARLES D. BYRNE, Secretary

Office of the State Board of Higher Education
Eugene, Oregon

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Oregon State System of Higher Education

THE Oregon State System of Higher Education, as organized in 1932 by the State Board of Higher Education following a Federal survey of higher education in Oregon, includes all the state-supported institutions of higher learning. The several institutions are now elements in an articulated system, parts of an integrated whole. The educational program is so organized as to distribute as widely as possible throughout the state the opportunities for general education and to center on a particular campus specialized, technical, and professional curricula closely related to one another.

The institutions of the State System of Higher Education are the University of Oregon at Eugene, Oregon State College at Corvallis, the Oregon College of Education at Monmouth, the Southern Oregon College of Education at Ashland, and the Eastern Oregon College of Education at La Grande. The University of Oregon Medical School, located on a separate campus in Portland, is administratively autonomous but traditionally and academically an integral part of the University of Oregon.

Each of the five institutions provides the general studies fundamental to a well-rounded education. At the three colleges of education general and professional studies are combined in the teacher-training curriculum. At the Southern Oregon College of Education and the Eastern Oregon College of Education students who do not plan to become elementary-school teachers may devote their time exclusively to lower-division studies in the liberal arts and sciences.

At the University and the State College two years of unspecialized work in liberal arts and sciences are provided on a parallel basis in the Lower Division. Major curricula, both liberal and professional, are grouped on either campus in accordance with the distinctive functions of the respective institutions in the unified State System of Higher Education.

The educational program thus developed, as shown in the following insert, includes: (1) Liberal Arts and Sciences, (2) Professional and Technical Curricula, and (3) Graduate Study and Research.

University of Oregon, Eugene
University of Oregon Medical School, Portland
Eastern Oregon College of Education, La Grande

THE OREGON STATE SYSTE

LIBERAL ARTS AND SCIENCES

UNIVERSITY OF OREGON

Lower Division (Junior Certificate)
Freshman and sophomore work in Liberal Arts and Sciences (Language and Literature, Science, and Social Science) is offered on essentially the same basis at both the University and the State College.

College of Liberal Arts (B.A., B.S., M.A., M.S., Ph.D.)
Major curricula in General Arts and Letters, General Social Science, General Science, and in Anthropology, Biology, Chemistry, Classics, Economics, English (including options in Speech and Dramatic Arts and in Prelibrary Training), Geology and Geography, Germanic Languages, History, Mathematics, Philosophy, Physics, Political Science, Psychology, Romance Languages, and Sociology. Premedical and Preparatory Nursing curricula.

OREGON STA

Lower Division (Junior Certificate)
Freshman and sophomore work in Lib
erature, Science, and Social Science) is
the State College and the University.

School of Science (B.A., B.S., M.A.
Major curricula in General Science, an
mology, Geology, Mathematics, Physic
Nursing curricula.

PROFESSIONAL AND TECHNICAL CURRICULA

School of Architecture and Allied Arts (B.A., B.S., B.Arch., B.L.A., M.A., M.S., M.Arch., M.F.A., M.L.A.)
Architectural Design, Interior Design, Landscape Architecture (with one year at State College), Drawing and Painting, Sculpture, Art Education, and General Art; Structural Design in Architecture, a joint curriculum with Engineering.

School of Business Administration (B.A., B.S., B.B.A., M.A., M.S., M.B.A.)
Accounting, Advertising and Selling, Finance, Foreign Trade, General Business, Industrial Management, Marketing and Merchandising; combined curriculum in Business Administration and Law.

School of Education (B.A., B.S., B.Ed., M.A., M.S., M.Ed., D.Ed., Ph.D.)
General Education Courses and preparation for Educational Administration. Major curricula preparing for teaching of Literature, Languages, Art, Music, Physical Education, Biological and Physical Sciences, Mathematics, the Social Sciences, Business Administration, and approved combinations of subjects. Training for teachers of atypical children. The School of Education operates jointly at the University and the State College.

School of Journalism (B.A., B.S., B.J., M.A., M.S.)
Reporting, Editing, Advertising, Publishing, Typography and Fine Printing.

School of Law (B.A., B.S., LL.B., J.D.)
A professional curriculum of three years above lower division (five years in all), leading to LL.B. degree; a professional curriculum of three years following a three-year general curriculum (six years in all), leading to baccalaureate and law degrees.

Medical School (Portland) (B.A., B.S., M.A., M.S., Ph.D., M.D.)
Four-year professional curriculum in Medicine (following three-year premedical curriculum offered at both the University and the State College); graduate study in the Medical Sciences. Five-year degree curriculum in Nursing Education, including preparatory work at the University or the State College; graduate curricula leading to certificates in nursing specialties.

School of Music (B.A., B.S., B.M., M.A., M.S., M.M.)
Music History and Appreciation, Theory and Composition, Applied Music, Public-School Music.

School of Physical Education (B.A., B.S., B.P.E., M.A., M.S.)
Professional curriculum combining work in physical education, health education, and recreation. Preparation for coaching and for teaching of physical education and health education.

In addition to the major professional curricula listed above, the University offers lower-division and service courses in Home Economics, and service courses in Secretarial Science.

School of Agriculture (B.S., B.Agr.,
Animal Industries (Animal, Dairy, an
Fish and Game Management, Fisherie
Management; Plant Industries (Farm C
tion and Maintenance, Food Industries)
neering; Agricultural Technology.

School of Education (B.A., B.S., Ed.
Major curricula preparing for teaching
matics, Agriculture, Home Economics,
proved combinations of subjects. Train
Preparation for part-time physical-educ
Education operates jointly at the Univers

School of Engineering and Industria
Ch.E., C.E., E.E., M.E., Min.E.)
Chemical Engineering, Civil Engineerin
way options), Electrical Engineering (E
ical Engineering (General curriculum,
Industrial Arts Education, Industrial
tecture, a joint curriculum with Architec

School of Forestry (B.S., B.F., M.S
Logging Engineering, Technical Forestr

School of Home Economics (B.A.,
Clothing, Textiles, and Related Arts; Fo
Institution Economics; Home Economics

School of Pharmacy (B.A., B.S., M.
Pharmacy, including Pharmaceutical A
preparation for certification as registered

Secretarial Science (B.A., B.S., B.S.
Stenography, Typewriting, Office Metho

In addition to the major professional cur
lower-division and service courses in Arch
tration, Journalism, Music, and Physical Edu

GRADUATE STUDY AND RESEARCH

Graduate Division
All graduate instruction is administered by the interinstitutional Graduate Division.

General Research Council
Research is assisted through the interinstitutional General Research Council, and through institutional agencies.

Graduate Division
Graduate study leading to advanced degrees has been allocated to the University in the following fields:

Liberal Arts and Sciences, Architecture and Allied Arts, Business Administration, Education, Journalism, Law, Medical Sciences, Music, and Physical Education.

Advanced degrees granted are listed above, following the name of each major college or school.

Graduate Division
Graduate study leading to advanced deg
the following fields:

Biological Sciences, Physical Science
cation, Engineering, Forestry, Home

Advanced degrees granted are listed abov

M OF HIGHER EDUCATION

Oregon State College, Corvallis
Oregon College of Education, Monmouth
Southern Oregon College of Education, Ashland

ATE COLLEGE

eral Arts and Sciences (Language and Lit- offered on essentially the same basis at both

., M.S., Ph.D.)
d in Bacteriology, Botany, Chemistry, Ento- s, and Zoology. Premedical and Preparatory

, M.S., Ph.D.)
d Poultry Husbandry, Dairy Manufacturing, s); Agricultural Economics including Farm rops, Soils, Horticulture, Landscape Construc- ; Agricultural Education; Agricultural Engi-

.B., M.A., M.S., Ed.M., Ed.D.)
of Biological and Physical Sciences, Mathe- Industrial Arts, Secretarial Science, and ap- ing for educational and vocational guidance. ation teaching and coaching. The School of ity and the State College.

l Arts (B.A., B.S., B.I.A., M.A., M.S.,

g (General curriculum, Business and High- Power and Communications options), Mechan- Aeronautical option), Mining Engineering, Administration; Structural Design in Archi- ture and Allied Arts.

., M.F., F.E.)
y (Forest Recreation option), Wood Products.

B.S., M.A., M.S.)
ods and Nutrition; Household Administration; Education.

A., M.S.)
nalysis, Pharmacology, and Pharmacognosy; pharmacist.

S.)
ds.

ricula listed above, the State College offers itecture and Allied Arts, Business Adminis- ucation.

rees has been allocated to the State College in

s (including Mathematics), Agriculture, Edu- Economics, and Pharmacy.
e, following the name of each major school.

OREGON COLLEGES OF EDUCATION

Lower Division (Junior Certificate)
At SOUTHERN OREGON COLLEGE OF EDUCATION, Ashland, and EASTERN OREGON COLLEGE OF EDUCATION, La Grande, freshman and sophomore work in Liberal Arts and Sciences (Language and Literature, Science, and Social Science) is offered within the limits of the college-of-education curriculum.

Elementary Teacher Training (B.S. in Elementary Education)
At OREGON COLLEGE OF EDUCATION, Monmouth, EASTERN OREGON COLLEGE OF EDUCATION, La Grande, and SOUTHERN OREGON COLLEGE OF EDUCATION, Ashland, three- and four-year curricula prepare students for teaching in the elementary schools. The three-year curriculum leads to a diploma, the four-year curriculum to a bachelor's degree. Both curricula qualify the student for the State Teacher's Certificate.

The work includes: (1) Training in the subjects to be taught, and in the effective teaching of those subjects. (2) Broad general education for the prospective teacher as an individual and citizen.

Secretarial Science
A two-year curriculum in Secretarial Science is offered at SOUTHERN OREGON COLLEGE OF EDUCATION and EASTERN OREGON COLLEGE OF EDUCATION.

EXTENSION

General Extension Division

The General Extension Division of the State System extends the services and instruction of the System to the people of the state through the following departments:

Correspondence Study

Portland Extension Center

Radio Station KOAC

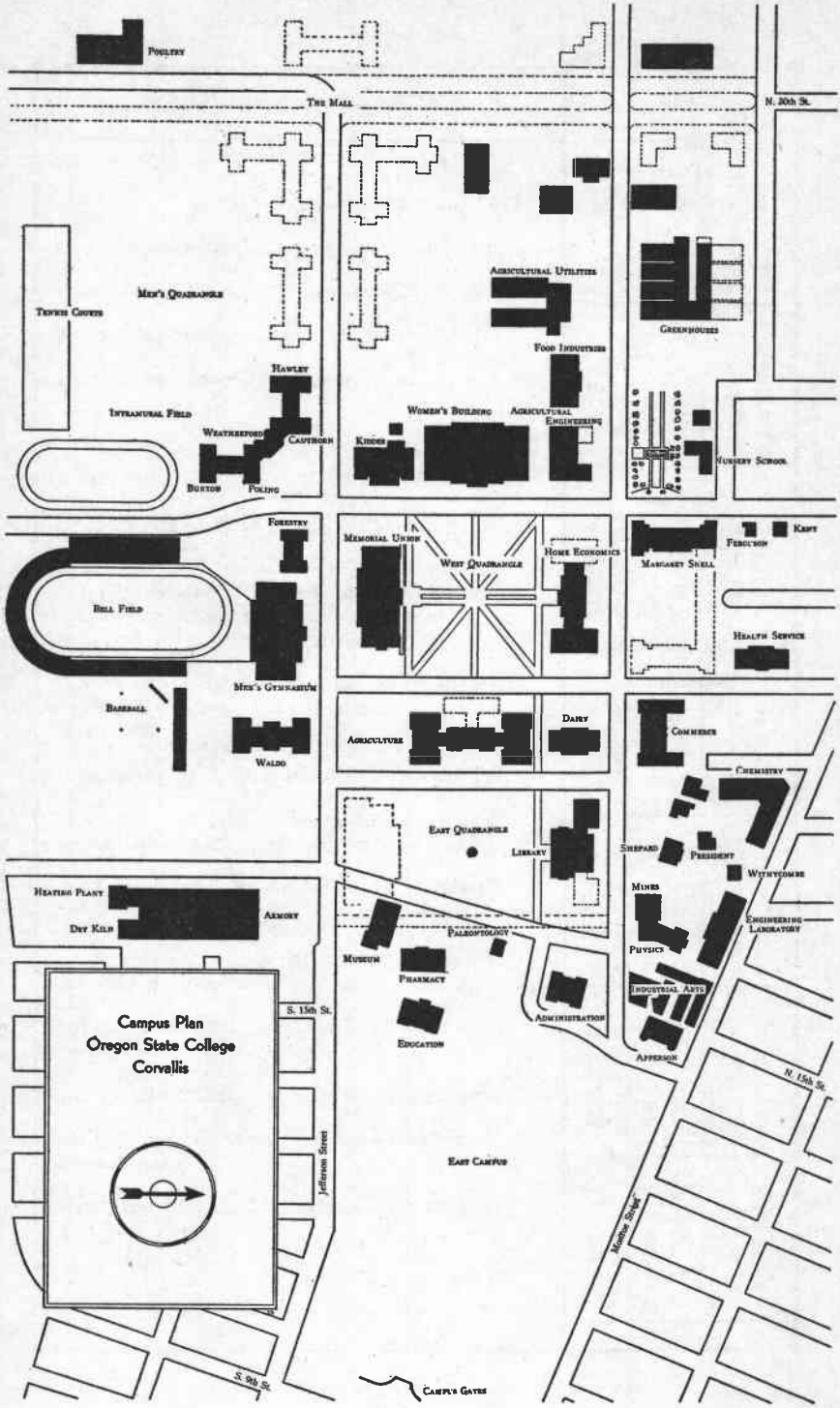
State-Wide Extension Classes

Visual Instruction

In certain fields graduate work may be taken at the Portland Extension Center, leading to degrees from the University or the State College, according to the major subject.

Federal Cooperative Extension

The Federal Cooperative Extension Service in agriculture and home economics of the State College is closely coordinated with the work of the General Extension Division.


Poultry
The Mall
N. 30th St.
Men's Quadrange
Tennis Courts
Agricultural Utilities
Food Industries
Greenhouses
Hawley
Intramural Field
Weatherford
Casteborn
Burton
Poling
Women's Building
Agricultural Engineering
Kidder
Nursery School
Forestry
Memorial Union
West Quadrangle
Home Economics
Margaret Snell
Fenton
Kent
Health Service
Bell Field
Men's Gymnasium
Baseball
Waldo
Agriculture
Dairy
Commerce
Chemistry
East Quadrangle
Library
Shepard
President
Withycombe
Mines
Engineering Laboratory
Physics
Industrial Arts
Heating Plant
Dry Kiln
Armory
Paleontology
Museum
Pharmacy
Education
Administration
Atterson
S. 15th St.
N. 15th St.
Jefferson Street
East Campus
Monroe Street
S. 9th St.
Campus Gates
Campus Plan
Oregon State College
Corvallis

1942

June

S	M	T	W	T	F	S
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7	8	9	10	11	12	13
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July

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August

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September

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November

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December

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27	28	29	30	31	----	----

ACADEMIC CALENDAR

1942 Summer Sessions

June 20, *Saturday*.....First session begins

July 25, *Saturday*.....First session ends

July 25, *Saturday*.....Second session begins

August 29, *Saturday*.....Second session ends

Fall Term 1942-43

September 18, *Friday*.....First faculty meeting (4:00 o'clock)

September 21-26, *Monday to Saturday*..Freshman Week and Registration for all students entering for the first time

September 26, *Saturday*....Registration of students who have previously been in attendance

September 28, *Monday*.....Classes begin

October 10, *Saturday*....Latest day for addition of new courses or new registrations

November 11, *Monday*.....Armistice Day, holiday

November 26-29, *Thursday to Sunday*..... ..... Thanksgiving vacation

November 21, *Saturday*.....Latest day for dropping courses

December 12, *Saturday*.....Classes end

December 14-18, *Monday to Friday*.....Final examinations

December 18, *Friday*.....Fall term ends

SEVENTY-FIFTH YEAR

Winter Term 1942-43

January 4, *Monday*.....Registration

January 5, *Tuesday*.....Classes begin

January 16, *Saturday*..Latest day for addition of new courses or new registrations

February 20, *Saturday*.....Latest day for dropping courses

March 13, *Saturday*.....Classes end

March 15-19, *Monday to Friday*.....Final examinations

March 19, *Friday*.....Winter term ends

Spring Term 1942-43

March 29, *Monday*.....Registration

March 30, *Tuesday*.....Classes begin

April 10, *Saturday*.....Latest day for addition of new courses or new registrations

May 15, *Saturday*....Latest day for dropping courses

May 31, *Monday*.....Memorial Day holiday

June 5, *Saturday*.....Classes end

June 5, *Saturday*.....Alumni Day

June 6, *Sunday*.....Baccalaureate Service

June 7, *Monday*.....Seventy-third Annual Commencement

June 7-11, *Monday to Friday*.....Final examinations

June 11, *Friday*.....Spring term ends

1943 Summer Sessions

June 26, *Saturday*.....First session begins

July 31, *Saturday*.....Second session begins

1943

January

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February

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March

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June

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20	21	22	23	24	25	26
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July

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18	19	20	21	22	23	24
25	26	27	28	29	30	31

Part I

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Oregon State College

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MARGARET MCLOUGHLIN LANGAN.....Secretary to the President

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EDWIN MONROE SMITH, B.S.D.....Business Manager Emeritus
ARTHUR ALONZO BROOKS.....Chief Requisition Clerk
MAE JOSEPHINE NUSBAUM.....Salary Clerk
RUTH WAGNER.....Cashier

* On sabbatical leave 1941-42.

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GEORGIA CHAPMAN BIBEE, B.S.....Supervisor of Memorial Union Dining Service

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MURRAY BATES, M.A., M.D.....Assistant Physician
EMILY FLUELLIN BOLCOM, M.D.....Assistant Physician
ERNA PLAGEMAN, R.N.....Supervising Nurse
MABEL DARELIUS, R.N.....Nurse
MARY RICHTER, R.N.....Nurse
ELIZABETH PITBLADO IRISH, R.N.....Laboratory Technician
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ELEANOR SHERMAN, R.N.....Nurse
ARDA ULEN, R.N.....Nurse
VALERA AMORT, R.N.....Nurse
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HELEN HICKS.....Secretary

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FRED MERLE SHIDELER, M.S.....Assistant in News Bureau
ETHEL E ALLEN, B.S.....Assistant Editor of Publications

LIBRARY

LUCY MAY LEWIS, A.B., B.L.S.....Librarian
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CATHARINE ANNE GARRETT, A.B., B.S. in L.S.....Circulation Assistant
EMMY LOU BOWMAN, A.B., B.S. in L.S.....Circulation Assistant
DORA HIMMELSBACH COSTELLO, B.Ed., B.S. in L.S.....Serials Assistant
LORETTA GAYLORD FISHER, A.B., B.S.....Reference Assistant

ETHEL EUGENIA PATTEN, B.A., B.S. in L.S.....Reclassification Cataloger
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IDA CATHERINE HILBERS, M.A.....Continuations Cataloger
SAM E KEETON, M.S.....Science Room Assistant
HELEN FOSS SHUMAKER, A.B.....Circulation Assistant
ELIZABETH DOLLEY, M.S.....Orders Assistant
LOREN GLENN STRAWN, M.A.....Reference Assistant
WILDA THOMPSON, B.A., B.A. in L.S.....Serials Assistant
GRACE ELIZABETH BEECHER, B.A., B.S. in L.S.....Reference Assistant
CECILE FERN BOLIN, B.A.....Catalog Assistant
LAVERNE MARIE PRUDEN, B.A., B.A. in L.S.....Reserve Librarian
ELEANOR ROSS, M.A.....Documents Cataloger
CARRIE HELEN THORY.....Secretary

PHYSICAL PLANT

LOUIS NAPOLEON TRAVER.....General Superintendent of Physical Plant
ERVIN EARL BARKLOW, B.S.....Superintendent of Campus Surveys, Roads and Walks, Sewer Maintenance, and Fire Protection
ELMER POLIC JACKSON, B.S.....Superintendent of Buildings
ARTHUR LEE PECK, B.S., B.A.....Superintendent of Campus
MARK CLYDE PHILLIPS, B.M.E.....Superintendent of Heating
DONALD BRUCE STUART.....Superintendent of Light and Power
CHARLES GEORGE WILTSHIRE....Superintendent of Plumbing and Steam Fitting
CECILE SMITH.....Secretary

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GEORGE YOULLE MARTIN, B.S.....Superintendent of College Press and Clerical Exchange
HELEN LUCILE HOLGATE, B.S.....Manager of Clerical Exchange

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BELVA DIXON, B.S.....Schedule Clerk
MARGARET SHUPE .....Recorder
JEAN OGLESBY, B.S.....Secretary

STUDENT WELFARE, PERSONNEL, AND PLACEMENT

ULYSSES GRANT DUBACH, Ph.D.....Dean of Men
BUENA MARGASON MARIS, M.S.....Dean of Women
CARL WALTER SALZER, Ed.M.....Head of Personnel and Placement Service

ERNEST WILLIAM WARRINGTON, M.A.....Director of Religious Education
EDWARD CHRISTOPHER ALLWORTH, B.S., LL.D.....Manager and Secretary, Memorial Union
PERCY PHILIP LOCEY, M.A.....General Manager of Student Activities
LORNA COLLAMORE JESSUP, B.S.....Assistant Dean of Women
DAN WILLIAMS POLING, M.S.....Assistant to the Dean of Men
CLYTIE MAY WORKINGER.....Placement Secretary
EMMA SERENA COE, B.A.....Employment and Housing Secretary

ALUMNI OFFICE

WARREN ALASKA REID, B.S.....Manager, Alumni Association
EUNICE ESTHER COURTRIGHT, B.S.....Records Clerk, Alumni Association

State College Staff*

FREDERICK MAURICE HUNTER, Ed.D., LL.D., Chancellor, Oregon State System of Higher Education; Professor of Education.

A.B., (1905), Nebraska; A.M. (1919), Columbia; Ed.D. (1925), California; LL.D. (1930), Colorado College; LL.D. (1932), University of Colorado; LL.D. (1939) Nebraska. Faculty, Nebraska (1911-12); City Superintendent of Schools, Lincoln, Nebraska (1912-17), Oakland, California (1917-28); Chancellor, University of Denver (1928-35); Professor (1935—), Oregon State. Chancellor, State System (1935—).

WILLIAM JASPER KERR, D.Sc., LL.D., Chancellor Emeritus, Oregon State System of Higher Education.

B.S. (1885), Utah; B.S. in Didactics (1894), D.Sc. (1896), General Education Board, Utah; LL.D. (1921), Idaho; LL.D. (1938), Utah State. Superintendent of Schools, Smithfield, Utah (1885-87); Faculty, Brigham Young (1887-90, 1891-92), Utah (1892-94); President, Brigham Young (1894-1900); President, Utah State (1900-07); President, Oregon State (1907-32); Chancellor, State System (1932-35); Chancellor Emeritus (1935—); Director of Research in Production and Marketing, State System (1935-38).

FRANCOIS ARCHIBALD GILFILLAN, Ph.D., Acting President; Dean of the School of Science; Professor of Chemistry; General Manager, Oregon Institute of Marine Biology.

B.S. (1918), Ph.G. (1918), Ph.C. (1920), Oregon State; Ph.D. (1921), Yale. Faculty, Florida (1925-27); Instructor (1918), Assistant Professor (1922-25), Associate Professor (1927-30), Professor (1930—), Department Head (1930-38), Dean (1938—), Acting President (1941—), Oregon State. Dean and Director of Science, State System (1938—), General Manager, Institute of Marine Biology, State System (1939—).

GEORGE WILCOX PEAVY, M.S.F., Sc.D., LL.D., President Emeritus; Dean Emeritus of the School of Forestry; Professor of Forestry.

B.L. (1895), M.S.F. (1905), Sc.D. (1936), Michigan; LL.D. (1937), Willamette. High-School Principal (1895-96), Jackson, Michigan, (1896-1901), Flint, Michigan; Professor (1910—), Dean (1913—), President (1934-40), President Emeritus (1940—), Oregon State. Dean and Director of Forestry, State System (1932—).

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†ORVILLE DANIEL ADAMS, M.S., Associate Professor of Vocational Education.

B.S. (1932), M.S. (1932), Oregon State. Director of Vocational Education (1926—), State of Oregon; Associate Professor (1926—), Oregon State.

RUSSEL MONROE ADAMS, M.S., Supervising Teacher in Agricultural Education.

B.S. (in Agric.) (1918), Washington State; M.S. (in Voc. Ed.) (1930), Oregon State. Supervising Teacher (1935—), Oregon State.

ARTHUR ALLEN ADRIAN, A.M., Instructor in English.

B.S. in Ed. (1929), Kansas State Teachers College (Emporia); A.M. (1935), Kansas. Faculty, Kansas (1936-39); Instructor (1940—), Oregon State.

WALTER MILO ADRION, M.A., Assistant Professor of Physical Education.

B.S. (1924), Michigan State Normal; M.A. (1939), Michigan. Faculty, Michigan State Normal College (1928-34); Assistant Professor (1939—), Oregon State.

ARTHUR LEMUEL ALBERT, M.S., E.E., Professor of Communication Engineering.

B.S. (1923), M.S. (1926), E.E. (1939), Oregon State. Instructor (1923-29), Assistant Professor (1929-34), Associate Professor (1934-38), Professor (1938—), Oregon State.

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* State College officers of administration, instruction, and extension at Corvallis having the rank of instructor or above are listed as of March 1941. The FACULTIES of the several academic divisions are printed under the school or divisional sections of this Catalog.

An INDEX OF NAMES of members of the State College staff, of United States Department of Agriculture scientists at the State College, and of interinstitutional officers of administration, research, and extension of the Oregon State System of Higher Education is printed on page 419.

† On leave of absence, 1942-43.

ETHEL E ALLEN, B.S., Assistant Editor of Publications.

B.S. (1916), Oregon State. Assistant in Library (1917-22), Assistant in Publications (1923-31), Assistant Editor (Assistant Professor) (1931—), Oregon State.

LEONARD JOHN ALLEN, M.S., Assistant State 4-H Club Leader.

B.S. (1914), M.S. (1915), Oregon State. Assistant State 4-H Club Leader (Assistant Professor) (1915-23), (Associate Professor) (1923—), Oregon State.

IRA SHIMMIN ALLISON, Ph.D., Professor of Geology.

A.B. (1917), Hanover College; Ph.D. (1924), Minnesota. Faculty, Minnesota (1920-28); Professor (1928—), Oregon State.

DELMAR ISAAC ALLMAN, Dr.P.H., Associate Professor of Hygiene.

B.S. (1928), Michigan State Normal College; M.S. (1931), Dr.P.H. (1936), Michigan. Faculty, Michigan State Normal College (1928-37); Associate Professor (1937—), Oregon State.

EDWARD CHRISTOPHER ALLWORTH, B.S., LL.D., Manager and Secretary of Memorial Union.

B.S. (1916), LL.D. (1929), Oregon State. Manager and Secretary (Assistant Professor 1936) (1925—), Oregon State.

VALERA AMORT, R.N., Nurse, Student Health Service.

R.N. (1939), St. Vincent School of Nursing. Nurse (1941), Oregon State.

WILLIAM BALLANTYNE ANDERSON, Ph.D., Professor Emeritus of Physics.

B.S. (1901), M.S. (1903), Ph.D. (1906), Wisconsin. Faculty, Iowa State (1905-14); Professor (1914-39), Professor Emeritus (1939—), Oregon State.

JAMES LOUIS ARMOUR, Sergeant, Instructor in Military Science and Tactics, (Field Artillery).

Instructor (1938), Oregon State.

MILDRED MARGUERITE ARNOLD, M.S., Instructor in Foods and Nutrition.

B.S. (1932), Bradley Polytechnic Institute; M.S. (1939), Chicago. Instructor (1939—), Oregon State.

WINFRED MCKENZIE ATWOOD, Ph.D., Professor of Plant Physiology.

A.B. (1907), A.M. (1910), Cornell College; M.S. (1911), Ph.D. (1913), Chicago. Instructor (1913-15), Associate Professor (1915-25), Professor (1925—), Oregon State.

HARRY GRANT AVERY, B.S., Assistant Extension Economist, Marketing.

B.S. (1930) Oregon State. County Agent, Union County (1921-41); Assistant Extension Economist, Marketing (1941—) (Associate Professor 1929-33, Professor 1933—) Oregon State.

GLENN ALMER BAKKUM, Ph.D., Professor of Sociology; Chairman of Department.

B.S. (1920), Iowa State; M.A. (1925), Columbia; Ph.D. (1928), Cornell. Faculty, University of Wichita (Department Head) (1927-35), Director of Bureau of Municipal Social Research (1930-33); Professor (1935—), Oregon State.

LAURIN BURTON BALDWIN, A.M., D.D., Assistant Professor Emeritus of English.

A.B. (1895), A.M. (1897), Philomath; A.B. (1925), California; D.D. (1910), Huntington College. Faculty, Hartsville College (1896-97), Edwards College (1899-1903), Philomath (1903-05); Instructor (1906-14), Assistant Professor (1914-25), Instructor (1925-32), Assistant Professor (1932-41), Assistant Professor Emeritus (1941—), Oregon State.

FRANK LLEWELLYN BALLARD, B.S., Editor of Agricultural Publications; Professor of Extension Methods.

B.S. (1916), Oregon State. County Agricultural Agent, New Hampshire (1916-17); Field Agent in Marketing (1917-18), Assistant County Agent Leader (1918-23), State County Agent Leader (Professor) (1923—), Vice Director of Federal Cooperative Extension Service (1934-40), Professor of Extension Methods (1939-40, 41), President (1940-41), Editor of Agricultural Publications (1941—), Oregon State.

ERVIN EARL BARKLOW, B.S., Superintendent of Campus Surveys, Roads and Walks, Sewer Maintenance, and Fire Protection.

B.S. (1927), Oregon State. Acting Superintendent (1939-41), (Assistant Professor) (1939—), Superintendent (1941—), Oregon State.

ELIZABETH MARIA BARNES, B.L.I., Associate Professor of Speech.

B.L.I. (1925), Emerson College. Faculty, Idaho (Southern Branch) (1911-15); Instructor (1922-24), Assistant Professor (1924-27), Associate Professor (1927—), Oregon State.

MURRAY BATES, M.D., M.A., Assistant Physician, Student Health Service.

B.S. (1925), M.B. (1927), M.D. (1928), M.A. (1937), Minnesota. Faculty, Stanford (1928-29): Director of Student Health, Santa Ana Junior College (1930-35); Physician and Instructor, Institute of Child Welfare, Minnesota (1935-38); Assistant Physician (Assistant Professor) (1940—), Oregon State.

HARRY LYNDEN BEARD, M.A., Assistant Professor of Mathematics; Professor of Music; Conductor of R.O.T.C. Band.

B.S. (1899), Oregon State; M.A. (1929), California. Instructor (1905-18), Assistant Professor of Mathematics (1918—), Professor of Music (1924—), Conductor (1905—), Oregon State.

EDWARD BENJAMIN BEATY, M.A., Professor of Mathematics.

B.S. (1903), Oregon State; M.A. (1916), California. Adviser of Freshmen (1916-27), Instructor (1908-12), Assistant Professor (1912-15), Associate Professor (1915-27), Professor (1927—), Oregon State.

JAMES RALPH BECK, B.S., Extension Specialist in Land Use Planning.

B.S. (1920), Oregon State. County Agent (Washington) (1920-22); County Agent Lincoln County (1922-26), Polk County (1926-36) (Associate Professor 1929-35), Professor (1935—), Rural Service Specialist (1936-40), Land Use Planning Specialist (1940—), Oregon State.

BEATRICE BUTLER BEEBE, M.A., Instructor in English.

A.B. (1908), Illinois; LL.B. (1912), M.A. (1925), Oregon. Instructor (1934—), Oregon State.

GRACE ELIZABETH BEECHER, B.A., B.S. in L.S., Reference Assistant, Library.

B.A. (1933) Depauw; B.S. in L.S. (1941) Illinois. Reference Assistant (1941—) Oregon State.

NOEL LINDSAY BENNION, M.S., Extension Poultryman.

B.S. (1928), Utah State; M.S. (1932), Kansas State. Extension Poultryman (Assistant Professor) (1937—), Oregon State.

FREDERICK BERCHTOLD, A.M., Litt.D., Professor Emeritus of English.

B. in Ped. (1879), State Normal, Berne, Switzerland; A.B. (1899), A.M. (1910), National University; Litt.D. (1934), Oregon State. Faculty (1884—), Professor and Department Head (1900-32), Professor Emeritus (1932—), Oregon State.

RALPH STEPHEN BESSE, M.S., Assistant Director of Agricultural Experiment Station.

B.S.A. (1913), M.S. (1915), Missouri. Faculty, Missouri (1913-15); State Leader of County Agents, Wyoming (1915-18); Extension Specialist in Farm Management (1922-25), Associate Professor (Research) (1926-28), Assistant to Director, Agricultural Experiment Station (1929-31), Assistant Director (Professor) (1932—), Oregon State.

GEORGIA CHAPMAN BIBEE, B.S., Assistant Professor of Institution Economics; Supervisor of Memorial Union Dining Service.

B.S. (1925), Washington. Assistant Manager of University Commons, Washington (1925-26); Instructor (1926-30), Assistant Director of Dormitories (1926-29), Assistant Professor and Supervisor of Memorial Union Dining Service (1930—), Oregon State.

FLORENCE BLAZIER, Ph.D., Professor of Home Economics Education; Head of Department.

Ph.B. (1918), Chicago; M.A. (1924), Indiana; Ph.D. (1932), Minnesota. Faculty, Iowa State (1918-20), Indiana (1920-24); Associate Professor (1924-25), Professor and Department Head (1925—), Oregon State.

*ESTHER WOOD BODNER, B.S., Supervising Teacher in Home Economics Education.

B.S. (1933), Oregon State. Supervising Teacher (1939—), Oregon State.

EMILY FLUELLIN BOLCOM, M.D., Assistant Physician, Student Health Service.

M.D. (1912), Women's Medical College of Pennsylvania; Assistant Physician (Assistant Professor) (1941—), Oregon State.

* On leave of absence.

CECILE FERN BOLIN, B.A., Catalog Assistant, Library.

B.A. (1937) California; Certificate in Librarianship (1938) California. Cataloger (1939-41), University of Colorado; Catalog Assistant (1941—) Oregon State.

WALTER BENO BOLLEN, Ph.D., Associate Professor of Bacteriology; Associate Bacteriologist, Agricultural Experiment Station.

B.S. (1921), M.S. (1922), Oregon State; Ph.D. (1924), Iowa State. Assistant Chemist, Idaho (1925-29); Assistant Professor and Associate Bacteriologist (1929-37), Associate Professor (1937—), Oregon State.

DANIEL ERNEST BONNELL, M.S., Acting Instructor in Entomology.

B.S. (1936), M.S. (1938), Washington. Acting Instructor (1941—), Oregon State.

ARTHUR GEORGE BRISTOW BOUQUET, M.S., Professor of Vegetable Crops; Horticulturist (Vegetable Crops), Agricultural Experiment Station.

B.S. (1906), Oregon State; M.S. (1930), Cornell. Faculty, Cornell (1929-30); Assistant Professor (1911-15), Associate Professor (1915-16), Professor and Horticulturist (1916—), Oregon State.

FLORENCE BOWDEN, B.A., Instructor in Cello, Violin, and Fretted Instruments; Conductor of Mandolin and Guitar Club.

B.A. (1915), Oregon. Instructor and Conductor (1911—), Oregon State.

EMMY LOU BOWMAN, A.B., B.S. in L.S., Circulation Assistant, Library.

A.B. (1929), Colorado College; B.S. in L.S. (1936), Denver. Library Assistant, Denver Public Library (1929-36); Periodical Assistant (Instructor) (1937-41), Circulation Assistant (1941—), Oregon State.

WILLIAM PINGRY BOYNTON, Ph.D., Sc.D., Professor Emeritus of Physics.

A.B. (1890), A.M. (1893), Dartmouth; Ph.D. (1897), Clark; Sc.D. (1937), Oregon. Faculty, Southern California (1890-93), California (1897-1901); Dean and Professor, California College (1901-03); Faculty (1903-32), Department Head (1906-32), Oregon; Professor (1932-37), Professor Emeritus (1937—), Oregon State.

*JAMES JOSEPH BRADY, Ph.D., Associate Professor of Physics.

B.A. (1927), Reed College; M.A. (1928), Indiana; Ph.D. (1931), California. Faculty, St. Louis (1932-37); Assistant Professor (1937-39), Associate Professor (1939—), Oregon State.

JOHN CLAUDE BRALY, Curator of Oölogy.

Curator of Oölogy (1941—), Oregon State.

VERA HASKELL BRANDON, Ph.D., Professor of Child Development.

B.S. (1911), B.S. (1927), M.S. (1929), Oregon State; Ph.D. (1936), Iowa. Instructor (1928-34), Assistant Professor (1934-36), Associate Professor (1936-37), Professor (1937—), (Acting Department Head 1934-36, 1937-38), Oregon State.

PHILIP MARTIN BRANDT, A.M., Professor of Dairy Husbandry; In Charge, Division of Animal Industries; Head of Department of Dairy Husbandry; Acting Head of Department of Animal Husbandry; Dairy Husbandman, Agricultural Experiment Station.

B.S. (1910), A.M. (1913), Missouri. Faculty, Missouri (1911-14); Assistant to Dean and Director (1914-17), Professor (Department Head) and Dairy Husbandman (1917—), Division Head (1933—), Oregon State.

*CLARENCE IVAN BRANTON, B.S., Assistant Agricultural Engineer, Agricultural Experiment Station.

B.S. (1933), Oregon State. Assistant Agricultural Engineer (1933—), Oregon State.

JEANNETTE ALICE BRAUNS, M.S., Instructor in Physical Education for Women.

B.S. (1930), Battle Creek College; M.S. (1941), Oregon State. Instructor (1930—), Oregon State.

LE ROY BREITHAUPT, B.S., Extension Agricultural Economist, (Statistics, News, and Outlook).

B.S. (1910), Oregon State. Superintendent, Harney Branch Experiment Station (1911-18), County Agent, Harney County (1914-15), Malheur County (1920-26), Extension Agricultural Economist (Professor) (1926—), Oregon State.

* On leave of absence.

LEWIS CLEMENCE BRITT, Ph.D., Associate Professor of Pharmacy.

Ph.C. (1925), B.S. (1926), Oregon State; M.S. (1929), Ph.D. (1937), Washington. Instructor (1926-28), Assistant Professor (1930-39), Associate Professor (1939—), Director of Drug Laboratory, Oregon State Board of Pharmacy (1930-41), Oregon State.

WALTER SHELDON BROWN, M.S., D.Sc., Professor of Horticulture; Head of Department; Horticulturist, Agricultural Experiment Station.

A.B. (1899), D.Sc. (1931), Alfred; B.S.A. (1904), Cornell; M.S. (1906), Wisconsin. Faculty, Wisconsin (1904-06); Head of Department of Horticulture and Forestry, Winona Agricultural Institute (1906-08); Extension Specialist (1913-19), Pomologist (1919-20), Professor (Department Head) and Horticulturist (1920—), Oregon State.

JESSE FRANKLIN BRUMBAUGH, A.M., Professor Emeritus of Psychology.

A.B. (1894), DePauw; LL.B. (1911), South Dakota; A.M. (1902), Chicago. Faculty Dakota Wesleyan (South Dakota) (1897-1901), DePauw (1902-06), State Law School of South Dakota (1909-13); Professor (1915-38), Professor Emeritus (1938—), Oregon State.

CLARENCE JOSEPH BUDELIER, B.S., Instructor in Logging Engineering.

B.S. (1917), Oregon State. Instructor (1935—), Oregon State.

DELOSS EVERETT BULLIS, M.S., Associate Chemist (Small Fruit and Hop Investigations), Agricultural Experiment Station.

B.S. (1917), M.S. (1929), Oregon State. Assistant Chemist (1917-34), Associate Chemist (Associate Professor) (1934—), Oregon State.

URIEL SELLERS BURT, Extension Specialist in Visual Instruction.

Assistant in Information and Exhibits (1919-30), Assistant Professor (1925), Extension Specialist in Visual Instruction (Associate Professor and Department Head) (1930—), Oregon State.

JOHN COLE BURTNER, B.S., In Charge of News Bureau and Extension Editor.

B.S. (1923), Oregon State. Instructor in Journalism (1924-28), Associate Director of News Service and Agricultural Press Editor (Associate Professor) (1929-32), Associate (In Charge) in News Bureau (1932—), Extension Editor (1933—), Oregon State.

*JOSEPH SHIREY BUTTS, Ph.D., Professor of Biochemistry.

B.S. (1926), Florida; M.S. (1928), Fordham; Ph.D. (1933), Southern California. Faculty, Massachusetts State (1928-29), Southern California (1929-39); Professor (1939—), Oregon State.

*WILLIAM ELMER CALDWELL, Ph.D., Associate Professor of Chemistry.

Met.E. (1924), Montana School of Mines; B.S. (1928), Ph.D. (1930), Wisconsin. Faculty, Wisconsin (1929); Assistant Professor (1930-39), Associate Professor (1939—), Oregon State.

CECIL CLARENCE CALLARMAN, M.S., Assistant Professor of Secretarial Science.

B.A. (1932) Oklahoma Central State Teachers College; M.S. (1940), Oklahoma Agricultural and Mechanical College. Assistant Professor (1941—), Oregon State.

EDWARD CLEVELAND CALLAWAY, M.S., Instructor in Chemistry.

B.S. (1909), M.S. (1911), M.S. (1931), Oregon State. Faculty, North Pacific College (1918-27); Dean of Pharmacy, Des Moines University (1927-29); Instructor (1929—), Oregon State.

PAUL CARPENTER, B.S., Extension Agricultural Economist (Marketing).

B.S. (1932), Minnesota. Extension Economist, Montana State (1928-34); County Agent, Polk County (1920-23), Baker County (1923-27); Extension Economist (Professor) (1934—), Oregon State.

LUCY ADA CASE, M.A., Extension Nutritionist; Associate Professor of Foods and Nutrition.

A.B. (1911), Wisconsin; M.A. (1912), Columbia; B.S. (1924), Minnesota. Nutrition Specialist, Wisconsin (1922-24); Extension Specialist (1924—), (Assistant Professor 1924-35), (Associate Professor 1935—), Oregon State.

GERARD JOSEPH CAVANAGH, B.S., Instructor in Civil Engineering.

B.S. (in C.E.) (1940), Oregon State. Instructor (1940—), Oregon State.

*WILLARD JOSEPH CHAMBERLIN, Ph.D., Associate Professor of Entomology.

B.S. (1915), M.S. (1921), Oregon State; Ph.D. (1930), Stanford. Instructor (1916-21), Assistant Professor (1921-28), Associate Professor (1928—), Oregon State.

* On leave of absence.

OTHNIEL ROBERT CHAMBERS, Ph.D., Professor of Psychology; In Charge of Department.

A.B. (1922), M.A. (1922), Indiana; Ph.D. (1926), Ohio State. Faculty, Ohio State (1923-26), Texas (1926-29); Professor (1929—), Oregon State.

MERWYN PIERCE CHAPMAN, D.V.M., Instructor and Research Assistant (Veterinary Medicine), Agricultural Experiment Station.

D.V.M. (1938) Kansas State. Instructor and Research Assistant (1940—), Oregon State.

HERBERT ELLSWORTH CHILDS, Ph.D., Assistant Professor of English.

A.B. (1926), Oberlin College; Ph.D. (1932), Washington. Faculty, Washington (1929-33), Boise Junior College (1933-35); Instructor (1935-38), Assistant Professor (1938—), Oregon State.

BERT EINAR CHRISTENSEN, Ph.D., Associate Professor of Chemistry.

B.S. (1927), Washington State; Ph.D. (1931), Washington. Instructor (1931-34), Assistant Professor (1934-41), Associate Professor (1941—), Oregon State.

JOHN MYERS CLIFFORD, Extension Secretary.

Secretary to Dean and Director of Agriculture (1918-20), Extension Secretary (Assistant Professor) (1933—), Oregon State.

RILEY JENKINS CLINTON, Ed.D., Professor of Education.

A.B. (1922), B.S. (in Ed.) (1922), M.A. (1925), Missouri; Ed.D. (1933), Stanford. Cubberley Teaching Fellow and Research Assistant in Psychology, Stanford (1927-28), Professor of Education, Hawaii (Summer, 1939); Associate Professor (1928-33), Professor (1933—), Oregon State.

HAROLD COCKERLINE, B.S., Associate Professor of Electrical Engineering.

B.S. (in E.E.) (1912), Oregon. Instructor (1921-23), Assistant Professor (1923-40), Associate Professor (1940—), Oregon State.

RALPH COLBY, Ph.D., Associate Professor of English.

B.A. (1916), M.A. (1917), Minnesota; Ph.D. (1928), Illinois. Faculty, Illinois (1919-28); Assistant Professor (1928-37), Associate Professor (1937—), Oregon State.

RALPH ORVAL COLEMAN, M.A., Professor of Physical Education; Director of Intramural Sports; Head Coach of Baseball.

B.S. (1918), Oregon State; M.A. (1929), Columbia. Instructor (1919-25), Associate Professor (1925-30), Director of Intramural Sports (1929—), Professor (1930—), Oregon State.

HOWARD NOTSON COLMAN, B.A., B.S., Assistant Professor of Dairy Husbandry.

B.A., B.S. (1915), Nebraska. Faculty, Nebraska (1915-18), Washington State (1918-20); Instructor (1920-25), Assistant Professor (1925—), Oregon State.

EDWARD HURSHAL COMBS, Sergeant, Instructor in Military Science and Tactics (Field Artillery Unit).

Instructor (1932—), Oregon State.

WILBUR TARLETON COONEY, B.S., Instructor in Poultry Husbandry; Research Assistant Poultry Husbandry, Agricultural Experiment Station.

B.S. (1937), Oregon State. Instructor and Research Assistant (1937—), Oregon State.

MARTIN PORTMAN COOPEY, B.S.; Instructor in Civil Engineering.

B.S. (1936), Oregon State. Instructor (1941—), Oregon State.

GODFREY VERNON COPSON, M.S., Acting Associate Dean of Science; Professor of Bacteriology; Head of Department; Bacteriologist in Charge, Agricultural Experiment Station.

B.S. (1911), M.S. (1913), Oregon State. Assistant Professor (1915-18), Acting Department Head (1918-20), Professor (Department Head) and Bacteriologist in Charge (1920—), Oregon State.

HUBERT ELMER COSBY, Professor of Poultry Husbandry; Head of Department; Poultry Husbandman, Agricultural Experiment Station.

Extension Poultryman, United States Department of Agriculture (1917-19); Extension Poultryman, Missouri Poultry Experiment Station (1919-20); Extension Poultryman (1920-36), Associate Professor (1924-36), Professor (Department Head) and Poultry Husbandman (1936—), Oregon State.

DORA HIMMELSBACH COSTELLO, B.Ed., B.S. in L.S., Serials Assistant, Library.

B.Ed. (1921), B.S. in L.S. (1938), Washington. Library Assistant, Louisiana State (1925-26); California State Library (1926-33); Yakima Public Library (1934-37); Library Assistant (1923-25), Reference Assistant (Instructor) (1937-41), Serials Assistant (1941—), Oregon State.

HELEN JULIA COWGILL, M.A., Assistant State 4-H Club Leader.

B.S. (1913), B.S. (1916), Oregon State; M.A. (1931), Washington. Assistant State Club Leader (Associate Professor) (1914—), Oregon State.

GEORGE BRYAN COX, M.S., Professor of Industrial Arts; Professor of Industrial Education; Head of Department; Director of Engineering Shops.

B.S. (1919), Missouri; M.S. (1940), Oregon State. Faculty, Missouri (1916-19), Huntsville (Texas) State Teachers College (1920-21), Wisconsin (1921-27); Professor (Department Head) and Director of Engineering Shops (1927—), Oregon State.

WILLARD MAXSON CRAIG, M.B.A., LL.B., Assistant Professor of Business Administration.

B.S. (1926), Oregon State; M.B.A. (1931), LL.B. (1936), Washington. Faculty, Grinnell College (1930-33), Washington (1936-38); Assistant Professor (1938—), Oregon State.

THEODORE PUTMAN CRAMER, B.S., Business Manager; Acting Executive Secretary.

B.S. (1918), Oregon State. Manager (Professor and Department Head) (1940—), Acting Executive Secretary (1941—), Oregon State. Assistant Comptroller, State System (1940—).

JOHN EARL CRAWFORD, Sergeant, Instructor in Military Science and Tactics (Infantry Unit).

Instructor (1937—), Oregon State.

FREDERICK ALEXANDER CUTHBERT, M.L.D., Associate Professor of Landscape Architecture.

A.B. (1926), M.L.D. (1928), Michigan. Faculty, Oregon (1932—); Instructor (1928-30), Assistant Professor (1930-34), Associate Professor (1934—), Oregon State.

LEONARD LLEWELLYN CUTSHALL, Major, Infantry, A.B., Associate Professor of Military Science and Tactics, Director of Infantry Unit.

A.B. (1929), University of Southern California; Graduate (1939), Infantry School. Assistant Professor (1940-41), Associate Professor (1941—), Oregon State.

ROBERT HORNIMAN DANN, M.A., Associate Professor of Economics; Associate Professor of Sociology.

B.A. (1917), Pacific College; M.A. (1918), Haverford College. Faculty, Guilford College (1920-24); Instructor (1927-28), Assistant Professor (1928-35), Associate Professor (1935—), Oregon State.

MABEL DARELIUS, R.N., Nurse, Student Health Service.

R.N. (1912), Eugene Hospital School of Nursing; Graduate work (1917) Los Angeles County Hospital. Nurse (1921—) (Instructor 1937), Oregon State.

GEORGE BALFOUR DAVIS, B.S., Instructor in Farm Management; Research Assistant (Farm Management), Agricultural Experiment Station.

B.S. (1939), Oregon State. Research Assistant in Land Use Planning, Bureau of Agricultural Economics, United States Department of Agriculture and Oregon Agricultural Experiment Station cooperating (1940-41); Research Assistant (1941—), Oregon State.

RALPH MAURICE DAVIS, First Lieutenant, Corps of Engineers, B.S., Assistant Professor of Military Science and Tactics.

B.S. (1936), Oregon State; Graduate (1940), Engineer School. Assistant Professor (1940—), Oregon State.

RICHARD HAROLD DEARBORN, A.B., E.E., Dean of the School of Engineering and Industrial Arts; Director of the Engineering Experiment Station.

A.B. (1895), Willamette; E.E. (1900), Cornell. Faculty, Oregon (1901-14), Department Head (1903-14); Professor and Department Head (1914-37), Acting Dean and Director (1933-35), Dean and Director (1935—), Oregon State. Dean and Director of Engineering, State System (1935—), System Representative for Engineering, Science, and Management Defense Training Program (1941—).

IVAN CUMMING DEARMOND, B.S., Extension Soil Conservationist.

B.S. (1928) Oregon State. Extension Soil Conservationist (1941—), Oregon State.

ALBERT HAROLD DEHNER, M.B.A., Instructor in Business Administration.

B.B.A. (1936), M.B.A. (1939), Ohio State. Faculty, Fenn College (1939-40); Ohio State (1940); Instructor (1940—), Oregon State.

DANIEL BARTON DELOACH, Ph.D., Associate Professor of Agricultural Economics; Associate Agricultural Economist, Agricultural Experiment Station.

B.S. (1927), Oregon State; M.A. (1932), Ph.D. (1935), California. Faculty, Oregon Normal School (1928-31); Research Assistant, Giannini Foundation in Agricultural Economics, California (1934-35); Assistant Professor (1935-38), Associate Professor of Business Administration (1938-39), Associate Professor and Associate Agricultural Economist (1939—), Oregon State.

JAMES DEMITH, Sergeant, Field Artillery, Instructor in Military Science and Tactics (Field Artillery Unit).

Instructor (1937—), Oregon State.

MARJORIE HAMPTON DENNIS, M.S., Instructor in Physical Education for Women.

B.S. (1937), University of Tampa; M.S. (1939), Wellesley College. Faculty, University of Rochester (1939-40); Instructor (1940—), Oregon State.

ERNEST MILTON DICKINSON, D.V.M., M.S., Professor of Veterinary Medicine; Veterinarian, Agricultural Experiment Station.

D.V.M. (1927), Ohio State; M.S. (1935), Oregon State. Junior Veterinarian, University of California (1936-38); Assistant Poultry Pathologist (1927-36), Associate Professor and Associate Veterinarian (1938-41), Professor and Veterinarian (1941—), Oregon State.

ROLAND EUGENE DIMICK, M.S., Professor of Fish and Game Management; Head of Department; Wildlife Conservationist in Charge, Agricultural Experiment Station.

B.S. (1926), M.S. (1931), Oregon State. Assistant (1929-31), Assistant Professor (1931-36), Professor (Department Head) and Wildlife Conservationist in Charge (1936—), Oregon State.

JAMES VICTOR DIXON, M.S., Assistant Professor of Physical Education; Assistant Coach of Football, Field and Boxing Coach.

B.S. (1931), M.S. (1939), Oregon State. Instructor (1927-40), Assistant Coach (1927—), Assistant Professor (1940—), Oregon State.

SAMUEL MICHAEL DOLAN, C.E., Associate Professor of Civil Engineering.

C.E. (1910), Notre Dame. Instructor (1910-14), Assistant Professor (1914-20), Associate Professor (1920—), Oregon State.

ELIZABETH DOLLEY, M.S., Orders Assistant, Library.

B.A. (1937), Pomona; M.S. (1938), New York University; B.S. (1940), Columbia. Orders Assistant (Instructor) (1940—), Oregon State.

ERNST JOHN DORNFELD, Ph.D., Instructor in Zoology.

B.S. (1933), Marquette; M.A. (1935), Ph.D. (1937), Wisconsin. Faculty, Wisconsin (1935-37), Oklahoma (1937-38); Instructor (1938—), Oregon State.

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B.S. (1927), Iowa State; D.V.M. (1936), Ohio State; M.S. (1941), Oregon State. Instructor (1937-38), Assistant Professor and Assistant Veterinarian (1938—), Oregon State.

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A.B. (1907), Greenville College (Illinois); M.A. (1916), Ph.D. (1918), Illinois. Faculty, Greenville College (1908-14), Illinois (1914-18); Assistant Professor (1918-22), Associate Professor (1922-29), Professor and Agricultural Economist (1929—), Oregon State.

ULYSSES GRANT DUBACH, Ph.D., Dean of Men; Professor of Political Science; Head of Department.

A.B. (1908), Indiana University; M.A. (1909), Harvard; Ph.D. (1913), Wisconsin. Professor and Department Head (1913—), Dean of Men (1924—), Oregon State.

MAY DU BOIS, M.S., Assistant Professor of Home Economics Education.

B.S. (1931), M.S. (1939), Colorado State. Faculty, Colorado State (1937-39); Assistant Professor (1939—), Oregon State.

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B.S. (1917), Rutgers; M.S. (1922), California; Ph.D. (1929), Stanford. Fruit Specialist, New Jersey Department of Agriculture (1917); County Club Leader, Wyoming (1919-20); Faculty, California (1920-29); Professor (1929—), Horticulturist (1933—), Oregon State.

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B.S. (1925), Iowa State; M.A. (1939), Columbia. Faculty, Graceland College (Iowa) (1929-30); Instructor (1939—), Oregon State.

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B.Arch. (1936), Oregon. Instructor (1936—), Oregon State.

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B.S. (1936), M.S. (1938) Washington. Faculty, Washington (1938-1941). Assistant Professor (1941—), Oregon State.

JOSEPH WALDO ELLISON, Ph.D., Professor of History.

A.B. (1917), M.A. (1919), Ph.D. (1923), California. Faculty, California (1922-24); Instructor (1924-27), Assistant Professor (1927-34), Associate Professor (1934-37), Professor (1937—), Oregon State.

JOHN ROBERT ELTING, Captain, Field Artillery, B.A., Assistant Professor of Military Science and Tactics.

B.A. (1932), Stanford. Assistant Professor (1940—), Oregon State.

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B.S. (in Ind. Engr.) (1941), Northwestern. Instructor (1941—), Oregon State.

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B.S. (1932), Oregon State. Instructor and Research Assistant (1937—), Oregon State.

JOHN LEO FAIRBANKS, Professor of Art and Architecture; Head of Department.

Cert. (1906), Beaux Arts, Paris; Cert. (1909), Academie Julien, Paris; Cert. (1909), Colorossi, Paris. Extension Instructor, Utah and Utah State (1918-22); Professor and Department Head (1923—), Oregon State.

NATHAN FASTEN, Ph.D., Professor of Zoology; Head of Department.

B.S. (1910), College of the City of New York; Ph.D. (1914), Wisconsin. Head of Biology Department, Marshall College (1910-11); Faculty, Wisconsin (1911-14), Washington (1914-20); Associate Professor (1920-21), Professor and Department Head (1921—), Oregon State.

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GRANT STEPHEN FEIKERT, M.S., E.E., Assistant Professor of Electrical Engineering.

B.S. (in E.E.) (1930), M.S. (in Physics) (1932), E.E. (1937), Oregon State. Assistant Engineer (1929-33), Chief Engineer, Radio Station KOAC (1933—), Assistant Professor (1938—), Oregon State.

JAMES WILLIAMS FERGUSON, Ph.D., Assistant Professor of Chemistry.

A.B. (1929), Miami; A.M. (1931), Oberlin; Ph.D. (1934), Michigan. Instructor (1936-39), Assistant Professor (1939—), Oregon State.

MARGARET LOUISE FINCKE, Ph.D., Associate Professor of Foods and Nutrition.

A.B. (1921), Mount Holyoke; A.M. (1932), Ph.D. (1935), Columbia. Associate Professor (1935—), Oregon State.

HAROLD ETHAN FINNELL, M.S., Assistant Professor of Farm Crops; Assistant Agronomist, Agricultural Experiment Station.

B.S. (1934), M.S. (1936), Oregon State. Assistant Extension Specialist (1936-37), Assistant Professor and Assistant Agronomist (1937—), Oregon State.

LORETTA GAYLORD FISHER, A.B., B.S., Reference Assistant.

A.B. (1930), Willamette; B.S. (1938), Columbia. Circulation Assistant (1938-39), Reserve Librarian (Instructor) (1938), (1939-41), Reference Assistant (1941—), Oregon State.

ROBERT ESTES FORE, Ph.D., Associate Professor of Farm Crops; Associate Agronomist, Agricultural Experiment Station.

B.S. (1929), Iowa State; M.S. (1931), Ph.D. (1935), Illinois. Assistant Professor and Assistant Agronomist (1935-39), Associate Professor and Associate Agronomist (1939—), Oregon State.

DOROTHY BOURKE FOX, B.A., Assistant Professor of Art.

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B.S. (1929), Oregon State. Instructor (1920-29), Assistant Professor (1929-35), Associate Professor (1935—), Oregon State.

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B.S. (1925), Maine; Ph.D. (1928), Wisconsin. Faculty, Oregon (1928-32); Assistant Professor (1932—), Oregon State.

ALMA CATHERINE FRITCHOFF, M.A., Professor of Clothing, Textiles, and Related Arts; Head of Department.

B.A. (1917), Nebraska; M.A. (1925), Columbia. Faculty, Wayne State Normal (1916-18), Nebraska (1923-25); Instructor (1918-22, 1925-29), Professor and Department Head (1929—), Oregon State.

JOHN FULTON, M.S., Professor Emeritus of Chemistry.

B.S. (1892), M.S. (1900), Oregon State. Instructor (1893-95), Acting Station Chemist (1896), Assistant Professor (1897), Associate Professor (1899), Professor (1901-40), Department Head (1907-40), Professor Emeritus (1940—), Oregon State.

JOHN CLIFTON GARMAN, Ph.M., Assistant Professor of Physics.

B.S. (in E.E.) (1922), Oregon State; Ph.M. (1933), Wisconsin. Instructor (1923-34), Assistant Professor (1934—), Oregon State.

HENRY MERLE GARRETSON, Captain, Field Artillery, B.S., Assistant Professor of Military Science and Tactics.

B.S. (1932), Oregon State; Graduate (1937), Field Artillery School. Assistant Professor (1940—), Oregon State.

CATHARINE ANNE GARRETT, A.B., B.S., Circulation Assistant, in Charge of McDonald Room, Library.

A.B. (1926), Grinnell College; B.S. in L.S. (1932), Denver. Periodical Assistant, Library, Nebraska (1935); General Assistant, Library (1935-41), Circulation Assistant (1941—), Oregon State.

EVRA ALTA GARRISON, M.A., Assistant Professor of Foods and Nutrition.

B.S. (1923), Nebraska; M.A. (1930), California. Instructor (1930-33), Assistant Professor (1933—), Oregon State.

DOROTHY GATTON, M.A., Associate Professor of Clothing, Textiles, and Related Arts.

A.B. (1925), M.A. (1933), Washington. Faculty, Iowa State (1930-31); Assistant Professor, Rhode Island State (1933-40); Associate Professor (1940—), Oregon State.

HEBER HOWARD GIBSON, A.M., Professor of Agricultural Education; Head of Department.

A.B. (1909), Denison University (Ohio); A.M. (1912), Columbia. Faculty, Cornell (1912-14), Kearney State Normal School (Nebraska) (1914-15), Iowa State (1915-17); State Supervisor of Agricultural Education, Vermont (1917-19); Faculty, Arizona (1919-21); Professor and Department Head (1921—), Oregon State.

GILBERT LEE GIFFORD, M.B.A., Instructor in Business Administration.

B.B.A. (1930), M.B.A. (1938), Washington. Faculty, Washington (1936-38), Iowa (1938-39); Instructor (1939—), Oregon State.

EARL C GILBERT, Ph.D., Professor of Physical Chemistry; Chairman of Department.

B.S. (1916), M.S. (1917), Hiram College; Ph.D. (1922), Chicago. John Simon Guggenheim Fellowship, Polytechnic Institute, Copenhagen, and University of Berlin (1928-29); Instructor (1917-21), Assistant Professor (1922-25), Associate Professor (1925-30), Professor (1930—), Chairman of Department (1940—), Oregon State.

HELEN MARGARET GILKEY, Ph.D., Associate Professor of Botany; Curator of Herbarium.

B.S. (1907), M.S. (1911), Oregon State; Ph.D. (1915), California. Faculty, California (1915-16); Assistant (1907-09), Instructor (1909-11), Assistant Professor (1918-27), Associate Professor (1927—), Oregon State.

AMORY TINGLE GILL, B.S., Head Coach of Basketball; Instructor in Physical Education.

B.S. (1925), Oregon State. Instructor and Coach (1926—), Oregon State.

WILLIAM JAMES GILMORE, B.C.E., B.S., Professor of Agricultural Engineering; Head of Department.

B.C.E. (1909), B.S. (in A.E.) (1911), Iowa State. Faculty, Manitoba Agricultural (1911-15); Professor and Department Head (1915—), Oregon State.

GEORGE WALTER GLEESON, Ch.E., Professor of Chemical Engineering; Head of Department; In Charge of Mining Engineering.

B.S. (in Ch.E.) (1928), M.S. (in M.E.) (1934), Ch.E. (1936), Oregon State. Engineering Experiment Station Fellow (1928-29), Instructor in Mechanics and Materials (1929-32), Assistant Professor of Chemical Engineering (1932-36), Associate Professor in Charge of Department (1936-37), Professor and Department Head (1937—), Oregon State.

BURDETTE GLENN, M.S., Professor of Highway Engineering.

B.S. (1919), Michigan; M.S. (1931), Iowa State. Faculty, Michigan (1918-19); Instructor (1919-22), Assistant Professor (1922-34), Associate Professor (1934-37), Professor (1937—), Oregon State.

DELMER MORRISON GOODE, M.A., Editor of Publications.

B.A. (1916), Minnesota; M.A. (1938), Oregon State. Assistant (1919-20), Assistant Editor (1920-22), Associate Editor (Associate Professor) (1922-35), Editor (Professor) (1935—), Oregon State.

KENNETH LLEWELLYN GORDON, Ph.D., Associate Professor of Zoology.

A.B. (1923), Colorado College; M.A. (1925), Missouri; Ph.D. (1936), Cornell. Instructor (1927-29), Assistant Professor (1929-40), Associate Professor (1940—), Oregon State.

SAMUEL HERMAN GRAF, M.E., M.S., Professor of Mechanical Engineering; Head of Department; Director of Engineering Research.

B.S. (in E.E.) (1907), E.E. (1908), B.S. (in M.E.) (1908), M.E. (1909), M.S. (in E.E.) (1909), Oregon State. Assistant in Mechanical Engineering (1908-09), Instructor (1909-12), Assistant Professor of Experimental Engineering and Department Head (1912-14), Professor (1914-20), Professor of Mechanics and Materials (Department Head) (1920-34), Professor of Mechanical Engineering (1934—), (Acting Department Head 1934-35, Department Head 1935—), Associate Director of Engineering Experiment Station (1927-28), Director of Engineering Research (1928—), Oregon State.

IRIS GRAY, B.Mus., Instructor in Piano.

B.Mus. (1933), Cincinnati Conservatory of Music. Instructor (1933—), Oregon State.

KENNETH WIESNER GRAY, M.S., Associate Entomologist, Agricultural Experiment Station.

B.S. (1930), M.S. (1935), Oregon State. Assistant (1930-37), Assistant Entomologist (Assistant Professor) (1937-41), Associate Entomologist (Associate Professor) (1941—), Oregon State.

*JAMES RINALDO GRIFFITH, C.E., Professor of Structural Engineering.

B.S. (in C.E.) (1916), C.E. (1922), Purdue. Faculty, Washington State (1920-23), Armour Institute of Technology (1925-29); Professor (1929—), Oregon State.

FRANCIS PRIDAY GRIFFITHS, Ph.D., Assistant Professor of Fish and Game Management; Assistant Conservationist, Agricultural Experiment Station.

B.S. (1927), Washington; M.S. (1933), Ph.D. (1935), Massachusetts State. Faculty (1927-30), Massachusetts State; Instructor (1936-38), Assistant Professor and Assistant Economic Biologist (1938—), Oregon State.

CLIFFORD GROBSTEIN, Ph.D., Instructor in Zoology.

B.S. (1936), College of the City of New York; M.A. (1938), Ph.D. (1940), California at Los Angeles. Instructor (1940—), Oregon State.

JOSEPH ROY HAAG, Ph.D., Chemist (Animal Nutrition), Agricultural Experiment Station.

B.S. (1918), M.S. (1923), Pennsylvania State; Ph.D. (1926), Minnesota. Assistant Chemist, Rhode Island Agricultural Experiment Station (1919-20); Assistant, Maryland Agricultural Experiment Station (1920-21); Faculty, Pennsylvania State (1921-23, 1926-27), Minnesota (1923-26); Chemist (Professor) (1927—), Oregon State.

BRUCE JACKSON HAHN, M.S., Supervising Teacher in Industrial Education.

B.S. (1930), M.S. (1941), Oregon State. Supervising Teacher (1939—), Oregon State.

JOHN MELVILLE HALEY, B.S., Assistant Irrigation Engineer, Agricultural Experiment Station.

B.S. (1936), California. Assistant Irrigation Engineer (Assistant Professor) (1940—), Oregon State.

LUCIA HALEY, A.B., Assistant Librarian.

A.B. (1911), Washington; Graduate (1912), Pratt Institute. Reference and Circulation Librarian (1919-20), Acting Librarian (1920-21), Montana; Head of Serials Department (1921—), Assistant Librarian (Associate Professor) (1925—), Oregon State.

GAINEFORD J HALL, M.A., Instructor in English.

B.A. (1929), Gonzaga; M.A. (1934), Washington. Faculty, Gonzaga (1929-30); Instructor (1936—), Oregon State.

PRESTON CLARENCE HAMMER, Ph.D., Instructor in Mathematics.

A.B. (1934), Kalamazoo College; A.M. (1935), Michigan; Ph.D. (1938), Ohio State. Instructor (1940—), Oregon State.

ELMER HANSEN, M.S., Assistant Horticulturist (Pomology), Agricultural Experiment Station.

B.S. (1934), M.S. (1935), Oregon State. Assistant Horticulturist (Assistant Professor) (1935—), Oregon State.

HENRY PAUL HANSEN, Ph.D., Instructor in Botany.

Ph.B. (1930), Ph.M. (1931), Wisconsin; Ph.D. (1937), Washington. Faculty, Wyoming (1937-38), Research Associate, Washington (1938-39); Instructor (1939—), Oregon State.

LEROY ROBERT HANSEN, M.S., Instructor in Range Agronomy; Research Assistant (Agronomy), Agricultural Experiment Station.

B.S. (1937), Nebraska; M.S. (1939), Oregon State. Agrostology Artist, Nebraska (1937); Instructor and Research Assistant (1939—), Oregon State.

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B.S. (1930), Utah State; M.S. (1932), Oregon State. Instructor (1933-34), Assistant County Agent (Malheur County) (1934-36); Assistant Professor and Assistant Agronomist (1936-41), Associate Professor and Associate Agronomist (1941—), Oregon State.

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HENRY HARTMAN, M.S., Professor of Horticulture; Horticulturist (Pomology), Agricultural Experiment Station.

B.S. (1917), Washington State; M.S. (1922), Iowa State. Faculty, Iowa State (1917-18); Pomologist, United States Department of Agriculture (1931-32); Instructor, Assistant Professor, Associate Professor (1919-29), Professor and Horticulturist (1929—), Oregon State.

EDWARD WINSLOW HARVEY, Ph.D., Assistant Professor of Food Industries, Assistant Food Industries Technologist, Agricultural Experiment Station.

B.S. (1934), M.S. (1937), Ph.D. (1940), Massachusetts State. Faculty, Massachusetts State (1934-38); Instructor (1939), Assistant Professor (1940—), Oregon State.

MILES BRAYTON HATCH, M.S., Assistant Chemist, Agricultural Experiment Station.

B.S. (1930), Washington State; M.S. (1934), Oregon State. Assistant Chemist (Assistant Professor) (1931—), Oregon State.

ELZIE VANCE HERBERT, Orders Librarian.

Secretary and Orders Clerk (1920-27), Head of Orders Department (1927—), Oregon State. Head of Orders Department (Assistant Professor), State System (1932—).

BERTHA EMMA HERSE, B.S., B.L.S., Reference Librarian.

B.S. (1910), B.S. (1928), Oregon State; B.L.S. (1924), New York State Library School. Reference Librarian (Assistant Professor) (1924—), Oregon State.

JACK ERNEST HEWITT, M.A., Associate Professor of Physical Education.

A.B. (1928), California; M.A. (1932), Oregon. Faculty, Oregon (1929-32); Assistant Professor (1932-39), Associate Professor (1939—), Oregon State.

IDA CATHERINE HILBERS, M.A., Continuations Cataloger, Library.

B.A. (1922), Arizona; Certificate of Librarianship (1928), M.A. (1932), California. Assistant cataloger, Berkeley Public Library, (1928-40); Continuations Cataloger (Instructor) (1940—), Oregon State.

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B.S. (1925), Oregon State; M.S. (1927), Kansas State; Ph.D. (1936), Cornell. Faculty, Cornell (1933-34, 1935-36); Instructor (1927-28), Assistant Professor (1928-30), Associate Professor (1930-39), Professor and Agronomist (1939—), Oregon State.

EDWIN THOMAS HODGE, Ph.D., Professor of Economic Geology.

B.A. (1913), M.A. (1914), Minnesota; Ph.D. (1916), Columbia. William Bayard Cutting Traveling Fellowship, Columbia (1915-16); Department Head, University of British Columbia (1917-20); Faculty, Oregon (1920-32); Professor (1932—), Oregon State.

GLENN WILLIS HOLCOMB, M.S., Professor of Civil Engineering.

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HELEN LUCILE HOLGATE, B.S., Manager of Clerical Exchange.

B.S. (1895), Oregon State. Instructor (1900-05), Secretary to Director of Agricultural Experiment Station (1906-14), Manager of Clerical Exchange (Assistant Professor 1917) (1914—), Oregon State.

ARTHUR BERRY HOLMES, Sergeant, Engineers, Instructor in Military Science and Tactics (Engineer Unit).

Instructor (1940—), Oregon State.

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B.S. (1927), M.S. (1931), Ph.D. (1938) Wisconsin. Faculty, Pennsylvania State (1927-28), Wisconsin (1928-41); Associate Professor (1941—) Oregon State.

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INGOMAR M HOSTETTER, Ph.D., Assistant Professor of Mathematics.

B.S. (1918), Ph.D. (1935), Washington. Faculty, Washington (1935-36), Howard College (1937-41); Assistant Professor (1941—), Oregon State.

ARTHUR DOUGLAS HUGHES, M.S., Assistant Professor of Mechanical Engineering.

B.S. (in M.E.) (1932), M.S. (1932), Washington State. Faculty, Washington State (1932-36); Instructor (1938-40), Assistant Professor (1940—), Oregon State.

KATHERINE WHIPPLE HUGHES, M.A., Science Reference Librarian.

B.S. (in L.S.) (1928), Washington; M.A. (1939), Oregon State. Reference Assistant (Instructor) (1929-39), Science Reference Librarian (Assistant Professor) (1939—), Oregon State.

MARY BOWMAN HULL, Curator, Horner Museum of the Oregon Country.

Secretary to the President (1910-32); Secretary to the Chancellor, State System (1932-36); Assistant Curator (Assistant Professor) (1936-39), Curator (1939—), Oregon State.

MELISSA HUNTER, M.A., Professor of Institution Economics; Head of Department; Director of Dormitories.

A.B. (1917), Indiana; M.A. (1925), Chicago. Faculty, Utah State (1918-19); Special Adviser to the Director of Dormitories, Miami (1925-26); Instructor and Assistant Director of Dormitories (1919-23), Professor (Department Head) and Director of Dormitories (1926—), Oregon State.

FLORENCE LOUISE HUPPRICH, M.A., Instructor in Physical Education for Women.

B.S. (1923), M.A. (1926), Wisconsin. Faculty, Lake Forest College (1923-25); Texas State College for Women (1926-37); Instructor (1937—), Oregon State.

GEORGE ROBERT HYSLOP, B.S., Professor of Farm Crops; Head of Department; In Charge, Division of Plant Industries; Agronomist, Agricultural Experiment Station.

B.S. (1907), Ohio State. Special Investigator, Bureau of Agricultural Economics, United States Department of Agriculture; Instructor, Assistant Professor, Associate Professor (1908-16), Professor (Department Head) and Agronomist (1916—), Division Head (1933—), Oregon State.

ELEANOR CALDWELL INGALLS, M.A., Instructor in English.

B.L. (1902), Ohio Wesleyan; B.S. (1904), Illinois; M.A. (1927), Columbia. Instructor (1923-32, 1934—), Oregon State.

ELIZABETH PITBLADO IRISH, B.S., R.N., Nurse, Student Health Service.

B.S. (1939), Portland; R.N. (1939), St. Vincent's School of Nursing. Nurse (Instructor) (1939—), Oregon State.

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B.S. (1920), Oregon State. County Agricultural Agent, Wasco County (1920-22); Extension Specialist (Associate Professor 1929-33), (Professor 1933) (1922-26); (1929—), Oregon State.

ELMER POLIC JACKSON, B.S., Superintendent of Buildings.

B.S. (in E.E.) (1904), Oregon State. Instructor (1903-04), Assistant Professor (1908-12), Professor of Industrial Arts (1913), Superintendent of Buildings (1914-36), Superintendent of Buildings (Associate Professor) (1936—), Oregon State.

KATE WETZEL JAMESON, Ph.D., Emeritus Dean of Women.

A.B. (1905), A.M. (1910), Ohio Wesleyan; A.M. (1914), Ph.D. (1916), Wisconsin. Faculty, Wisconsin (1914-16); Professor of German and Dean of Women, Montana (1916-20); Head of German Department and Dean of Women, Arizona (1920-23); Professor and Dean (1923-41), Emeritus Dean (1941—), Oregon State.

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B.S. (1937), Pennsylvania State; M.S. (1940), California. Faculty, Pennsylvania State (1937-38); Instructor (1940—), Oregon State.

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B.S. (1921), Brigham Young; M.A. (1936), New York. District Extension Agent (1930-34), Home Agent-at-Large (1936), Utah State; Extension Specialist (Assistant Professor) (1936—), Oregon State.

WILLIAM ARTHUR JENSEN, M.S., Executive Secretary.

M.S. (1932), Oregon State. Faculty, Utah State (1904-07); Secretary (1907-15), Executive Secretary (Professor and Dean) (1915—), Oregon State.

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B.S. (1923), Oregon State. Head of Home Economics Department, Flagstaff (Arizona) State Teachers College (1923-27); Assistant Dean of Women (1927—), Oregon State.

JAMES RALPH JEWELL, Ph.D., LL.D., Dean of the School of Education.

A.B. (1903), Coe; M.A. (1904), Ph.D. (1906), Clark; LL.D. (1927) Arkansas. Director of Training, South West Louisiana Industrial Institute (1906-07); Faculty, Kansas State Teachers (1907-09, 1911-13); Dean, College of Education, Arkansas (1913-27); Dean and Professor (1927—), Oregon State. Dean of Education, Director of High School Teacher Training, State System (1932—).

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B.S.S. (1937), Oregon State. Secretary to Chancellor, State System (1937-38), Assistant in Athletics (1940—), Oregon State.

KERMIT MILTON JOHNSON, Captain, Field Artillery, B.S., Assistant Professor of Military Science and Tactics.

B.S. (1931), Oregon State; Graduate (1939), Field Artillery School, (1941) Command and General Staff School. Assistant Professor (1940—), Oregon State.

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IDWAL RALPH JONES, Ph.D., Professor of Dairy Husbandry; Dairy Husbandman, Agricultural Experiment Station.

B.S. (1920), Pennsylvania State; M.S. (1921), Rutgers; Ph.D. (1925), Minnesota. Faculty, Clemson College (1921-23); Caleb Dorr Fellow, Minnesota (1923-25); Assistant Professor (1925-29), Associate Professor and Associate Dairy Husbandman (1929-40), Professor and Dairy Husbandman (1940—), Oregon State.

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B.S. (1903), California; M.S.A. (1914), Cornell. Chemist, Idaho (1906-18); Faculty, Idaho (1908-18), Director of Idaho Agricultural Experiment Station (1914-18); Professor and Chemist in Charge (1919—), Oregon State.

KENNETH STANTON JONES, D.V.M., Instructor and Research Assistant (Veterinary Medicine), Agricultural Experiment Station.

D.V.M. (1936), Ohio State. Instructor and Research Assistant, (1941—), Oregon State.

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B.S. (1926), Oregon State; M.S. (1928), Iowa State. Assistant Entomologist (Assistant Professor) (1930-41), Associate Entomologist (Associate Professor) (1941—), Oregon State.

WILLIAM ERNEST JORGENSEN, B.A., Engineering Librarian.

B.A. (1938), Idaho; Certificate in Librarianship (1940), California. Circulation Assistant (1940-41), Engineering Librarian (1941—), Oregon State.

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LOUISA AMES KANIPE, B.S., Junior Botanist, Assistant Seed Technologist, Assistant Professor of Farm Crops.

B.S. (1933), Colorado State. Staff, New Jersey Experiment Station (1934-36), U. S. Department of Agriculture (1936—), Assistant Seed Technologist and Assistant Professor (1941—), Oregon State.

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B.S. (1935), M.S. (1936), Certificate in Library Science (1940), California. Faculty, California (1937-39); General Assistant (1940-41), Science Room Assistant (1941—), Oregon State.

CURTIS KELLEY, M.B.A., Associate Professor of Business Administration.

A.B. (1925), M.B.A. (1927), Washington. Faculty, Washington (1926-27); Assistant (1927-28), Instructor (1928-29), Assistant Professor (1929-36), Associate Professor (1936—), Oregon State.

JOHN M KIERZEK, Ph.D., Professor of English.

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ARTHUR SOLOMON KING, M.S., Extension Specialist in Soils.

B.S. (1928), M.S. (1930), Oregon State. District Agent (Baker, Union, and Wallowa Counties) (1929), Extension Soil Conservationist (1937-39), Extension Specialist (Instructor 1929-35, Assistant Professor 1935—) (1930-37, 1939—), Oregon State.

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ELIZABETH WILEY KLEINSORGE, A.M., Associate Professor of Clothing, Textiles, and Related Arts.

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PAUL XENOPHON KNOLL, M.S., Assistant Professor of Speech.

B.S. (1923), M.S. (1930), Oregon State. Faculty, Oregon (1933-34); Instructor in Economics and Sociology (1927-28), Instructor in Speech (1928-33), Assistant Professor (1934—), Oregon State.

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RUTH CAROLINE KRUEGER, M.A., Circulation Librarian.

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A.B. (1909), Willamette; A.M. (1925), Stanford. Instructor (1910-15), Assistant Professor (1925-29), Associate Professor (1929—), Oregon State.

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Bachellier en Lettres (1934), Université de Montpellier, France; B.S. (1938), B.S. (in Aero.E.) (1939), M.S. (in Aero.E.) (1940), California Institute of Technology. Instructor (1940—), Oregon State.

ADELAIDE VALETA LAKE, M.A., Instructor in Journalism.

B.A. (1920), Oregon; M.A. (1942), Oregon State. Assistant (1939-40), Instructor (1940—), Oregon State.

CARL LAMANNA, Ph.D., Instructor and Research Assistant in Bacteriology.

B.S. (1936), M.S. (1937), Ph.D. (1939) Cornell. Faculty, Cornell (1936-39), Washington State (1940-41); Instructor (1941—), Oregon State.

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A.B. (1921), Baker University, Kansas; M.A. (1938), Iowa. Extension Specialist (Assistant Professor) (1938—), Oregon State.

CLAIR VAN NORMAN LANGTON, Dr.P.H., Ed.D., Director of the Division of Physical Education; Professor of Physical Education; Professor of Hygiene; Technical Counselor in Sanitary Engineering, Engineering Experiment Station.

B.S. (1923), M.S. (1925), Dr.P.H. (1928), Michigan; Ed.D., (1938), Oregon. Faculty, Michigan (1923-26), Director of Hygiene Laboratory (1926-28); Dean of the School of Health and Physical Education (1929-32), Professor and Director (1928—), Oregon State.

LLOYD Q LARSE, Ed.M., Assistant Professor of Secretarial Science.

B.S. (1928), Oklahoma A. & M.; Ed.M. (1935), Oklahoma. Assistant Professor (1940—), Oregon State.

OLOF LARSELL, Ph.D., Sc.D., Dean of Graduate Division.

B.S. (1910), Sc.D. (1937), Linfield; M.A. (1914), Ph.D. (1918), Northwestern. Faculty, Linfield (1910-15), Northwestern (1915-18, 1920-21, 1926), Wisconsin (1918-20), California (1931-32), University of Oregon Medical School (1921—); Dean and Director Graduate Division, Director State System (1938—).

*HERBERT REYNOLDS LASLETT, Ph.D., Professor of Educational Psychology.

A.B. (1918), Kansas; A.M. (1923), Ph.D. (1926), Stanford; Certificate (1919), Universite Montpellier. Faculty, Colorado State (1923-24), Whitman College (1926-28); Associate Professor (1928-29), Director of Supervised Teaching (1930-38), Professor (1929—), Oregon State.

WILLIAM EVANS LAWRENCE, B.S., Associate Professor of Plant Ecology.

B.S. (1904), Earlham College. Faculty, Michigan State (1906-09), Oklahoma A. & M. (1909-10); Instructor (1910-15), Assistant Professor (1915-20), Associate Professor (1920—), Oregon State.

WILLIAM DORR LEGG, M.L.D., Assistant Professor of Landscape Architecture.

A.B. (1926), B.M., M.L.D. (1928), Michigan. Assistant Professor (1935—), Oregon State.

JEROME LLOYD LEMASTER, LL.B., M.A., Associate Professor of Business Administration.

LL.B. (1923), Illinois; Cert.d' A. en Droit Civile (1924), Bordeaux; M.A. (1925), Colorado. Oregon Bar (1930); American Bar Association (1935). Faculty, Illinois (1925-28); Assistant Professor (1928-29), Associate Professor (1929—), Oregon State.

ERWIN BERTRAN LEMON, B.S., Registrar.

B.S. (1911), Oregon State. Statistician, State Statistical Bureau, Oregon (1911-12); Instructor in Accounting (1912-18), Assistant Professor (1918-20), Associate Professor (1920-22), Registrar (Professor and Dean) (1922—), Oregon State.

* On leave of absence.

LUCY MAY LEWIS, A.B., B.L.S., Librarian.

A.B. (1905), B.L.S. (1906), Illinois. Librarian, New Mexico State (1906-11); Assistant Librarian and Cataloger (1911-18), Assistant Librarian and Reference Librarian (1918-20), Acting Librarian (1920), Librarian (Department Head) (1920-32), Librarian (Professor and Dean) (1932—), Oregon State. Director of Libraries, State System (1932—).

MARY EUNICE LEWIS, Ph.D., Associate Professor of Modern Languages.

B.S. (1906), Pacific College; A.B. (1907), Penn College; M.A. (1918), California; Ph.D. (1939), Washington. Faculty, Pacific College (1910-26); Instructor (1928-30), Assistant Professor (1930-33), Associate Professor (1933—), Oregon State.

MORTIMER REED LEWIS, C.E., Irrigation and Drainage Engineer, Agricultural Experiment Station.

B.S. (1906), C.E. (1925), Utah. Faculty, Idaho (1922-28), Head of Department (1925-28); Irrigation and Drainage Engineer (Professor) (1928—), Oregon State.

HARRY ARTHUR LINDGREN, B.S., Extension Animal Husbandman.

B.S. (in Agric.) (1911), Oregon State. Superintendent, John Jacob Astor Experiment Station (1913-15); Agriculturist (Colorado Reclamation Projects) (1915-19); Extension Animal Husbandman (1920—), (Associate Professor 1920-37, Professor 1937—), Oregon State.

PERCY PHILIP LOCEY, M.A., Director of Intercollegiate Athletics; Director of Educational Activities; Professor of Physical Education.

B.S. (1924), Oregon State; M.A. (1935), California. Professor of Athletic Education, Denver (1932-36); Assistant Professor (1936-38), Professor (1938—), Oregon State.

EDWARD GIBSON LOCKE, Ph.D., Assistant Professor of Chemical Engineering.

B.S. (in Ch.E.) (1928), Oregon State; M.S. (1930), Ph.D. (1932), Ohio State. Faculty, Ohio State (1928-32); Assistant Professor (1936—), Oregon State.

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B.S. (1939), Oregon State. Instructor and Research Assistant (1940—), Oregon State.

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B.S. (1933), Lingnan; M.S. (1937), Ph.D. (1941), Oregon State. Instructor (1941—), Oregon State.

WALTER THOMAS LUND, M.S., Instructor-Technician in Botany.

B.S. (1930), M.S. (1932), Oregon State. Instructor-Technician (1937—), Oregon State.

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LOIS AILEEN LUTZ, M.A., Extension Specialist in Home Management.

B.S. (1932), Oregon State; M.A. (1940), Columbia. Home Agent, Lane County (1936-40); (Instructor 1936-38), (Assistant Professor 1938—), Extension Specialist (1940—), Oregon State.

EDWARD HIRAM MCALISTER, A.M., Sc.D., Professor Emeritus of Mathematics.

A.B. (1890), A.M. (1893), Sc.D. (1937), Oregon. Tutor (1891-95), Faculty, Oregon (1895-1902), Dean of the College of Engineering (1902-15), Head of Department of Mechanics and Astronomy (1915-32); Professor (1932-37), Professor Emeritus, (1937—), Oregon State.

LAURA CORNELIA MCALLESTER, B.S., Assistant Professor of Physical Education for Women.

Diploma (1906), Boston Normal School of Gymnastics; B.S. (1932), Oregon State. Faculty, North Carolina College for Women (1909-17), Oregon (1920-21); Instructor (1926-33), Assistant Professor (1933—), Oregon State.

WALTER FRASER MCCULLOCH, M.S., Assistant Professor of Forestry.

B.A. (1925), British Columbia; M.S. (1936), Syracuse (New York State College of Forestry). Director, Forest Experiment Station (1936-37), Michigan State; Assistant Professor (1937—), Oregon State.

GERTRUDE ELIZABETH MCELFRESH, A.M., Assistant Professor of English.

B.S. (1902), Oregon State; A.B. (1909), Cornell; A.M. (1924), Columbia. Instructor (1909-22), Assistant Professor (1922—), Oregon State.

BETTY JELINEK MCGLASSON, B.S., Supervising Teacher in Commercial Education.

B.S. (1933), Oregon State. Supervising Teacher (1939—), Oregon State.

CHARLES JARVIS MCINTOSH, B.S., B.S.D., Professor Emeritus of Industrial Editing.

B.S. (1893), Christian College; B.S.D. (1893), Oregon State Normal. Editor of Press Bulletins (1913-27), Instructor (1914-18), Assistant Professor (1919-20), Professor (1920-41), Professor Emeritus (1941—), Oregon State.

WILLIAM W MCKALIP, B.S., Instructor in Physical Education; Freshman Coach.

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ESTHER FLORA MCKINNEY, Accountant, School of Agriculture and Agricultural Experiment Station.

Secretary to the Director of the Agricultural Experiment Station (1920-31), Accountant, School of Agriculture and Agricultural Experiment Station (1931—), (Assistant Professor 1938—), Oregon State.

FRED ORVILLE MCMILLAN, M.S., Professor of Electrical Engineering; Head of Department.

B.S. (in E.E.) (1912), Oregon State; M.S. (in E.E.) (1919), Union College. Assistant Professor (1920-23), Associate Professor (1923-30), Research Professor (1930—), Department Head (1937—), Oregon State.

FRANK PADEN MCWHORTER, Ph.D., Plant Pathologist, Agricultural Experiment Station.

B.S. (1917), Vanderbilt; M.S. (1920), Chicago; Ph.D. (1928), Cornell. Faculty, University of the Philippines (1920-23); Pathologist, Virginia Truck Experiment Station (1924-29); Associate Pathologist (1929-32), Pathologist (Professor) (1932—), Oregon State.

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B.S. (1912), Washington State. County Agent, Washington State (1915-20); County Agent, Washington County (1920-30), Extension Horticulturist (1930—), (Professor 1929—), Oregon State.

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THOMAS THEODORE MACKENZIE, Captain, Corps of Engineers, M.S., Assistant Professor of Military Science and Tactics.

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GEORGE YOULLE MARTIN, B.S., Superintendent of College Press and Clerical Exchange.

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DONALD LYMAN MASON, B.S., Instructor in Industrial Arts.

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EARL GEORGE MASON, M.F., Professor of Forestry; Acting Dean, School of Forestry.

B.S. (1920), Oregon State; M.F. (1923), Yale. Instructor (1920-24), Assistant Professor (1924-32), Associate Professor (1932-34), Professor (1934—), Assistant to Dean (1935-38), Assistant Dean (1938-41), Acting Dean (1941—), Oregon State. Acting Dean and Director of Forestry, State System (1941—).

IDA MARTHA MATSEN, A.M., Associate Professor of Art.

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B.S. (1908), M.S. (1910), Ph.D. (1931), Purdue. Instructor (1920-24), Assistant Professor (1924-34), Associate Professor (1934—), Oregon State.

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EDWIN DAVID MEYER, M.S., Assistant Professor of Industrial Arts Education.

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AVA BERTHA MILAM, M.A., Dean of the School of Home Economics.

Ph.B. (1910), M.A. (1911), Chicago. Faculty, Iowa State (1911); Director of Home Economics and Visiting Professor, Yenching University (Peiping, China) (1922-24, 1931-32), Visiting Professor, Lingnan University (Canton, China), Kwassui College (Nagasoki, Japan), Ewha College (Seoul, Korea) (1931-32); Assistant Professor (1911-16), Professor (1916—), Dean (1917—), Oregon State. Dean and Director of Home Economics, State System (1932—).

JOHN A MILBRATH, Ph.D., Assistant Plant Pathologist.

B.S. (1934), Washington State; Ph.D. (1938), Oregon State. Research Assistant (Instructor) (1937-40), Assistant Plant Pathologist (Assistant Professor) (1940—), Oregon State.

WILLIAM EDMUND MILNE, Ph.D., Professor of Mathematics; Head of Department.

A.B. (1912), Whitman College; A.M. (1913), Ph.D. (1915), Harvard. Faculty, Bowdoin College (1915-18), Oregon (1919-32); Professor and Department Head (1932—), Oregon State.

CHARLES BUREN MITCHELL, M.A., Professor of Speech; Head of Department.

B.A. (1911), DePauw; M.A. (1912), Michigan. Faculty, Michigan State (1912-20); Professor and Department Head (1920—), Oregon State.

CHARLES ARTHUR MOCKMORE, C.E., Ph.D., Professor of Civil Engineering, Head of Department.

B.E. (1920), C.E. (1926), M.S. (1932), Ph.D. (1935), Iowa. Research Associate, Iowa (1931-32); Instructor (1921-24), Assistant Professor (1925-28), Associate Professor (1929-32), Professor (1932—), Acting Department Head (1933-34), Department Head (1934—), Oregon State.

HAROLD WILLIAM MOE, B.S., Assistant Coach of Football; Instructor in Physical Education.

B.S. (1934), Oregon State. Assistant Coach (1934—), (Instructor 1937—), Oregon State.

DELBERT WARREN MOORE, B.A., Professor of Stringed Instruments; Conductor of Orchestras.

B.A. (1933), Oregon. Professor (1935—), Oregon State.

FRED BUCKNER MORGAN, M.S., Assistant Professor of Physics.

B. Ped. (1910), Kirksville State Normal (Missouri); A.B. (1915), B.S. (1915), Missouri; M.S. (1930), Pittsburgh. Faculty, Oregon (1932-34); Instructor (1921-30), Assistant Professor (1930-32, 1934—), Oregon State.

HENRIETTA MORRIS, Sc.D., Associate Professor of Hygiene.

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VICTOR PIERPONT MORRIS, Ph.D., Dean in Charge of Secretarial Science.

B.A. (1915), M.A. (1920), Oregon; Ph.D. (1930), Columbia. Faculty, Grinnell (1922-24), Oregon (1919-20, 1926—); Instructor (1924-26), Dean in Charge (1936—), Oregon State. Dean and Director of Business Administration, State System (1936—).

HUGH ENGLE MORRISON, M.S., Assistant in Entomology.

B.S. (1927), Franklin and Marshall; M.S. (1936), Ohio. Faculty (1932, 1936, 1937), Ohio State; Assistant in Entomology (Instructor) (1937—), Oregon State.

ROGER WILLIAM MORSE, B.S., Extension Dairyman.

B.S. (1916), Washington State. County Agent, Wyoming (1921-23); County Agent, Morrow County (1923-27), Baker County (1927-30), Extension Dairyman (1930) (Associate Professor 1929-35), Professor (1935—), Oregon State.

ROY EARL MORSE, M.S., Instructor in Food Industries.

B.S. (1940), M.S. (1941), Massachusetts State. Faculty, Massachusetts State (1940-41); Instructor (1941—), Oregon State.

DON CARLOS MOTE, Ph.D., Professor of Entomology; Head of Department; Entomologist in Charge, Agricultural Experiment Station.

B.S. (1911), M.S. (1912), Ph.D. (1928), Ohio State. Parasitologist (1912-19), Ohio Experiment Station; State Entomologist (1919-23), Arizona; Associate Entomologist (1923-24), Assistant and Acting Head (1924-25), Professor (Department Head) and Entomologist in Charge (1925—), Oregon State.

DWIGHT CURTIS MUMFORD, M.S., Professor of Farm Management; Head of Department; Economist (Farm Management), Agricultural Experiment Station.

B.S. (1923), Illinois; M.S. (1925), Cornell. Faculty, Minnesota (1925-28); Associate Economist, Bureau of Agricultural Economics, Division of Farm Management and Costs (1928-33), Associate Economist, A.A.A. Wheat Section (1933-34), Agricultural Economist, A.A.A., Wheat Section (1934-35). Senior Administrative Officer, A.A.A., Division of Grains, Western Division (1935-36), Senior Extension Economist, Agricultural Economics Section, Division of Cooperative Extension Work, Extension Service, United States Department of Agriculture (1936-38); Professor (Department Head) and Economist (1938—), Oregon State.

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B.S. (1934), Oregon State. Instructor (1939—), Oregon State.

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D.V.M. (1929), M.S. (1935), Michigan State. Veterinary Pathologist, Wisconsin (1936-37); Assistant Veterinarian (1929-36), Associate Professor and Associate Veterinarian (1937-40), Associate Veterinarian (Associate Professor) (1940—), Oregon State.

RAYMOND GEORGE NEBELUNG, Dr.P.H., Associate Professor of Hygiene.

B.S. (1929), M.S. (1931), Dr. P.H. (1935), Michigan. Faculty, Michigan (1934-35); Associate Professor (1937—), Oregon State.

HERBERT BENJAMIN NELSON, M.A., Assistant Professor of English.

A.B. (1926), M.A. (1927), Colorado. Instructor (1927-34), Assistant Professor (1934—), Oregon State.

MILTON NELS NELSON, Ph.D., Professor of Economics; Head of Department; Professor of Agricultural Economics; Acting Head, Department of Business Administration.

A.B. (1915), M.A. (1917), Ph.D. (1921), Illinois. Faculty, Minnesota (1921-22), Illinois (1922-23), Ohio State (1923-26); Professor (Department Head) and Agricultural Economist (1926—), Acting Head, Department Business Administration (1939—), Oregon State.

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HARRY IRA NETTLETON, M.S.F., Assistant Professor of Forestry.

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B.S. (1918), Oregon State; M.S. (1928), Wisconsin. Faculty, Idaho (1918-19); Instructor (1919-22), Assistant Professor and Assistant Animal Husbandman (1922-40), Associate Professor and Associate Animal Husbandman (1940—), Oregon State.

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B.S. (1924), Oregon State; M.S. (1935), Massachusetts State. Instructor (1928-31), Assistant Horticulturist (1931-38), Assistant Professor (1931-40), Assistant Food Industries Technologist (1938-40), Associate Professor and Associate Food Industries Technologist (1940—), Oregon State.

HENDRIK JACOB OORTHUYS, M.S.; Instructor in Electrical Engineering.

B.S. (1934), M.S. (1938), Oregon State. Instructor (1941—), Oregon State.

DANIEL THOMAS ORDEMAN, Ph.D., Associate Professor of English.

A.B. (1920), M.A. (1922), Washington and Lee; Ph.D. (1927), Maryland. Faculty, Maryland (1924-27); Assistant Professor (1927-37), Associate Professor (1937—), Oregon State.

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B.S. (1922), M.S. (1940), Oregon State. Instructor (1936—), Oregon State.

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Ph.C. (1915), Michigan; A.B. (1922), Kansas; A.M. (1923), Nebraska; Ph.D. (1939), Washington. Faculty, Nebraska (1922-23); Instructor (1923-34), Assistant Professor (1934—), Oregon State.

JAMES CAREY OTHUS, M.E., M.S., Associate Professor of Mechanical Engineering.
M.E. (1917), Cornell; M.S. (1932), Illinois. Instructor (1921-26), Assistant Professor (1926-37), Associate Professor (1937—), Oregon State.

*ANDREA JOHNSEN OVERMAN, M.Sc., Instructor in Foods and Nutrition.
B.S. (1933), M.Sc. (1937), Nebraska. Faculty, Nebraska (1937-38); Instructor (1938—), Oregon State.

CHARLES ELMER OWENS, Ph.D., Professor of Botany and Plant Pathology; Head of Department; Plant Pathologist in Charge, Agricultural Experiment Station.
A.B. (1910), A.M. (1911), Indiana; Ph.D. (1934), Wisconsin. Instructor (1912-16), Assistant Professor (1916-20), Associate Professor (1920-30), Professor (1930—), Acting Department Head (1934-35), Department Head (1935—), Oregon State.

EARL LEROY PACKARD, Ph.D., Dean and Director of General Research; Director of Research in the Institute of Marine Biology; Professor of Paleontology; Head of Department of Geology.
A.B. (1911), M.A. (1912), Washington; Ph.D. (1915), California. Faculty, Washington (1915-16), Mississippi A. & M. (Department Head) (1917-18), Oregon (1916-32) (Department Head 1930-32); Dean of the School of Science (1932-38), Professor (Department Head) (1932—), Oregon State. Dean and Director of Science, State System (1932-38); Dean and Director of General Research, State System (1932—).

*THOMAS RICHARDSON PALMERLEE, A.M., Instructor in Mechanical Engineering.
B.S. (in Ed.) (1929), North Dakota Agricultural; A.M. (in Mth.) (1933), B.S. (in M.E.) (1939), Kansas. Faculty, Kansas (1931-33), North Carolina (1933-34), Kansas (1937-39); Instructor (1939—), Oregon State.

JOHNNIE ERNEST PARKER, Sergeant, Field Artillery, Instructor in Military Science and Tactics (Field Artillery Unit).
Instructor (1937—), Oregon State.

FRANK WINTHROP PARR, Ph.D., Professor of Secondary Education; Director of Supervised Teaching.
B.S. (1925) Illinois; M.A. (1926), Ph.D. (1929), Iowa. Associate Professor (1929-30), Professor (1930—), Director of Supervised Teaching (1938—), Oregon State.

ETHEL EUGENIA PATTEN, M.A., Reclassification Cataloger, Library.
B.A. (1926), Vassar College; B.S. in L.S. (1930), Western Reserve; M.A. (1940), California. Junior Assistant (1937-39), California; Catalog Assistant (Instructor) (1939—), Reclassification Cataloger (1940—), Oregon State.

HENRY RICHARD PATTERSON, B.S., Professor of Logging Engineering; Head of Department.
B.S. (in C.E.) (1909), Oregon. Associate Professor (1920-23), Professor and Department Head (1923—), Oregon State.

JOAN PATTERSON, B.Arch., Associate Professor of Clothing, Textiles, and Related Arts.
B.Arch. (1931), Oregon. Faculty, Oregon (1932-34); Extension Specialist (1936-40) (Instructor 1936-38), (Assistant Professor 1938-40), Associate Professor of Clothing, Textiles, and Related Arts (1940—), Oregon State.

WILLIAM HOWARD PAUL, M.S., Professor of Automotive Engineering.
B.S. (1924), M.S. (1935), Oregon State. Instructor (1926-35), Assistant Professor (1935-39), Associate Professor (1939-42), Professor (1942—), Oregon State.

OSCAR INGAL PAULSON, B.S., Acting Associate Professor of Vocational Education.
B.S. (1920), Oregon State. Director of Vocational Education pro tem (1941—), State of Oregon; Acting Associate Professor (1941—), Oregon State.

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CHARLES S PEASE, Ph.D., Associate Professor of Organic Chemistry.
B.S. (1918), Denison University; Ph.D. (1928), Ohio State. Faculty, Ohio State (1919-25); Instructor (1925-30), Assistant Professor (1930-40), Associate Professor (1940—), Oregon State.

ARTHUR LEE PECK, B.S., B.A., Professor of Landscape Architecture; Head of Department.
B.S. (1904), Massachusetts State; B.A. (1904), Boston. Faculty, Kansas State (1907-08), Oregon (1932—); Instructor (1908-09), Assistant Professor (1909-10), Associate Professor (1912-17), Professor (1917—), Department Head (1932—), Oregon State.

EMMAJEAN STEPHENS PETERSON, B.S., Supervising Teacher in Home Economics Education.
B.S. (1933), Oregon State. Supervising Teacher (1941—), Oregon State.

KARL GEORGE PETERSON, B.S., Instructor in English.
B.S. (1932), Oregon State. Instructor (1938—), Oregon State.

SIGURD HARLAN PETERSON, Ph.D., Professor of English; Head of Department.
A.B. (1910), Minnesota; Ph.D. (1931), Washington. Instructor (1911-14), Assistant Professor (1914-21), Associate Professor (1921-33), Department Chairman (1932-33), Professor and Department Head (1933—), Oregon State.

LILLIAN JEFFREYS PETRI, Professor of Piano and Music Theory.
Professor (1924—), Oregon State.

PAUL PETRI, Director of Music; Professor of Singing and Conductor of Choruses; Head of Department.
Faculty, Oregon (1933-39); Director and Professor (Department Head) (1924—), Oregon State.

MARK CLYDE PHILLIPS, B.M.E., Professor of Mechanical Engineering.
B.M.E. (1896), Oregon State. Instructor (1897-1909), Associate Professor (1909-37), Professor (1937—), Oregon State.

ERNA PLAGEMAN, R.N., Supervising Nurse, Student Health Service.
R.N. (1926), Michigan. Supervising Nurse (1929—), (Instructor 1937), Oregon State.

DAN WILLIAMS POLING, M.S., Assistant to Dean of Men; Assistant Professor of Political Science.
B.S. (1928), M.S. (1938), Oregon State. Assistant to Dean of Men, Assistant Professor (1937—), Oregon State.

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B.S. (1932), Michigan State. Technician (Instructor) (1939—), Oregon State.

ERMINE LAWRENCE POTTER, M.S., Professor of Agricultural Economics; In Charge, Division of Agricultural Economics; Agricultural Economist, Agricultural Experiment Station.
B.S. (1906), Montana State; B.S.A. (1908), M.S. (1920), Iowa State. Instructor (1908-10), Assistant Professor (1910-11), Professor and Agricultural Economist (1911—), Department Head (1913-33), In Charge of Division of Agricultural Economics (1933—), Oregon State.

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B.S. (Bus.) (1928), M.S. (1934), Idaho. Instructor (1938—), Oregon State.

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B.S. C.E. (1926), Massachusetts Institute of Technology. Assistant Professor (1941—), Oregon State.

WILBUR LOUIS POWERS, Ph.D., Professor of Soils; Head of Department; Soil Scientist in Charge, Agricultural Experiment Station.
B.S. (1908), M.S. (1909), New Mexico Agricultural; Ph.D. (1926), California. Instructor (1909-12), Assistant Professor (1912-14), Associate Professor (1914-15), Professor (1915—), Department Head and Soil Scientist in Charge (1918—), Oregon State.

LEE HUSE PRAY, Captain, Infantry, B.A., Assistant Professor of Military Science and Tactics.

B.A. (1933), Illinois; Graduate (1940), Infantry School. Assistant Professor (1941—), Oregon State.

SARA WATT PRENTISS, M.A., Professor of Child Development and Parent Education; Head of Department of Household Administration.

B.S. (1917), Oregon State; M.A. (1929), California. Faculty, California (1934-36); Instructor (1917-21), Assistant Professor (1921-31), Professor (1931—) (Acting Department Head 1932-34, Department Head 1936—), Oregon State.

FREDERICK EARL PRICE, B.S., Professor of Agricultural Engineering; Assistant Dean, School of Agriculture; Agricultural Engineer, Agricultural Experiment Station.

B.S. (1922), Oregon State. Extension Agronomist, Montana State (1922); Extension Specialist in Soils (1922-25), Extension Specialist in Soils and Agricultural Engineering (1925-28), Professor and Agricultural Engineer (1929—) (Acting Department Head 1935-37), Assistant to Dean (1935-38), Assistant Dean (1938—), Oregon State.

LAVERNE MARIE PRUDEN, B.A., Reserve Librarian, Library.

B.A. (1938) Doane College; B.A. in L.S. (1941) Washington. Reserve Librarian (1941—) Oregon State.

HOWARD WILLIAM RAABE, M.S., Assistant Professor of Physical Education.

B.S. (1935), M.S. (1939), Oregon State. Instructor (1935-41), Assistant Professor (1941—), Oregon State.

KATHERINE HASKELL READ, M.S., Assistant Professor of Child Development; Director of Nursery School.

A.B. (1925), Mills College; M.S. (1938), Purdue. Faculty, (1929-31), Instructor (1935-40), Purdue; Research Assistant and Nursery School Instructor (1940-41), California; Assistant Professor (1941—), Oregon State.

EDWIN THOMAS REED, B.S., A.B., Editor of Publications; Head of Department.

B.S. (1895), Minnesota; A.B. (1896), Harvard. Head of English Department, Moorhead (Minnesota) State Teachers College (1901-12); Editor (Professor and Department Head) (1912—), Oregon State. Editor of Publications, State System (1932—).

CHARLOTTE GOODDING REEDER, M.A., Herbarium Assistant.

B.S. (1938) New Mexico; M.A. (1939), Wyoming. Herbarium Assistant Rocky Mountain Herbarium (1938-39); Herbarium Assistant (1941—), Oregon State.

NATALIE REICHART, M.A., Assistant Professor of Physical Education for Women.

B.S. (1924), Columbia; M.A. (1929), New York. Faculty, Washington State (1924-25); Instructor (1925-37), Assistant Professor (1937—), Oregon State.

ROBERT RAY REICHART, Ed.D., Assistant Professor of English and Educational Psychology.

B.S. (1917), M.S. (1937), Oregon State; Ed.D. (1941), Oregon. Instructor (1926-32, 1934-40), Assistant Professor (1940—), Oregon State.

WARREN ALASKA REID, B.S., Manager, Oregon State College Alumni Association.

B.S. (1934), Oregon State. Manager, Alumni Association (Instructor) (1938—), Oregon State.

WILLIAM CURTIS REID, Ph.D., Instructor in Physics.

B.A. (1929), Willamette; M.S. (1932), New York University; Ph.D. (1941), Oregon State. Camp Educational Adviser C.C.C. (1934-37); Part-time Instructor (1937-41), Instructor (1941—), Oregon State.

DANIEL CLYDE REYNOLDS, B.S., M.D., Director of Student Health Service; Professor of Hygiene.

B.S. (1916), M.D. (1918), Michigan. Director Health Service, Michigan State (1920-22); Physician, Health Service, Michigan (1918-20, 1922-29); Professor and Director (1929—), Oregon State. Assistant Director of Health Services, State System (1933—).

CLARENCE WILFRED RICHEN, B.S., Instructor in Forestry.

B.S. (1935), Oregon State. Instructor (1937—), Oregon State.

MARY E RICHTER, R.N., Nurse, Student Health Service.

R.N. (1925), St. Joseph's School of Nursing. Nurse (1935—), (Instructor 1937), Oregon State.

ELIZABETH PROPHET RITCHIE, A.B., B.L.S., Catalog Librarian.

A.B. (1900), Cotner College; B.L.S. (1909), Illinois. Head Cataloger (Assistant Professor) (1920—), Oregon State.

ALFRED NATHAN ROBERTS, M.S., Instructor in Horticulture; Research Assistant, Agricultural Experiment Station.

B.S. (1939), M.S. (1941), Oregon State. Instructor and Research Assistant (1940—), Oregon State.

VIVIAN MAE ROBERTS, M.S., Assistant Professor of Foods and Nutrition.

B.S. (1928), Rockford College; M.S. (1933), University of Chicago. Faculty, Carolina New College (Burnsville, North Carolina) (1928-29); Connecticut College (1934-37); Instructor (1937-41), Assistant Professor (1941—), Oregon State.

FRANK LESLIE ROBINSON, M.Acct., Associate Professor Emeritus of Accounting.

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REGINALD HEBER ROBINSON, M.S., Chemist (Insecticides and Fungicides), Agricultural Experiment Station.

A.B. (1909), Pacific; M.S. (1912), California. Assistant Chemist, U.S. Department of Agriculture (1910-11, 1928), Principal Chemist (1934); Assistant Chemist (1911-18), Associate Chemist (1918-24), Chemist (Professor) (1924—), Oregon State.

ASA AUSTIN ROBLEY, B.S., Instructor in Industrial Arts.

B.S. (1939), Oregon State. Instructor (1939—), Oregon State.

BENJAMIN WILLIAM RODENWOLD, M.S., Assistant Professor of Animal Husbandry; Assistant Animal Husbandman, Agricultural Experiment Station.

B.S. (1920), Nebraska; M.S. (1929), Iowa State. Assistant Professor and Assistant Animal Husbandman (1920—), Oregon State.

ZELTA FEIKE RODENWOLD, M.S., Director of Women's Programs, Radio Station KOAC; Assistant Professor of Home Economics Extension.

B.S. (1919), Oregon State; M.S. (1929), Iowa State. Secretary, School of Home Economics (1919-21), Alumni Association (1921-26); Extension Economist in Home Management (1930-32), Director and Assistant Professor (1932—), General Extension Division.

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B.A. (1934), M.A. (1935), California at Los Angeles; Ph.D. (1938), Wisconsin. Instructor (1938-41), Assistant Professor (1941—), Oregon State.

ARNOLD SAMUEL ROSENWALD, B.S., D.V.M., Assistant Veterinarian.

B.S. (1930), California; D.V.M. (1936), Kansas State. Agent, Arizona and New Mexico (1930-33), Junior Veterinarian, United States Bureau of Animal Industry, California (1936), Minnesota (1936-37); Assistant Veterinarian (Instructor 1937-40, Assistant Professor 1940—) (1937—), Oregon State.

ELEANOR ROSS, M.A., Documents Cataloger, Library.

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LEWIS FRANKLIN ROTH, Ph.D., Instructor in Botany.

B.A. (1936), Miami; Ph.D. (1940), Wisconsin. Instructor (1940—), Oregon State.

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B.S. (in M.E.) (1929), Aero.E. (1930), M.S. (1935), New York University. Faculty, New York University (1929-36); Assistant Professor (1936-37), Associate Professor (1937-39), Professor (1939—), Coordinator of Civilian Pilot Training (1939—), Oregon State.

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B.S. (1934), Oregon State; Ecole Americainé des Beaux-Arts, Palais de Fontainebleau (1939). Instructor (1939—), Oregon State.

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B.S. (1919), Montana State; M.A. (1921), Columbia. Extension Specialist, South Dakota State (1921-25); Home Demonstration Agent, California (1926-30); Extension Specialist (Associate Professor) (1932-36), Professor and State Leader (1936—), Oregon State.

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CARL WALTER SALSER, Ed.M., Professor of Education; Head of Department; Head of Placement; Assistant Dean of the School of Education.

A.B. (in Ed.) (1911), Kansas State Teachers (Emporia); Ed.M. (1926), Harvard. Faculty, Kansas State Teachers (Emporia) (1911-29), Director of Extension Division (1914-29), Head of Appointment Bureau (1911-14); Professor and Department Head (1929—), Assistant to the Dean (1932-34), Assistant Dean (1934—), Oregon State.

ETHEL IDA SANBORN, Ph.D., Associate Professor of Botany; Associate Professor of Paleobotany.

B.S. (1903), South Dakota State; B.A. (1904), M.A. (1907), South Dakota; Ph.D. (1928), Stanford. Faculty, Oregon (1914-32), Curator of Herbarium (1914-17); Assistant Professor (1932-33), Associate Professor (1933—), Oregon State.

AMELIA GRACE SANSOM, B.S., Instructor in Household Administration.

B.S. (1930), Oregon State. Instructor (1940—), Oregon State.

WILLIAM ALFRED SCHOENFELD, M.B.A., Dean of the School of Agriculture; Director of the Agricultural Experiment Station; Director of Federal Cooperative Extension.

B.S. (1914), Wisconsin; M.B.A. (1922), Harvard. Faculty, Wisconsin (1912-14), Secretary of Experiment Station (1914); Faculty, Texas (1914-15); Assistant and Acting Director of Extension, Tennessee (1915-20); Lecturer, Massachusetts Institute of Technology (1921); Professor, Dean and Director (1931—), Oregon State. Dean and Director of Agriculture, State System (1932—).

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B.S. (in L.E.) (1935), B.S. (in Tech. For.) (1935), M.S. (1936), Oregon State. Instructor (1936-39), Assistant Professor (1939—), Oregon State.

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WILLIAM Ross SCOTT, Colonel, Infantry, B.S., Commandant and Professor of Military Science and Tactics.

B.S. (1904), U. S. Military Academy; Graduate, Command and General Staff (1928); Army Industrial College (1933); Infantry School, Advanced Course (1927). Commandant and Professor (1942—), Oregon State.

HENRY DESBOROUGH SCUDDER, B.S., Professor of Farm Management.

B.S. (1902), Illinois. Research Assistant, United States Department of Agriculture (1903-04); Faculty, Kansas State (1906-07); (Department Head and Economist in Charge 1907-1936), Professor (1907—), Oregon State.

HERMAN AUSTIN SCULLEN, Ph.D., Associate Professor of Entomology.

B.A. (1910), M.A. (1927), Oregon; Ph.D. (1934), Iowa State. Faculty, Iowa State (1912-18); Instructor (1921-22), Assistant Professor (1922-29), Associate Professor (1929—), Oregon State.

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EVA M SEEN, Ed.D., Professor of Physical Education for Women; Head of Department.

B.S. (1922), Knox College; M.A. (1926), Wisconsin; Ed.D. (1937), New York University. Director of Physical Education for Women, Central State Teachers (Stevens Point, Wisconsin) (1927-35); Professor (Department Head) (1935—), Oregon State.

HARRY CASE SEYMOUR, State Leader of 4-H Club Work.

State Leader of 4-H Club Work (Professor) (1916—), Oregon State.

JAMES NIVEN SHAW, B.S., D.V.M., Professor of Veterinary Medicine; Head of Department; Veterinarian, Agricultural Experiment Station.

B.S. (1915), Oregon State; B.S., D.V.M. (1917), Washington State. Instructor (1919-21, 1926-27), Assistant Professor (1927-34), Associate Professor (1934-38), Professor and Department Head Veterinarian (1938—), Oregon State.

MILTON CONWELL SHEELY, B.S., Instructor in Industrial Arts.

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JAMES WILSON SHERBURNE, Ph.D., Associate Professor of Psychology.

A.B. (1927), Greenville College; M.A. (1928), Michigan; Ph.D. (1938), Ohio State. Faculty, Wessinton Springs College (1928-29), Ohio State (1934-38); Assistant Professor (1938-40), Associate Professor (1940—), Oregon State.

FRED MERLE SHIDELER, M.S., Associate Professor of Journalism; In Charge of Department; Assistant in News Bureau.

B.S. (1927), Kansas State; M.S. (1941), Oregon State. Instructor (1929-32), Assistant Professor (1932-39), Associate Professor (1939—), Oregon State.

HELEN FOSS SHUMAKER, A.B., Circulation Assistant, Library.

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JOSEPH ELLSWORTH SIMMONS, M.S., Professor of Bacteriology; Bacteriologist, Agricultural Experiment Station.

B.S. (1916), M.S. (1918), Wisconsin. Faculty, Ontario Agricultural (1916), Wisconsin (1916-17); Instructor (1919-20), Assistant Professor (1920-26), Associate Professor and Associate Bacteriologist (1926-38), Professor and Bacteriologist (1938—), Oregon State.

WILLIAM BERKELEY SINGER, Ph.D., Instructor in Psychology.

B.A. (1932), M.A. (1934), Reed College; Ph.D. (1938), Illinois. Faculty, Reed College (1932-35, 1937-38), Illinois (1935-37); Instructor (1940—), Oregon State.

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CHARLES WESLEY SMITH, B.S., County Agent Leader.

B.S. (1921), Washington State. County Agent, Morrow County (1927-34) (Assistant Professor 1929-33), Assistant County Agent Leader (1934-40), (Associate Professor 1933-37), (Professor 1937—), County Agent Leader (1940—), Oregon State.

CLIFFORD LOVEJOY SMITH, M.S., Assistant County Agent Leader.

B.S. (1929), Oregon State; M.S. (1930), Kansas State. County Agent, Clatsop County (1931-34), (Assistant Professor 1934), Assistant Extension Economist (Associate Professor) (1940—), Assistant County Agent Leader (1941—), Oregon State.

EDWIN MONROE SMITH, B.S.D., Business Manager Emeritus.

B.S.D. (1891), Oregon Normal School. Requisition and Order Clerk (1915-18), Chief Clerk (1918-20), Assistant Manager (1920-25), Manager (Professor and Department Head) (1925-40), Business Manager Emeritus (1940—), Oregon State. Assistant Comptroller, State System (1934-40).

FRANK HERSCHEL SMITH, Ph.D., Assistant Professor of Botany.

B.S. (1929), Arkansas; M.S. (1930), Washington State; Ph.D. (1932), Wisconsin. Faculty, St. Lawrence (1935-36); Instructor (1936-40), Assistant Professor (1940—), Oregon State.

* On leave of absence.

MAHLON ELLWOOD SMITH, Ph.D., Dean of Lower Division; Dean of Lower Division and Service Departments; Director of Summer Sessions; Professor of English.

A.B. (1906), Syracuse; M.A. (1909), Ph.D. (1912), Harvard. Faculty, Syracuse (1906-08, 1912-19), Director of Summer Session (1917-19), Director of Evening Session (1918-19); Dean of School of Basic Arts and Sciences (1919-32), Director of Summer Sessions (1919—), Professor of English (1919—), Dean of Lower Division and Service Departments (1934—), Oregon State; Dean (1932—), Oregon State and Oregon. Dean and Director of Lower Division, State System (1932—).

ANDREW SOBCZYK, Ph.D., Instructor in Mathematics.

B.A. (1935), M.A. (1936), Minnesota; Ph.D. (1939), Princeton. Faculty, Princeton (1936-39); Instructor (1939—), Oregon State.

THURMAN JAMES STARKER, B.S., Professor of Forestry; Head of Department.

B.S. (1910), Oregon State. Assistant Professor (1922-23), Associate Professor (1923-24), Professor and Department Head (1924—), Oregon State.

EUGENE CARL STARR, B.S., E.E., Professor of Electrical Engineering.

B.S. (1923), E.E. (1938), Oregon State. Instructor (1927-30), Assistant Professor (1930-37), Associate Professor (1937-39), Professor (1939—), Oregon State.

ROBERT ADOLPH STEINER, M.B.A., Instructor in Economics.

B.B.A. (1933), M.B.A. (1936), Washington. Faculty, Washington (1934-36); Instructor (1937—), Oregon State.

ROSCOE ELMO STEPHENSON, Ph.D., Professor of Soils; Soil Scientist, Agricultural Experiment Station.

B.S. (1915), Purdue; M.S. (1917), Illinois; Ph.D. (1920), Iowa State. Faculty, West Virginia (1918-20), Kentucky (1920-23); Associate Professor and Associate Soil Scientist (1923-38), Professor and Soil Scientist (1938—), Oregon State.

ROBERT HOWARD STERLING, B.S., Assistant Extension Specialist in Land Use.

B.S. (1935), Oregon State. Faculty (1936-40), Montana State; Assistant County Agent-at-large (1940-41), Assistant Specialist in Land Use Planning (1941—), Oregon State.

EDWARD ALMERON STEVENS, LL.B., Assistant Professor of Physical Education; Coach of Rowing.

LL.B. (1909), Cornell. Assistant Coach of Rowing, Cornell (1911-12); Head Coach of Rowing, Harvard (1923-26); Instructor (1931-38), Assistant Professor (1938—), Oregon State.

ELMO NALL STEVENSON, Ed.D., Professor of Science Education; Head of Department.

A.B. (1927), San Jose State Teachers College; A.M. (1929), Ed.D. (1938), Stanford. Faculty, Eastern Oregon College of Education (1929-40), Professor of Science Education (1940—), Oregon State.

ALONZO L STINER, B.S., Head Coach of Football; Instructor in Physical Education.

B.S. (1927), Nebraska. Faculty, Colorado (1927-28); Instructor, Track Coach, and Assistant Football Coach (1928-33), Head Coach of Football (1933—), Oregon State.

WILLARD JOHN STONE, A.B., M.D., Assistant Physician, Student Health Service.

A.B. (1928), M.D. (1931), Oregon. Assistant Physician (1935—), (Assistant Professor 1937), Oregon State.

*ROY EDGAR STOUT, M.S., Research Assistant in Dairy Manufacturing.

B.S. (1938), M.S. (1939), Oregon State. Research Assistant (Instructor) (1939—), Oregon State.

LOREN GLENN STRAWN, M.A., Reference Assistant, Library.

B.A. (1936), M.A. (1938), Idaho; B.A. in L.S. (1940), Washington. Faculty (Chairman, Department of Languages) State Teachers College, Dickinson, North Dakota (1938-39), Washington (1940-41); Reference Assistant (Instructor), (1941—), Oregon State.

* On leave of absence.

GERTRUDE STRICKLAND, B.S., Assistant Professor of Clothing, Textiles, and Related Arts.

B.S. (1935), Texas State College for Women. Faculty, Denton (Texas) School of Industrial Arts (1912-18), Washington State (1918-19); Instructor (1920-36), Assistant Professor (1936—), Oregon State.

DONALD BRUCE STUART, Superintendent of Light and Power.

Superintendent (Assistant Professor) (1914—), Oregon State.

ERNST THEODORE STUHR, M.S., Associate Professor of Pharmacology and Pharmacognosy; In Charge of Department.

Ph.G. (1922), Ph.C. (1922), B.S. (1925), Nebraska; M.S. (1927), Florida. Faculty, Nebraska (1920-22), Florida (1925-27); Assistant Professor (1927-30), Associate Professor (1930—), Oregon State.

BERTHA WHILLOCK STUTZ, M.S., Associate Professor of Secretarial Science.

B.Ped. (1910), Missouri State Teachers; B.S. (1918), M.S. (1927), Oregon State. Instructor (1918-27), Assistant Professor (1927-29), Associate Professor (1929—), Oregon State.

EVELYN SWAIM, M.S., Supervising Teacher in Home Economics Education.

B.S. (1932), M.S. (1940), Purdue. Supervising Teacher (1941—), Oregon State.

GRANT ALEXANDER SWAN, B.S., Assistant Professor of Physical Education; Head Coach of Track.

B.S. (1922), Oregon State. Instructor (1926-30), Assistant Professor (1930—), Oregon State.

NICHOLAS TARTAR, B.S., Associate Professor Emeritus of Mathematics.

B.S. (1907), Oregon State. Instructor (1904-09), Assistant Professor (1909-29), Associate Professor (1929-32), Associate Professor Emeritus (1932—), Oregon State.

LILLIAN CATHERINE TAYLOR, M.A., Assistant Professor of Foods and Nutrition.

B.S. (1916), Illinois; M.A. (1927), Columbia. Instructor (1919-37), Assistant Professor (1937—), Oregon State.

WILLIAM LEROY TEUTSCH, B.S., Assistant Director, Federal Cooperative Extension Service.

B.S. (1920), Oregon State. County Agent (Lake County) (1920-23), District Agricultural Agent (1924-27). (Associate Professor 1924-35), Assistant County Agent Leader (Professor 1935) (1927-40), Assistant Director (1940—), Oregon State.

CHARLES EDWIN THOMAS, M.M.E., Professor of Engineering Materials.

M.E. (1913), M.M.E. (1931), Cornell. Faculty, Cornell (1914-17); Assistant Professor (1918-22), Associate Professor (1922-39), Professor (1939—), Oregon State.

ISABELLE ROSE THOMAS, B.S., Instructor in Foods and Nutrition.

B.S. (1929), Iowa State. Instructor (1941—), Oregon State.

MARION DAWS THOMAS, B.S., Assistant Extension Economist.

B.S. (1937), Oregon State. Assistant Extension Economist (1937—), Oregon State.

BENJAMIN GARRISON THOMPSON, Ph.D., Associate Entomologist, Agricultural Experiment Station.

B.S. (1918), M.S. (1924), Oregon State; Ph.D. (1939), Washington. Assistant Entomologist (Assistant Professor) (1924-39), Associate Entomologist (Associate Professor) (1939—), Oregon State.

BETTY LYND THOMPSON, M.A., Associate Professor of Physical Education for Women.

A.B. (1923), Illinois Wesleyan; M.A. (1926), Wisconsin. Faculty, Illinois Wesleyan (1924-25); Instructor (1927-30), Assistant Professor (1930-39), Associate Professor (1939—), Oregon State.

WILDA THOMPSON, B.A., Serials Assistant, Library.

B.A. (1933), B.A. in Librarianship, (1935) Washington. Catalog Assistant, (1937-41) University of Idaho; Serials Assistant (Instructor) (1941—), Oregon State.

ELNORA ELVIRA THOMSON, R.N., Professor of Nursing Education; Director of Department.

R.N. (1910), State of Illinois; R.N. (1920), State of Oregon. Executive Secretary and Director, Illinois Society for Mental Hygiene (1911-18); Director, Department of

Public Health Nursing, Chicago School of Civics and Philanthropy (1917-18, 1919-20); Director, Public Health Nursing Education, American Red Cross Tuberculosis Commission to Italy (1918-19); Director, Far-Western Office, American Child Health Association (1923-25); Professor (1920-23, 1925—), Director of Public Health Nursing (1920-23), Director of Health and Nursing Education (Portland School of Social Work) (1925-32), Director, Nursing Education, Medical School (1932—), Oregon State.

CHARLES JACKSON THURMOND, M.A., Instructor in English.

B.A. (1932), Centre College; M.A. (1933) Kentucky. Instructor (1941—), Oregon State.

EDWARD FRITCHOFF TORGERSON, B.S., Associate Professor of Soils; Associate Soil Scientist (Soil Survey), Agricultural Experiment Station.

B.S. (1914), Illinois. Faculty, Illinois (1914-18); Assistant Professor and Assistant Soil Scientist (1918-36), Associate Professor and Associate Soil Scientist (1936—), Oregon State.

LOUIS NAPOLEON TRAVER, General Superintendent of Physical Plant.

General Superintendent of Physical Plant (Professor) (1940—), Oregon State.

GLADYS TURLEY, B.S., Cert. P.H.N., Physiotherapist, Student Health Service.

B.S. (1932), R.N. (1932), Cert. P.H.N. (1932), Oregon. Supervisor of Health Service, Eastern Oregon College of Education (1933-34); Physiotherapist (Instructor), (1940—), Oregon State.

HARRIET KLEINSORGE TURNER, M.S., Supervising Teacher in Home Economics Education.

B.S. (1939), Oregon State; M.S. (1941), Wisconsin. Supervising Teacher (1941—), Oregon State.

ARDA ULEN, R.N., Nurse, Student Health Service.

R.N. (1939) St. Vincent's School of Nursing. Nurse (1941—), Oregon State.

JOHN ALBERT VAN GROOS, M.S., Associate Professor of Mathematics.

B.S. (1899), Oregon State; M.S. (1903), Yale. Instructor (1919-22), Assistant Professor (1922-39), Associate Professor (1939—), Oregon State.

WILLIAM ROY VARNER, E.E., Ph.D., Assistant Professor of Physics.

B.S. (1912), M.S. (1932), Ph.D. (1939), Oregon State; E.E. (1914), Westinghouse. Faculty, Oregon (1933-34); Instructor (1929-33, 1934-36), Assistant Professor (1936—), Oregon State.

EARNEST VANCOURT VAUGHN, Ph.D., Professor of History; In Charge of Department.

B.L. (1900), M.A. (1904), Missouri; Ph.D. (1910), Pennsylvania. Faculty, Missouri (1905-11); Department Head, Delaware (1911-22); Associate Professor (1924-37), Professor (1937—), Oregon State.

WILLEM JOHAN VAN WAGTENDONK, Ph.D., Research Associate.

B.S. (1931), M.S. (1934), Ph.D. (1937), Rijksuniversiteit Utrecht. Faculty (1935-37), Rijksuniversiteit Utrecht; Research Chemist, N. V. Polaks Frutal Works Amersfoort, Holland (1937-39); Research Associate, Rockefeller Foundation, Stanford University (1939-41); Research Associate (1941—), Oregon State.

HENRY JAMES VAUX, M.S., Instructor in Forestry.

B.S. (1933), Haverford College; M.S. (1936), California. Instructor (1937—), Oregon State.

EDWARD VIETTI, M.S., Instructor in Secretarial Science.

B.A. (1929), Utah; M.S. (1937), Southern California. Instructor (1938—), Oregon State.

HAROLD ROTH VINYARD, Ph.D., Instructor in Physics.

B.S. (in E.E.) (1924), M.S. (1928), Oregon State; Ph.D. (1938), Pennsylvania State. Instructor (1938—), Oregon State.

GLENN VOORHIES, M.S., F.E., Assistant Professor of Wood Products.

B.S. (1929), M.S. (1930), F.E. (1940), Oregon State. Instructor (1936-39), Assistant Professor (1939—), Oregon State.

MARIAN LUCILLE WABY, A.B., B.S., Orders Assistant, Library.

A.B. (1934), California at Los Angeles; B.S. in L.S. (1935), Illinois. Orders Assistant (Instructor) (1935—), Oregon State.

CLYDE WALKER, M.S., Associate Professor of Agricultural Engineering.

B.S. (1924), M.S. (1930), Nebraska. Instructor (1928-29), Assistant Professor (1929-32), Associate Professor (1932—), Oregon State.

HELEN ELIZABETH WALSH, M.A., Assistant Professor of Household Administration.

B.S. (1928), Iowa State College; M.A. (1940), Columbia. Assistant Professor (1940—), Oregon State.

RUPERT ALRED WANLESS, B.S., Assistant Professor of Civil Engineering; Chairman of General Engineering.

B.S. (in C.E.) (1923), Oregon State. Instructor (1929-32), Assistant Professor (1935—), Oregon State.

GLEN CHASE WARE, M.S., Instructor in Chemistry.

B.S. (1918), M.S. (1928), Kansas State. Instructor (1928—), Oregon State.

HARRIET JANET WARNER, A.B., Assistant Reference Librarian.

A.B. (1919), California. Reference Assistant (Instructor) (1930-39), Assistant Reference Librarian (Assistant Professor) (1939—), Oregon State.

ERNEST WILLIAM WARRINGTON, M.A., Professor of Philosophy; Professor of Religion; Head of Department.

A.B. (1905), Delaware; M.A. (1907), Princeton. Faculty, Oregon (1934-36); General Secretary, Student Y.M.C.A. (1921-26), Professor and Department Head (1928—), Oregon State.

IVAN FREDERIC WATERMAN, C.E., Associate Professor of Civil Engineering.

B.S. (1910), John B. Stetson University; C.E. (1912), Wisconsin. Faculty, John B. Stetson University (1912-16); Instructor (1919-21), Assistant Professor (1921-37), Associate Professor (1937—), Oregon State.

GLEN MERRILL WEBSTER, Major, Corps of Engineers, B.S., Associate Professor of Military Science and Tactics; Director of Engineer Unit.

B.S. in Engr. and Ec. (1922), California Institute of Technology. Assistant Professor (1941—), Oregon State.

EARL WILLIAM WELLS, M.A., J.D., Professor of Speech.

A.B. (1921), Iowa; M.A. (1927), Wisconsin; J.D. (1928), Iowa. Faculty, Wisconsin (1926-27); Instructor (1921-26), Assistant Professor (1927-30), Associate Professor (1930-39), Professor (1939—), Oregon State.

WILLIBALD WENIGER, Ph.D., Associate Dean of the Graduate Division; Professor of Physics; Head of Department.

B.A. (1905), M.A. (1906), Ph.D. (1908), Wisconsin. Instructor (1908-09), Assistant Professor (1909-10), Professor and Department Head (1910-14, 1920—), Assistant Dean (1933-41), Associate Dean (1941—), Oregon State.

LLOYD ELLIS WEST, Ph.D., Assistant Professor of Chemistry.

A.B. (1929), Doane College; M.S. (1930), Florida; Ph.D. (1939), Washington. Faculty, North Dakota State (1930-35); Instructor (1938-41), Assistant Professor (1941—), Oregon State.

HAZEL KELSEY WESTCOTT, B.S., Administrative Assistant, President's Office.

B.S. (1920), Oregon State. Secretary-Statistician (1926-36), Administrative Assistant (Assistant Professor) (1936—), Oregon State.

PAUL HENRY WESWIG, Ph.D., Assistant Chemist, Agricultural Chemistry, Agricultural Experiment Station.

B.A. (1935) St. Olaf College; M.S. (1939), Ph.D. (1941) Minnesota. Assistant Chemist (1941—), Oregon State.

RUTH VEE WHEELOCK, M.A., R.N., Associate Professor of Nursing Education.

B.A. (1911), M.A. (1915), Michigan; Diploma (1920), Bellevue Hospital School of Nursing; R.N. (1920), States of New York, Michigan, California, Oregon. Faculty, Michigan (1921-26); Department Director, Riverside Junior College (1927-33); Assistant Professor (1933-35), Associate Professor (1935—), Oregon State.

HAROLD H WHITE, M.S., Associate Extension Economist.

B.S. (1920), M.S. (1938), Oregon State. Instructor in Agricultural Education (1923-27), Associate Extension Economist (Assistant Professor) (1931—), Oregon State.

BRUCE STEPHEN WHITEHEAD, Sergeant, B.S., Instructor in Military Science and Tactics (Engineer Unit).

B.S. in C.E. (1933), Colorado. Instructor (1940—), Oregon State.

ERNEST HERMAN WIEGAND, B.S.A., Professor of Food Industries; Head of Department; Food Technologist in Charge, Agricultural Experiment Station.

B.S.A. (1914), Missouri. Poultry Specialist, United States Department of Agriculture (1917-19); Professor (1919—), Horticulturist (1919-38), Department Head and Food Industries Technologist in Charge (1938—), Oregon State.

WILLIAM DONALD WILKINSON, Ph.D., Associate Professor of Geology.

B.A. (1923), Ph.D. (1932), Oregon. Faculty, Oregon (1930-32); Instructor (1932-33), Assistant Professor (1933-41), Associate Professor (1941—), Oregon State.

EARL CLARK WILLEY, M.S., Assistant Professor of Mechanical Engineering.

B.S. (1921), M.S. (1941), Oregon State. Instructor (1922-37), Assistant Professor (1937—), Oregon State.

GEORGE ALFRED WILLIAMS, A.M., Associate Professor of Mathematics.

A.B. (1918), Illinois; A.M. (1926), California. Instructor (1920-27), Assistant Professor (1927-39), Associate Professor (1939—), Oregon State.

JESSAMINE CHAPMAN WILLIAMS, M.A., Professor of Foods and Nutrition; Head of Department.

B.S. (1906), M.A. (1921), Columbia. Head, Home Economics Department, Sweet Briar College (Virginia) (1906-11); Head, Home Economics Department, Oklahoma State (1912-13); Faculty, Arizona (1914-23); Professor and Department Head (1923—), Oregon State.

MAX BULLOCK WILLIAMS, Ph.D., Instructor in Chemistry.

B.S. (1936), M.S. (1938) Utah; Ph.D. (1941) Cornell. Instructor (1941—), Oregon State.

CHARLES HERBERT WILLISON, JR., M.F., Assistant Professor of Forestry.

B.S. (1933), Oregon State; M.F. (1934), Yale. United States Forest Service (1934, 1938-39); Research, Duke Forest (1934-35), Pacific Northwest Forest Experiment Station (1935-37, 1938); Faculty, Idaho (1937); Assistant Professor (1939—), Oregon State.

MAUD MATHES WILSON, A.M., Home Economist, Agricultural Experiment Station; Professor in Charge of Home Economics Research.

B.S. (1913), Nebraska; A.M. (1931), Chicago. Faculty, Nebraska (1913-15), In Charge of Home Economics Extension, Nebraska (1915-18); State Leader of Home Economics Extension, Washington State (1918-22), Assistant Director of Extension, Washington State, (1922-25); Home Economist and Professor (1925—), Oregon State.

GUSTAV HANS WILSTER, Ph.D., Professor of Dairy Manufacturing; Dairy Husbandman, Agricultural Experiment Station.

B.S. (1920), M.S. (1921), Ph.D. (1928), Iowa State. Faculty, Utah State (1921-25, 1927-28); Professor and Dairy Husbandman (1929—), Oregon State.

CHARLES GEORGE WILTSHIRE, Superintendent of Plumbing and Steam Fitting.

Superintendent (Assistant Professor) (1911—), Oregon State.

CARLYN REO WINGER, M.A., Assistant Professor of Speech.

B.A. (1928), Washington State; M.A. (1932), Wisconsin. Faculty, Pacific University (1928-38); Instructor (1938-39), Assistant Professor (1939—), Oregon State.

JOHN CARSON WOODBURY, Technical Sergeant, Assistant to Professor of Military Science and Tactics (Sergeant-Major).

Assistant to Commandant (1920—), Oregon State.

LAWRENCE FISHER WOOSTER, M.S., Professor of Applied Electricity.

B.S. (in E.E.) (1906), Illinois; M.S. (1931), Oregon State. Instructor (1910-14), Assistant Professor (1914-19), Superintendent of Light and Power (1914-19), Professor (1919—), Oregon State.

CLYTIE MAY WORKINGER, Placement Secretary.

Secretary of School of Agriculture (1911-18), Secretary of School of Vocational Education (1918-23), Placement Secretary (Assistant Professor) (1923—), Oregon State.

*ROSALIND WULZEN, Ph.D., Associate Professor of Zoology.

B.S. (1904), M.S. (1910), Ph.D. (1914), California. Department Head, Mills (1909-13); Faculty, California (1914-28), Oregon (1928-34); Assistant Professor (1933-41), Associate Professor (1941—), Oregon State.

CHARLES THEODORE YERIAN, Ph.D., Associate Professor of Secretarial Science.

B.S. (1932), Oregon State; M.S. (1936), Ph.D. (1938), Iowa. Faculty, Iowa (1936-37); Assistant Professor (1937-39), Associate Professor (1939—), Oregon State.

DELOSS PALMER YOUNG, B.S., Assistant Professor of Speech and Dramatics.

B.S. (1926), Oregon State. Instructor (1927-35), Assistant Professor (1935—), Oregon State.

FRED HARRIS YOUNG, B.A., Instructor in English.

B.A. (1938), Oregon State. Instructor (1940—), Oregon State.

EDWIN ARTHUR YUNKER, Ph.D., Associate Professor of Physics.

A.B. (1924), California; Ph.M. (1930), Wisconsin; Ph.D. (1939), Stanford. Instructor (1925-33), Assistant Professor (1933-39), Associate Professor (1939—), Oregon State.

SANFORD MYRON ZELLER, Ph.D., Professor of Plant Pathological Research and Plant Pathologist, Agricultural Experiment Station.

B.S. (1909), Greenville College; A.B. (1912), A.M. (1913), Washington; Ph.D. (1917), Washington University (St. Louis). Faculty, Seattle Pacific College (1909-12), Washington (1912-14); Assistant Professor and Assistant Plant Pathologist (1919-20), Associate Professor and Associate Plant Pathologist (1920-24), Professor and Plant Pathologist (1924—), Oregon State.

ADOLPH ZIEFLE, M.S., Phar. D., Dean of the School of Pharmacy; Professor of Pharmacy.

Ph.C. (1904), B.S. (1907), M.S. (1919), Michigan; Phar.D. (1928), Pittsburgh. Faculty, Michigan (1905-07), Kansas (1907-09), North Dakota State (1909-14); Professor (Department Head) and Dean (1914—), Oregon State. Dean and Director of Pharmacy, State System (1932—).

* On sabbatical leave, 1941-42.

Part II
General Information

Organization and Facilities

History

OREGON State College is the oldest state-supported institution of higher learning in Oregon and in 1943 will celebrate the seventy-fifth anniversary of its establishment. History of the institution, however, goes back to Oregon's territorial beginnings. In 1858 a coeducational community school located at Fifth and Madison Streets, Corvallis, was incorporated as Corvallis College. In 1865 the college passed under the control of the Methodist Episcopal Church, South. While in its inception a private enterprise, the institution from the beginning served a public purpose. It was destined to become both a state college and one of the national system of "land-grant" institutions.

A National College. The first Morrill Act, approved by President Lincoln on July 2, 1862, provided Federal aid, derived from what is known as the Land-Grant Fund, for each state for the maintenance of a "college where the leading objects shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."

Ninety thousand acres of land were appropriated to Oregon; and by an Act approved October 9, 1862, the Legislative Assembly of Oregon accepted the provisions of the Congressional law. On October 27, 1868, the legislature provided for the location of the land received under the Act of 1862, and "designated and adopted" Corvallis College as the state's agricultural college and the recipient of the income from the land-grant funds. The Act specified that "The students . . . shall be instructed in all the arts, sciences, and other studies, in accordance with the requirements of the Act of Congress."

A State College. The history of Oregon State College as a state institution thus dates from 1868. The first class was graduated in 1870. The legislature in 1870 "permanently adopted" Corvallis College "as the agricultural college of the State of Oregon." In 1885, the State assumed entire control of the institution. During the summer of 1887, the cornerstone of a building erected by the citizens of Benton County on the present campus was laid by the Governor of Oregon. The structure is the present Administration Building.

The population of Oregon was small and the annual enrollment did not reach a total of one hundred students until 1889. By 1906-07 the enrollment was eight hundred and thirty-three, and since then the growth in attendance has been rapid. As late as 1900, though the preparatory department had been discontinued, Oregon had only four high schools, and the scope of the college work was necessarily extended downward to bridge the gap. Since 1915 full high-school preparation has been demanded for admission to freshman standing.

The State College is accredited by the Association of American Universities, the Northwest Association of Secondary and Higher Schools, the American Association of University Women, and other accrediting organizations.

Since the founding of the State College in 1868, the following men have served the institution as president: the Reverend W. A. Finley, 1865-1871; B. L. Arnold, 1871-1892; John M. Bloss, 1892-1896; H. B. Miller, 1896-1897; Thomas M. Gatch, 1897-1907; W. J. Kerr, 1907-1932; George W. Peavy, 1934-1940; F. L. Ballard, 1940-41. In September 1941 Dr. F. A. Gilfillan was named Acting President.

Liberal Education. The land-grant institutions, whether known as universities, colleges, or institutes, have the university plan of organization, commonly including a basic division of liberal arts and sciences with various professional schools. Under the Morrill Act a primary purpose of these institutions is to provide "liberal education."

Corvallis College was devoted chiefly to liberal arts. After the introduction of technical work various plans of organization were followed. From 1872 to 1885 seven coordinate divisions, each called a "school," offered major groups of studies leading to a degree, as follows: Physics, Mathematics, Moral Science, Language, History and Literature, Engineering, Agriculture. In 1885 a single four-year "course of study prescribed by the State" was established, including English, languages, philosophy, mathematics, science, agriculture, and military training. As professional schools were developed, the nonprofessional departments in some cases became part of the school organization. The social sciences were in the School of Commerce, geology was in the School of Mines, psychology in the School of Vocational Education. Twelve nonprofessional departments were organized in the nonmajor School of Basic Arts and Sciences.

In the reorganization of 1932, when the School of Commerce was consolidated with the School of Business Administration at the University, the School of Science of the State System of Higher Education was established at the State College, offering undergraduate and graduate work in all the biological and physical sciences. In the same year, the Lower Division was established on a parallel basis at the University and the State College, offering freshman and sophomore work in all the liberal arts and sciences.

Professional Education. A second primary purpose of Oregon State College is to provide professional education. The Morrill Act specifies that "agriculture and mechanic arts" must be taught. The professional schools most characteristic of the land-grant institutions are agriculture, engineering, teacher education, home economics, physical education, and business administration. At Oregon State College the first instruction in agriculture (1869) was given principally in the Chemistry Department. The earliest instruction in engineering (about 1888-89) was in connection with the Department of Mathematics. The departments of Agriculture and Engineering were the first of their kind in any college in the Pacific Northwest. Landscape architecture, first introduced in the nineties, became a degree curriculum in 1910, the first to be offered west of the Mississippi River. Business training, represented in economics and accounting from the time of the establishment of the institution, was organized in a department in 1900, offering a two-year curriculum. The Department of Household Economy (1889) was likewise a pioneer department. By 1900, therefore, definite establishments had been made that were to develop by 1908 into full degree-granting schools of Agriculture, Commerce, Engineering, and Home Economics.

Other schools soon followed. Forestry, first developed in the Department of Botany, was organized as a school in 1913. Pharmacy, established as a department in 1898 on petition of the druggists of the state, was organized as a school in 1917. Education, first established as a Department of Industrial Pedagogy in 1909, became the School of Vocational Education in 1918, and in

1932 was organized as a coordinate division of the School of Education, which operates jointly at the University and the State College.

Graduate work in 1910 was organized under a faculty committee on graduate study and advanced degrees and in 1933 was organized in the Graduate Division. The first summer session was held in 1909.

Income

THE state law creating the Board of Higher Education specified that this body was to "have and exercise control of the use, distribution and disbursement of all funds, appropriations and taxes, now or hereafter in possession, levied, and collected, received or appropriated for the use, benefit, support and maintenance of institutions of higher education." By virtue of this act, and beginning July 1, 1931, the Board has administered all funds for all state-supported higher educational activities, including Oregon State College, on the basis of a unified budget.

Funds for the support of higher education in Oregon are derived primarily from the following sources: a millage appropriation equal to 2.04 mills on all taxable property; certain continuing appropriations from the State for definite purposes; specified sums from the National Government assigned for definite purposes by Congressional acts; income from student tuition and fees; and other sources such as sales, service charges, gifts, and miscellaneous.

During the year 1941-42, the income budgeted for all institutions under the control of the Board was approximately $4,622,248. Of this total $2,917,114 was provided from state sources, $392,662 from Federal sources, $124,319 from county sources, $910,483 from student fees, and $277,670 from gifts and other sources. The state support for general instructional functions was $2,569,977. The remaining state support accrued through special appropriations for agricultural extension, research, and other state-wide public service.

Location

CORVALLIS (population 8,392), situated in the heart of the Willamette Valley 85 miles south of Portland, is a healthful city with a remarkably equable climate, the average annual temperature being about 52 degrees Fahrenheit. Rainfall, mostly during the winter months, averages about 42 inches annually. Corvallis has pure mountain water, modern sanitation, good schools, numerous churches, and strong civic and social organizations. The Coast Range mountains and the distant splendor of the Cascades present a constant panorama of mountain scenery.

Campus

DEVELOPMENT of the State College campus during the past thirty years has been in accordance with a permanent plan prepared for the institution by consulting landscape architects of national recognition. The campus buildings are arranged first as colleges or schools, and further are grouped in quadrangles, so arranged that expansion can take place without injury to the established buildings and campus areas.

The campus proper, exclusive of farm and forest lands, includes about 189 acres. It extends from near Ninth Street westward between Monroe and Jef-

ferson Streets in a wedge-shaped area to Sixteenth Street, thence in a rectangular form to the Mall (Thirtieth Street). The area from Ninth to Fourteenth Streets, known as the East Campus, is a spacious, attractively planted, park-like recreation area. The East Quadrangle is partly developed. The Library and Agriculture Hall enclose two sides of it. The site for the auditorium is to the south of the East Quadrangle, and there is room for further building on the east side.

Northwest of the Library is Chemistry Hall, the first building of a large science group. The engineering group is located to the east of the science court and buildings.

The West Quadrangle is the heart of the present campus. Between it and the Mall are the men's and women's quadrangles, devoted to halls of residence and recreation areas. To the north are the greenhouses with adjacent gardens. Across the Mall, facing east, are a number of agricultural buildings, together with limited land areas required for teaching the particular subject housed. Between this row of buildings and the farms will be found the barns and stables.

Each quadrangle is provided with walks convenient to general student circulation and is planted with ornamental trees and shrubs that add much to the beauty and dignity of the campus. These plants also serve as living laboratory material for students engaged in landscape and horticultural studies.

Farm and Forest Lands

FOR research and instruction in agriculture the State owns and leases a number of tracts of land in addition to the county-owned land on which branch experiment stations are located. Land used jointly for instruction and research includes the main campus and adjoining area consisting of 1,156 acres. For use of the Agricultural Experiment Station, including the nine branch stations, in conducting research with crops and livestock problems, 22,626 acres are utilized, 2,897 acres of which are owned by the State, 17,827 acres are owned by the County and Federal governments, and 1,902 acres are leased by the Experiment Station. Of this amount 20,477 acres are grazing land, 2,059 acres are crop land, and 90 acres are for tree-fruit experiments.

The Peavy Arboretum, the McDonald Forest, the Blodgett Tract, the Spaulding Woodlot, and the Prospect Tract of the School of Forestry total 8,122 acres.

Buildings

THE principal buildings on the State College campus are described briefly below. The date of erection is given in parentheses following the name of the building; if a building was erected by units, the dates of the several units are given. The location of the various buildings is shown on the map on page 9.

The Administration Building (1889), the gift of the citizens of Benton County, is a three-story brick structure, 90 by 120 feet, containing the offices of the Registrar, the Business Manager, the Comptroller and Director of Business Offices of the Oregon State System of Higher Education, and the Director of Music; the studios of the music faculty; the Workshop Theater; and recitation

rooms. On the second floor is a memorial tablet erected in 1894 by the Alumni Association in honor of Benjamin Lee Arnold, A. M., President 1871-92.

Agricultural Engineering Building (1912, 1939). The Agricultural Engineering Building is built of brick and reinforced concrete, two stories high, and consists of a main unit 50 by 120 feet with a wing 40 by 50 feet. The building provides drafting rooms, classrooms, and laboratories for the work in agricultural engineering. Facilities are provided for teaching and experimental work dealing with farm power, farm machinery, farm water supply and irrigation equipment, farm shop, farm building, automobile mechanics, and rural electrification.

Agriculture Hall (1909, 1913), constructed of brick and sandstone, consists of the central section with wings. The central section, 66 by 140 feet, with four stories and basement, contains offices of the School of Agriculture, the Agricultural Experiment Station, and the Federal Cooperative Extension Service, including 4-H Clubs; soils research laboratories; offices, classrooms, and laboratories of the departments of Botany, Zoology, and Entomology. The fourth floor is occupied by the Department of Bacteriology. The north wing, 72 by 130 feet, three stories high, is occupied by the departments of Entomology, Soils, and Farm Crops, including the cooperative seed-testing laboratory. The south wing, 72 by 130 feet, with its basement and three floors, accommodates the central offices and various activities of the Department of Horticulture, the Visual Instruction Department of the Extension Service, and some of the laboratories, museums, lecture rooms, and offices of the departments of Botany and Zoology. United States Department of Agriculture cooperative research workers also occupy offices and laboratories in Agriculture Hall.

Apperson Hall (1898, 1920), named in honor of the late Honorable J. T. Apperson, regent of the State College from 1888 until his death in 1917, is 90 by 120 feet in size, three stories high, constructed of Oregon gray granite, sandstone, and terra cotta. The building contains the offices of the Dean of the School of Engineering and of the Departments of Civil Engineering and Electrical Engineering; laboratories, drawing rooms, and lecture rooms.

The Armory (1910, 1911), of concrete and steel construction, 126 by 355 feet, contains offices, store rooms, and classrooms used by the Military Department. The drill hall, with a floor of earth 36,000 square feet in area, is used for the military instruction of the R.O.T.C., for practices of the football and track teams during inclement weather, and for various other events. At the northwest corner is a tablet in memory of the late General Ulysses Grant McAlexander, known as "The Rock of the Marne" during the World War, who was Commandant at Oregon State College from 1907 to 1911.

Chemistry Hall (1939) is of reinforced-concrete construction, brick veneered, and extends 173 feet along Monroe Street and 182 feet along Twenty-second Street. The building provides laboratories for instruction and research in chemistry, agricultural chemistry, and chemical engineering. Each floor is provided with a stockroom, balance rooms, and offices. On the first and second floors large lecture rooms, each seating about 275 students, are located at the junction of the two wings.

Commerce Hall (1922), constructed of brick and terra cotta, is 186 feet long and 67 feet wide, with wings 28 by 107 feet, and contains the offices of the President and the Executive Secretary, the Dean of Lower Division, the Dean of Men, the Dean of Women, and the Editor of Publications. It provides

offices, classrooms, and laboratories for the Department of Secretarial Science. On the ground floor are located the Clerical Exchange, the College Press, and the Department of Agricultural Economics Extension.

Crew House. The Crew House, 42 by 105 feet, located about twelve blocks from the campus on the Willamette River, contains storage space for 15 shells, locker room for 250 men, concrete shower room and lavatories, and a completely equipped repair and construction shop. Present equipment includes 7 shells, a 20-position training barge, a 21-foot coaching launch, and 4 four-oared barges. Nearly one acre of ground surrounds the Crew House, including the approach to the river floats. The Willamette River affords one of the best rowing courses in the United States. Rowing is carried on throughout practically the whole year.

Dairy Building (1912). Similar in both outside and inside architecture to Agriculture Hall, the Dairy Building is 54 by 141 feet, three stories high. The building contains the laboratories for buttermaking, cheesemaking, and market-milk instruction; laboratories and offices of the Division of Animal Industries; and the offices of the Division of Agricultural Economics.

Education Hall (1902, 1940). Education Hall as remodeled in 1940 is a fireproof structure, with the original outside walls of gray granite and sandstone; it covers a ground space 85 by 125 feet and is four stories high. Within it are located offices, laboratories, and classrooms of the School of Education and the departments of Geology, Mathematics, Philosophy, Psychology, and Religion. A set of four small testing rooms is included for use by the testing and advisory service conducted through the cooperation of the School of Education and the Department of Psychology.

The Engineering Laboratory (1920) is built of brick and concrete, 63 by 220 feet in dimensions and three stories high. The main laboratory is 40 by 220 feet and includes three principal divisions: (a) a materials laboratory occupying about one-third of the building at the east end; (b) a hydraulics laboratory occupying the middle third; and (c) a steam- and gas-engine laboratory occupying the west end of the building. All are served by a five-ton electric traveling crane. The south part of the building contains offices, recitation rooms, drafting rooms, and special laboratories.

Ferguson House, located between Kent House and the Nursery School, is now in use for the WPA Nursery School, affording the School of Home Economics a supplementary observation center.

The Food Industries Building (1919, 1923) houses all work in food manufacture. The main building is constructed of brick, three stories high, 46 by 72 feet in dimensions, with a one-story wing 46 by 60 feet. The main structure contains the offices, lecture and laboratory rooms, and research laboratories designed and equipped for investigations and teaching in the field of food technology and utilization of byproducts from various food and agricultural industries. The building likewise has equipment and facilities for experimental research and technical investigation and instruction in the field of commercial canning, fruit-juice manufacture, vinegar, carbonated beverages, pickling, dehydration, preserving and jelly making, freezing of foods, and other food-manufacturing processes.

The Forestry Building (1917), three stories high, 80 by 136 feet, constructed of brick, contains roomy laboratories for work in silviculture, dendrol-

ogy, mensuration, forest protection, technology, mapping, logging engineering, timber testing, and wood products. Space is devoted to a collection of manufactured wood products, showing the various uses to which wood may be put, and to the forest museum containing large specimens of all commercial woods of the United States.

The Foundry (1899), a brick structure approximately 40 by 180 feet, houses the foundry, the sheet-metal shop, a cabinet shop for construction and repair service, operated by the Superintendent of Buildings, and the finishing laboratory. The foundry proper, approximately 40 by 85 feet in size, is equipped with a 22-inch cupola, brass-melting furnaces, core ovens, cranes, molding machines, and ladles of ample capacity for commercial production. The sheet-metal shop is 40 by 40 feet, with the machines and processing equipment on the main floor and the planning and drafting equipment on a balcony floor. The finishing laboratory is fully equipped with a spray booth and auxiliary apparatus for industrial finishing and for laboratory use.

The Greenhouses (1927-28, 1930-31), constructed with steel frames and curved eaves, provide approximately 27,000 square feet under glass. Space is provided for class work in vegetable crops, floriculture, pomology, landscape maintenance, soils, farm crops, entomology, bacteriology, and botany. In addition, any plant material required by research men working in any of these fields can be grown in spaces assigned to them. Much of the research space is used by United States Department of Agriculture specialists stationed at Oregon State College.

The Heating Plant (1923), 52 by 80 feet in dimensions and one story high, is constructed of brick and concrete, with concrete tunnel and conduits leading to the various buildings of the campus. The plant is equipped with outside coverage for fuel storage and a conveyor system of moving fuel to the three 500-horse-power boilers that are set with dual furnaces permitting the burning of either fuel oil or the Oregon mill refuse known as hogged fuel. The radial brick chimney is 175 feet high and 10 feet inside diameter, having an outside ladder and platforms permitting student work on temperature of flue gases. The present plant, which joins the south end of the Armory, is designed to permit enlargement.

The Home Economics Building (1914, 1920) measures about 215 feet in length and 120 feet in total width. It consists of three stories above a high basement, and is built of brick and terra cotta. Electric elevator, rest rooms, lounges for students and faculty, lockers, and dressing rooms are provided, together with lecture rooms, laboratories, and offices for all phases of home economics. A large auditorium is located on the third floor of the central unit. A number of classrooms and offices are used by the Department of English.

The Home-Management Houses, Dolan House, Kent House, and Withycombe House, are campus residences used as laboratories in family living and home-management practice for upper-division and advanced students in home economics.

The Industrial Arts Building (1908), includes a central portion, 52 feet square and two stories high, flanked by a one-story wing on the east, 40 by 220 feet, and a similar wing on the south, 40 by 200 feet. The central portion contains the offices and classrooms of the Department of Industrial Arts, a general drafting room, a seminar room, and a recitation room. The south wing contains the main woodworking shop, 40 by 97 feet. The east wing contains the machine shop, 40 by 80 feet, the blacksmith shop, 40 by 100 feet, and a store room.

Kidder Hall (1892), is devoted to studios, classrooms, and offices, affording accommodations for the departments of Art and Architecture, Landscape Architecture, and Modern Languages, and the Federal Rural Rehabilitation Division and Soil Conservation Service. The lobby of the building forms an attractive and commodious hall for the exhibition of student work, loan collections, paintings, and other works of art. The building is named in honor of Ida Angeline Kidder, librarian of the State College from 1908 until her death in 1920.

Library Building (1918, 1941). Constructed of brick and gray terra cotta, the Library includes the original central unit and the new west wing. It provides at present seating accommodation for twenty per cent of the student body at one time and book storage for five years growth. Public stairways and an elevator facilitate use of the building. An electric elevator and a book lift connect all five decks of the fireproof stack room. The central unit contains the circulation lobby, public catalog lobby, microfilm reader room, reference room, engineering and technology reference room, open-shelf reserve room, and periodical room. Adjoining the stacks are a faculty study room and a graduate students' study room, in addition to twenty-two carrells. Special rooms are provided for the Mary J. L. McDonald Collection of rare books, microfilm camera equipment, and an open-shelf reading collection. The west wing provides on the first floor a well-equipped reserve book room seating 132 readers; a science reference room seating 174 readers and affording shelving for 30,000 volumes on the first floor and balcony; quarters for the Library administrative offices, catalog, order, and serials divisions, and the union catalog, accessible to the Circulation and Reference departments.

Margaret Snell Hall (1921), dormitory for women, is 96 by 235 feet in size, built of brick and terra cotta, three stories high above a basement. On the first floor are located the reception rooms and the dining room and kitchens, together with a few student rooms. The laundry and freight room in the basement are connected by elevator with a trunk-storage room on each floor. Seventy rooms, most of them designed to accommodate two students, provide for a total of 141 students. The rooms are equipped with individual closets, running water, steam heat, and electric lights. Compartment bathrooms, with showers in addition, a hair-dressing room, and a clothes-pressing room, are provided on each floor. The building is named in honor of the late Dr. Margaret Comstock Snell, by whom the first work in home economics at the State College was established during the period from 1889 to 1907.

The Memorial Union (1928), center of student and campus life, was financed from funds subscribed by students, alumni, faculty members, and other friends of the State College as a memorial to the men and women of the institution who gave their lives in service to their country during the Spanish-American and World wars. The cost to date has been $794,005. In addition to accommodating the numerous social events of students and faculty, and institutional affairs, the building affords offices for student publications, honor organizations, the Associated Students, the Associated Women Students, the Alumni Association, accommodations for student religious groups, the Students' Cooperative Bookstore including the campus post office, and the Memorial Union headquarters. Institutional activities accommodated in the building include the offices of the College News Bureau, the Department of Journalism, the offices of the Student Loan Committee, and the office of the Director of Student Educational Activities and of Intercollegiate Athletics. The College Herbarium has fireproof quarters in the Union. The state administrative and engineering offices of the Federal Agricultural Conservation Program are located in this building.

Consolidation of these many activities in the Memorial Union has released space in other buildings much needed for instructional work.

The Men's Dormitory Building (1928), including five halls of residence for men, accommodates 340 students. Built of brick and stone with tile roof, three stories above a basement and with a central tower five stories in height, the building is arranged on the unit plan. Each unit constitutes a separate hall accommodating from 48 to 76 men, with a social room, electric elevator, trunk-storage room, laundry and pressing rooms. Each floor unit, accommodating approximately twenty-four men, has its own telephone booth, tiled lavatory and shower rooms, and sleeping hall. The study rooms, arranged for two men each, average ten by twelve feet in size. Modern heating and lighting are provided, and floors are covered with linoleum. The central hall, Weatherford, faces northeast, with Buxton and Poling extending as wings to the south and Cauthorn and Hawley to the west. At the base of Weatherford Tower are a general reception room, guest room, general offices for the manager-hostess, and council room. Four of the halls honor the memory of former regents of the State College: James Knox Weatherford (B.S. 1872, LL.D. 1923, Oregon State), regent from 1885 to 1929; Austin T. Buxton (B.S. 1895, Oregon State), regent from 1905 to 1909; Curtis L. Hawley, regent from 1909 to 1923; and Thomas E. Cauthorn, regent from 1888 to 1893. Poling Hall is named in honor of Dr. D. V. Poling, Y. M. C. A. secretary at Oregon State College during the war and post-war period 1917 to 1920.

The Men's Gymnasium (1915, 1921) provides modern equipment for physical education and recreation. The main, central unit contains locker and shower rooms, lobby and offices, restricted exercise room, and the great gymnasium hall with a floor ninety by one hundred and fifty feet in dimensions, with three basketball courts across the main floor. A balcony encircling the main hall seats nearly a thousand persons. The south unit contains the natatorium, with a white-tile pool fifty by one hundred feet in size, and a surrounding gallery seating 1,500 spectators. High and low diving boards are part of the equipment. The natatorium meets all requirements of the State Board of Health for a Grade A pool. The east wing has an auxiliary gymnasium for volleyball and apparatus work. The physical-education offices and lecture rooms are also located in this wing of the building. The west wing contains four handball courts, one wrestling and one boxing room.

The Mines Building (1913), 65 by 81 feet in dimensions, is a four-story building, constructed of brick, trimmed with stone, and similar in type to all the newer buildings on the campus. The basement laboratories are devoted to Physics research and to ore dressing under the Department of Mining Engineering. The latter department also has an Assay Laboratory on the first floor. The major portion of the first floor serves the Department of Mechanical Engineering, with the office of the head of that department, a lecture room, and a laboratory for fuels and lubricants. The second floor contains offices and recitation rooms for the joint use of Engineering and Physics, and the fourth floor houses Aeronautical Engineering offices, class rooms, and a drafting room.

The Museum Building (1899) is 70 by 120 feet in size, constructed of stone and wood. Located on a slope at the southeast corner of the East Quadrangle, the building has direct entrances at two levels. The east entrance admits to the Horner Museum of the Oregon Country. The west entrance admits to Museum Hall, with its adjoining offices and balcony, used for concerts and assemblies, as headquarters for the R. O. T. C. Band and the Oregon State Symphony Orchestra, and for instruction of various kinds.

The Nursery School (1939), located near the Home Economics Building, has large pleasant rooms for play, rest, and other activities of the children in attendance. Special provision has been made for observations by students. Adjoining is a covered play area and an enclosed playground for outdoor activities of the school. The house and yard are equipped with furnishings and play apparatus adapted to the needs of preschool children.

Paleontology Laboratory. The Paleontology Laboratory, a small building located near Education Hall and easily accessible to the Department of Geology, contains laboratories and research rooms for paleontology and paleobotany. All paleontology collections are housed in this building.

The Pharmacy Building (1924) is a three-story brick structure, 62 by 123 feet. In addition to the regular classrooms and laboratories, special features of the building include a model drug store for instructional work, a drug museum, a sign-card and window trimming department, dark room, fireproof vault, stock rooms, and an amphitheater seating two hundred persons and provided with modern equipment for motion pictures. The Oregon State Board of Pharmacy maintains in this building the State Drug Laboratory with a competent staff for enforcing the pure drug law of Oregon. The lighting, heating, and ventilating systems are all modern.

The Physics Building (1928) is a three-story brick structure that architecturally forms the east wing of the Mines Building. It has a maximum length of 169 feet north and south and 85 feet east and west, with a total floor area of approximately 32,700 square feet. The building houses the Department of Physics (except for several laboratories and research rooms in the basement of Mines), the Photographic Service Department, the departments of Campus Surveying, Sewer Maintenance, Roads and Walks, Fire Protection, and Blue Print Service, the offices and studios of the State-owned broadcasting station KOAC, and the offices of the dean of the School of Science and of the associate dean of the Graduate Division. The roof of the building is utilized as a special laboratory for the teaching of astronomy.

The Poultry Building (1927) is a modern three-story brick and stone building, 53 by 128 feet, equipped with the necessary laboratories for judging, incubating, fattening, dressing, egg grading and candling, and has excellent facilities for instruction in these poultry subjects. The building has modern cold-storage equipment. In addition to classrooms the building provides laboratories and offices for the departments of Veterinary Medicine and Poultry Husbandry.

President's House. The President's House is a frame residence located midway between Shepard Hall and Withycombe House. The house was purchased by the State College in 1920 and remodeled for use as the official residence of the President.

Shepard Hall (1908-09), located near the Library, houses the Department of Speech. In addition to offices and classrooms, the building is equipped with a modern Speech Clinic for students with speech defects, a forensic seminar and laboratory, and an up-to-date radio speech laboratory with complete facilities for broadcasting. A reading table is maintained in the lobby for student use. The building also accommodates an auxiliary library storage room and the office of Student Housing and Employment.

The Stables and Barns are located in the western part of the campus. All recent barns have been built west of the Mall. The barns and farm service

buildings are arranged in seven or eight groups according to their use—horse, beef-cattle, dairy, hog, and sheep barns, veterinary barn, and poultry buildings. Located on the farm proper, close to the land that the livestock use, are the hog barn south and west of the present barn group, and the dairy barn about a mile west of the campus, close to the irrigated pastures.

The Stadium. The covered stands and bleachers around Bell Field, adjacent to the Men's Gymnasium, seating approximately 20,000 people, have been built from student fees and from the receipts of athletic contests held in the Stadium and elsewhere.

The Stock Judging Pavilion (1912) provides quarters for part of the demonstration work with livestock.

The Student Health Service (1936) is a three-story fireproof brick building, 46 by 127 feet. On the ground floor are the dining room, kitchen, heating plant, and refrigeration plant. On the second floor is the dispensary, including the registration office, waiting room, secretary's office, clinical laboratory, pharmacy, X-ray laboratory, and physicians' consultation and examining rooms. On the third floor there are 30 beds in two-bed and four-bed wards for students requiring confinement for general medical care or isolation for contagious and communicable diseases.

The Veterinary Clinic Building (1918), a frame structure 56 by 65½ feet, contains four fairly large rooms besides a washroom and a small room. The Department of Veterinary Medicine uses one room for dissecting purposes during the second half of the first term and the entire second term. The other rooms are used by the Department of Animal Husbandry.

Waldo Hall (1907), women's dormitory built of concrete and brick, is 96 by 240 feet, contains one hundred and nineteen student rooms, and has accommodations for 252 students. On the entrance floor are the dining rooms and kitchens and a student laundry. On the first floor are reception rooms and a number of student rooms. The upper floors are given up entirely to student rooms. Each room has closets, running water, steam heat, and electric lights. Each floor has a trunk room, baths and showers. The hall is named in honor of the late Dr. Clara Humason Waldo, State College regent 1905-19.

The Women's Building (1926), 150 by 254 feet in dimensions, serves as a campus center for women's interests. The large gymnasium, games room, dance studio, two corrective rooms, and the pool provide space for a varied program of physical activities that may be carried on simultaneously. The pool, 35 by 75 feet, meets the requirements of the State Board of Health for a Grade A pool. The facilities of the dressing room and showers are ample to care for large incoming and outgoing classes. Three social rooms and kitchenette, furnished by the Women's Athletic Association and the Physical Education Club, help to meet the social needs of different student groups.

Library

THE Library, described in detail under BUILDINGS, occupies a central location in the East Quadrangle. The various reading rooms provide seating accommodations for twenty per cent of the student body at one time.

The main working collection of the Library includes the scientific and technical books provided for the instructional and research activities of the dif-

ferent schools and of the experiment stations. The State College is a designated depository for the publications of the United States government and the Carnegie Institution of Washington, and for official publications of the State of Oregon. The Library contains a practically complete file of the publications of the United States Department of Agriculture and of the agricultural experiment stations of the various states, as well as agricultural literature from foreign governmental and educational institutions. A considerable collection of duplicates is available for lending to students and faculty. The Library owns a collection of more than 2,000 documents received as a gift of the late U. S. Senator Dolph.

The book collection numbered 186,883 volumes on March 1, 1942. Exclusive of the United States government documents, 1,655 periodicals are currently received, the titles of which include the best scientific and technical magazines, selected on recommendation of the specialists on the campus. Back files of these journals and science proceedings form the background for research and advanced study. Newspapers received by subscription, gift, or exchange total 119. In addition, through unified library administration, all the books (totaling 606,130 on March 1, 1942) in the libraries of the several state institutions of higher education are made available to the students and faculties of all the institutions.

The Library's notable collection of books on the history of horticulture includes rare books of the sixteenth, seventeenth, eighteenth, and nineteenth centuries. The home-economics collection is unusually complete, especially in the fields of textiles, costume design, and nutrition. A good foundation has been laid for research work in agriculture, food industries, chemistry, entomology, pharmacy, and other scientific fields. The collections on plant pathology, mycology, and taxonomy probably rank among the upper five in the United States; that on plant ecology is also outstanding for research source material. Approximately one-third of the books in the Library are devoted to science and are located in the science reference room.

The engineering and technology collection of 16,669 volumes is housed in a special reading room. Progress has been made in the development of source material for graduate study, especially in science and engineering.

Over a period of years the Library has built up a map collection of 4,902 items, which is particularly well adapted to the needs of work in geology, soils, and engineering. A collection of 38,770 pictures has been especially selected to meet the needs of classes in art, household arts, and advertising. There is an excellent file of herd-books. A well-balanced collection of dictionaries, encyclopedias, yearbooks, and other standard reference books is found on open shelves in the main reading room. Departmental libraries are at present limited to the few books needed for laboratory purposes.

In addition to professional and technical literature, effort is made to buy some of the best current and standard books for general and recreational reading. Small circulating collections are sent on request to residence halls and organized houses.

The Mary J. L. McDonald collection of fine books numbers 4,001 volumes in fine bindings and special editions. Some of the items, such as a Caxton leaf, a Hebrew scroll, an Antiphonal, and many others, are rare and of unusual interest. The present collection is largely the gift or bequest of the late Mrs. McDonald, but notable gifts from other sources may be added from time to time. Outstanding among recent additions are 14 items of fine printing presented by Dr. John Henry Nash. The room housing this colection is beautifully furnished in Jacobean style. For the present this room is open on special occasions only.

Service. The Library is open daily except Sundays from 7:45 a.m. to 10:00 p.m. It is closed during official convocations and lyceum programs, and on legal holidays. The reference room and periodical reading room are open Sundays from 2 to 5, for reading purposes only.

The circulation lobby is off the main reading room. Books may be taken for home use by any one connected with the State College. Students may keep books for two weeks, with privilege of renewal. Officers may borrow for more extended periods if their work requires it. Graduate students and seniors are admitted to the stacks by permission of the Librarian, on recommendation of their dean or major professor. Twenty-two tables for these readers are placed on the several stack floors. Two study rooms adjoining the stacks are available for faculty and graduate students.

A system of interlibrary loans is maintained with other libraries on the Coast, especially within the state. The Library is also able to borrow for advanced students from the United States Department of Agriculture Library and other governmental bureaus, and from certain specialized libraries in the East.

The reference desk is in the main reading room, where technical and general reference questions are handled. The staff is ready to assist students in using books and catalogs, and in identifying references. Any adult is welcome to use the Library for reference purposes. An information desk is maintained at the card catalog forty-three hours a week.

The periodical reading room on the first floor contains current magazines and newspapers, and unbound numbers of recent general periodicals.

Two reserved-book reading rooms contain the books that have been set aside at the request of the faculty for assigned reading. Although intended for reading in the building, these books may be borrowed for overnight use.

Catalogs and Indexes. A general catalog of all library books on the campus, arranged alphabetically by author, title, and subject, is accessible to the public. The library is classified according to the Library of Congress system, except for part of the collection not yet changed from the Dewey Decimal system. There is also a card catalog of the publications of the United States Department of Agriculture arranged in the same manner; and card indexes of essays, plays, and short stories are regularly increased as new volumes are added to the library. Special indexes are maintained of material of local interest, including various campus publications, the *Oregon Voter, Oregon Historical Quarterly, Oregon Education Journal,* and faculty publications. At the reference desk is a card list of periodicals and journal holdings, and a subject list of current periodicals received. The current subject list is duplicated in the periodical reading room, with a visible index of all titles in alphabetical order. In the Reference Room are found many standard indexes, including such notable examples as: the *Reader's Guide, Education Index,* and *Agricultural Index.* The Science reference room and the Engineering and Technology reference room also contain important specialized indexes.

Library Fines and Charges. The following regulations govern Library fines and charges:

(1) A fine of 5 cents per day is charged for all overdue books borrowed from the Circulation Department.

(2) All books especially needed for use at the library are subject to recall at any time and should be returned promptly when sent for. A maximum fine of $1.00 per day may be imposed for failure to comply with this request.

(3) The following fines are charged for violation of the rules of the Reserve Department: (a) for overdue books, a regular fine of 25 cents for the first hour and 5 cents for

each succeeding hour, or fraction thereof, until the book is returned or reported lost (a maximum charge of $1.00 per hour may be made in cases of flagrant violation of the rules); (b) for failure to recheck books at stated times, a fine of 25 cents; (c) for failure to return books to proper department desk, a fine of 25 cents.

(4) A service charge of 10 cents is added to all accounts reported to the Business Office for collection.

(5) If a book, which has been reported lost and has been paid for, is returned within one year, refund will be made after deduction of the accumulated fines, plus 5 per cent of the list price of the book for each month it was missing from the Library.

Unified Facilities. The library facilities of the state institutions of higher education in Oregon are organized into a single unit under the supervision of a director, with a local librarian on each campus. The director is also librarian of the State College at Corvallis, where the central offices of the library system are located.

The collections at the several institutions are developed to meet special needs on each campus; but the book stock of the libraries, as property of the state, circulates freely to permit the fullest use of all books.

A combined author list of all books and periodicals in the State System is maintained in the central office to facilitate a better distribution of the book stock and to eliminate unnecessary duplication of published material. It has also proved most valuable as a checking source for bibliographical resources of the system. An author list of books in the State College Library is maintained at the University Library.

Museums and Collections

MUSEUMS and collections maintained by the State College include scientific, industrial, historical, and art material classified and arranged for effective use. Some of the collections are described in connection with the various departments and schools.

Horner Museum of the Oregon Country

MARY BOWMAN HULL.....Curator

The Horner Museum of the Oregon Country, located in the Museum Building, contains notable collections of historic, scientific, industrial, and artistic interest. It is the repository of relics, curios, and acquisitions of permanent value. The Museum was formally opened February 20, 1925. In 1933 it was moved to its present quarters, and in 1934 was named for the late Dr. J. B. Horner, for many years Professor of History and Director of Oregon Historical Research. Dr. Horner was active in the early development of the Museum, and served as its first director.

Collections. Among the larger collections are mounted animals and birds; historical and other relics; zoological specimens, geological specimens; fluorescent minerals displayed under ultra-violet light; articles from prehistoric burial grounds; baskets and other Indian relics; bones of prehistoric animals, including one of the three largest mastodon tusks ever found; historic guns and weapons and World War trophies; war implements of savage tribes of South America, Africa, and the Philippine Islands; animal skins from Portuguese East Africa and objects made by the natives; marine shells; paintings and sculptures; antiques; oriental fabrics, embroideries, old bronzes, etc.; square pianos, one of which came around Cape Horn in a sailing vessel and up the Valley by ox team; old-style organs; the famous Hank Monk stagecoach; and a great many other

types of exhibits, all representing approximately ten thousand articles from more than four hundred donors.

Valuable material is being added from time to time in the way of loans, gifts, or exchange collections that are of particular interest to the College and to the public. Information concerning desirable collections that might be available either as gifts or as loans is solicited.

Administration. The Museum is administered by the Curator and a Museum Committee composed of Professors J. Leo Fairbanks, E. V. Vaughn, Ira S. Allison, W. E. Lawrence, Robert H. Dann, R. E. Dimick, and Kenneth L. Gordon.

The Herbarium

HELEN MARGARET GILKEY, Ph.D. ..... Curator
CHARLOTTE G REEDER, M.A. ..... Herbarium Assistant

The flora of Oregon and other parts of the United States and of the world is represented in the Herbarium, which contains approximately 72,000 mounted ferns, algae, mosses, flowering plants, and packeted fungi; a seed collection of 2,207 numbers; and 242 photographs of types of Northwestern species. The largest collection of subterranean fungi in the United States, both of Basidiomycetes and Ascomycetes, is housed on this campus.

Entomological Collection

The entomological collection contains approximately 130,000 specimens of insects; of these 96,500 are named. About 90 per cent are from Oregon, the remainder being from various regions of the country and about 3,000 from foreign lands. Orders represented are Coleoptera 29,500, Hymenoptera 20,000, Diptera 9,000, Lepidoptera 3,000; other orders constitute the remainder. The collection now contains more than 285 types, paratypes, and cotypes; *types* are the specimen in the hands of the authorities when the species are first described. A microscope slide collection contains 2,100 minute and fragile forms. In 1941 1,650 specimens were donated to the insect collection from other institutions here and abroad and from individuals interested in entomology in Oregon.

Special attention is being paid to Oregon aquatic insects, which now number 4,800 vials of preserved specimens. A collection of 820 authentically determined specimens is housed in a special rack system.

A special student reference collection containing 8,000 forms has been prepared. Specimens are mounted in permanent transparent-topped tin boxes and so arranged that the important taxonomic characters are visible. Illustrated keys to the orders of insects, accompanied by the actual specimens, have been arranged in glass-topped display boxes. Life histories of the most important insects are contained in 450 glass-topped Riker mounts. A catalog of Oregon insects is in the process of preparation.

The value of the collection is greatly enhanced by the research publications available in the entomological library.

Zoological Collections

The zoological collections, housed in and adjacent to the zoological laboratories, include minor collections of marine invertebrates, fishes, reptiles and amphibians, and small mammals. An ornithological collection quite representative of the local bird life supplements the Braly collection described on page 70.

The Braly Ornithological Collection

JOHN CLAUDE BRALY.....Curator of Oölogy

The ornithological collection of Mr. J. C. Braly of Depoe Bay was brought to Oregon State College in 1941. This collection consists of more than a thousand mounts, several thousand skins, and the largest and most complete assemblage of bird eggs in the Northwest. This collection, together with other collections of bird skins and mounts at the State College, forms a complete ornithological unit suited to both research and exhibition. Research students in zoology, fish and game management, and certain phases of agriculture will find the collection indispensable. The exhibit, open to the public in the afternoons, is housed in Education Hall.

Geological Collections

The geological collections include minerals, ores, rocks, invertebrate fossils, some vertebrate fossils, and a large collection of fossil plants. The mineral collections include more than 700 species arranged according to the Dana classification and at least one specimen, and in some cases several, of nearly all of the minerals listed by Dana. The ore-deposit collection includes one or more samples for each mineral arranged according to the Lindgren classification of ores. In addition, there are 300 hand specimens of rocks representing a wide variety of types taken from the classical localities of the world. This collection is supplemented by 150 samples arranged according to Harker's book on igneous rocks. There are also on file thin sections of each of these rocks. The geological collections are housed in Education Hall; the paleontological collections are in the Paleontology Laboratory.

Official Publications

OFFICIAL publications include those issued directly by the State Board of Higher Education and various institutional publications issued by the State College. The legislative act placing all the state institutions of higher education under the control of one Board provided that all public announcements pertaining to the several institutions "shall emanate from and bear the name of the Department of Higher Education and shall be conducted in such a way as to present to the citizens of the state and prospective students a fair and impartial view of the higher educational facilities provided by the state and the prospects for useful employment in the various fields for which those facilities afford preparation." All publications of the State System are issued under the editorial supervision of the Division of Information of the System, through the central offices of the division or through institutional offices.

System Publications

Announcements emanating directly from the Board are published in a BULLETIN and in a LEAFLET SERIES.

The Bulletin of the Oregon State System of Higher Education, issued monthly, includes announcements of curricula, annual catalogs, information for students, and official reports.

The Leaflet Series of the State System of Higher Education, issued semimonthly, includes special announcements to prospective students and to the general public.

State College Publications

All State College publications that present the results of research and creative scholarship at the State College, except those issued through the Agricultural Experiment Station and the Engineering Experiment Station, are under the general administration of the State College Publications Committee. The committee also has control over any subject-matter periodicals that may be issued by the institution. Members of the committee are E. C. Gilbert, Chairman; Edwin T. Reed, Secretary; R. S. Besse, S. H. Graf, E. L. Packard.

The Oregon State Monographs reporting the results of research and creative scholarship by staff members are selected and published on behalf of Oregon State College by the Publications Committee. The monographs are sold at cost.

Agricultural Experiment Station Publications. The Station BULLETINS include reports and monographs on research and experimental investigations conducted at the central station or at the several branch stations. The Station also issues a series of CIRCULARS, a mimeograph series of CIRCULARS OF INFORMATION, and occasional pamphlets and reports. Single copies of experiment station publications are supplied free to residents of Oregon who request them.

Engineering Experiment Station Publications. These include series of BULLETINS, CIRCULARS, and REPRINTS, reporting progress in engineering research. The engineering publications are distributed at cost on request.

Extension Publications. The Federal Cooperative Extension Service publishes a series of BULLETINS meeting the demand for scientific knowledge in popular form, especially with reference to its application to everyday life. The subjects covered by these publications include the various phases of agriculture, agricultural economics, home economics, agricultural engineering, and applied science. A series of OUTLOOK CIRCULARS deals with the outlook in respect to major lines of agricultural production. Twenty-one different series of 4-H Club Bulletins are issued. The Extension Service also publishes occasional miscellaneous circulars, posters, and reports. Single copies of extension bulletins are supplied free to residents of Oregon who request them.

Academic Regulations

Admission

IN order to be admitted to the State College a student must be of good moral character and must present evidence of acceptable preparation for work at the college level. The development of character is regarded as a primary aim in education and is emphasized at all the state institutions of higher education.

Every person applying for admission to the regular sessions of the State College must submit complete records of all his high-school and his college work, if any. (These records become the property of the State College. For failure to submit complete records the State College may cancel the student's registration.) All records should be filed with the Registrar of the State College at least two weeks before the applicant expects to enter the State College. If records are filed later, the student's registration may be unavoidably delayed. The Registrar will evaluate the records submitted, and will notify the applicant of his entrance standing.

Admission to First-Year Standing

The requirements for admission to first-year or freshman standing conform to the following uniform entrance requirements adopted by all the institutions of higher education in Oregon:

Graduation from a standard high school, which in Oregon involves the completion of 16 units, 8 of which shall be required as follows: 3 units in English; 2 units in social science, comprising the state-adopted courses in United States history-civics and socio-economic problems; 1 unit in health and physical education; and 2 units selected from the fields of natural science and mathematics or the field of foreign language. Two units in either natural science or mathematics or 1 unit in each of these subjects will be acceptable; but a minimum of 2 units in a single language will be required if a foreign language is selected. In order to be admitted to any of the four-year curricula in engineering, except industrial arts, a student must present one unit in elementary algebra, one-half unit in higher algebra, and one unit in plane geometry. A student deficient in mathematics may be admitted but must pursue a five-year program to qualify for graduation.

Graduates from standard out-of-state high schools shall be required to present substantially the same distribution of units. Applicants who are not residents of Oregon may be held for additional requirements demonstrating superior ability.

Evidence of acceptable scholastic preparation may consist of either (1) certificate of preparatory-school record, or (2) statement of standing on College Entrance Board examinations.

Application for admission by certificate is made on the official form, *Application for Admission to Oregon Higher Institutions*, furnished to schools by the State Department of Education. The applicant's scholastic record must be certified by the principal or superintendent of his school.

Students seeking admission by examination should obtain information from the secretary of the College Entrance Examination Board, 431 West 117th Street, New York City.

Admission with Advanced Standing

Advanced standing is granted to students transferring with acceptable records from accredited institutions of collegiate rank. The amount of credit granted depends upon the nature and quality of the applicant's previous work, evaluated according to the academic requirements of the State College.

A student wishing credit for work done elsewhere than at an accredited educational institution must petition the Committee on Academic Requirements for permission to take examinations in specific courses listed in the Catalog of the State College. In general, credit by examination is allowed only for work taken in regularly organized courses in nonaccredited institutions of collegiate rank.

Final determination of the amount of credit to be granted may be deferred until after the student has been in attendance for at least three terms.

Admission as Special Student

An applicant for admission as a special student should be not less than 21 years of age, and must file with the Registrar documentary evidence sufficient to prove his special fitness to pursue the subjects desired.

Two classes of special students are recognized: (1) those not qualified for admission as regular students but qualified by maturity and experience to work along special lines; and (2) those qualified for admission as regular students who are not working toward a degree.

A special student may petition for regular standing when he has made up entrance deficiencies or has completed at least 45 term hours in the State College.

Credits earned by a special student will not subsequently be counted toward a degree until the student has completed at least two years of work (93 term hours) as a regular student. In case a regular student changes to special status, work done while classified as a special student will not count toward a degree.

Admission with Graduate Standing

Graduates of accredited colleges and universities are admitted to graduate classification by the Dean of the Graduate Division and the State College Registrar on presentation of an official transcript of their undergraduate work. But admission to candidacy for an advanced degree is determined only after a qualifying examination, given when a student has completed not more than one-third of the work for the degree.

Graduates of nonaccredited universities and colleges are expected to obtain the bachelor's degree from an accredited institution before proceeding to graduate work.

Placement Examinations

TO provide the faculty with a basis for reliable advice and assistance to students planning their college programs, the State College requires entering undergraduates to take several placement examinations.

Psychological Examination. All entering undergraduate students are required to take a psychological examination. This test is considered to some extent a measure of college aptitude, and the results are weighed in arranging

the student's program of study. Students who have taken the American Council on Education psychological examination at another institution may be exempt from taking the State College examination on submitting a certified copy of the scores earned.

Examination in English. All students entering as freshmen are required to take a preliminary examination for the purpose of determining their preparation in English. The examination covers the fundamental principles of grammar and tests the student's ability to apply these principles in writing. Students failing to obtain a satisfactory grade in this examination are required to take and pass Corrective English (English K) before registering for work in English Composition.

Physical Examination. All entering undergraduate students are given a complete physical examination. This examination is a safeguard both to the institution and to the student. For the student, it may result in the discovery and correction of defects which, if allowed to continue, might seriously impair his health; for the institution it may result in the prevention of epidemics which might develop from undiagnosed cases of contagious disease. The examination also provides a scientific basis for the adjustment of the student's physical-education program to his individual needs.

Examination in Mathematics. All entering students intending to take mathematics during their freshman year (including students registering in any curriculum in engineering or forestry) are required to take a placement examination in first year high-school algebra, on the basis of which their college work in mathematics is determined.

Degrees and Certificates

THE State College offers curricula leading to certificates on the completion of two years' work, and to baccalaureate and graduate degrees. If changes are made in the requirements for degrees or certificates, special arrangements may be made for students who have taken work under the old requirements. In general, however, a student will be expected to meet the requirements in force at the time he plans to receive a degree or certificate. The State College grants the following academic degrees:*

Science, *B.A., B.S., M.A., M.S., Ph.D.*
Agriculture, *B.S., B.Agr., M.S., Ph.D.*
Education, *B.A., B.S., Ed.B., M.A., M.S., Ed.M., Ed.D.*
Engineering and Industrial Arts, *B.A., B.S., B.I.A., M.A., M.S., Ch.E., C.E., E.E., M.E., Min.E.*
Forestry, *B.S., B.F., M.S., M.F., F.E.*
Home Economics, *B.A., B.S., M.A., M.S.*
†Nursing Education, *B.A., B.S.*
Pharmacy, *B.A., B.S., M.A., M.S.*
Secretarial Science, *B.A., B.S., B.S.S.*

Work leading to the degree of *Master of Arts (General Studies)* is offered under the direction of the Graduate Division.

Lower-division work leading to certificates *(Junior Certificate, Junior Certificate with Honors Privileges, Lower-Division Certificate)* is offered in liberal

*On April 28, 1942, the State Board of Higher Education authorized at Oregon State College, beginning with the academic year 1942-43, curricula leading to appropriate degrees and offering the necessary training in business. The Board action was too late to permit including in this Catalog details of the new program; these will be announced in a supplementary bulletin.

†Conferred on behalf of the University of Oregon Medical School on students who complete the Preparatory Nursing Curriculum at the State College.

arts and sciences, in the professional and technical fields listed above, and in architecture and allied arts, business administration, journalism, music, and physical education. Approved preparation is also offered for the degree curricula in medicine and nursing education at the University of Oregon Medical School in Portland.

Requirements for Certificates

The Junior Certificate admits to upper-division standing and the opportunity to pursue a major curriculum leading to a degree.* A student is expected to fulfill the requirements for the Junior Certificate during his first two years at the State College. The requirements are as follows:

(1) Term Hours: Minimum, 93.†
(2) Grade-Point Average: Minimum, 2.00.
(3) English:
  (a) A general examination in English is required upon entrance. If this examination is not passed, the course designated English K must be taken and passed.
  (b) English Composition: 9 term hours unless excused. A student whose work meets the standards aimed at may, with the consent of the head of the Department of English, be excused from further required written English at the end of any term.
(4) Physical Education: 5 terms in activity courses unless excused.
(5) Military Science: 6 terms for men unless excused.
(6) General Hygiene.
(7) Group requirements: A prescribed amount of work selected from three "groups" representing comprehensive fields of knowledge. The three groups are: language and literature, science, social science.‡ The group requirements are as follows:
  (a) For students in liberal arts and sciences—At least 9 approved term hours in each of the three groups and at least 9 additional approved term hours in courses numbered 200-210 in any one of the three groups. Courses that satisfy group requirements for students in liberal arts and sciences are numbered from 100 to 110 and from 200 to 210.
  (b) For students in the professional and technical schools—At least 9 term hours in English literature or upper-division foreign language or social science and at least 9 term hours in science. If a school cannot meet this requirement by the end of the sophomore year, fulfillment may be deferred by agreement between the dean of the school concerned and the Academic Requirements Committee, such agreement to be filed in the Registrar's Office.

The Junior Certificate with Honors Privileges admits to upper-division standing and permits the student to work for a bachelor's degree with honors in those colleges and schools providing an honors program. For this certificate the student must have a grade-point average of at least 2.75, in addition to fulfilling all the requirements for the Junior Certificate.

The Lower-Division Certificate recognizes the successful completion of two years of lower-division work. This certificate is granted upon request to

* A student who transfers to the State College after completing the equivalent of the requirements for the Junior Certificate at another institution may be admitted to upper-division standing without the formal granting of the Junior Certificate.
† In schools having a graduation requirement of 204 term hours, students should present 96 hours for the Junior Certificate.
‡ For a classified list of courses satisfying the group requirements see pages 106-107.

students whose desire has been only to round out their general education. It does not require the scholastic average specified for the Junior Certificate, and does not admit to upper-division standing.

The Certificate in Agriculture recognizes the completion of the Two-Year Curriculum offered by the School of Agriculture. For this certificate students must meet requirements (3), (4), (5), and (6) specified for THE JUNIOR CERTIFICATE, must complete 9 term hours of science and 9 term hours of either language and literature or of social science, must complete a minimum of 85 term hours including 43 term hours in agriculture, and must have the dean's recommendation certifying fulfillment of all requirements of the School of Agriculture.

Requirements for Degrees

The Bachelor's Degree. When a student has fulfilled all the requirements for a Junior Certificate, he is classified as an upper-division student and may become a candidate for a bachelor's degree in the college or school of his choice. The requirements for a bachelor's degree (including both lower- and upper-division work) are as follows:

(1) Term Hours: Minimum, 192, including—
  (a) Hours in upper-division courses: Minimum 45.
  (b) Hours in the major: Minimum, 36, including at least 24 in upper-division courses.
  (c) Hours after receipt of Junior Certificate: Minimum, 45.
(2) Distribution of hours for different bachelor's degrees:
  (a) Bachelor of Arts: 36 hours in arts and letters, including two years (normally 24 term hours) of college work in a foreign language.
  (b) Bachelor of Science: 36 hours in science or 36 hours in social science.
  (c) Professional bachelor's degree: Fulfillment of all major requirements.
(3) Grade-Point Average:
  (a) Minimum 2.00 on all college work.
  (b) Minimum 2.00 on last 45 hours for which registered.
(4) Residence: Minimum, 45 term hours (normally the last 45).
(5) Dean's Recommendation, certifying fulfillment of all requirements of major department or school.
(6) Restrictions:
  (a) Correspondence Study: Maximum, 60 term hours.
  (b) Law or Medicine: Maximum, 48 term hours.
  (c) Applied Music: Maximum, 12 term hours.

Senior Honors. Senior honors are conferred each year by the Administrative Council upon those members of the graduating class, candidates for a bachelor's degree, who throughout their entire college course have maintained the highest scholastic standing in their respective schools. A student to be eligible to such honor must have a grade-point average of 3.25 or higher and must have been in attendance at the State College for two regular academic years. Election is limited to 10 per cent of the graduating members of a school. Students attaining this honor are listed in the commencement program as Senior Honor Students.

Advanced Degrees. The requirements for advanced degrees are listed on another page under GRADUATE DIVISION.

Academic Procedure

THE regular academic year throughout the State System of Higher Education is divided into three terms of approximately twelve weeks each. The summer sessions supplement the work of the regular year (see special announcements). Students may enter at the beginning of any term. It is important that freshmen and transferring students entering in the fall term be present for Freshman Week (see page 84). A detailed calendar for the current year will be found on pages 10-11.

Students are held responsible for familiarity with State College requirements governing such matters as the routine of registration, academic standards, student activities, organizations, etc. Complete academic regulations are published annually in a pamphlet, a copy of which is furnished to each student by the Registrar's Office.

Definitions

A COURSE is a subject, or an instructional subdivision of a subject, offered through a single term.

A YEAR SEQUENCE consists of three closely articulated courses extending through the three terms of the academic year.

A CURRICULUM is an organized program of study arranged to provide integrated cultural or professional preparation.

A TERM HOUR represents three hours of the student's time each week for one term. This time may be assigned to work in classroom or laboratory or to outside preparation. The number of lecture, recitation, laboratory, or other periods per week for any course may be found in the course descriptions in this catalog, or in the separately printed Schedule of Classes.

Course Numbering System

Courses throughout the State System of Higher Education are numbered as follows:

1-99. Courses in the first two years of foreign language, or other courses of similar grade.

100-110, 200-210. Survey or foundation courses that satisfy the lower-division group requirements in the language and literature, science, and social science groups.

111-199, 211-299. Other courses offered at first-year and second-year level.

300-399. Upper-division courses not applicable for graduate credit.

400-499. Upper-division courses primarily for seniors. If approved by the Graduate Council, these courses may be taken for graduate credit. In this catalog, 400-499 courses approved for graduate *major* credit are designated (*G*) following the title. Courses approved for graduate *minor* credit only are designated (*g*).

500-599. Courses primarily for graduate students but to which seniors of superior scholastic achievement may be admitted on approval of instructor and department head concerned.

600-699. Courses that are highly professional or technical in nature and may count toward a professional degree only and cannot apply toward an advanced academic degree such as M.A., M.S., or Ph.D.

Certain numbers are reserved for courses that may be taken through successive terms under the same course number, credit being granted according to the amount of acceptable work done. These course numbers are as follows:

301, 401, 501. Research or other supervised original work.
303, 403, 503. Thesis (reading or research reported in writing).
305, 405, 505. Reading and Conference (individual reading reported orally to instructor).
307, 407, 507. Seminar.

The following plan is followed in numbering summer-session courses:

(1) A summer-session course that is essentially identical with a course offered during the regular year is given the same number.

(2) A summer-session course that is similar to a course offered during the regular year, but differs in some significant respect, is given the same number followed by "s."

(3) A course offered during the summer session which does not parallel any course offered during the regular year is given a distinctive number followed by "s."

Grading System

The quality of student work is measured by a system of grades and grade points.

Grades. The grading system consists of: four passing grades, A, B, C, D; failure, F; incomplete, INC.; withdrawn, W. The grade of A denotes exceptional accomplishment; B, superior; C, average; D, inferior. Students ordinarily receive one of the four passing grades or F, failure. When the quality of the work is satisfactory, but the course has not been completed, for reasons acceptable to the instructor, a report of INC. may be made and additional time granted. Students may withdraw from a course by filing the proper blanks at the Registrar's Office in accordance with State College regulations. A student who discontinues attendance in a course without official withdrawal receives a grade of F in the course.

Points. Grade points are computed on the basis of 4 points for each term hour of A grade, 3 points for each term hour of B, 2 points for each term hour of C, 1 point for each term hour of D, and 0 points for each term hour of F. Marks of INC. and W are disregarded in the computation of points. The grade-point average (GPA) is the quotient of total points divided by total term hours in which A, B, C, D, and F are received. The grade-point average that is used as a standard of acceptable scholarship and as a requirement for graduation is computed on all work for which the student receives credit—including work for which credit is transferred, correspondence study, and work validated by special examination, but not including "no-grade" courses.

Scholarship Regulations

The administration of the regulations governing scholarship requirements is vested in the Personnel Committee of the faculty. This committee has discretionary authority in the enforcement of rules governing probation, and also has authority to drop a student from the State College when it appears that his work is of such a character that he cannot continue with profit to himself and with credit to the institution. In general, profitable and creditable work means substantial progress toward meeting graduation requirements.

(1) A lower-division student is automatically placed on probation if his grade-point average for any term is below 1.50. He is not released from probation until his grade-point average for a subsequent term is at least 1.75.

(2) An upper-division student is given written warning if his grade-point average falls below 2.00 in any term. He is automatically placed on probation if his grade-point average for any term falls below 1.75, or his cumulative grade-point average below 2.00. He is not released from probation until he has made a term grade-point average of at least 2.00 and a cumulative grade-point average of at least 2.00.

(3) A certificate of eligibility must be obtained from the Dean of Men or Dean of Women before a student can qualify for an elective or appointive office in any student, extra-curricular, or organization activity. Scholastic probation automatically removes a student from any such office, and prevents him from participating in any such activities while he is on probation (except as provided in Paragraph 5 below).

(4) Any student elected or appointed to any official position in any student activity becomes ineligible in any term in which he is not regularly registered for at least twelve hours of academic work, or in which at least ten hours were not completed in the preceding term last in attendance.

(5) No student who has been enrolled for 93 term hours or more is eligible to hold an elective office or to accept an appointment in a student activity unless he has a cumulative grade-point average of at least 2.00.

(6) The rules of the Pacific Coast Intercollegiate Athletic Conference govern in all questions of athletic eligibility.

(7) Students who have been suspended or expelled are denied all the privileges of the institution and of all organizations in any way connected with it, and are not permitted to attend any social gathering of students, or to reside in any fraternity, sorority, or club house, or in any of the halls of residence.

Fees and Deposits

STUDENTS at the State College and at the University pay the same fees. In the fee schedule printed below, *regular fees* are those fees paid by all students under the usual conditions of undergraduate or graduate study. Regular fees are payable in full at the time of registration. *Special fees* are fees paid under the special conditions indicated.

The institution reserves the right to change the schedule of tuition and fees without notice.

Payment of the stipulated fees entitles all students registered for academic credit (undergraduate and graduate, full-time and part-time) to all services maintained by the State College for the benefit of students. These services include: use of the State College Library; use of laboratory and course equipment and materials in connection with courses for which the student is registered; medical attention and advice at the Student Health Service; use of gymnasium equipment (including gymnasium suits and laundry service); a subscription to the student daily newspaper; admission to concert and lecture series sponsored by the State College. No reduction of fees is made to students who may not desire to use some of these privileges.

Regular Fees

Undergraduate Students. Undergraduate students enrolled in the State College at Corvallis who are residents of Oregon pay regular fees each term of the regular academic year, as follows: tuition, $10.00; laboratory and course fee, $12.00; incidental fee, $7.50; building fee, $5.00. The total in regular fees, which include all laboratory and other charges in connection with instruction, is $34.50 per term.*†

* Except special fees for instruction in applied music. See MUSIC.

† Undergraduate students registered in the State System of Higher Education for the first time pay a matriculation fee. See SPECIAL FEES, pages 80-81.

Undergraduate students who are not residents of Oregon pay the same fees as Oregon residents, and, in addition, a nonresident fee of $50 per term, making a total of $84.50 per term. (See footnotes on page 79.)

The regular fees for undergraduate students for a term and for a year may be summarized as follows:

Fees	Per term	Per year
Tuition	$ 10.00	$ 30.00
Laboratory and course fee	12.00	36.00
Incidental fee	7.50	22.50
Building fee	5.00	15.00
*Total for Oregon residents	$ 34.50	103.50
*Total for nonresidents (who pay an additional nonresident fee of $50.00 per term)	$ 84.50	$253.50

* See footnote on matriculation fee on page 79.

Graduate Students. All graduate students registered for seven term hours of work or more pay a fee of $32.50 a term. Graduate students do not pay the nonresident fee. Graduate students registered for six hours of work or less pay the regular part-time fee. Payment of the graduate fee entitles the student to all services maintained by the State College for the benefit of students.

Deposits

Persons who enroll for academic credit (except staff members) must make a deposit of $5.00, payable once each year at the time of first registration. This is required as a protection against loss or damage of institutional property such as: dormitory equipment, laboratory equipment, military uniforms, library books, locker keys. If at any time charges against this deposit become excessive, the student may be called upon to re-establish the original amount.

Special Fees

The following special fees are paid by students under the conditions indicated:

Matriculation Fee $5.00

Undergraduate students registering in the State System of Higher Education for the first time pay a matriculation fee. For students registering at the State College, the University, or the Medical School, this fee is $5.00. For students registering at the colleges of education, the matriculation fee is $2.00. Students transferring from one of the colleges of education to the State College or the University pay an additional matriculation fee of $3.00.

Part-Time Fee ..... $4.00 per term hour; minimum per term $10.00

Any student (undergraduate or graduate, including staff members) registering for six term hours of work or less pays a fee of $4.00 per term hour, but not less than $10.00 per term, instead of regular registration fees. This fee is payable at the time of registration. Students registered for six term hours of work or less do not pay the nonresident fee. Payment of the part-time fee entitles the student to all services maintained by the State College for the benefit of students. (A similar fee is paid for courses up to six term hours *in absentia*.)

Late-Registration Fee ..... $1.00 to $5.00

Students registering after the scheduled registration dates of any term pay a late-registration fee of $1.00 for the first day and $1.00 for each additional day until a maximum charge of $5.00 is reached. Students registered for six term hours or less and auditors are not required to pay the late-registration fee.

Change-of-Program Fee $0.25
The student pays this fee for each change in his official program after the program has been approved and accepted by the Registrar's Office.

Reinstatement Fee $2.00
If for any reason a student has his registration canceled during a term for failure to comply with the regulations of the institution, but is later allowed to continue his work, he must pay the reinstatement fee.

Special-Examination Fees ..... $1.00 to $10.00
A student pays a fee of $1.00 per term hour for the privilege of taking an examination for advanced credit, or other special examination. A graduate student taking his preliminary or final examination at a time when he is not registered for academic work pays an examination fee of $10.00.

Auditor's Fee ..... per term hour, $2.00
An auditor is a person who has obtained permission to attend classes without receiving academic credit. The auditor's fee is payable at the time of registration and entitles the student to attend classes, but to no other institutional privileges. Staff members and students regularly enrolled in the State College may be granted the privileges of an auditor without paying the auditor's fee.

Registration in Absentia Fee ..... $10.00 to $24.00
This fee is paid at the rate of $4.00 per term hour for work taken in absentia up to 6 term hours; minimum fee $10.00.

Transcript Fee $1.00
This fee is charged for each transcript of credits issued after the first, which is issued free of charge. This fee is not charged persons entering military service.

Degree Fee $6.50
The degree fee is paid for each degree taken. No person may be recommended for a degree until he has paid all fees and charges due the institution, including the degree fee. This fee entitles the student to one year's membership in the Alumni Association. When a student receives a certificate at the same time that he receives his degree, an additional fee of $2.50 is charged for the certificate.

Placement-Service Fees ..... See SCHOOL OF EDUCATION

Special Music-Course Fees ..... See MUSIC

Library Fines and Charges ..... See LIBRARY

Refunds

Fee Refunds. Students who withdraw from the State College and who have complied with the regulations governing withdrawals are entitled to certain refunds of fees paid, depending on the time of withdrawal. The refund schedule has been established by the State Board of Higher Education and is on file in the Registrar's Office. All refunds are subject to the following regulations:

(1) Any claim for refund must be made in writing before the close of the term in which the claim originated.

(2) Refunds in all cases shall be calculated from the date of application for refund and not from the date when the student ceases attending classes, except in unusual cases when formal withdrawal has been delayed through causes largely beyond the control of the student.

Deposit Refunds. The $5.00 deposit, less any deductions which may have been made, is refunded about three weeks after the close of the academic year. Students who discontinue their work at the State College before the end of the year may receive refunds, upon petition to the Business Office, about three weeks after the close of the fall or winter term.

Regulations Governing Nonresident Tuition

The Oregon State Board of Higher Education has defined a nonresident student as a person who comes into Oregon from another state for the purpose of attending one of the institutions under the control of the Board.

In order to draw a clear line between resident and nonresident students the Board has ordered that all students in the institutions under its control who have not been domiciled in Oregon for more than one year immediately preceding the day of their first enrollment in the institution shall be termed nonresident students, with the following exceptions:

(1) Students whose fathers (or mothers, if the father is not living) are domiciled in the state of Oregon.

(2) Children of regular employees of the Federal Government stationed in the state of Oregon.

(3) Students holding bachelor's or higher degrees from higher educational institutions whose work is acceptable as preparation for graduate work.

(4) Students in summer sessions.

Student Life and Welfare

Student Personnel Program

THE student personnel program of the State College aims to assist each student to develop a personality of power and influence, to appreciate the joy that may come from accomplishment stimulated by interest and enthusiasm, and to have a keen sense of responsibility for his or her own behavior. College student personnel services include admissions, orientation, records, educational and vocational guidance, loans and scholarships, health service, housing and boarding, and placement. The personnel program includes services institutional in scope as well as services organized within the several schools. All aspects of student personnel work are coordinated through a standing committee of the faculty known as the Committee on Student Personnel. Records and meetings of the committee and of several cooperating committees are centered in the office of the Registrar.

Deans of Students. The Dean of Men and the Dean of Women have general responsibility for student welfare. The deans keep in contact with organized student activities and living groups, and are of assistance to students collectively through these agencies as well as to individuals having special problems. In particular they act as advisers to freshmen, and are concerned with the orientation of new students in college life and work.

Special Committees. The Committee on Student Interests, including student as well as faculty members, assists students with social and living problems. The Committee on Student Housing assists students in making proper adjustments relative to housing and boarding. The Committee on Health and Sanitation takes initiative in the development and maintenance of high standards of health and sanitation in the various places of student residence. The Committee on Religious Education concerns itself with coordinating the various campus religious agencies, and serves as a connecting link between the religious work on the campus and the various local churches. The Committee on Educational Activities, including both student and faculty members, promotes and supervises the various student educational activities. The Student Employment Bureau, the Student Health Service, the Student Loan Fund administration, and other agencies of student welfare, are described on later pages.

Guidance Program. The Committee on Student Personnel seeks to promote an efficient personnel service in each school or division of instruction, and makes available to all students the advisory and guidance services of the entire institution, including the clinical services. It makes contacts with individual students, and invites students to come to it as they may desire. It may scrutinize the scholastic record of a student. It gives particular attention to any student who is not measuring up to his possibilities. When the causes of poor accomplishment can be ascertained, suggestions for improvement are offered. To students who are placed on probation under the regulations governing scholarship, the committee seeks to give all possible aid.

Placement. In all of the schools the placement of graduates is recognized as an important concern of the faculty generally, and especially of the dean's office. Each school maintains vital contacts with the professional fields for which its curricula give preparation, and is thus enabled to be of greater service

both to the profession and to graduates. The demands of the professions and the industries are taken into account in the revision of courses of study. Assistance is regularly given to students in finding work for which they are qualified by personality and training. In the counseling of students special assistance is given to the selection of a program of studies for each student that will develop his particular abilities and at the same time prepare him for some type of service for which there is demand.

The aid given students in obtaining part-time and vacation jobs is described under SELF-SUPPORT (pages 87-88). The Teacher Placement Service is described under SCHOOL OF EDUCATION.

Freshman Week

FRESHMAN WEEK, a program of orientation for entering undergraduate students, is held annually the first week of the fall term. By means of general assemblies, group lectures and discussion, individual conferences, and examinations and tests (see pages 73-74), an effort is made to assist every new student in getting the best possible start in his new work. During Freshman Week new students are made familiar with the aims of higher education, the principles governing the wise use of time and money, methods of study, and the ideals and traditions of Oregon State College. Full directions concerning Freshman Week and registration procedure are sent to each new student who is accepted for admission.

The examinations and tests given entering students during Freshman Week provide the State College faculty with reliable information as a basis for advising and assisting students in planning their college programs. These examinations are scheduled at regular times during the week. Each entering student will receive from the Registrar a detailed program of the Freshman Week activities. The student should follow this schedule faithfully, in order to avoid delay in registration and possible penalty for make-up appointments.

The 1942-43 session of the State College officially opens for new undergraduate students on Monday, September 21, 1942; the first freshman assembly and the first sections of the placement examinations required of entering students are scheduled for this day. New students should arrive on the campus by Sunday, September 20, in order to be ready for the opening of Freshman Week at 8:00 o'clock Monday morning. Rooms in the dormitories will be available Saturday, September 19. Meals will be served beginning Sunday evening.

The State College, recognizing that fraternities and sororities are a part of university life and provide living quarters for a substantial part of the student body, has, with the cooperation of these organizations, made provisions by which they may choose their members in an orderly fashion, with a minimum of interference with fall-term registration and the beginning of college work. A definite period has been designated, during which the members of fraternities and sororities and new students interested in fraternity membership may become acquainted.

Student Living

COMFORTABLE, healthful, and congenial living conditions contribute much to the success of college life and work. Living conditions of the right kind not only aid students to do the best in their studies but also through the experiences of group life contribute to the building of character and personality. Hence the State College is vitally concerned with student housing.

Halls of residence are maintained on the campus by the institution, and the living conditions of students residing outside the dormitories are closely supervised. Increased enrollment of women students has made necessary the organization of smaller living units in private homes. Reservations for the residence halls are accepted in order of application. After the residence halls are filled, women students will be assigned to approved smaller living units.

Many students live in fraternity, sorority, or club houses accommodating groups of from twenty to fifty persons. Admission to these groups is by invitation only. Students also live with relatives near the campus or in private homes or boarding houses. Opportunity for cooperative group living, with a house mother in charge, is available to a limited number of women students who can qualify under certain scholastic and personal requirements. By sharing costs and duties of housekeeping, requiring from 1 to 1½ hours of work per day, the student living in a cooperative house may reduce living expenses from $7 to $10 per month below the regular price of room and board. Applications and requests for information should be addressed to the dean of women. Four cooperative houses have been established for men, accommodating a limited number. Applications should be addressed to the dean of men.

The halls of residence provide comfortable, democratic living conditions favorable to successful work as a student and to participation in the wholesome activities of campus life.

Men's Dormitories. Five halls of residence for men—Buxton, Cauthorn, Hawley, Poling, and Weatherford—are maintained, accommodating a total of 344 students. The five halls are part of a single structure described under BUILDINGS as the "Men's Dormitory Building."

Rooms accommodate two students each and are equipped with study tables, chairs, dressers, and wardrobe facilities. All floors are covered with a good grade of linoleum. Adequate lighting is provided, besides which there are attachments for study lamps. Each floor has lavatory and shower-bath facilities. For each floor common sleeping rooms are provided, equipped with cots, mattresses, mattress-covers, and pillows. Each student furnishes his own student lamp, bedding, towels, and personal furnishings. In each hall a club or social room, comfortably and tastefully furnished, is available for the use of all students in the hall. Telephone service is provided on each floor of each hall, and in the basement of each hall laundry facilities with electric irons and trunk storage accommodations are available. One of the halls contains a general reception room and guest suite for the entertainment of parents and other guests.

Women's Dormitories. Two halls of residence for women—Margaret Snell and Waldo—are maintained. Both halls are home-like and attractive and are supplied throughout with pure mountain water, electric lights, and steam heat. The rooms are furnished with single beds, mattresses, dressers, tables, and chairs. Other furnishings, including pillows, pillowcases, sheets, blankets, bed spreads, curtains, rugs, and towels, are furnished by the student. The bedrooms average about 12 by 15 feet with one window 3 by 7 feet. Many of the rooms are larger and a few of them have two or three windows. All rooms in Margaret Snell Hall have two or more windows. Each hall contains reception and social rooms for the use of students. Laundry facilities and trunk storage accommodations are available in each hall. Telephone service is provided.

Dormitory Living Expenses. The charge for rooms in the dormitories is $24.00 per term when the student shares a double room and $36.00 when a single room is occupied. Room rent is payable in two equal installments, the

first installment being due at the opening of each term. The charge for rooms covers the period of the school term only.

The charge for board in the dormitories is $26.00 per calendar month. Payment for board must be made monthly in advance. Students paying board or room charges after the date on which payment is due are charged a late-payment fee of $1.00 for the first day, and $1.00 for each additional day until a maximum charge of $5.00 is reached. If dormitory charges are not paid within ten days after the date due, the student's registration may be canceled.

The right is reserved to increase the charges for room and board should advance in costs require it. The charges will be decreased whenever decreased costs make this possible.

Students should not arrive at halls of residence until the day the halls are officially open, usually one day before the opening of a term.

Dormitory Room Deposit. A deposit of $5.00 must be sent to the Director of Dormitories at the time of application for room. The amount of the deposit will be deducted from the first room-rent installment.

If a student, after making deposit, does not enter the State College, the deposit will be refunded, provided the Director of Dormitories is notified at least one week before the opening day of the term. Rooms will not be held after the first day of registration.

College Tea Room. A tea room in the Memorial Union under the supervision of the Department of Institution Economics in the School of Home Economics serves attractive luncheons during the regular school week. The tea room also makes a specialty of catering for luncheon and dinner parties.

Private Board and Room. Board and room can be obtained in private homes or boarding houses at rates from $26.00 to $35.00 a month. For a room without board the rates are from $10.00 to $20.00 a month for a double room and $6.00 to $15.00 a month for a single room. Board alone can be obtained for from $20.00 to $25.00 a month.

The Housing Committee exercises general supervision over all student living quarters and endeavors to see that all students have comfortable rooms and wholesome living conditions. Students are allowed to live only in rooms approved by the committee.

Housing Regulations. The following regulations govern housing of students, with the provision that when financial reasons make it necessary the housing committee may excuse students from dormitory residence and permit them to live in approved homes when rates for board and room are lower.

All unmarried students are required to live either in private homes, dormitories, or fraternity, sorority, or cooperative houses.

All freshman women at the State College are required to live in the dormitories during the first year. Increased enrollment of women students has made necessary the organization of smaller living units in private homes. Reservations for the residence halls are accepted in order of application. After residence halls are filled, women students will be assigned to approved smaller living units.

Women students not living with relatives as residents of Corvallis are required to live in the dormitories, sorority houses, cooperative houses, or private living units and housekeeping units approved by the Housing Committee. Upon application to the Housing Committee permission may be obtained to live in approved homes to work for room and board or some portion thereof.

Upperclass women at the State College may move to the sorority houses at the beginning and end of any term.

Freshman and sophomore men not living with relatives in Corvallis must live in the dormitories or in the present organized fraternities. Any exemptions from this requirement must be approved by the Housing Committee.

Any student reserving a room in the men's halls must occupy it until the end of the term. If he moves out of the dormitory before the end of the term without proper permission, he must pay his room and board to the dormitory for the remainder of the term or forfeit his registration. A student who pledges to a fraternity may move to a fraternity house at the end of either the first or the second term.

All women students living in the dormitories must take their meals at the dormitories. All men students living in the dormitories must take their meals in the dining room provided for them in the Memorial Union.

Student Expenses. The average expenses incurred by a student at the State College during an academic year are shown in the table below. Some students with ample means spend more; but many students find it possible to attend the State College at a much lower cost. Board and room estimates are based on charges in the halls of residence. The incidental item will vary greatly with the individual. The expenses of the fall term are listed also, since there are expenses during this term not incurred during the winter or spring terms.

Fees	Per term	Per year
Fees	$ 34.50	$103.50
Deposits	5.00	5.00
Books, supplies, etc.	20.00	35.00
Board and room	$100.00	285.00
Incidentals	25.00	75.00
	$184.50	$503.50

Note: This table does not include the matriculation fee of $5.00 paid by undergraduate students registering for the first time.

It should be remembered that, in thinking of the cost of a year at college, a student usually has in mind the amount he will spend from the time he leaves home until he returns at the close of the year. Such an estimate would include clothing, travel, and amusements—items, not included in the table, that vary according to the thrift, discrimination, and habits of the individual.

Self-Support. Many students earn a large part of their expenses by work in the summers and during the academic year. Some students are entirely self-supporting. In some cases students devote an occasional term or two to regular employment in addition to vacation periods, thus taking more than the usual number of years to complete a curriculum.

The work available during the academic year consists of such tasks as janitor work, house cleaning, typewriting, reporting, tutoring, waiting on table, dish washing, clerking, service-station work, service as hotel bell boys, messenger service, caring for children, odd jobs, etc.

Organized effort is made to assist those desiring to find work. The employment bureau for men is conducted in Shepard Hall under the direction of the office of the Dean of Men. The employment bureau for women is conducted by the office of the Dean of Women in Commerce Hall.

Remunerative employment cannot be guaranteed to all who may desire it, and the new student should have sufficient funds to cover the expenses of at least the first term. It is difficult to earn one's way while carrying a program of studies and only capable students of good health should attempt it. The attention of new students who intend to earn all or part of their living is called to the following facts:

(1) Work of any kind is much more readily obtained after the student has had opportunity to familiarize himself with the local conditions.

(2) No student should expect to obtain employment by correspondence. It is helpful to write to the employment office early in July stating the kind of work desired, experience, and the amount of work actually needed. As competition is very keen in all fields of work open to students, it is advisable to come to the campus three or four days before the opening of the term and to be ready to meet with any prospective employers who may have reported to the employment bureau their need for student help. Positions for part-time employment are not listed, as a rule, until about the time the term opens.

(3) No student should come expecting to earn money unless he knows how and is willing to work. Only those students who do their work well can succeed in obtaining sufficient employment to meet their needs. Those who have skill in some field of work usually have greater opportunity and receive better pay.

(4) There is a constant oversupply of those wishing to do teaching and clerical work. None but those having superior qualifications and experience are likely to obtain employment of this type during the first term.

(5) There is a considerable demand for efficient stenographers, but generally there is not sufficient work of this kind to meet the needs of all applicants. There is a considerable demand for radio repair men, printers, licensed electricians, motion-picture operators, high-school and city bus operators, clerks, and barbers.

(6) A limited number of opportunities exist for students who have good health, and who can perform domestic or manual labor well, to earn the equivalent of board and room by working three hours a day for board or three and one-half hours a day for board and room. There are always more applications for this type of employment than there are openings.

The National Youth Administration has, during the past several years, made a grant to Oregon State College for the purpose of providing part-time employment for students. Approximately 500 students have received work through the NYA grant each year. At the time this Catalog went to press it was not known whether the NYA program would be carried on through 1942-43. Students wishing NYA work, if the program is continued, should make application through the Registrar. NYA work is allotted primarily on the basis of financial need; however, the committee in charge also takes account of scholastic record. Students receiving appointments are employed on the campus or with public-service agencies in the community at tasks that offer the greatest possible opportunity for worthwhile vocational experience.

Student Health Service

THROUGH the Student Health Service the State College does all in its power to safeguard the health of its students. This is accomplished through health education, detection of incipient diseases, medical treatment of acute diseases, and the maintenance of hygienic student living conditions.

The student health services at the institutions in the Oregon State System of Higher Education are supported by student registration fees. Every student registered for credit is entitled to general medical attention and advice at the Student Health Service during office hours. If his condition requires hospitalization for general medical attention he is entitled to free care at the Student Health Service for a period not to exceed fifteen days during any one academic year. For longer periods an additional charge is made, sufficient to cover the cost of the services rendered ($3.00 per day for 1942-43). When a special nurse is necessary, the expense must be met by the student. All expenses of, or connected with, surgical operations, or specialized service, must be borne by the student. In no case will the Health Service pay a private hospital bill. A student who is ill may, on request, be attended at his rooming place by a health-service physician. An additional charge of $1.00 is made for each room call and for each call at the Health Service after office hours. If sufficient balance is left in a student's deposit at the business office, such charges are deducted therefrom. Calls, after office hours, should be telephoned to the Student Health Service. The privileges of the Student Health Service are not available to members of the faculty.

All entering students are given a complete physical examination (see page 374).

All the activities pertaining to the medical examination and care of students are centered in the Student Health Service building. The clinic occupies the entire second floor and includes physicians' offices, examining rooms, X-ray and clinical laboratories, pharmacy, and minor surgery. Patients who are confined to bed are cared for on the third floor. The Student Health Service Building is described on page 65.

There are four physicians, eight registered nurses, a laboratory technician, and an X-ray technician on the staff.

Vaccination. Under ruling of the State Board of Higher Education, students are required, as a condition of entrance to any of the institutions in the State System, to satisfy the institutional physician of immunity to smallpox (by the evidence of having had the disease or of successful vaccination). Exception is made, however, for students who decline vaccination because of religious convictions. Such students may be admitted, but only on the condition that they or (in case of minor or dependent students) their parents or guardians agree in writing to assume all expenses incident to their care or quarantine, should they fall ill with smallpox while students at the institution.

Loan Funds

AS AN aid to students in financing a part of their study at the State College a number of loan funds have been established. In addition to the general "Student Loan Fund," to which there are many donors, a number of special loan funds have been established.

The Student Loan Fund

The Student Loan Fund is a perpetual revolving trust fund, established for the purpose of lending money to worthy students attending or who wish to attend Oregon State College. It is administered by the Student Loan Fund of the State College, a membership organization, incorporated under the laws of the State of Oregon, whose members are known and designated as trustees, and are appointed by the President of the State College. This fund has arisen through the liberality of friends of the institution and through the accumulation of interest on loans.

The purpose, as expressed by one of the donors, is "not to induce students to attend school by providing money that can be easily obtained, but rather to aid those who have determined to secure an education and are paying the cost wholly or in part from their own earnings." Students are eligible to loan aid after they have been in attendance at the State College *at least one term.*

Among the many donors to the Student Loan Fund may be mentioned the following: Hon. R. A. Booth, Dr. Clara Humason Waldo, Mr. Ashby Pierce, Mr. R. M. Johnston, Mr. L. J. Simpson, Mr. Ben Selling, Dr. U. M. Dickey, the College Folk Club, the Agricultural Club, the Oregon Countryman, miscellaneous contributions by Faculty, Professors Paul Petri and Lillian Jeffreys Petri, Winter Short Course Students, the A. Grace Johnson Memorial Fund, the Forestry Fund, the Piano Practice Fund, various Class Donations, the Phi Pi Phi fraternity, Y.M.C.A. Rifle Club, Marguerite MacManus String Quartet, Salem Oregon State Club, Portland Oregon State Club, Oregon State Barometer, Domestic Science Dining Room (Panama-Pacific International Exposition,

San Francisco), Waldo Hall Club, Cauthorn Hall Club, Miners' Club, Silverton Rotary Club, Grand Army of the Republic and Women's Relief Corps, Oregon Technical Council Engineers Fund, student chapter of the American Society of Civil Engineers.

A special faculty committee with offices in the Memorial Union is charged with the responsibility of administering the Student Loan Fund and cooperates in the administration of the other loan funds available for students at the State College.

The fundamental principles upon which the Student Loan Fund is administered and upon which the success of the fund has been built are:

(1) Care in the selection of student character as a credit basis.
(2) Detailed budgeting of expenses and receipts to assure that the sums borrowed are not disproportionate with the student's capacity to pay.
(3) Insurance against loss by a "Contract of Guaranty" signed by the parent or guardian.
(4) Effective follow-up system on delinquent loans.

Other Loan Funds

The Crawford Loan Fund. By the wills of the late Edward G. Crawford and his wife Ida M. Crawford a fund has been left in trust with the United States National Bank of Portland to assist worthy young men desiring to educate themselves. Applications for assistance under this will are made through the local loan office. Applicant must be a native-born citizen of the United States, have attended primary school, either public or private, and have shown a desire and ability to help to educate himself. He must be regularly enrolled as a student in the school or college at which the proceeds of the loan will be used. According to the terms of the will, this fund can be used to assist young men who require financial aid in obtaining an education in any of the mechanical arts, trades, or in practical business, or along any particular line of study save and except the professions of medicine, law, theology, pedagogy, and music.

The Federation of Women's Clubs Educational Fund provides loans to women students who are well recommended.

Eastern Star Educational Fund. Loans are available to students who are members or daughters of members of the Order of the Eastern Star. Loans are made upon honor, no security being asked, and will be made by the Trustees of the Grand Chapter on the recommendation of the president of the institution which the student is attending and the approval of the Worthy Matron and Worthy Patron of the chapter of the Order of the Eastern Star located in the same place as the institution of learning.

The J. T. Apperson Educational Fund. By the will of the late Hon. J. T. Apperson, who had been a Regent of the State College from its foundation, a fund amounting to between $55,000 and $75,000 is to be a perpetual endowment, administered by the State Land Board of Oregon, for the assistance of worthy young men and women, "who are actual bona fide residents of the State of Oregon, and who would otherwise be unable to bear the expense of a college course at the Oregon State Agricultural College." The income from this estate is loaned to students. Applicants for loans must be recommended to the State Land Board by the President of the State College and the State Superintendent of Public Instruction. Application is made through the Student Loan Committee.

The Arthur Palmer Tifft Memorial Loan Fund. By the will of the late Mrs. Joan C. Palmer Tifft, practically her entire estate is left as a permanent loan fund for deserving young men needing financial assistance while attending Oregon State College. This fund is left as a memorial to her son, Arthur Palmer Tifft, Portland attorney, who died on January 14, 1919. The fund is irreducible and all interest accruing therefrom is added to the fund.

The Oregon State Pharmaceutical Association Educational Fund, established by the Oregon State Pharmaceutical Association at its thirty-sixth convention held at Corvallis in July 1925, is a fund to be used primarily in making loans to needy and deserving students of the School of Pharmacy.

The Joseph N. Teal Loan Fund. By bequest the late Joseph N. Teal of Portland gave to the State College the sum of $5,000 "to be administered as a perpetual revolving fund to be loaned . . . to worthy students pursuing courses of instruction in said College."

The Ben Selling Scholarship Loan Fund. By the will of the Honorable Ben Selling of Portland, $100,000 is set aside, from a part of the income of which loans may be made to men and women of the State College. Applicants must be approved by the State College Student Loan Committee.

A. W. S. Emergency Loan Fund for Women Students. The Associated Women Students have set aside a sum of money which is available to women students who are in need of small amounts of money for short periods of time. The fund is administered by the Dean of Women.

Oregon State College Chamber of Commerce Loan Fund. The Oregon State College Chamber of Commerce placed $600 with the Loan Committee for the assistance of worthy students. This money is administered by the Student Loan Committee with special consideration for students interested in the business aspects of their field of specialization.

Scholarships and Fellowships

A NUMBER of scholarships and fellowships have been established largely through the generosity of private donors, providing funds in varying amounts for the encouragement of students of ability and promise. Some of these are general scholarships. Others are limited to special fields.

State Scholarships. A limited number of scholarships are awarded annually to students in the institutions of the Oregon State System of Higher Education. These scholarships cover tuition and laboratory and course fees (a total of $22.00 a term or $66.00 a year for a student attending the State College). Recipients of scholarships must, however, pay the matriculation fee, incidental fee, the building fee, and special fees. At least fifty per cent of the scholarships are awarded to entering freshmen. To be eligible, an entering student must rank in the upper third of his high-school graduating class. Students who have previously attended an institution of higher learning must have a grade-point average of 2.50 (computed according to the grade-point system in use at the Oregon state institutions of higher education). All applicants, to be eligible, must be in need of financial assistance. Application should be made on official blanks to the State College Registrar. All applications must be filed by April 1.

State College Assistantships, Scholarships, and Fellowships. A number of graduate and research assistantships, scholarships, and fellowships are

awarded annually by the State College to qualified graduate students in various fields. For stipends and application procedure, see GRADUATE DIVISION.

Bernard Daly Educational Fund. Under terms of the will of the late Dr. Bernard Daly of Lakeview, Oregon, worthy self-supporting young men and women of Lake County, Oregon, may receive a part or all of their necessary college expenses. The terms of the will provide that the income from this fund be used to pay the college expenses of at least fifteen students each year. The fund is administered by the board of trustees, who select candidates annually from a list of applicants recommended by the county judge and county school superintendent of Lake County, following a qualifying examination held in Lake County.

Phi Kappa Phi Exchange Scholarship. To encourage interchange among students of the cultures of this and other countries, the local chapter of Phi Kappa Phi supports, on a biennial basis, an international exchange scholarship, under which a foreign student receives tuition, board, and room for one academic year at Oregon State College. The Oregon State student who goes abroad receives similar assistance from the foreign institution; he returns to this campus for the year following the one spent abroad.

The American Association of University Women Graduate Scholarship. Every two years the Oregon Division of the American Association of University Women gives a scholarship of $1,200 to a woman who is a resident of Oregon, and who holds at least a bachelor's degree, for advanced study at an American or foreign university.

Portland Mothers Club Scholarships. The Portland Mothers Club of Oregon State College provides annual awards of $25 each to men and women students of the State College who have shown courage and determination in obtaining an education.

Standard Oil Company of California Fellowship. A grant of $750 for the year is made by the Standard Oil Company of California for fundamental research in branches of pure and applied science on problems which might be of interest in the recovery and the refining of petroleum.

Standard Oil Company of California Agricultural Scholarships. The Standard Oil Company of California will grant a total of six $100 scholarships, each year for the next five years beginning with the fall term 1942 and ending with the fall term 1946, to worthy boys graduating from high school, three of the scholarships to be awarded to boys belonging to 4-H Clubs and three to boys belonging to the Future Farmers of America.

The Mary J. L. McDonald Fellowship in Reforestation. Through the generosity of the late Mrs. Mary J. L. McDonald of San Francisco, a fellowship has been established giving opportunity to do advanced study in problems of reforestation. The fellowship is awarded each year by a committee of the faculty of the Oregon State School of Forestry to a graduate of a recognized school of forestry on the basis of proficiency in forestry studies, personality, and demonstrated ability to do independent work.

Oregon Home Extension Council Scholarship. The Oregon Home Extension Council Scholarship is an award of $25 made annually at the Oregon Conference for the Study of Home Interests to a junior or senior girl who shows sincere interest in and promise of leadership in extension work, who stands high in scholarship, is active in school affairs, and is in need of assistance. The scholarship student is selected by a committee consisting of the Dean

of the School of Home Economics, the State Leader of Home Economics Extension, and the President of the State Home Extension Council. The scholarship fund is sponsored by the Oregon Home Economics Extension Council and the extension units in counties having home demonstration agents.

International Friendship Scholarship. The Home Economics Club of the State College on March 2, 1926, established a scholarship of $500 which is awarded annually to a graduate foreign student to study home economics at Oregon State College. The recipient of the scholarship is selected by a committee composed of the executive council of the Home Economics Club, the Dean of the School of Home Economics, and a representative of Omicron Nu.

The A. Grace Johnson Memorial Scholarship is awarded in units of $25 or less to a worthy, needy home economics student who is registered as an upper classman and whose scholastic average is equal to or above that of the student body. The scholarship fund, started in the spring of 1935, is a continually growing one contributed to by former fellow workers, students, friends, and relatives of Miss Johnson, professor of household administration at the State College from 1915 to the time of her death in 1933.

The Leonora Kerr Scholarship is an award of $66.00 made annually to an outstanding woman student, a high-school graduate, selected by the scholarship committee of the College Folk Club. The scholarship was established by the College Folk Club as a tribute to its founder and first president, Mrs. W. J. Kerr.

The Lee Scholarship is awarded each year to a woman student in home economics registered as a junior, who during her career in college has shown improvement in her work, stability and meritorious record in all her activities, and general all-round worthiness. This scholarship provides a sum of money derived from the annual income of a fund of $1,000 bequeathed by Minnie E. Lee as a memorial to her husband J. B. Lee and herself, to be paid to the recipient at the time of her registration in the senior year. The award is not open to any student who has received any other monetary prize.

Rotana Club Scholarship. The Rotana Club of Portland provides a scholarship of $25 awarded each year to a sophomore student in the School of Home Economics on the basis of scholastic promise, qualities of personality, and leadership. In making the selection consideration is given to the need of the student for assistance in financing her education. The recipient of the scholarship is selected by the Dean of the School of Home Economics from nominations made by the school faculty.

Standard Oil Company of California Home Economics Scholarships. The Standard Oil Company of California will grant through Oregon State College four $100 scholarships, each year for the next five years beginning with the fall term 1942 and ending with the fall term 1946, to worthy girls graduating from high schools that are qualified and operating under the George-Deen Act.

Blumauer-Frank Drug Company Scholarship. A scholarship of $50, established 1935, is awarded annually to the junior student in pharmacy who makes the highest average in a competitive examination given to selected members of his class whose records have been outstanding during their three years in college. Should the winner not return the following academic year, the scholarship is awarded to the student making the next highest average. The purpose of the scholarship is to further the advancement of professional phar-

macy and to aid a worthy student in completing his senior year. The Blumauer-Frank Drug Company has furnished a heavy bronze plaque upon which is engraved the name of the winner and the year.

Oregon State Pharmaceutical Association Educational Fund Scholarship. The Board of Trustees of the Oregon State Pharmaceutical Association Educational Fund will grant an annual scholarship of $100 to a member of the freshman class of the School of Pharmacy who meets the following requirements: (1) His father or mother must be a member of the Oregon State Pharmaceutical Association. (2) He must rank high in scholarship, character, and effort. (3) He must make application for the scholarship and certify that he will continue his course in pharmacy at Oregon State College until graduation.

The Sears Roebuck and Company Scholarships. A grant of $2,000 for the year 1942-43 is made by Sears, Roebuck and Company for scholarships in the School of Agriculture of Oregon State College. Eighteen $100 scholarships will be awarded to worthy Oregon farm boys of good character and scholastic attainment, who have for the past several years demonstrated leadership ability through participation in 4-H Club, Future Farmers, or agricultural or community activities. An award of $200 will be made to the outstanding sophomore selected from the 1941-42 freshman Sears Scholarship recipients.

J. A. Hanson Scholarship. The J. A. Hanson Scholarship of $75 is awarded annually to the outstanding junior majoring in poultry husbandry.

Prizes and Awards

DISTINCTION in scholarship is recognized at the State College by the presentation of Senior Honors at the time of graduation, through election to the various honor societies, and through prizes and awards. A description of requirements for recognition as Senior Honor Students and a list of honor societies will be found elsewhere in this Catalog. There are also essay and oratorical prizes, and awards for proficiency in special fields, and for all-round distinction in student life. The Phi Kappa Phi Freshman Awards recognize each year those students who have made distinguished records in scholarship during their first year in college.

The Clara H. Waldo Prizes, totaling $70 annually, are awarded each spring in the proportions of $25, $20, $15, and $10 respectively to the woman student of highest standing registered as a regular student in the senior, junior, sophomore, and freshman year. The committee having charge of the award of these prizes is guided by the following points: (a) proficiency in scholarship, (b) success in student activities, (c) qualities of womanhood, and (d) qualities of leadership.

The Lipman Wolfe Prizes, totaling $100 annually, are awarded each year in the proportions of $50, $30, and $20 respectively to the man or woman of highest standing registered as a regular student in the senior, junior, and sophomore classes. The committee having charge of the award of these prizes is guided by the following points: (a) proficiency in scholarship, (b) qualities of manhood or womanhood with special emphasis on unselfishness and kindness, (c) qualities of leadership, and (d) contribution to campus welfare.

Sigma Xi Award. The Oregon State College chapter of The Society of Sigma Xi has established an annual award of $25 for the best master's thesis

in science or related fields. The society reserves the right of nonaward in case no thesis of exceptional merit is submitted.

The Chi Omega Prize. Eta Alpha of Chi Omega offers an annual award of $25 to the senior woman who is adjudged by a college committee on honors and awards to approach most nearly an ideal of intellect and spirituality and to have exerted the most wholesome influence upon her associates.

Mortar Board Senior Award. An award of $40 provided by Mortar Board, is presented to the woman who, in adversity as well as good fortune, has demonstrated the qualities of fortitude, confidence, and resourcefulness that make for progress.

Altrusa Award is an award of $50 given by the Altrusa Club of Portland to a senior woman whose performance during her college years has shown the qualities of integrity, loyalty, and firmness of purpose in making the most of her opportunities.

Sigma Delta Pi Spanish Award. A Spanish masterpiece and the medal of the American Association of Teachers of Spanish are given annually by the Oregon chapter of Sigma Delta Pi (Spanish national honor society) to the advanced student of Spanish who has made the greatest progress during the academic year.

Phi Sigma Scholarship Award. The Phi Sigma scholarship award is a sterling silver medal awarded annually by the national organization of Phi Sigma, honor society in biological science, to the outstanding senior student at Oregon State College, who has shown creative interest in biology. The purpose of the award is to stimulate interest and application in science, especially in the biological sciences.

The Student Library Awards, consisting of two $25 purchase orders donated annually by the Oregon State College Cooperative Association, are made each year to the two upperclassmen, men or women, judged to possess the most outstanding personal libraries.

The Alpha Zeta Scholarship Cup is awarded during the first term of the sophomore year to the student in agriculture receiving the highest grade average in the freshman class.

Swift & Company Essay Award. An award of $130 is given to the student registered in agriculture who submits the best essay on any phase of the methods employed by the meat-packing business in marketing meats, poultry, eggs, butter, and cheese. The award is used for traveling and other expenses in making a trip to Chicago to attend the International Livestock Exposition and participate while there in a market study program under the direction of Swift & Company.

The Kappa Delta Pi Award of $25 is made annually to the sophomore enrolled in the School of Education who as a freshman in that school made the highest scholastic average.

The American Institute of Electrical Engineers Prize is an associate membership in the institute, awarded annually by the Portland Section for the best paper prepared and delivered by an undergraduate member of the Oregon State College student branch.

The A. S. M. Awards. The American Society of Metals (Oregon Chapter) awards annually three memberships in the society and cash awards of $10 and $5 each for the best papers prepared by student members of the society.

Epsilon Pi Tau Award. A certificate of merit is awarded annually to the sophomore in industrial arts who during his freshman year has made the greatest progress in scholarship and development of fellowship.

The American Society of Civil Engineers Prizes are junior memberships in the society awarded annually for the three best papers prepared and delivered in the student branch of the society.

The American Society of Mechanical Engineers Prizes of $25, $15, and $10 respectively are awarded annually for the three best papers prepared and delivered in the student branch of the society.

Institute of the Aeronautical Sciences Awards. The Student Branch of the Institute of the Aeronautical Sciences awards annually a certificate of merit and a two-year membership ($20) in the Institute to the senior member having the highest scholastic rank during the junior and senior years and to the student member preparing and presenting the best lecture at a regular meeting of the Student Branch.

Eta Kappa Nu Award. A certificate of merit is awarded annually to the outstanding student in the sophomore electrical engineering class. A permanent record of this award is kept on a bronze plaque in Apperson Hall.

The S. A. E. Awards. The Society of Automotive Engineers (Oregon Section) awards annually three prizes of $25, $15, and $10 for the best papers prepared by student members of the society.

The A. I. Ch. E. Award. The American Institute of Chemical Engineers awards a pin each year to the junior member of the student chapter who made the highest record during his freshman and sophomore years.

Sigma Tau Award. A medal is awarded each year to the sophomore student in engineering who as a freshman was the most outstanding student.

Tau Beta Pi Local Awards. Two awards valued at $5.00 each are made annually by the local chapter of Tau Beta Pi for the best papers presented by initiates of the chapter. Certificates of merit are also awarded to six freshmen in engineering having the highest scholastic standing during the first two terms of the year.

The Charles Lathrop Pack Forestry Prize. Through the generosity of Mr. Charles Lathrop Pack of New Jersey, a gift of $2,000 has been made to the State College to encourage forestry students to write for publication. The income from the gift is awarded each year to the student in forestry who produces the most interesting, logical, and technically significant paper for publication.

The Xi Sigma Pi Plaque is awarded each year to the student in forestry who has maintained the highest grade average during the sophomore year.

The Omicron Nu Plaque is awarded each year to the senior woman who has best lived the teachings of home economics throughout her college career. Candidates are first selected by a committee of the home economics faculty and their names then submitted to vote of the Home Economics faculty, final decision resting with the committee.

Oregon Home Economics Association Award. An award of $25 is made annually by the Oregon Home Economics Association to an Oregon girl majoring in home economics who is a sophomore and needs financial aid to continue her education. The selection is made by a committee made up of the

President of the Oregon Home Economics Association, the Dean of the School of Home Economics, and a member of the home economics staff.

The Home Economics Freshman Award of $10 was established (1928) by members of Omicron Nu for the purpose of promoting scholarship and leadership in home economics, the recipient being selected by a joint committee representing Omicron Nu and the faculty in home economics.

The Lamplighter Award of $15 is presented annually by the Lamplighter Club to the senior who during his college career has, in the opinion of the Committee on Honors and Awards, contributed most to the success of THE LAMPLIGHTER magazine.

The Drucilla Shepard Smith Prize. Through the generosity of John E. Smith of the Class of 1902 a sum of $500 has been contributed as a memorial to his mother, the late Drucilla Shepard Smith (Mrs. F. S. Smith) formerly of McCoy, Polk County, Oregon. The income from this gift is awarded annually to the senior woman having the highest scholastic standing during the eight terms preceding her selection for this award, provided that it shall not be given to any student who receives any other award during the same academic year.

The Rho Chi Prize of $10 is awarded annually to the freshman in pharmacy who in the judgment of the Rho Chi society and the faculty in pharmacy has been most outstanding in scholarship and activities.

The Lehn and Fink Medal. A gold medal, appropriately engraved, is awarded each year to the senior student in the School of Pharmacy who has attained the highest scholarship rank, or who in the judgment of the faculty has made the most distinctive contribution to the advancement of science in pharmacy.

Women's Auxiliary to Oregon State Pharmaceutical Association Prize. A cash prize of $25 is awarded annually to the senior woman in pharmacy who in the judgment of the faculty in pharmacy has shown the greatest proficiency in scholarship, qualities of leadership and womanhood, and success in student activities.

North Pacific Branch of the American Pharmaceutical Association Award. This award, consisting of a year's membership in the American Pharmaceutical Association and a scholarship certificate, is made annually to an outstanding junior in pharmacy.

The Locey Athletic Award is a medal given annually to the senior man outstanding in athletic participation, citizenship, and sportsmanship, in inspiration and leadership as a member of his team, and in scholarship.

Extracurricular Activities

THE State College recognizes the values of extracurricular student activities as a part of a college education: formation of habits of civic responsibility and leadership through self-government and student clubs and societies; the broadening of outlook and sympathies through varied human associations; cultural development through participation in the intellectual and esthetic life of the campus.

The Memorial Union provides a center for democratic fellowship among all students, faculty, alumni, and friends of the College.

While the building is beautiful in design, construction, and furnishings, it has been planned for practical usefulness and, with its social rooms, student bookstore, post office, telegraph office, barber shop, tea room, and other facilities, is a busy center of student life throughout each day of the academic year. Students read or converse in the lounges; the business of the student body is transacted in the various student offices; here the student publications are edited and student activities are planned and carried out. In the tea room small and large groups hold social and conference luncheons and dinners. In the ball room are held afternoon or evening dances. In the various committee and assembly rooms meetings of many kinds fill a busy calendar each week.

Here faculty and students meet in many relationships. Alumni, especially at Homecoming, Commencement, and on other similar occasions, use the Union as their campus headquarters. Visitors from within and without the state, parents and friends of students, and notable institutional guests are welcomed in the Union.

The Memorial Union has demonstrated its efficiency as a center of College life on the Oregon State campus. Dedicated in 1928 "to the service and inspiration of the living and to the memory of our immortal dead," it conforms to the standard set by the International War Memorial Association, which determined that all memorials should be, not only commemorative of the dead, but of use to the living. The president of the Memorial Union is a student, and students share actively in the management of the Union. (For description of the building see BUILDINGS.)

The Associated Students. The students of the State College are organized for self-government into the Associated Students of Oregon State College. The A. S. O. S. C. sponsors and manages such activities as intercollegiate athletics, student publications, forensics and dramatics, and concert and lecture series.

The Associated Women Students, a group within the general student body organization, sponsors and supervises activities of women students. The A. W. S. is a chapter of the Intercollegiate Association of Women Students.

Each entering class forms an organization within the A. S. O. S. C. which retains its identity throughout the four undergraduate years at the State College and after graduation. Class reunions are held regularly by alumni. During their undergraduate days students in the different classes uphold various distinctive traditions. Graduating classes usually leave a gift to the State College. Classes returning for their silver anniversary or jubilee also may make gifts as an expression of their loyalty and appreciation toward the institution at which they received their undergraduate education.

Clubs and Associations. A large number of clubs and associations flourish on the State College campus to serve special student interests. Some of these organizations are: American Institute of Agricultural Engineers (Oregon student branch); Agricultural Club; Agriculture Economic Forum; American Institute of Chemical Engineers (Oregon State chapter); American Society of Civil Engineers (Oregon State student chapter); American Society of Mechanical Engineers (Oregon State student branch); American Institute of Electrical Engineers (Oregon State chapter); Artists' Guild; Dairy Club; Daughters of the American Revolution; Ding Darling Wildlife Club; Engineers Student Council; Society of Automotive Engineers (Oregon State student branch); Bernard Daly Club (students holding Daly scholarships); Forestry Club; 4-H Club; Home Economics Club; Industrial Arts Club; Pharmaceutical Association; Science Club; Society of American Military Engineers (Oregon State student chapter); Student Affiliates of the American Chemical Society;

Round Table, YMCA-YWCA; Temenids (Eastern Star); Women's Athletic Association.

The parents of Oregon State students are organized into two groups, Oregon State Dads and Oregon State Mothers, both active in the support of the State College. Other organizations important in the life of the campus are the Biology Club (faculty); the Faculty Men's Club; the Faculty Women's Club; American Association of University Women (Corvallis branch); College Folk Club (faculty women and wives of staff members); Oregon State Dames (wives and mothers of students, affiliated with the national University Dames).

Honor Societies. A number of honor societies are maintained on the Oregon State campus for the recognition of general scholarship, scholarship in particular fields, and student leadership. Most of them are national organizations with chapters at the leading colleges and universities of the country. Among these societies are: Phi Kappa Phi (all-college scholastic, men and women); Sigma Xi (research, science; men and women); Alpha Lambda Delta (sophomore women); Alpha Zeta (agriculture, men); Aquabats (swimming, women); Blue Key (senior men); Delta Sigma Rho (forensics, men and women); Eta Kappa Nu (electrical engineering); Euterpe (music, women); Gamma Sigma Delta (agriculture); Kappa Kappa Alpha (art, men and women); Kappa Kappa Psi (band); Mortar Board (senior women); Mu Beta Beta (4-H Clubs, men and women); National Collegiate Players (dramatics, men and women); Omicron Nu (home economics); Orchesis (dancing, women); Parthenia (physical education, women); Phi Lambda Upsilon (chemistry); Phi Sigma (biology, men and women); Rho Chi (pharmacy, men and women); Sigma Pi Sigma (physics, men and women); Sigma Tau (engineering); Tau Beta Pi (engineering); Talons (sophomore women); Thanes (men); Theta Sigma Phi (journalism, women).

Professional and Departmental Societies. Student societies are maintained in many of the schools and departments for the promotion of high standards of scholarship and professional training. Most of them are national organizations. Among these societies are: Alpha Delta Sigma (advertising, men); Epsilon Pi Tau (industrial arts); Kappa Delta Pi (education, men and women); Kappa Psi (pharmacy, men); Phi Chi Theta (commerce, women); Pi Mu Epsilon (mathematics, men and women); Scabbard and Blade (military); Sigma Delta Chi (journalism, men); Sigma Delta Psi (physical education, men); Sigma Gamma Epsilon (geology and mining); Xi Sigma Pi (forestry).

Athletics and Sports. Oregon State College is a member of the Pacific Coast Intercollegiate Athletic Conference composed of ten leading universities and colleges of the coast region. In addition to intercollegiate athletics a comprehensive program of intramural sports is sponsored by the institution through the Division of Physical Education. The sports program is closely correlated with instruction in physical education. Student organizations encourage sports participation and give recognition for proficiency.

Major intercollegiate sports for men include football, basketball, baseball, swimming, and track. Minor intercollegiate sports include skiing, tennis, golf, wrestling, boxing, and fencing. Intramural sports include touch football, basketball, Sigma Delta Psi, foul throwing, volleyball, handball, wrestling, speedball, bowling, swimming, table tennis, gymnastics, fencing, horseshoes, softball, track, tennis, golf, rowing, and bridge.

Organized sports for women include hiking, volleyball, archery, dancing, hockey, baseball, basketball, swimming, tennis, badminton, deck tennis, horseshoes, golf, fencing, and games of low organization.

The Varsity "O" Association includes men who have been awarded a major-sports letter. The Minor "O" Association includes all men who have been awarded a letter in any of the minor sports.

The Women's Athletic Association sponsors women's athletic contests and the organization of various sport clubs. As a member of the Athletic Conference of American College Women, it correlates its program with a nationwide effort to maintain women's athletics on a high educational level. The Orange "O" Association is composed of women holders of Orange "O," awarded to those who have met the requirements, including the earning of points in interclass athletics.

Lectures. The regular State College curriculum is supplemented by frequent public lectures by faculty members and visiting scholars. Lectures are sponsored by the Committee on Convocations and Lectures, the Faculty Men's Club, the American Association of University Women, the College Folk Club, the Committee on Religious Education, the Associated Students, the Associated Women Students, Phi Kappa Phi, Sigma Xi, and schools and departments.

Forensics and Dramatics. Forensics and dramatics are fostered at the State College not only for their value to those participating but also for their intellectual and cultural value for the whole campus community. The State College is a member of the Pacific Forensic League composed of the leading colleges and universities on the coast, and of the Intercollegiate Forensic Association of Oregon composed of ten colleges and universities.

Training and experience in acting, play production, and stage craft are provided by the Speech Department. Each season groups of short plays are given in connection with the instruction in community drama. Three major and two minor plays are presented each year by the National Collegiate Players, Workshop Theater Players, or Mask and Dagger, the campus dramatic groups. Special student organizations such as the Wesley Players and the Westminster Players also provide outlets for dramatic talent.

The Associated Students sponsor a full schedule of varsity and freshman debate and oratory for both men and women. From 36 to 40 Oregon State teams supporting both negative and affirmative of many questions participate each year in more than 100 intercollegiate debates. Oregon State representatives compete in the old-line State Oratorical Contest, the state Peace oratorical contest, and the state and Pacific Coast extempore-speaking contests. Interclass extempore speaking contests are held each term, the winners receiving loving cups.

Art and Music. The State College gives special encouragement to extracurricular activities in art and music. Exhibitions, concerts, and recitals sponsored by the departments of Art and Music, the Associated Students, and student musical and art organizations play a central part in the cultural life of the State College community.

The Oregon State Symphony Orchestra, composed of about fifty student musicians, gives two or more major concerts each year; it plays for Commencement and other important institutional events. The orchestra cooperates with the choral organizations in oratorio productions. Any State College student is eligible to try out for the orchestra.

Membership in the 75-piece, uniformed R.O.T.C. Band is open to students passing a satisfactory examination in the elements of music and ability to perform on a band instrument. Individual practice and attendance at rehearsals are required. The Band furnishes basses, baritones, altos, and drums; otherwise, members must furnish their own instruments, which must be in low pitch.

The Co-ed Band, composed of women students who can play a band instrument, appears in concert two or three times a year.

The Glee Club, student men's organization, prepares programs of male choruses, glees, and compositions of a lighter nature. Membership is determined through individual examination of candidates. The Madrigal Club, student women's organization, studies compositions for women's voices of various types and gives concerts both alone and in conjunction with the Glee Club at various times during the year. Membership is determined through individual examinations of candidates. The College Chorus is composed of the members of both the Glee and Madrigal clubs. Besides attending regular rehearsals of the club to which they belong, the members are required to attend additional rehearsals of the combined clubs, at which numbers are rehearsed for concerts given at Christmas time, Easter time, and Commencement.

The Educational Activities Board brings artists of international fame to the campus each year for concerts and recitals. Free Sunday afternoon concerts are offered to students and the public. Free public recitals by advanced music students are given frequently during the academic year.

Under the patronage of the Convocations Committee, seven or eight exhibitions are held each year in the lobby of Kidder Hall for the purpose of stimulating interest in the fine arts and of acquainting students with arts movements throughout the country. Kappa Kappa Alpha, honor society in art, is active in promoting art interests on the campus. The Artists' Guild sponsors field trips, sketching exhibitions, and lectures on art subjects.

Several dance recitals are given each year under the auspices of the Division of Physical Education, Orchesis, and other organizations.

Social Organizations. Personal associations with fellow students through social organizations and living groups constitute one of the pleasantest features of campus life. All students have opportunity to belong to some social organization.

Students not belonging to fraternities or sororities are organized for social activities. Each residence hall and cooperative house has its own group organization. The men's halls and the women's halls are organized for united activities. Independent women are organized in Phrateres, national society for college women. Independent men maintain a group of clubs. All independent students, including those residing in the dormitories, are represented in the Independent Student Council.

Fraternities on the Oregon State campus are organized into the Interfraternity Council, which is a member of the National Interfraternity Conference. The sororities on the campus are organized into the Panhellenic Council, which is a member of the National Panhellenic Congress.

Fraternities at the State College are: Alpha Chi Rho, Alpha Gamma Rho, Alpha Sigma Phi, Alpha Tau Omega, Beta Kappa, Beta Theta Pi, Chi Phi, Delta Chi, Delta Sigma Phi, Delta Tau Delta, Delta Upsilon, Kappa Delta Rho, Kappa Sigma, Lambda Chi Alpha, Phi Delta Theta, Phi Gamma Delta, Phi Kappa Tau, Phi Sigma Kappa, Pi Kappa Phi, Sigma Alpha Epsilon, Sigma Chi, Sigma Nu, Sigma Phi Epsilon, Sigma Phi Sigma, Sigma Pi, Theta Chi, Theta Xi.

Sororities at the State College are: Alpha Chi Omega, Alpha Delta Pi, Alpha Gamma Delta, Alpha Xi Delta, Chi Omega, Delta Delta Delta, Delta Zeta, Gamma Phi Beta, Kappa Alpha Theta, Kappa Delta, Kappa Kappa Gamma, Pi Beta Phi, Sigma Kappa.

Student Publications. Oregon State College student publications are listed below. The official publications of the State College and of the State System of Higher Education are listed on another page.

THE OREGON STATE BAROMETER is a full-sized newspaper, containing campus news and selected general and educational news, issued five days a week during the academic year. It is edited, managed, and financed by students. Any student may qualify for a position on the staff.

THE BEAVER, the year book of the Associated Students, is a substantially bound, pictorial record of student life. The volume is published in May.

THE AGRICULTURAL JOURNAL, a quarterly magazine published by the Agricultural Club, is devoted to the promotion of agricultural interests.

THE LAMPLIGHTER, a monthly literary magazine written and printed by students, has as its aim to give encouragement to students having talent for writing.

THE OREGON STATE TECHNICAL RECORD, a quarterly magazine (a member of Engineering College Magazines Associated), is devoted to engineering and industry.

THE ANNUAL CRUISE, an illustrated magazine published annually by the Forestry Club, is devoted to scientific forestry and lumbering and to the forestry and lumbering industries.

THE STUDENT DIRECTORY is compiled and published twice a year by the Oregon State chapters of Sigma Delta Chi and Alpha Delta Sigma.

Alumni Association

ALUMNI of Oregon State College include 13,748 graduates and approximately 32,473 former students. The association is governed by a board of seventeen directors, some of this number being elected each year at the annual business meeting held at Commencement. Each board member represents a particular section of the state or area outside the state and serves for a term of three years. Membership in the association may be obtained by the payment of $3 annual dues or by the payment of $50 that entitles one to a Life Membership. The Life Membership includes a copy of the ORANGE AND BLACK, a 70-year pictorial book of the college published in 1938 by the association. The association maintains its permanent manager and office staff in Room 110, Memorial Union, where complete files are kept of all graduates and former students of the State College. The officers of the association for 1941-42 are as follows:

GEORGE F. CHAMBERS, '16, Salem.....President
RALPH E. REYNOLDS, '08, Portland.....Vice President
EMIL SEIBERT, '20, Corvallis.....Treasurer
WARREN A. REID, '34, Corvallis.....Manager
CHARLES T. PARKER, '08, Portland.....Director
RICHARD M. BROWN, '34, Portland.....Director
ALBERT ENGBRETSON, '16, Astoria.....Director
CLYDE WILLIAMSON, '08, Albany.....Director
CHESTER A. HUBBARD, '30, Medford.....Director
CHARLES H. MACK, '31, Klamath Falls.....Director
J. DONALD MEYERS, '15, LaGrande.....Director
LOWELL STOCKMAN, '22, Pendleton.....Director
MATT L. MATHES, '23, Corvallis.....Director
RONALD DAVIS, '42, Corvallis.....Director
ROSS CADY, '09, Boise, Idaho.....Director
NORMAN OLIPHANT, '31, Seattle, Wash.....Director
LINDSEY SPIGHT, '25, San Francisco, Calif.....Director
HAROLD WAHLBERG, '14, Santa Ana, Calif.....Director

The official publication of the association is THE OREGON STATER, a monthly magazine devoted to the upbuilding of Oregon State college and its program of service. It is mailed regularly to all members of the association.

Part III

Resident Instruction

Lower Division

MAHLON ELLWOOD SMITH, Ph.D., Dean and Director of Lower Division, Oregon State System of Higher Education.
GERTRUDE FULKERSON, Secretary to the Dean.

General Statement

FRESHMAN and sophomore work in the liberal arts and sciences is unspecialized. The work is offered through the Lower Division on a parallel basis at the University and the State College and leads to the Junior Certificate. Students completing the work of the Lower Division and fulfilling all requirements for the Junior Certificate may select a major in a specialized field at the close of the sophomore year.

For students who plan to complete work for the bachelor's degree the two lower-division years provide broad general education and a foundation for specialization during the junior and senior years in some major field in the liberal arts and sciences or in a professional or technical curriculum. Lower-division students explore several fields of study with a view to determining special interests and aptitudes.

For students who complete no more than the first two years of college work, the Lower Division aims to afford a balanced cultural program and preparation for intelligent citizenship.

The State Board of Higher Education, in establishing the Lower Division, defined its primary purpose as follows:

(1) Basic Education.
Insuring to all students the elements of a sound general education during their first two years; delaying specialization until the junior and senior years and then encouraging it to a high degree.

(2) Orientation.
Providing students with a period of exploratory contact which will enable the institution to assist them to make a wise selection of specialization on the basis of their abilities and aptitudes.

Lower-Division Groups. For the purpose of adjusting the work to the two-fold objectives of basic education and orientation, lower-division work in the liberal arts and sciences has been arranged in three groups, each representing a comprehensive field of knowledge, as follows: LANGUAGE AND LITERATURE, SCIENCE (including the biological and physical sciences and mathematics), and SOCIAL SCIENCE.

Group Requirements. Students intending to major in the liberal arts and sciences must complete at least 9 approved term hours in each of the three groups and at least 9 additional approved term hours in courses numbered 200-210, or equivalent, in any one of the same three groups. Courses that satisfy group requirements are numbered from 100 to 110 and from 200 to 210. (For group requirements for students in the professional schools see page 75.)

Required Courses. Besides fulfilling group requirements, lower-division students must take required work in English Composition, Hygiene, Physical Education, and Military Science and Tactics, as stated on page 75. Entering

students are required to take certain aptitude and placement examinations, and to make any adjustments indicated as a result of standings achieved in these tests.

Major Requirements and Electives. Students complete their study programs with courses required by major departments or schools or with electives. Students who have decided on a major field take the courses prescribed by the major school or department. Students who are uncertain of their dominant interest or their vocational intentions, or who do not plan to pursue major specialization later, take a program of studies designed to aid them in self-exploration and individual development.

The general distribution of work for lower-division students is shown in the curriculum on pages 109-110.

Lower-Division Advisers. Each entering student is assigned to a Lower-Division adviser, whom the student consults in making out his study program. It is the duty of the adviser to assist the student in building an integrated program, in line with his interests and with institutional and lower-division requirements.

Certificates

STUDENTS who have met the group requirements, and have completed a total of at least 93 term hours of required and elective freshman and sophomore work, qualify for one of three certificates, depending on their objectives and attainments:

The Junior Certificate, which admits to upper-division standing and the opportunity to pursue a major curriculum leading to a degree. It requires a grade-point average of at least 2.00.

The Junior Certificate with Honors Privileges, which admits to the privilege of working for honors in the colleges and schools providing honors work. To receive this certificate the student must have a grade-point average of at least 2.75 in addition to fulfilling all requirements for the Junior Certificate.

The Lower-Division Certificate, which recognizes the successful completion of two years of lower-division work. It is granted upon request to students whose desire has been only to round out their general education. The scholastic average specified for the Junior Certificate is not required. The Lower-Division Certificate does not admit to upper-division standing.

Group Courses

YEAR SEQUENCES applicable in meeting group requirements are listed below. These courses may also be taken as electives. Descriptions of the courses are printed under the several departmental headings.

LANGUAGE AND LITERATURE GROUP

English

Eng 101, 102, 103. Literature Survey, 3 hours each term.
Eng 104, 105, 106. Introduction to Literature, 3 hours each term.
Eng 201, 202, 203. Shakespeare, 3 hours each term.

Germanic Languages

GL 201, 202, 203. German Literature, 3 hours each term.

Romance Languages

FRENCH

RL 201, 202, 203. French Literature, 3 hours each term.

SPANISH

RL 207, 208, 209. Spanish Literature, 3 hours each term.

SCIENCE GROUP

Science Surveys

GS 101, 102, 103. Biological Science Survey, 4 hours each term.
GS 104, 105, 106. Physical Science Survey, 4 hours each term.

Bacteriology

Bac 201, 202, 203. Elementary Bacteriology, 3 hours each term.
Bac 204, 205, 206. General Bacteriology, 3 hours each term.

Botany

Bot 201, 202, 203. General Botany, 3 hours each term.

Chemistry

Ch 101, 102, 103. Elementary General Chemistry, 3 hours each term.
Ch 201, 202, 203. Principles of Chemistry, 4 hours each term.
Ch 204, 205, 206. General Chemistry, 5 hours each term.
Ch 208, 209. General Chemistry, 5 hours winter and spring terms.

Entomology

Ent 201, 202, 203. General Entomology, 3 hours each term.

Geology

G 201, 202, 203. Geology, 3 hours each term.
G 204, 205, 206. Geology Laboratory, 1 hour each term.

Mathematics

Mth 100. Intermediate Algebra, 4 hours one term.
Mth 101, 102, 103. Elementary Analysis, 4 hours each term.
Mth 106. Trigonometry, 4 hours one term.
Mth 108. Mathematics of Finance, 4 hours one term.
Mth 109. Elements of Statistics, 4 hours one term.
Mth 201, 202, 203. Differential and Integral Calculus, 4 hours each term.

Physics

Ph 201, 202, 203. General Physics, 4 hours each term.
Ph 204, 205, 206. Astronomy and Meteorology, 3 hours each term.

Psychology

Psy 201, 202, 203. Elementary Psychology, 3 hours each term. (Applicable in satisfying group requirements in Science group if accompanied by Psy 204, 205, 206.)
Psy 204, 205, 206. Elementary Psychology Laboratory, 1 hour each term.

Zoology

Z 201, 202, 203. General Zoology, 3 hours each term.
Z 204, 205, 206. Vertebrate Zoology, 4 hours each term.
Z 208, 209, 210. Elementary Human Anatomy, 3 hours each term.

SOCIAL SCIENCE GROUP

General Social Science

SSc 101, 102, 103. Background of Social Science, 3 hours each term.

Economics

Ec 201, 202, 203. Principles of Economics, 3 hours each term.

History

Hst 201, 202, 203. History of Western Civilization, 3 hours each term.
Hst 204. History of the Far East, 3 hours.
} Hst 204 may be substituted for Hst 203

Hst 207, 208. England and the British Empire, 3 hours fall and winter terms.
Hst 209. The World Since 1914, 3 hours spring term.
} Hst 207, 208, 209 constitute a year sequence.

Political Science

PS 201, 202, 203. Modern Governments, 4 hours each term.

Psychology

Psy 201, 202, 203. Elementary Psychology, 3 hours each term.
Psy 204, 205, 206. Elementary Psychology Laboratory, 1 hour each term.

Sociology

Soc 201, 202, 203. Elements of Sociology, 3 hours each term.

Other Lower-Division Courses

Not satisfying group requirements.

IN ADDITION to the courses applicable in meeting group requirements, the following lower-division courses in liberal arts and sciences are offered at the State College. Descriptions of the courses are printed under the several departmental headings.

LANGUAGE AND LITERATURE

English

LITERATURE

Eng 161. American Literature, 3 hours fall or spring term.
Eng 231. Directed Recreational Reading, 1 or 2 hours any term.
Eng 261, 262. Individual Authors, 3 hours fall term.
Eng 263. Great Books, 3 hours winter term.
Eng 264, 265, 266. Continental European Literature, 3 hours each term.
Eng 271, 272, 273. Contemporary Literature, 3 hours each term.
Eng 274. The Short Story, 3 hours spring term.
Eng 275. The Bible as Literature, 3 hours spring term.
Eng 276. The Novel, 3 hours winter term.

WRITTEN ENGLISH

English K. A one-term course for students failing to pass the English Placement examination. One hour fall or winter term.
Eng 111, 112, 113. English Composition, 3 hours each term.
Eng 118. Technical Report Writing, 3 hours fall or spring.
Eng 211. Vocabulary Building, 3 hours winter term.
Eng 213, 214, 215. Short Story Writing, 2 hours each term.
Eng 217. Business English, 3 hours any term.
Eng 218. Creative Writing, 3 hours winter term.

SPEECH

Sp 111, 112, 113. Extempore Speaking, 3 hours each term.
Sp 120. Voice and Diction, 3 hours spring term.
Sp 211, 212, 213. Oratory Squad, 2 hours each term.
Sp 214, 215, 216. Extempore Speaking Squad, 2 hours each term.
Sp 217, 218, 219. Debating, 2 hours each term.
Sp 220. Argumentation, 3 hours any term.
Sp 221. Speech Composition, 3 hours fall term.
Sp 231. Parliamentary Procedure, 3 hours fall or spring term.
Sp 234, 235, 236. Radio Speaking, 3 hours each term.
Sp 250. Speech Defects, 3 hours spring term.

DRAMA

Sp 121. Interpretation I, 3 hours any term.
Sp 122. Interpretation II, 3 hours any term.
Sp 123. Interpretation III, 3 hours spring term.
Sp 244. Stagecraft and Lighting, 3 hours any term.
Sp 247, 248, 249. Community Drama, 3 hours each term.
Sp 251. Workshop Theater Players, 1 to 3 hours any term.

Modern Languages

GERMAN

GL 1, 2, 3. First-Year German, 4 hours each term.
GL 4, 5, 6. Second-Year German, 4 hours each term.

FRENCH

RL 1, 2, 3. First-Year French, 4 hours each term.
RL 4, 5, 6. Second-Year French, 4 hours each term.
RL 211, 212, 213. Directed Reading in French, 1 hour each term.

SPANISH

RL 11, 12, 13. First-Year Spanish, 4 hours each term.
RL 14, 15, 16. Second-Year Spanish, 4 hours each term.
RL 214, 215, 216. Directed Reading in Spanish, 1 hour each term.

SCIENCE

Bacteriology

Bac 230. Principles of Bacteriology, 3 hours spring term.

Chemistry

Ch 130. Descriptive General Chemistry, 3 hours spring term.
Ch 226. Organic Chemistry, 4 or 5 hours.
Ch 227. Organic Chemistry, 5 hours winter term.

Ch 231. Advanced Qualitative Analysis, 4 or 5 hours fall term.
Ch 232, 233. Quantitative Analysis, 4 or 5 hours winter and spring terms.
Ch 234. Quantitative Analysis, 5 hours spring.
Ch 250. Elements of Biochemistry, 4 hours winter or spring term.
Ch 251, 252. Organic and Agricultural Biochemistry, 5 hours fall and 3 hours winter.
Ch 253. Agricultural Biochemistry, 2 hours winter term.
Ch 254. Quantitative Analysis for Agricultural Students, 3 hours spring.

Entomology
Ent 223. Elementary Entomology, 3 hours winter term.

Mathematics
Mth 10. Elementary Algebra, 4 hours one term.
Mth 20. Elementary Geometry, 4 hours one term.

Nursing Education
Nur 111, 112, 113. Backgrounds of Nursing, 2 hours each term.
Nur 211, 212, 213. Modern Nursing Problems, 1 hour each term.

Physics
Ph 111, 112, 113. Engineering Physics, 3 hours each term.
Ph 161. Rudiments of Photography, 2 hours any term.
Ph 211, 212. Qualitative Physics, 3 hours fall and winter terms.
Ph 214. Household Physics, 4 hours spring.

Zoology
Z 130. Principles of Zoology, 3 hours spring term.
Z 211. Elementary Human Physiology, 5 hours spring term.

SOCIAL SCIENCE

Economics
Ec 211. Outlines of Economics, 4 hours any term.
Ec 212. Outlines of Economics, 3 hours any term.
Ec 214. Economic Development of the United States, 4 hours winter term.

History
Hst 224, 225, 226. History of American Civilization, 3 hours each term.

Philosophy
Phl 211, 212, 213. Practical Life Philosophies, 2 hours each term.

Political Science
PS 212. American National Government, 3 hours any term.
PS 231, 232, 233. Current Affairs, 2 hours each term.

Psychology
Psy 111. Mental Hygiene, 3 hours any term. (No credit allowed to students who have taken Ed 102.)
Psy 112, 113, 114. Aids to Effective Thinking. 3 hours each term.
Psy 212, 213, 214. Modern Logic and Scientific Method, 3 hours each term.
Psy 215. Industrial Psychology, 3 hours any term.
Psy 221, 222. Outlines of Psychology, 3 hours each term.

Sociology
Soc 211. General Sociology, 4 hours any term.
Soc 212. General Sociology, 3 hours any term.

Lower-Division Curriculum

Junior Certificate
Junior Certificate with Honors Privileges
Lower-Division Certificate

Freshman Year	Term hours F	W	S
Year sequence in any one of the three groups	3–4	3–4	3–4
Year sequence in another of the three groups (may be deferred until sophomore year)	3–4	3–4	3–4
English Composition (Eng 111, 112, 113)	3	3	3
Military Science and Tactics (men)	1	1	1
[1]Physical Education	1	1	1
[2]Departmental or school requirements or exploratory electives	5–3	5–3	5–3
	16	16	16

[1] General Hygiene (PE 150), 2 term hours, must be taken in place of physical education one term of the freshman year. Women take Social Ethics (PE 131) in addition to physical education one term of the freshman year.

[2] Chosen with the approval of the dean of the Lower Division. If one of the year sequences in group requirements is deferred to the sophomore year, the opportunity for school requirements or electives is correspondingly increased.

Sophomore Year	Term hours F	W	S
Sophomore year sequence in one of the groups begun in the freshman year	3–4	3–4	3–4
Year sequence in a third group	3–4	3–4	3–4
Military Science and Tactics (men)	1	1	1
Physical Education	1	1	1
[1]Departmental or school requirements or exploratory electives	8–6	8–6	8–6
	16	16	16

[1]Chosen with the approval of the dean of the Lower Division. See footnote [2] on page 109.

School of Science

Faculty

FRANCOIS ARCHIBALD GILFILLAN, Ph.D., Dean of the School of Science.

GODFREY VERNON COPSON, M.S., Acting Associate Dean of the School of Science.

GEORGENA SAMSON, B.S., Secretary to the Dean.

*General Science**

WILLIAM DONALD WILKINSON, Ph.D., Associate Professor of Geology.

HENRY PAUL HANSEN, Ph.D., Instructor in Botany.

OLOF LARSELL, Ph.D., Sc.D., Lecturer on the History of Science.

RICHARD DUNN NORTHCRAFT, Graduate Assistant in Biological Science.

ERNEST CLIFFORD ANDERSON, B.S., Graduate Assistant in Biological Science.

Bacteriology

GODFREY VERNON COPSON, M.S., Professor of Bacteriology; Head of Department.

CLAIR VAN NORMAN LANGTON, Dr.P.H., Ed.D., Professor of Hygiene.

JOSEPH ELLSWORTH SIMMONS, M.S., Professor of Bacteriology.

HENRIETTA MORRIS, Sc.D., Associate Professor of Hygiene.

WALTER BENO BOLLEN, Ph.D., Associate Professor of Bacteriology.

CARL LAMANNA, Ph.D., Instructor in Bacteriology.

IRVING MILTON SHAPIRO, B.S., Graduate Assistant in Bacteriology.

Botany

CHARLES ELMER OWENS, Ph.D., Professor of Botany and Plant Pathology; Head of Department.

WINFRED MCKENZIE ATWOOD, Ph.D., Professor of Plant Physiology.

FRANCOIS ARCHIBALD GILFILLAN, Ph.D., Chairman of Executive Committee, Institute of Marine Biology.

EARL LEROY PACKARD, Ph.D., Director of Research, Institute of Marine Biology.

WILLIAM EVANS LAWRENCE, B.S., Associate Professor of Plant Ecology.

HELEN MARGARET GILKEY, Ph.D., Associate Professor of Botany; Curator of Herbarium.

ETHEL IDA SANBORN, Ph.D., Associate Professor of Botany.

FRANK HERSCHEL SMITH, Ph.D., Assistant Professor of Botany.

HENRY PAUL HANSEN, Ph.D., Instructor in Botany.

LEWIS FRANKLIN ROTH, Ph.D., Instructor in Botany.

WALTER THOMAS LUND, M.S., Instructor-Technician in Botany.

* The Department of General Science is in general charge of a committee composed of the heads of the departments, with a chairman in immediate charge.

CHARLOTTE GOODDING REEDER, M.A., Herbarium Assistant.
JOHN RAYMOND REEDER, M.S., Graduate Assistant in Botany.
JOHN MERKLE, B.A., Graduate Assistant in Botany.
MARSHALL MINTON ROSS, M.S., Graduate Assistant in Botany.

Chemistry

EARL C GILBERT, Ph.D., Professor of Physical Chemistry; Chairman of Department.
JOHN FULTON, M.S., Professor Emeritus of Chemistry.
J SHIRLEY JONES, M.S.A., Professor of Agricultural Chemistry.
FRANCOIS ARCHIBALD GILFILLAN, Ph.D., Professor of Chemistry.
*JOSEPH SHIREY BUTTS, Ph.D., Professor of Biochemistry.
JOSEPH PARKE MEHLIG, Ph.D., Associate Professor of Analytical Chemistry.
*WILLIAM ELMER CALDWELL, Ph.D., Associate Professor of Chemistry.
CHARLES S PEASE, Ph.D., Associate Professor of Organic Chemistry.
BERT EINAR CHRISTENSEN, Ph.D., Associate Professor of Chemistry.
LEO FRIEDMAN, Ph.D., Assistant Professor of Chemistry.
JAMES WILLIAMS FERGUSON, Ph.D., Assistant Professor of Chemistry.
*JACK GLYNDON ROOF, Ph.D., Assistant Professor of Chemistry.
LLOYD ELLIS WEST, Ph.D., Assistant Professor of Chemistry.
GLEN CHASE WARE, M.S., Instructor in Chemistry.
EDWARD CLEVELAND CALLAWAY, M.S., Instructor in Chemistry.
*ALLEN BREWSTER SCOTT, Ph.D., Instructor in Chemistry.
MAX BULLOCK WILLIAMS, Ph.D., Instructor in Chemistry.
GERALD WATSON KEILHOLTZ, M.A., Instructor in Chemistry.
JOSEPH SCHULEIN, B.S., Research Associate in Chemistry.
ALOYSIUS JOSEPH CLASSEN, B.S., Research Fellow in Chemistry.
ARTHUR BAYARD VANE, B.S., Research Fellow in Chemistry.
†ELTON MURRAY BAKER, M.S., Graduate Scholar in Chemistry.
LEMAR FRED REMMERT, B.S., Graduate Scholar in Chemistry.
CARL MARTIN ANDERSON, M.S., Graduate and Research Assistant in Chemistry.
WARREN RICHARD BIGGERSTAFF, B.A., Graduate Assistant in Chemistry.
GORDON ELDRED BROWN, B.S., Graduate Assistant in Chemistry.
RAY ALLEN CLARK, B.A., Graduate Assistant in Chemistry.
KEENE PAUL DIMICK, M.S., Graduate Assistant in Chemistry.
ARNOLD ROBERT GAHLER, B.S., Graduate and Research Assistant in Chemistry.
HENRY RUSSELL HULETT, B.S., Graduate Assistant in Chemistry.
ROBERT WILLIAM ISENSEE, B.A., Graduate Assistant in Chemistry.
ROBERT WARREN MCGILVERY, B.S., Graduate Assistant in Chemistry.
FLOYD FREDERICK RAWLINGS, B.A., Graduate and Research Assistant in Chemistry.
WILLIAM EARL ROAKE, B.S., Graduate Assistant in Chemistry.

* On leave of absence, 1941-42.
† Resigned.

OTTO FRANK SLONEK, B.A., Graduate Assistant in Chemistry.
JAMES SIMPSON SMYTH, B.A., Graduate Assistant in Chemistry.
HUGH ALEXANDER SOUTHWORTH, B.A., Graduate and Research Assistant in Chemistry.
FRANCIS LEONARD VAN VEEN, B.S., Graduate Assistant in Chemistry.
GLENN EDWARDS WILLIAMS, A.B., Graduate Assistant in Chemistry.
ROBERT WONG, B.S., Graduate and Research Assistant in Chemistry.
JAMES KILBOURNE CLAUSS, B.A., Graduate Assistant in Chemistry.
CHESTER ALBERT SCHINK, B.A., Graduate Assistant in Chemistry.

Entomology

DON CARLOS MOTE, Ph.D., Professor of Entomology; Head of Department.
*WILLARD JOSEPH CHAMBERLIN, Ph.D., Associate Professor of Entomology.
HERMAN AUSTIN SCULLEN, Ph.D., Associate Professor of Entomology.
RICHARD LEWIS POST, B.S., Technician in Entomology.
DANIEL ERNEST BONNELL, M.S., Acting Instructor in Entomology.
JOHN EMERSON DAVIS, M.S., Graduate Assistant in Entomology.
CHARLES HAMMOND STARKER, B.S., Graduate Assistant in Entomology.
HERBERT JOHN OSTLIND, B.S., Research Assistant in Entomology.

Geology

EARL LEROY PACKARD, Ph.D., Professor of Paleontology; Head of Department of Geology; Director of Research, Institute of Marine Biology.
EDWIN THOMAS HODGE, Ph.D., Professor of Economic Geology.
IRA SHIMMIN ALLISON, Ph.D., Professor of Geology.
ETHEL IDA SANBORN, Ph.D., Associate Professor of Paleobotany.
WILLIAM DONALD WILKINSON, Ph.D., Associate Professor of Geology.
†PHILIP FRANCE MCKINLAY, B.A., Research Assistant in Geology.
†ALI GHOALI HESHMATI, B.A., B.S., Research Assistant in Geology.
HAROLD ARTHUR CULP, B.S., Graduate Assistant in Geology.

Mathematics

WILLIAM EDMUND MILNE, Ph.D., Professor of Mathematics; Head of Department.
EDWARD HIRAM MCALISTER, A.M., Sc.D., Professor Emeritus of Mathematics.
EDWARD BENJAMIN BEATY, M.A., Professor of Mathematics.
NICHOLAS TARTAR, B.S., Associate Professor Emeritus of Mathematics.
JOHN ALBERT VAN GROOS, M.S., Associate Professor of Mathematics.
GEORGE ALFRED WILLIAMS, A.M., Associate Professor of Mathematics.
HARRY LYNDEN BEARD, M.A., Assistant Professor of Mathematics.
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INGOMAR M HOSTETTER, Ph.D., Assistant Professor of Mathematics.
†HENRY SCHEFFÉ, Ph.D., Instructor in Mathematics.

* On leave of absence.
† Resigned.

ANDREW SOBCZYK, Ph.D., Instructor in Mathematics.
PRESTON CLARENCE HAMMER, Ph.D., Instructor in Mathematics.
RHODA MANNING, Ph.D., Instructor in Mathematics.
FRANCIS EDWARD EHLERS, B.S., Graduate Assistant in Mathematics.
BEATRICE ANNE HYLAND, B.A., Graduate Assistant in Mathematics.

Nursing Education

*ELNORA ELVIRA THOMSON, R.N., Professor of Nursing Education; Director of Department.
*RUTH VEE WHEELOCK, M.A., R.N., Associate Professor of Nursing Education.

Physics

WILLIBALD WENIGER, Ph.D., Professor of Physics; Head of Department.
WILLIAM PINGRY BOYNTON, Ph.D., Sc.D., Professor Emeritus of Physics.
WILLIAM BALLANTYNE ANDERSON, Ph.D., Professor Emeritus of Physics.
EDWIN ARTHUR YUNKER, Ph.D., Associate Professor of Physics.
†JAMES JOSEPH BRADY, Ph.D., Associate Professor of Physics.
FRED BUCKNER MORGAN, M.S., Assistant Professor of Physics.
JOHN CLIFTON GARMAN, Ph.M., Assistant Professor of Physics.
WILLIAM ROY VARNER, E.E., Ph.D., Assistant Professor of Physics.
WILLIAM CURTIS REID, Ph.D., Instructor in Physics.
HAROLD ROTH VINYARD, Ph.D., Instructor in Physics.
CHUNG KWAI LUI, Ph.D., Acting Instructor in Physics.
HUBERT WATERBURY ANDERSON, B.S., Graduate Assistant in Physics.
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Science Education

ELMO NALL STEVENSON, Ed.D., Professor of Science Education; Head of Department.
WINFRED MCKENZIE ATWOOD, Ph.D., Professor of Plant Physiology.
HENRIETTA MORRIS, Sc.D., Associate Professor of Hygiene.
WILLIAM DONALD WILKINSON, Ph.D., Associate Professor of Geology.

Zoology

NATHAN FASTEN, Ph.D., Professor of Zoology; Head of Department.
FRANCOIS ARCHIBALD GILFILLAN, Ph.D., Chairman of Executive Committee, Institute of Marine Biology.
EARL LEROY PACKARD, Ph.D., Director of Research, Institute of Marine Biology.
DELMAR ISAAC ALLMAN, Dr.P.H., Associate Professor of Hygiene.
KENNETH LLEWELLYN GORDON, Ph.D., Associate Professor of Zoology.
‡ROSALIND WULZEN, Ph.D., Associate Professor of Zoology.

* Members of the faculty of the Department of Nursing Education, University of Oregon Medical School, Portland.
† On leave of absence.
‡ On sabbatical leave 1941-42.

JOHN LYNN OSBORN, Ph.D., Assistant Professor of Zoology.
GRANT ALEXANDER SWAN, B.S., Assistant Professor of Physical Education.
ERNST JOHN DORNFELD, Ph.D., Instructor in Zoology.
CLIFFORD GROBSTEIN, Ph.D., Instructor in Zoology.
WILLEM JOHAN VAN WAGTENDONK, Ph.D., Research Associate, Williams-Waterman Research Project.
WALDO RICHARD HARDIE, B.S., Research Assistant, Williams-Waterman Research Project.
ERNEST CLIFFORD ANDERSON, B.S., Graduate Assistant in Zoology.
IRENE JOSEPHINE CARSON, B.A., Graduate Assistant in Zoology.
KENNETH MARION HUGHES, B.A., Graduate Assistant in Zoology.
ROBERT MACLEOD STORM, M.S., Graduate Assistant in Zoology.

General Statement

MAJOR work in the Oregon State System of Higher Education leading to baccalaureate and advanced degrees in the biological and physical sciences and mathematics is centered in the School of Science at the State College. The School of Science performs a three-fold function; it provides:

1. Liberal-arts education with majors in science leading to degrees of Bachelor of Arts or Bachelor of Science.
2. Professional education for students planning to enter some scholarly occupation in the realm of science. Such students take an undergraduate science major and from one to three or more years of graduate study in science.
3. Elective and service courses in science for students majoring in other schools, or for students interested in science who need it as a basis for professional or technical work in other allied schools.

Instruction in science is afforded students preparing for science teaching in secondary schools or in institutions of higher education; for study in medicine or nursing; for positions in which a knowledge of science is fundamental for research, or for professional work in science or in its many applications in modern civilization.

The instruction in the first two years is made as broad and liberalizing as possible, laying a solid foundation for upper-division and graduate work in the various fields of science and affording preparation in basic sciences underlying the work of professional schools.

Major Curricula

The departments included in the School of Science are: General Science, Bacteriology, Botany, Chemistry, Entomology, Geology, Mathematics, Physics, and Zoology. Each department provides the usual undergraduate majors in its field. At the graduate level, where specialization is provided, the number of possible majors is larger. The Department of Science Education is a joint department with the School of Education. The Department of Nursing Education is a joint department with the University of Oregon Medical School.

Departmental Majors. The undergraduate curricula indicate the most satisfactory sequence of courses leading to a degree and the minimum courses required for a major in a given department. Each curriculum permits election of at least one-half of a student's work outside of the School of Science, thus enabling the student to obtain a liberal-arts education even though he may be preparing for specialized work in some field of science. The electives should be utilized to meet a definite objective rather than as an easy way of accumulating credit for graduation.

Where the student's chosen field involves an applied field as well as science, he may elect one or more minors in a professional school.

The undergraduate departmental curricula are printed on pages 119-127.

General Science Majors. The general-science majors have been organized to meet the needs of students of scientific interests who desire broad general education in science; or plan to be teachers of high-school science, and hence must be adequately prepared in a considerable range of subject matter.

The courses pursued by students are selected on a rather flexible basis from the offerings of the various departments. A special committee is responsible for the advising of students majoring in this department. The curriculum in General Science is printed on pages 119-120.

Interdepartmental Majors. For students interested in the developing sciences that involve two or more of the traditional sciences—as for example, biophysics, geophysics, life sciences, paleobiology, seismology—special curricula will be outlined. Interdepartmental majors are administered through the Department of General Science and student programs are supervised jointly by the departments concerned.

Science Teaching. Students preparing to teach science in the secondary schools may major in one of the sciences or in Science Education or General Science, fulfilling the requirements for a State Teacher's Certificate. Under SCHOOL OF EDUCATION are printed the state certification requirements, together with approved teaching majors and minors in biological sciences, general science, mathematics, and physical sciences. Advanced work in Science Education may be obtained by taking courses in the Department of Science Education.

Students preparing to teach health education major in either the School of Science or the School of Education; they will find a wide range of health-education courses in the School of Science; in the Schools of Agriculture, Education, Engineering, and Home Economics; and in the Division of Physical Education. A student can utilize such courses toward a major in the School of Science, electing from the other schools such work as most closely meets his requirements. Both undergraduate and graduate majors in Hygiene and Sanitation are offered in the Department of Bacteriology.

Special Curricula

To meet the needs of special groups of students, the School of Science offers special curricula (1) for premedical students; for nursing education students, and (3) for students preparing to be medical laboratory technicians. Students may likewise prepare for entrance to dental schools and other fields where preparation in science is a prerequisite; for such students programs of study are outlined and guidance given in the work pursued.

Premedical Curriculum. A premedical curriculum including courses prescribed by the American Medical Association for entrance to standard medical schools is offered at both Oregon State College and the University of Oregon. At each institution students pursuing this curriculum work under the supervision of a special Premedical Advisory Committee to insure a selection of studies which will satisfy medical-school entrance requirements and the cultural needs of students planning to enter the profession of medicine. At the State College the chairman of this committee is Professor Nathan Fasten.

For entrance to standard medical schools the student must not only complete certain prescribed work but also show an aptitude for medical studies. The medical-aptitude test of the Association of American Medical Colleges is given each year by the Premedical Advisory Committee to all students who expect to apply during the next academic year for admission to a medical school. Further knowledge of the student's ability is obtained through frequent conferences between the student and his instructors and authorized advisers.

The University of Oregon Medical School requires for admission at least three academic years of preparatory work (135 term hours) and recommends that the student, in his preparatory work, plan a balance in elective courses between courses in the liberal arts and courses (beyond the minimum requirements) in subjects required for admission to the Medical School.

The Medical School also requires that the student who enters without a Bachelor of Arts or Bachelor of Science degree must complete the work for one of these degrees in the Oregon State System of Higher Education, or in the institution at which he received his premedical preparation, before entering upon the work of the third year at the Medical School. Since the State College, together with most of the colleges and universities of the Pacific Northwest, recognizes credit earned during the first year at the Medical School as credit earned in residence toward a bachelor's degree, the student may obtain a bachelor's degree after one year at the Medical School.

Before entering the Medical School, the student should satisfy all requirements for the Junior Certificate and all requirements for a degree (including State College requirements and requirements for a major within the School of Science) that cannot be satisfied at the Medical School. The courses taken during the first year of medical training, together with the science courses prescribed in the premedical curriculum, will satisfy all major requirements in general science or zoology. Students selecting other liberal-arts majors in the School of Science must satisfy all major requirements before entering the Medical School, with the exception that Biochemistry (BCh 411, 412), offered at the Medical School, may be counted toward the satisfaction of the major requirement in chemistry.

Students at the Medical School who are candidates for a bachelor's degree from Oregon State College are eligible for loans from the Student Loan Fund of the State College on making arrangements acceptable to the loan fund administration. The Premedical Curriculum is printed on pages 126-127.

Preparatory Nursing Curriculum. Nursing offers many opportunities for a woman who is well prepared. The Department of Nursing Education of the University of Oregon Medical School offers a five-year curriculum which leads to the Bachelor of Science degree and to a certificate in a nursing specialty, and prepares for state examinations for nurse registration. The student takes five or six terms of work at Oregon State College at Corvallis, or at the University of Oregon at Eugene. This preparatory work is followed by three years in the Department of Nursing Education on the campus of the Medical School in Portland. The work in Portland is coordinated with

clinical education in the Multnomah County Hospital School of Nursing and in the Doernbecher Memorial Hospital for Children, both located on the Medical School campus. In the fifth year of the curriculum the student receives training in a nursing specialty. Students in nursing education receive their degree from the University, with the exception that students who take their first two years at Oregon State College receive their degrees from the latter institution.

Preparatory nursing students with a satisfactory grade-point average may, if they desire, be admitted to the Medical School in the spring term of their sophomore year.

The Preparatory Nursing Curriculum is printed on page 127.

Curriculum for Medical Technicians. The two-year Curriculum in Preparation for Medical Technicians (page 127) represents the minimum requirements of the American Society of Clinical Pathologists as given in regular courses at Oregon State college with the addition of two terms in physics (12 hours of physics is highly recommended by the Society). As it is difficult to complete all the courses listed here in two years, it is recommended that three years or more be devoted to this curriculum since some hospitals require three years of college work and a few demand a college degree for entrance to the technician's course.

Requirements for Admission and Graduation

STUDENTS entering as freshmen with the definite intention of specializing in science or mathematics or of preparing to enter a medical school, register in the Lower Division for the first two years, designating Science as their "group" or principal interest. The student's aim in the Lower Division is to obtain a broad general education and to determine upon a field in which he desires a major. Students who complete all requirements of the Lower Division receive the Junior Certificate. A student who has not fulfilled all lower-division requirements but has completed two years of college work (93 term hours or more) may be admitted to the School of Science but is responsible to the Lower Division for the completion of the Junior Certificate requirements.

The science advisers, representing the different departments in which upper-division students may major, help students in the Lower Division in the selection of specific courses prerequisite to major work. In the science curricula (pages 119-127), suggested lower-division programs are included to aid students in meeting the requirements for a Junior Certificate and in the selection of those courses that will best prepare for majoring in a particular department.

Baccalaureate Degrees. A student may be granted the degree of Bachelor of Arts or Bachelor of Science by meeting the institutional requirements for the particular degree and completing 192 term hours, of which 45 must be in upper-division work and of these at least 24 must be in a major department. Curricula have been so planned that students are enabled to follow their own interests outside the School of Science while obtaining adequate preparation in science, including the requirements for entering upon graduate work leading to advanced degrees.

Advanced Degrees. Through the Graduate Division graduate work is offered leading to the degrees of Master of Arts and Master of Science in each of the science departments, and to the degree of Doctor of Philosophy in the departments of Botany, Chemistry, Entomology, Geology, Mathematics, Physics,

and Zoology. For the requirements for the M.A., M.S., and Ph.D. degrees see GRADUATE DIVISION.

Facilities

MATERIAL facilities for the work of the School of Science include the various laboratories equipped for instruction and research in science. The biological-science laboratories are located in Agriculture Hall. The Department of Mathematics occupies the third and fourth floors of Education Hall; the Department of Geology occupies the first floor of Education Hall, also the former Health Service Building now known as the Paleontology Laboratory; the Department of Chemistry occupies the new Chemistry Hall. The Department of Physics occupies the Physics Building and a part of the Mines Building. Important adjuncts to the instruction in physics are radio station KOAC and the Photographic Service, both located in the Physics Building.

Oregon is a region of almost unlimited opportunities for field studies with plants, animals, and geological materials, thus offering many interesting research problems for advanced and graduate students.

Scientific Collections. In addition to the usual laboratory equipment available in each department, mention should be made of the Herbarium, consisting of 80,000 plants, the Department of Entomology collection of insects numbering more than 80,000 specimens, the Department of Zoology collection of representative birds of Oregon, the Braly Ornithological Collection, and the extensive geological collections of invertebrate fossils and igneous rocks of Oregon. See MUSEUMS AND COLLECTIONS.

Institute of Marine Biology. The Oregon State System of Higher Education maintains an interinstitutional Institute of Marine Biology at Coos Head on the Oregon coast during the summer months, for the benefit of students of biology in the institutions of the State System. The institute is located on a 100-acre tract and occupies a group of buildings erected by the Civilian Conservation Corps. The institute is administered under an executive committee of which the Dean of the School of Science is chairman.

Curricula in Science

B.A., B.S., M.A., M.S., Ph.D. Degrees

For each department a general undergraduate curriculum is outlined, including a suggested freshman and sophomore program for students in the Lower Division. Where several majors are listed in a department, the student's electives, or in some cases approved substitutions, provide the desired differentiation.

For the graduate level no specific curricula are outlined. Each graduate student's program is planned according to his particular needs and objectives, under the regulations of the Graduate Division.

GENERAL NOTES

All students in science curricula should observe carefully the following notes:

a. The maximum number of term hours required within the School of Science does not exceed 102 in any major curriculum. The maximum number of hours required for a major in any department is 66. The student thus has liberal opportunity to elect courses in other fields as well as in science.

b. In the freshman year General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education. Women take Social Ethics (PE 131) one term.

c. Students expecting to meet the language requirements for a B.A. degree or to obtain a reading knowledge of German or French in preparation for graduate work may elect a language in the freshman and sophomore years. If two years of German or French are elected in the freshman and sophomore years, the completion of the group requirement in either Language and Literature or Social Science may be postponed until the junior year. Students expecting to major in chemistry or physics may similarly postpone two groups.

d. For state teacher's certificate 6 hours of psychology should be elected in the sophomore year as it is prerequisite to upper-division courses in education. Psy 221, 222 meets this requirement; Psy 201, 202, 203 also meets this requirement as well as the Social Science group requirement.

e. Students wishing to qualify for a state teacher's certificate should elect 12 term hours in prescribed education courses in the junior year, at least 11 term hours in the senior year, and 9 term hours in the first term of the graduate year.

DEPARTMENT OF GENERAL SCIENCE[1]

Undergraduate and graduate general science majors: General Science, Biology, Physical Science.

Interdepartmental graduate majors: Biophysics, Geophysics, Life Sciences, Paleobiology, Seismology, and other fields involving joint majors.

Freshman Year	Term hours F	W	S
Group requirement in Social Science or Language and Literature	3	3	3
Approved group requirement in Science	3–5	3–5	3–5
English Composition (Eng 111, 112, 113)	3	3	3
Military Science (men)	1	1	1
Elementary Analysis (Mth 101, 102, 103) or approved science elective	4	4	4
Physical Education	1	1	1
	15–17	15–17	15–17
Sophomore Year			
Group requirement in Social Science or Language and Literature	3	3	3
Sophomore Science sequence	3–5	3–5	3–5
Military Science (men)	1	1	1
Physical Education	1	1	1
[2]Approved electives	7	7	7
	15–17	15–17	15–17
Junior Year			
[1]Approved upper-division Science	4	4	4
[2]Approved electives	12	12	12
	16	16	16
Senior Year			
[1]Approved upper-division Science	4	4	4
[2]Approved electives	12	12	12
	16	16	16

DEPARTMENT OF BACTERIOLOGY[3]

Undergraduate majors: Bacteriology with emphasis, if desired, on one of the fields of the graduate majors.

Graduate majors: Bacteriology, Agricultural Bacteriology, Food Bacteriology, Hygiene and Sanitation, Soils Bacteriology.

Freshman Year	Term hours F	W	S
Group requirement in Social Science or Language and Literature	3	3	3
General Zoology (Z 201, 202, 203)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
General Chemistry (Ch 204, 205, 206)	5	5	5
Military Science (men)	1	1	1
Physical Education	1	1	1
	16	16	16

[1]These courses should be in fields related to work taken in Lower Division, and must include one year-sequence. G 330, 331, 332, G 340, 341, 442 apply as either biological or physical science.

[2]The electives may include courses in health education leading to special training in that field.

[3]See GENERAL NOTES on page 119-120.

Sophomore Year	Term hours F	W	S
General Bacteriology (Bac 204, 205, 206)	3	3	3
Group requirement in Language and Literature or Social Science	3	3	3
Organic Chemistry (Ch 226, 227)	5	5	....
Quantitative Analysis (Ch 234)	....	....	5
Military Science (men)	1	1	1
Physical Education	1	1	1
[1]Electives	3	3	3
	16	16	16
Junior Year			
Dairy Bacteriology (Bac 411)	3	....	....
Immunity and Serum Therapy (Bac 333)	....	....	3
Pathogenic Bacteriology (Bac 332)	....	3	....
General Physics (Ph 201, 202, 203)	4	4	4
Elementary Physical Chemistry (Ch 340)	....	....	3
Electives (recommended)	10	10	7
	17	17	17
Senior Year			
Bacteriological Technique (Bac 431)	5	....	....
Systematic Bacteriology (Bac 441)	....	3	....
Systematic Bacteriology Laboratory (Bac 442)	....	2	....
Physiology of Bacteria Laboratory (Bac 452)	....	....	2
Physiology of Bacteria (Bac 451)	....	....	3
Seminar (Bac 407)	1	1	1
Electives (recommended)	10	10	10
	16	16	16

DEPARTMENT OF BOTANY[2]

Undergraduate majors: General Botany with emphasis, if desired, on one of fields of the graduate majors.

Graduate majors: Cytology, Ecology, Morphology, Mycology, Plant Pathology, Physiology, Systematic Botany.

Freshman Year	Term hours F	W	S
Group requirement in Language and Literature or Social Science	3	3	3
General Botany (Bot 201, 202, 203)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
[3]Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
Military Science (men)	1	1	1
Physical Education	1	1	1
Electives	3	3	3
	17	17	17
Sophomore Year			
Group requirement in Social Science or Language and Literature	3	3	3
The Lower Plants (Bot 311)	4	....	....
The Higher Plants (Bot 312)	....	4	....
Systematic Botany (Bot 313)	....	....	4
General Zoology (Z 201, 202, 203)	3	3	3
Elementary Analysis (Mth 101, 102, 103)	4	4	4
Military Science (men)	1	1	1
Physical Education	1	1	1
	16	16	16
Junior Year			
Principles of Plant Pathology (Bot 351)	4	....	....
Principles of Plant Ecology (Bot 341)	....	4	....
Principles of Plant Physiology (Bot 331)	....	....	4
General Physics (Ph 201, 202, 203)	4	4	4
[4]Electives	8	8	8
	16	16	16

[1]Mathematics recommended.

[2]See GENERAL NOTES on pages 119-120.

[3]Students interested in physiological and chemical aspects of plant life should take Ch 204, 205, 206 and elect Ch 226, 227, and 340, or their equivalent as early as convenient.

[4]Students majoring in botany should elect work in bacteriology and entomology and, if possible, advanced work in the botanical field of chief interest. Hrt 311 is advised for second term of junior or senior year.

Senior Year

	Term hours F	W	S
Microtechnique (Bot 469)	---	3	---
Seminar (Bot 407)	1	1	1
Geology (G 201, 202, 203)	3	3	3
Electives	11	8	11
	15	15	15

DEPARTMENT OF CHEMISTRY[1]

Undergraduate and graduate majors: Agricultural Chemistry, Analytical Chemistry, Biochemistry, Electrochemistry, Inorganic and Metallurgical Chemistry, Organic Chemistry, Physical (including Colloidal) Chemistry, Pulp and Paper Chemistry.

Freshman Year

	Term hours F	W	S
Group requirement in Language and Literature or Social Science	3	3	3
General Chemistry (Ch 204, 205, 206)	5	5	5
English Composition (Eng 111, 112, 113)	3	3	3
Elementary Analysis (Mth 101, 102, 103)	4	4	4
Military Science (men)	1	1	1
Physical Education	1	1	1
	17	17	17

Sophomore Year

Advanced Qualitative Analysis (Ch 231)	5	---	---
Quantitative Analysis (Ch 232, 233)	---	5	5
Group requirement in Language and Literature or Social Science	3	3	3
General Physics (Ph 201, 202, 203)	4	4	4
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
Military Science (men)	1	1	1
Physical Education	1	1	1
	18	18	18

Junior Year

[2]Organic Chemistry (Ch 430, 431, 432)	4	4	4
[2]Physical Chemistry (Ch 440, 441, 442)	4	4	4
[3]Electives	4	4	4
[4]German or French	4	4	4
	16	16	16

Senior Year

[5]Approved upper-division Chemistry courses	4	4	4
Electives	9	9	9
	13	13	13

DEPARTMENT OF ENTOMOLOGY[6]

Undergraduate and graduate majors: Entomology, Applied Entomology, Bee Culture, Forest Entomology.

Freshman Year[6]

	Term hours F	W	S
Group requirement in Language and Literature or Social Science	3	3	3
General Entomology (Ent 201, 202, 203)	3	3	3
General Zoology (Z 201, 202, 203)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
[6]Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
Military Science (men)	1	1	1
Physical Education	1	1	1
	17	17	17

[1]See GENERAL NOTES on pages 119-120.

[2]Both of these sequences need not be taken in the junior year although the program as listed above is strongly recommended.

[3]Electives must include at least 5 term hours in humanities, social science, or biological science in addition to the freshman and sophomore requirements in these fields.

[4]Students are expected to acquire a reading knowledge of German (or of French) prior to graduation.

[5]Of the 12 upper-division chemistry electives, 6 credits must consist of laboratory work, of which 3 must be in Organic Chemistry.

[6]Students planning to major in Forest Entomology should confer with Dr. Don C. Mote.

Sophomore Year	Term hours F	W	S
Principles of Economic Entomology (Ent 314)	----	3	----
Practical Bee Culture (Ent 335)	----	----	3
Principles of Forest Entomology (Ent 321)	3	----	----
General Botany (Bot 201, 202, 203)	3	3	3
Military Science (men)	1	1	1
Physical Education	1	1	1
Electives or group requirement	9	9	9
	17	17	17

Junior Year			
Approved upper-division courses in Entomology	6	6	6
Entomological Nomenclature and Literature (Ent 352)	----	3	----
Historical Entomology (Ent 351)	3	----	----
Principles of Plant Pathology (Bot 351)	4	----	----
Elementary Bacteriology (Bac 204)	----	3	----
[1]Electives	2	3	9
	15	15	15

Senior Year			
Seminar (Ent 409)	1	1	1
[1]Electives	14	14	14
	15	15	15

DEPARTMENT OF GEOLOGY

Undergraduate and graduate majors: General Geology, Paleontology, Professional Geology.

Common Freshman Year	Term hours F	W	S
Group requirement in Language and Literature or Social Science	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
Geology (G 201, 202, 203)	3	3	3
Geology Laboratory (G 204, 205, 206)	1	1	1
Military Science (men)	1	1	1
Physical Education	1	1	1
[2]Electives	4	4	4
	16	16	16

Major in General Geology

Sophomore Year			
Group requirement in Language and Literature or Social Science	3	3	3
Military Science (men)	1	1	1
Physical Education	1	1	1
Geology electives	3	3	3
[3]Electives	8	8	8
	16	16	16

Junior Year

Norm

Upper-Division Geology	4	4	4
Electives	12	12	12
	16	16	16

Senior Year

Norm

Upper-Division Geology	4	4	4
Electives	12	12	12
	16	16	16

[1]Students interested in the statistical phases of applied entomology should elect Elementary Analysis and Statistical Methods. Prospective professional entomologists should elect Ch 251, 252, and 254, or their equivalent as early as convenient. Students majoring in entomology should also elect courses in geology.

[2]Students preparing for professional geology are advised to elect Principles of Chemistry (Ch 201, 202, 203).

[3]Advanced Field Geology (G 380) can be taken during the summer.

Major in Paleontology

Students majoring in Paleontology must take certain courses in addition to meeting the requirements of the curriculum in General Geology. In the sophomore year the geology courses should include Rocks and Minerals (G 350) and either General Botany (Bot 201, 202, 203) or General Zoology (Z 201, 202, 203). The junior year program should include Invertebrate Paleontology (G 340, 341), Paleobotany (G 442); and a second year sequence in biology. In the senior year the student majoring in Paleontology should include Stratigraphy (G 323) in the upper-division electives and 9 to 12 hours of upper-division Zoology or Botany. These latter courses may very profitably be earned at the Institute of Marine Biology.

Major in Professional Geology

Sophomore Year

	Term hours F	W	S
Group requirement in Language and Literature or Social Science	3	3	3
Stratigraphy (G 323)	4	....	....
Physiography (G 322)	....	4	....
Structural Geology (G 321)	....	....	4
Intermediate Algebra (Mth 100)	4	....	....
Trigonometry (Mth 106)	....	4	....
Plane Surveying (CE 226)	....	....	3
Engineering Drawing (GE 111, 112, 113)	2	2	2
Military Science (men)	1	1	1
Physical Education	1	1	1
Electives	1	1	2
	16	16	16

Junior Year

Mineralogy (G 312, 313, 314)	4	4	4
Advanced Qualitative Analysis (Ch 231)	4	....	....
Quantitative Analysis (Ch 232)	....	4	....
Elementary Physical Chemistry (Ch 340) or instead of	....	....	3
Ch 231, 232, 340, General Physics (Ph 201, 202, 203)	(4)	(4)	(4)
Fire Assaying (Met 471, 472)	2	2	....
Mine Surveying (MiE 453)	....	....	3
Ore Dressing (Met 481, 482)	3	3	....
Electives	3	3	6
	16	16	16

Senior Year

Petrography (G 412, 413)	4	4	....
Mineral Deposits (G 414)	....	....	4
Invertebrate Paleontology (G 340, 341)	4	4	....
Paleobotany (G 442)	....	....	4
Approved sequence in Engineering or Physics or Chemistry	4	4	4
Electives	4	4	4
	16	16	16

DEPARTMENT OF MATHEMATICS[1]

Undergraduate majors: Mathematics with emphasis on any of the fields of the graduate majors.

Graduate majors: Analysis, Algebra, Geometry, Applied Mathematics (including Statistics).

Freshman Year

	Term hours F	W	S
Group requirement in Language and Literature or Social Science	3	3	3
Elementary Analysis (Mth 101, 102, 103)	4	4	4
English Composition (Eng 111, 112, 113)	3	3	3
Military Science (men)	1	1	1
Physical Education	1	1	1
Electives	4	4	4
	16	16	16

[1]See General Notes on pages 119-120.

Sophomore Year

Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
Group requirement in Language and Literature or Social Science	3	3	3
Physical or Biological Science	3–4	3–4	3–4
Military Science (men)	1	1	1
Physical Education	1	1	1
Electives	3–4	3–4	3–4
	15–17	15–17	15–17

Junior Year

Upper-Division Mathematics	6	6	6
Physical or Biological Science	3–4	3–4	3–4
Electives	7	7	7
	16–17	16–17	16–17

Senior Year

Upper-Division Mathematics	3	3	3
[1]Electives	13	13	13
	16	16	16

DEPARTMENT OF PHYSICS[2]

Undergraduate major: Physics (Classical and Modern, including Measurements).

Graduate majors: Physics with theses in any of the Classical branches, Modern Physics, Meteorology, Photography, Radio, and Applied Physics.

Freshman Year

	Term hours F	W	S
Group requirement in Language and Literature or Social Science	3	3	3
General Physics (Ph 201, 202, 203) *or* Engineering Physics (Ph 111, 112, 113)	4–3	4–3	4–3
Elementary Analysis (Mth 101, 102, 103)	4	4	4
English Composition (Eng 111, 112, 113)	3	3	3
Military Science (men)	1	1	1
Physical Education	1	1	1
	16–15	16–15	16–15

Sophomore Year

Group requirement in Language and Literature or Social Science	3	3	3
Introduction to Modern Physics (Ph 311, 312, 313)	3	3	3
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
General Chemistry (Ch 204, 205, 206) *or* Principles of Chemistry (Ch 201, 202, 203) *or* Elementary General Chemistry (Ch 101, 102, 103)	5–3	5–3	5–3
Military Science (men)	1	1	1
Physical Education	1	1	1
	17–15	17–15	17–15

Senior Year

Physical Measurements (Ph 321, 322, 323)	3	3	3
[3]Electives	12–14	12–14	12–14
	15–17	15–17	15–17

Senior Year

Radio Communication (Ph 331, 332, 333)	3	3	3
Photography (Ph 361)	3	...	...
Light (Ph 465, 466)	...	3	3
Electives	11–9	11–9	11–9
	17–15	17–15	17–15

DEPARTMENT OF ZOOLOGY[2]

Undergraduate majors: Zoology with emphasis, if desired, on one of the fields of the graduate majors.

Graduate majors: Invertebrate Zoology, Vertebrate Zoology, Anatomy, Cytology, Embryology, Field Zoology, Histology, Parasitology, Physiology.

[1]Include supporting science courses for students planning graduate work in mathematics.
[2]See GENERAL NOTES on pages 119-120.
[3]Suggestions: mathematics, photography, modern languages, physics.

Freshman Year

	Term hours F	W	S
Group requirement in Language and Literature or Social Science	3	3	3
General Zoology (Z 201, 202, 203)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
General Chemistry (Ch 204, 205, 206)	5	5	5
Military Science (men)	1	1	1
Physical Education	1	1	1
	16	16	16

Sophomore Year

Group requirement in Language and Literature or Social Science	3	3	3
Vertebrate Zoology (Z 204, 205, 206)	4	4	4
Organic Chemistry (Ch 226, 227)	5	5	...
Military Science (men)	1	1	1
Physical Education	1	1	1
[1]Electives	3	3	8
	17	17	17

Junior Year

Evolution and Eugenics (Z 314)	3	....	....
Genetics (Z 315)	....	3	....
Approved upper-division Zoology	3	3	3
General Physics (Ph 201, 202, 203) or suitable science substitute	4	4	4
[2]Electives	5	5	5
	15	15	15

Senior Year

Approved upper-division Zoology	3	3	3
Seminar (Z 407)	1	1	1
Electives	12	12	12
	16	16	16

PREMEDICAL CURRICULUM[3]

(School of Science and Medical School)

Freshman Year

General Zoology (Z 201, 202, 203)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
General Chemistry (Ch 204, 205, 206)	5	5	5
Military Science (men)	1	1	1
Physical Education	1	1	1
[4]Electives	4	4	4
	17	17	17

Sophomore Year

Vertebrate Zoology (Z 204, 205, 206)	4	4	4
Organic Chemistry (Ch 226, 227)	5	5	...
Quantitative Analysis (Ch 234)	....	....	5
German or French	4	4	4
Military Science (men)	1	1	1
Physical Education	1	1	1
[4]Electives	1	1	1
	16	16	16

Junior Year

General Physics (Ph 201, 202, 203)	4	4	4
German or French	4	4	4
[4]Electives	9	9	9
	17	17	17

[1]Ch 234, and Bot 201, 202, 203 are recommended for those wishing a physiological major.
[2]Ent 471 and G 340, 341 are suggested electives outside the department.
[3]See GENERAL NOTES on pages 119-120.
[4]Students should confer with their premedical adviser in the selection of all electives. These electives should include the nonscience group requirement in Language and Literature and in Social Science in order to satisfy the requirements for a Junior Certificate.

MAJOR IN SCIENCE AT THE STATE COLLEGE

B.A., B.S. Degrees

The student preparing to enter a medical school should complete by the end of his junior year an approved major in science and all requirements for a degree except the fourth year of undergraduate residence. The first year at the medical school may be counted in lieu of the fourth year of undergraduate residence. The courses taken during the first year of medical training, together with the science courses prescribed in the premedical curriculum, will satisfy all major requirements in general science or zoology, and biochemistry taken at medical school may be applied toward a major in chemistry.

PREPARATORY NURSING CURRICULUM[1]

FIVE-YEAR DEGREE CURRICULUM

Freshman Year

	Term hours		
	F	W	S
Principles of Chemistry (Ch 201, 202, 203)	4	4	4
General Zoology (Z 201, 202, 203)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
Introduction to Literature (Eng 104, 105, 106) *or* Shakespeare (Eng 201, 202, 203)	3	3	3
Electives or Backgrounds of Nursing (Nur 111, 112, 113)	2	2	2
General Hygiene (PE 147, 148, 149)	1	1	1
Physical Education	1	1	1
	17	17	17

Sophomore Year

Organic Chemistry (Ch 226, 227)	5	5	----
Sociology	3	3	----
Electives or Modern Nursing Problems (Nur 211, 212, 213)	4	4	----
Outlines of Psychology (Psy 221, 222)	3	3	----
Physical Education	1	1	----
	16	16	----

CURRICULUM IN PREPARATION FOR MEDICAL TECHNICIANS

The following curriculum is suggested as meeting the requirements of the American Society of Clinical Pathologists for admission to approved training schools. Some hospital authorities require three years of college work and some a bachelor's degree. It is recommended that, where possible, students devote at least three years to preparing for their clinical-laboratory training.

Freshman Year

	Term hours		
	F	W	S
General Zoology (Z 201, 202, 203)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
Social Science including 6 hours in American History and Government	3	3	3
Principles of Chemistry (Ch 201, 202, 203)	4	4	4
Literature (Eng 101, 102, 103; or Eng 104, 105, 106; or Eng 201, 202, 203, or approved elective)	3	3	3
General Hygiene	----	----	2
Physical Education	1	1	----
	17	17	18

Sophomore Year

General Bacteriology (Bac 204)	3	----	----
Pathogenic Bacteriology (Bac 332)	----	3	----
Immunity and Serum Therapy (Bac 333)	----	----	3
Organic Chemistry (Ch 226, 227)	5	5	----
Quantitative Analysis (Ch 234)	----	----	5
Elementary Human Physiology (Z 211)	----	----	5
Qualitative Physics (Ph 211, 212)	3	3	----
Physical Education	1	1	1
Approved Electives	5	4	3
	17	16	17

[1]See GENERAL NOTES on pages 119-120.

General Science

CERTAIN phases of the instructional work of the School of Science are of general character, being broader in scope and objective than any of the departments. The Department of General Science is peculiarly the ally of all of the science departments, with the function of supplementing and correlating the work. The courses aim to give the student a comprehensive view of science as a division of knowledge, and are open, not only to students majoring in science, but also to students in the professional schools. The general-science major provides opportunity for students to pursue a broad program of study in science, either for a liberal-arts degree or as preparation for professional service involving general science. The interdepartmental undergraduate and graduate majors provide opportunity for students to pursue one of the newer sciences such as biophysics, life sciences, and other fields involving joint majors.

The survey courses in biological and physical science cover the fundamental fields of science rather than the content usually included in the special-science departments. These courses are nontechnical and are designed for the student interested in science more as a cultural subject than for any other specific purpose. The courses may serve as satisfaction of a Lower-Division Science group requirement or as part satisfaction of education norms, but they are not usually considered as prerequisites to further work in science or in the professional schools.

NOTE: *Students who have earned 6 term hours or more in one of the biological sciences prior to taking GS 101, 102, 103 are not allowed to count credit earned in the latter toward graduation except with the approval of the Dean of the School of Science. A similar limitation exists regarding GS 104, 105, 106.*

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

GS 101, 102, 103. **Biological Science Survey.** 4 hours each term.

The fundamental principles of biology as they apply to both plants and animals. Not designed as foundational or introductory to subsequent special work in bacteriology, botany, entomology, or zoology; planned rather for general students and those majoring in other fields and designed to acquaint them with the general phenomena of life as concretely illustrated in fields of biology. Dr. Hansen.

GS 104, 105, 106. **Physical Science Survey.** 4 hours each term.

A general introductory study of the fundamental principles of physics, chemistry, astronomy, and geology. Special attention is given to the development and application of the scientific method. Not designed as foundational for a major in the physical sciences, but for students majoring in other fields who wish a broad view of the principles of several physical sciences. Associate Professor Wilkinson.

UPPER-DIVISION COURSES

GS 405. **Reading and Conference.** Terms and hours to be arranged.

GS 411, 412, 413. **History of Science.** (G) 2 hours each term.

The development of science from the beginnings, with emphasis on the scientific method and spirit. Prerequisite: eighteen hours of upper-division science, or equivalent. Associate Professor Wilkinson.

GS 421, 422, 423. **Classics of Science.** (G) 2 hours each term.

Works notable in the development of biology, physical science, and mathematics, studied for (1) their significance to science and (2) their form. The biographies of men of science are studied as a background. Students also prepare papers suitable for oral presentation before organized groups, such as section meetings of a scientific society. Prerequisite: eighteen hours of upper-division science, or equivalent. Professor Stevenson.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

GS 505. **Reading and Conference.** Terms and hours to be arranged.

GS 507. **Seminar.** Terms and hours to be arranged.

Bacteriology

BACTERIOLOGY, especially through its applications in agriculture, sanitation, and medicine, is of great importance in modern civilization. Because of its close relation to many fundamental aspects of human life, bacteriology affords an excellent field of concentration for a liberal-arts degree; it also affords opportunity to prepare for professional service, especially in fields involving applications of bacteriology and hygiene. The instruction in bacteriology, hygiene, and related fields is planned to give undergraduates a thorough understanding of the subject and an appreciation of its importance. The graduate majors include general bacteriology, agricultural bacteriology, food bacteriology, hygiene and sanitation, and soils bacteriology. As agriculture and allied fields are vital in Oregon industrial life, a very valuable and practical field of research is open to the student taking advanced work in agricultural bacteriology.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Bac 201, 202, 203. **Elementary Bacteriology.** 3 hours each term.

The fundamental principles of the bacteriology of food and water supplies; sanitation and hygiene; infectious disease; sewage disposal, etc. Designed to meet the needs of students who have had no training in chemistry but who desire a general knowledge of bacteriology. Two lectures; 1 two-hour demonstration period.

Bac 204, 205, 206. **General Bacteriology.** 3 hours any term.

Lectures, recitations, and laboratory experiments to familiarize students with the fundamental principles of bacteriology. General in nature the first term, the scope of the work broadens out in the second and third terms to include bacteriological studies of water, milk, foods, infectious diseases, disinfection, germicides, and preservatives. Prerequisite: one year of chemistry. Two lectures; 2 two-hour laboratory periods. Bac 204 is offered each term; Bac 205, winter and spring; and Bac 206, spring term.

Bac 230. **Principles of Bacteriology.** 3 hours spring.

Lectures and demonstrations in the basic principles of bacteriology as applied to everyday life.

UPPER-DIVISION COURSES

Bac 332. **Pathogenic Bacteriology.** 3 hours winter.

Confined strictly to the microorganisms associated with disease in man. Prerequisite: Bac 204. Two lectures; 2 two-hour laboratory periods. Professor Simmons.

Bac 333. **Immunity and Serum Therapy.** 3 hours spring.

Theories of immunity and their application to serum therapy; preparation of toxins, antitoxins, vaccines, etc.; study of normal and pathological blood. Prerequisite: Bac 205 or 332. Two lectures; 2 two-hour laboratory periods. Professor Simmons.

Bac 350. **Applied Hygiene.** 3 hours spring.

Application of the principles of hygiene to sanitary, statistical, governmental, epidemiological, and sociological problems. Prerequisite: junior or senior standing. Dr. Morris.

Bac 361. **Forest Sanitation.** 3 hours fall.

The sanitary provisions necessary for forest camps, camp grounds, and summer homes; location and construction of camp facilities. Prerequisite: junior standing in forestry or equivalent. Professor Langton.

Bac 401. **Research.** Terms and hours to be arranged.

Bac 403. **Thesis.** Terms and hours to be arranged.

Bac 405. **Reading and Conference.** Terms and hours to be arranged.

Bac 407. **Seminar.** One hour each term. Professor Copson.

Bac 411. **Dairy Bacteriology.** (g) 3 hours fall.

Application of bacteriology to dairy practice; physiological activities of bacteria underlying bacterial analysis of dairy products; dairy sanitation; bacteriology of diseases of dairy cattle. Prerequisite: Bac 204. Two lectures; 2 two-hour laboratory periods. Professor Simmons.

Bac 412. **Dairy Bacteriology.** (G) 3 hours winter.

Continuation of Bac 411. A more thorough study of specific problems in dairy bacteriology and practice in special technique. Prerequisite: Bac 411. One lecture; 2 two-hour laboratory periods. Professor Simmons.

Bac 413. **Agricultural Bacteriology.** 3 hours spring.

For students in agriculture. Application of bacterial activities to farm practices and to the farm home; rural sanitation, hygiene, control of infectious diseases, fermentation, food preservation, etc. Prerequisite: Bac 204, Ch 250. One lecture; 2 two-hour laboratory periods. Professor Copson.

Bac 421. **Soil Bacteriology.** (g) 4 hours spring.

Microorganisms of the soil and their relation to soil fertility; biochemistry of the decomposition of humus; nitrogen-fixation; ammonification, etc. Prerequisite: Bac 204 or Ch 330. Two lectures; 3 two-hour laboratory periods. Associate Professor Bollen.

Bac 422. **Soil Bacteriology.** (G) 3 hours winter.

Continuation of Bac 421. Review of literature on soil bacteriology. Prerequisite: Bac 421. One lecture; 2 two-hour laboratory periods. Associate Professor Bollen.

Bac 431. **Bacteriological Technique.** (g) 5 hours fall.

Intensive study of the fundamental principles underlying methods used in the study of bacteria. Optics of microscopy; cultural requirements of mic-

roorganisms; H-ion concentration and methods of determination; oxidation-reduction potentials in bacteriology; properties and uses of biological dyes and indicators; physical and chemical properties of bacteria, yeasts, and molds. Critical manipulation of the microscope and accessories; detailed study of the Manual of Methods for Pure Culture Study of Bacteria; special methods of staining, isolation, and culture. Prerequisite: Bac 206 or equivalent and two years of chemistry. Three lectures; 2 laboratory periods. Associate Professor Bollen, Dr. Lamanna.

Bac 441. **Systematic Bacteriology.** (g) 3 hours winter.

Taxonomy and nomenclature of the bacteria; history of bacterial classifications; the International Rules of Nomenclature and the Bacteriological Code; biology, evolution, and relationships of bacteria; detailed study of Bergey's Manual; development of a satisfactory classification; review of other organisms closely related to the bacteria. Prerequisite: Bac 206 or equivalent and two years of chemistry. Associate Professor Bollen.

Bac 442. **Systematic Bacteriology Laboratory.** (g) 2 hours winter.

Laboratory studies to accompany Bac 441. Prerequisite: Bac 432. Dr. Lamanna.

Bac 451. **Physiology of Bacteria.** (g) 3 hours spring.

Growth, reproduction, and death of bacteria; physical, chemical, and biological factors of environment; digestive and metabolic activities of microorganisms; chemistry and energetics of microbial nutrition enzymes and fermentations. Prerequisite: Bac 206 or equivalent and two years of chemistry. Associate Professor Bollen.

Bac 452. **Physiology of Bacteria Laboratory.** (g) 2 hours spring.

Laboratory studies to accompany Bac 451. Prerequisite: Bac 442. Dr. Lamanna.

Bac 461. **Sanitary Bacteriology.** 3 hours spring.

Lectures, recitations, and laboratory experiments to familiarize the student with the principles of bacteriology as applied to problems of community and municipal sanitation. Prerequisite: Bac 205. Two lectures; 2 two-hour laboratory periods. Professor Copson.

Bac 462. **Microscopy of Waters.** 3 hours spring.

Planned to give a thorough knowledge of the microorganisms found in surface waters; treatment of water by chemicals, aeration, etc. Prerequisite: Bac 461. One lecture; 2 two-hour laboratory periods. Professor Copson.

Bac 472, 473. **Bacteriological Problems.** (g) 5 hours each term, winter and spring.

For students qualified to study intensively some of the problems concerned with systematic bacteriology and to carry on research studies concerned with the principles underlying some of the physiological activities of bacteria. Prerequisite: Bac 441, 442, or their equivalent. Staff.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

Bac 501. **Research.** Terms and hours to be arranged.

Bac 503. **Thesis.** Terms and hours to be arranged.

Bac 505. **Reading and Conference.** Terms and hours to be arranged.

Bac 507. **Seminar.** Terms and hours to be arranged. Professor Copson.

Bac 551, 552. **Advanced Bacterial Physiology.** 3 hours each term, fall and winter.

Growth, fermentation, and death of microorganisms as effected by chemical and physical agents; emphasis on the morphology, cytology, and microchemistry of the cell. Prerequisite: Bac 451 or equivalent; organic and physical chemistry. Associate Professor Bollen, Dr. Lamanna.

Bac 553. **Biochemistry of Bacteria.** 3 hours spring.

Changes that microorganisms induce in the substratum; isolation and identification of the products of fermentation; factors involved in fermentative variability. Prerequisite: Bac 551, 552, and Organic Analysis. Dr. Lamanna.

Botany

THE courses in botany provide comprehensive and advanced training in the various branches of this subject: first, for those who expect to make some field of plant science their major or life work; second, as a foundation for the work of students majoring in such professional schools as Agriculture and Forestry; and third, for those interested largely or entirely in botany from the cultural point of view.

For those having a professional interest in botany (the first two groups), it is proposed to meet the needs of those preparing (1) for professional careers as plant pathologists, plant physiologists, ecologists, taxonomists, or other specialized service at experiment stations, in the United States Department of Agriculture, or in other research institutions, or for botany teaching and research in colleges and universities; (2) for technical positions in which a knowledge of botany is essential, such as in agricultural extension work, plant disease control work, plant quarantine inspection, grazing assistant work, seed testing, food and drug analysis; and (3) for advanced study and research in such fields as horticulture, agronomy, forestry, soil science, biochemistry, and paleobotany.

The herbarium collections are under the care of a curator. They total approximately 80,000 specimens, including 40,000 classified specimen sheets of higher plants, 10,000 unmounted specimens; and 30,000 packets of parasitic fungi.

Excellent greenhouse facilities are available at the State College for botanical instruction and research.

An extensive and diversified research program relating to plant disease is conducted under the Botany Department by a group of State and Federal investigators. This involves the use of modern equipment and technique for laboratory, greenhouse, and field. Students are therefore provided with exceptional opportunities for training in plant pathology and often for part-time employment under able scientists.

Botany students also have a special advantage at this institution since they may elect minor work in the fields of forestry and agriculture, which provide the greatest opportunities for the useful application of plant science.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Bot 201, 202, 203. **General Botany.** 3 hours each term.

Introductory study of plant life. Structure and functions of higher plants; chief groups of plants, principles of reproduction and genetics, practical

relationships in everyday life; practice in plant identification. Prerequisite to further work in botany. One lecture; 1 recitation; 2 two-hour laboratory periods. Staff.

UPPER-DIVISION COURSES

Bot 311. **The Lower Plants.** 4 hours fall.

Typical structure and life histories of the algae, fungi, hepatics, and mosses. Prerequisite: Bot 201, 202 or equivalent. Two lectures; 2 three-hour laboratory periods. Associate Professor Sanborn.

Bot 312. **The Higher Plants.** 4 hours winter.

Typical structure and life histories of the ferns, fern allies, gymno-sperms, and flowering plants. Prerequisite: Bot 201, 202 or equivalent. Two lectures; 2 three-hour laboratory periods. Associate Professor Sanborn.

Bot 313. **Systematic Botany.** 4 hours fall or spring.

Principles of plant classification; common plant families; collection and identification of Oregon higher plants. Prerequisite: Bot 203. Two lectures; 3 two-hour laboratory periods. Associate Professor Gilkey.

Bot 314. **Range and Pasture Botany.** 3 hours spring.

Taxonomy of grasses; ecology of range plants and their forage value; ecology of the grazing ranges and pastures from the standpoint of their maintenance; methods of grazing study; poisonous plants and methods of preventing stock poisoning. Prerequisite: Bot 201, 202. Two lectures; 2 two-hour laboratory periods. Associate Professor Lawrence.

Bot 315. **Forest Pathology.** 3 hours winter.

Introductory study of the nature, cause, and prevention of tree diseases and timber defects, especially those related to fungal parasites, saprophytes, and symbionts. Prerequisite: Bot 201, 202. One lecture; 2 two-hour laboratory periods. Dr. Roth.

Bot 321. **Aquatic Plants.** 3 hours fall.

Designed to acquaint the student with the important food plants of wild fowl, with particular reference to the Pacific Coast. Field and laboratory studies in identification and distribution of species, together with growth-limiting factors. Prerequisite: Bot 203. One lecture; 2 three-hour laboratory periods. Associate Professor Gilkey.

Bot 331. **Principles of Plant Physiology.** 4 hours spring.

Introductory study of the physiology of living plants with the aid of laboratory and greenhouse experiments of special interest in agriculture and forestry. Prerequisite: Bot 201, 202, or equivalent, and at least one year of chemistry. Two lectures; 3 two-hour laboratory periods. Professor Atwood.

Bot 341. **Principles of Plant Ecology.** 4 hours winter or spring.

Principles governing the interrelations of plants and environment; influence of living agencies and of light, heat, and other atmospheric and soil factors on the native vegetation and cultivated crops. Of particular interest to students in forestry and agriculture. Not open to freshmen or sophomores. Prerequisite: Bot 201, 202. Two lectures; 2 two-hour laboratory periods. Associate Professor Lawrence.

Bot 351. **Principles of Plant Pathology.** 4 hours fall.

Causes, symptoms, effects, methods of spread and principles of control of plant diseases with laboratory examination of typical specimens. Prerequisite: Bot 201, 202. Two recitations; 3 two-hour laboratory periods. Professor Owens.

Bot 401. **Research.** Terms and hours to be arranged.

Bot 403. **Thesis.** Terms and hours to be arranged.

Bot 405. **Reading and Conference.** Terms and hours to be arranged.

Bot 407. **Seminar.** Term and hours to be arranged.

Bot 411, 412, 413. **Comparative Morphology.** (G) 3 hours each term.
Comparative structure and life history of the chief plant groups with evolutionary trends and the basic principles of phylogeny and classification; Algae; Bryophytes; Pteridophytes and Spermatophytes, with evolution of stele and strobilus from Pteridophytes. Prerequisite: Bot 311, 312, or equivalent. One lecture; 2 three-hour laboratory periods. Offered alternate years. Not offered 1942-43. Associate Professors Lawrence and Sanborn.

Bot 414. **Advanced Range and Pasture Ecology.** (g) 3 hours winter.
Continuation and advanced consideration of the problem of plant successions on the range, methods of vegetation analysis, ecology of range species and poisonous plants, the identification of grasses, rushes, and sedges. Prerequisite: Bot 314, 341. Two lectures; 2 two-hour laboratory periods. Associate Professor Lawrence.

Bot 421, 422, 423. **Advanced Systematic Botany.** (G) 3 hours each term.
Advanced studies of higher plants. Prerequisite: Bot 313. One lecture; 2 three-hour laboratory periods. Associate Professor Gilkey.

Bot 431, 432, 433. **Advanced Plant Physiology.** (G) 3 hours each term.
Physiological processes and relations of plants, with reviews of literature. Prerequisite: Bot 331 and organic chemistry. One lecture; 2 three-hour laboratory periods. Offered alternate years. Offered 1942-43. Professor Atwood.

Bot 441, 442, 443. **Advanced Plant Ecology.** (G) 3 hours each term.
Measurement of environmental factors and their relation to field practice, with special reference to forest, grazing, and agricultural ecology; structure of the plant community, including plant succession and methods in vegetation analysis. Each term may be taken separately. Prerequisite: Bot 341, or equivalent. Two lectures; 1 three-hour laboratory period. Bot 441, 442 offered alternate years. Not offered 1942-43.

Bot 451. **Plant Pathological Technique.** (g) 3 hours fall.
Introduction to the treatment of problems involved in study and research on the fungous, bacterial, and virous diseases of plants. Prerequisite: Bot 351 or equivalent. One lecture; 2 three-hour laboratory periods. Dr. Roth.

Bot 452. **Field and Truck Crop Diseases.** (G) 3 hours winter.
Chief diseases of field crops and vegetables and the principles of control. Especially for students in farm crops, vegetable crops, and plant pathology. Prerequisite: Bot 351 or equivalent. Three two-hour periods. Professor Owens.

Bot 453. **Fruit Diseases.** (G) 3 hours spring.
Chief diseases of fruits and their control. Especially for students in horticulture and plant pathology. Prerequisite: Bot 351 or equivalent. Three two-hour periods. Professor Owens.

Bot 461, 462, 463. **Mycology.** (G) 3 hours each term.
Mushrooms, smuts, rusts, and other Basidiomycetes; Ascomycetes and imperfect fungi; Myxomycetes and Phycomycetes. Prerequisite: Bot 311 or equivalent. One lecture; 2 three-hour laboratory periods. Dr. Roth.

Bot 469, 470. **Microtechnique.** (g, G) 3 hours winter and spring.
First term: Principles and practices in preparation of permanent microscopic slides of plant materials. Prerequisite: Bot 201, 202. One lecture; 2 three-hour laboratory periods. Second term: Making slides for cytological study of reduction divisions, anthers, ovules, fertilization; preparation of temporary and permanent smears of pollen mother cells, root tips, other special staining techniques. Two three-hour laboratory periods. Bot 470 offered alternate years, not offered 1942-43. Assistant Professor Smith.

Bot 471. **Plant Anatomy.** (G) 3 hours fall.
Microscopic structure and development of plant tissues. Prerequisite: Bot 201, 202, and two terms of upper division botany, or equivalent. One lecture; 2 three-hour laboratory periods. Assistant Professor Smith.

Bot 473. **Plant Cytology.** (G) 3 hours spring.
The various components of cells, nuclear and cell division, meiosis and fertilization. Prerequisite: Bot 201, 202, and two terms of upper-division botany or equivalent. Two lectures; 2 two-hour laboratory periods. Assistant Professor Smith.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

Bot 501. **Research.** Terms and hours to be arranged.

Bot 503. **Thesis.** Terms and hours to be arranged.

Bot 505. **Reading and Conference.** Terms and hours to be arranged.

Bot 507. **Seminar.** Terms and hours to be arranged.

Bot 541. **Plant Formations.** 3 hours fall.
Classification of vegetation areas of the world, floristic plant geography, especially with reference to North America. Prerequisite: Bot 341, 441. Two lectures; 1 three-hour laboratory period. Offered alternate years. Offered 1942-43. Associate Professor Lawrence.

Bot 542. **Structural and Experimental Ecology.** 3 hours winter.
Special adaptations of plant species with reference to their ecological relations. Prerequisite: Bot 313, 331, 341, 442, 472. One lecture; 2 three-hour laboratory periods. Offered alternate years. Not offered 1942-43. Associate Professor Lawrence.

Bot 543. **Field Ecological Methods.** 3 hours spring.
Field practice in the use of ecological instruments and methods of studying vegetation. Prerequisite: Bot 341, 443. One lecture; 2 three-hour laboratory periods. Offered alternate years. Offered 1942-43. Associate Professor Lawrence.

Bot 573. **Cytogenetics.** 3 hours winter.
The cytological basis of inheritance; heredity in plants and animals considered from the point of view of chromosome behavior; emphasis on chromosome behavior in forms that do not show typical Mendelian inheritance. Prerequisite: Bot 473 or Z 537; AI 315, FC 415, or Z 315. Two lectures; 1 two-hour laboratory and discussion period. Assistant Professor Smith.

Chemistry

IN THE first three years of the chemistry curriculum provision is made for thorough grounding in fundamental chemistry and related sciences, as well as cultural subjects. Undergraduate students major in chemistry as a field of concentration for a liberal-arts degree or as preparation for professional work in the field of chemistry. Beginning with the fourth year numerous elective choices permit the student to begin more intensive study in one of the classical fields—analytical, inorganic, organic, and physical, or in some field of special interest such as agricultural chemistry, biochemistry, colloids, electrochemistry, or pulp and paper chemistry.

The Department of Chemistry thus aims to prepare its students for graduate work in pure or applied chemistry or for (1) governmental work under the Civil Service; (2) teaching positions in colleges, universities, junior colleges, and secondary schools; (3) positions as research chemists and technical experts in commercial testing laboratories of all sorts, and in chemical industries; (4) positions as chemists in laboratories of state agricultural experiment stations, or in industries specializing in the manufacture of food or agricultural products.

Additional training beyond the baccalaureate degree is highly advantageous in obtaining better positions in any field of chemical activity whether it be teaching, governmental, or industrial work. The undergraduate curriculum serves well as a foundation for this specialization and qualified students are encouraged to continue toward the master's or doctor's degree involving research and original investigation.

Prerequisite to graduate work leading to an advanced degree with a major in chemistry is the completion of undergraduate work in chemistry, mathematics, and physics substantially equivalent to that required of undergraduate students in the chemistry curriculum.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Ch 101, 102, 103. **Elementary General Chemistry.** 3 or 4 hours each term.
A year sequence for students desiring an introduction to the general field. Required in certain curricula in agriculture, engineering, home economics, or nursing education. One lecture; 1 recitation; 1 three-hour laboratory period (3 hours). For nursing education students: one lecture; 2 recitations; 1 three-hour laboratory period (4 hours).

Ch 130. **Descriptive General Chemistry.** 3 hours spring.
A nonlaboratory course for students desiring a general knowledge of chemistry as an aid to better understanding of the numerous developments in the commercial and industrial world today; particularly for forestry students. Not accepted as a substitute for other chemistry courses.

Ch 201, 202, 203. **Principles of Chemistry.** 4 hours each term.
A year sequence in general chemistry for students in chemical engineering. Fall and winter, 2 lectures, 1 recitation, 1 three-hour laboratory period; spring, 2 lectures, 2 three-hour laboratory periods.

Ch 204, 205, 206. **General Chemistry.** 5 hours each term.
For students planning to major in chemistry and for other students requiring extensive knowledge of the subject. Laboratory work in Ch 206 in-

cludes elementary qualitative analysis. Two lectures; 1 recitation; and 2 three-hour laboratory periods.

Ch 208, 209. **General Chemistry.** 5 hours each term, winter and spring.

Designed to cover in two terms the same material as Ch 101, 102, 103, for students starting at the beginning of the winter term. Two lectures; 1 recitation; 2 three-hour laboratory periods.

Ch 226. **Organic Chemistry.** 4 or 5 hours.

A substantial course in the chemistry of the carbon compounds of the aliphatic series. Prerequisite: Ch 206 or Ch 103. Two lectures; 1 recitation; 1 three-hour laboratory period (4 hours). Two lectures; 1 recitation; 2 three-hour laboratory periods (5 hours).

Ch 227. **Organic Chemistry.** 5 hours winter.

An intensive study of the chemistry of the aromatic series. Prerequisite: Ch 226.

Ch 231. **Advanced Qualitative Analysis.** 4 or 5 hours fall.

Advanced theory of qualitative analysis and examination of commercial products. Prerequisite: Ch 206. Two lectures; 2 or 3 three-hour laboratory periods.

Ch 232, 233. **Quantitative Analysis.** 4 or 5 hours each term, winter and spring.

Principles of quantitative analysis, including electrometric analysis and hydrogen-ion concentration. Credit 4 hours each term for chemical-engineering students, 5 hours each term for students majoring in chemistry. Prerequisite: Ch 206. Two lectures; 2 or 3 three-hour laboratory periods.

Ch 234. **Quantitative Analysis.** 5 hours spring.

Principles of gravimetric analysis, volumetric analysis, and H-ion concentration. Designed for pharmacy and premedical students. Prerequisite: Ch 103. Two lectures; 3 three-hour laboratory periods.

Ch 250. **Elements of Biochemistry.** 4 hours winter or spring.

A laboratory study of proteins, carbohydrates, fats, and other compounds having biochemical significance; fundamentals of analysis as applied in this work. Prerequisite: Ch 226 or equivalent. Two lectures; 2 three-hour laboratory periods.

Ch 251, 252. **Organic and Agricultural Biochemistry.** 5 hours fall, 3 hours winter.

Fundamental principles of organic chemistry and biochemistry, with applications in agriculture and related industries. Prerequisite: Ch 103. Three lectures, 2 three-hour laboratory periods, fall; 3 lectures, winter.

Ch 253. **Agricultural Biochemistry.** 2 hours winter.

Biochemical laboratory work to accompany Ch 252. Two three-hour laboratory periods.

Ch 254. **Quantitative Analysis for Agricultural Students.** 3 hours spring.

Fundamental training in quantitative procedure necessary for laboratory work in any phase of agricultural technology. Prerequisite: Ch 103. One lecture; 2 three-hour laboratory periods.

UPPER-DIVISION COURSES

Ch 321, 322, 323. **Metallurgical Chemistry.** 3 hours each term.

Analysis of limestone, iron ores, phosphorus in iron ores, determination of manganese, sulphur, copper, arsenic, etc. Prerequisite: Ch 233 or equivalent. Professor Fulton.

Ch 330, 331. **Physiological Chemistry.** 2 hours winter, 3 hours spring.
Designed for students in home economics, pharmacy, and bacteriology. Prerequisite: Ch 251 or 227. One lecture-recitation period and 1 three-hour laboratory winter term; 2 lecture-recitation and 1 three-hour laboratory periods spring term. Associate Professor Pease.

Ch 340. **Elementary Physical Chemistry.** 3 hours.
A nonmathematical course designed for those who desire a knowledge of the elements of physical chemistry. Kinetic theory, atomic structure, molecular weights, classification of elements, solubility, ionization, colloids, hydrogen-ion measurements, and electrochemistry. Prerequisite: Ch 203 or equivalent. Three lectures. Mr. Ware.

Ch 350, 351, 352. **Agricultural Chemical Technology.** 3 hours each term.
Students in this sequence are expected to have some special interest, as in fertilizers, insecticides and fungicides, feeding stuffs, food industries products, irrigation and drainage waters. Intensive reading is required in addition to laboratory work on chemical principles involved in manufacturing and utilization. Prerequisite: Ch 233 or Ch 254. Three three-hour laboratory periods. Professor Jones.

Ch 353. **Dairy Chemistry.** 3 hours.
The chemistry of organic acids, fats, proteins, amino acids, carbohydrates, and vitamins as applied to products of the creamery. Prerequisite: Ch 252, 254. Two four-hour or 3 three-hour laboratory periods. Professor Jones, Mr. Callaway.

Ch 370, 371, 372. **Glass Blowing.** 1 hour each term.
Practice in the manipulation of glass and assembling set-ups. Prerequisite: one year of laboratory science. Two two-hour laboratory periods. Professor Fulton.

Ch 401. **Research.** Terms and hours to be arranged.

Ch 403. **Thesis.** Terms and hours to be arranged.

Ch 405. **Reading and Conference.** Terms and hours to be arranged.

Ch 407. **Seminar.** One hour each term.

Ch 411, 412, 413. **Advanced Inorganic Chemistry.** (g) 2 hours each term.
Radioactivity, modern periodic table, atomic structure, inorganic isomerism, complex compounds, elementary metallurgy, and geochemistry; practical and theoretical importance of the chemical elements and their compounds. Prerequisite: Ch 206, 233, or equivalent. Assistant Professor West.

Ch 414, 415. **Inorganic Preparations.** (g) Terms and hours to be arranged.
Preparation and purification of typical inorganic compounds. Prerequisite: Ch 232, 233, or their equivalent. Assistant Professor West.

Ch 418. **History of Chemistry.** (G) 3 hours.
Rise and development of chemical theories and laws. Prerequisite: three years of chemistry. Assistant Professor Friedman.

Ch 420, 421, 422. **Advanced Quantitative Analysis.** (g) 3 hours each term.
Laboratory study acquainting the student with special analytical procedures such as those of electroanalysis, fuel analysis, analysis of nonferrous alloys, water, iron and steel, etc. Prerequisite: Ch 231, 232, 233. One lecture; 2 three-hour laboratory periods. Associate Professor Mehlig.

Ch 423. **Organic Quantitative Microanalysis.** (G) 3 hours.
Laboratory practice in methods of quantitative organic microanalysis. Prerequisite: Ch 233, 432. One lecture; 2 laboratory periods. Associate Professor Christensen.

Ch 425. **Chemical Microscopy.** (g) 3 hours spring.
Microscopic, qualitative, inorganic analysis. Prerequisite: Ch 232. One lecture; 2 three-hour laboratory periods. Associate Professor Christensen.

Ch 426. **Gas, Oil, and Fuel Analysis.** (g) 3 hours.
Analysis of natural, artificial, and flue gases and gas calorimetry; the analysis and calorimetry of coal, and analysis and physical testing of oils. Prerequisite: Ch 231. One lecture; 2 three-hour laboratory periods. Associate Professor Christensen.

Ch 427, 428, 429. **Advanced Laboratory Methods.** (G) 3 hours each term.
Designed to familiarize the student with special types of apparatus and methods used for both process control and research. Theory and practice of colorimetry, spectrophotelometry, polarimetry, nephelometry, indicators, electrometric and polarographic titrations; theory and practice in fractional, vacuum, molecular, and steam distillations; crystallization, filtration, absorption, and extraction. Laboratory hydrogenation and chlorination processes. Special methods for purification and separation of organic compounds. Prerequisite: Ch 432, 442. One lecture; 2 laboratory periods. Associate Professor Christensen.

Ch 430, 431, 432. **Organic Chemistry.** (g) 4 hours each term.
Chemistry of the compounds of carbon; compounds important from the theoretical, technical, and biological standpoints; aliphatic compounds; aromatic series. Prerequisite: two years of college chemistry. Three lectures; 1 laboratory period. Assistant Professor Ferguson.

Ch 433. **Organic Combustion Analysis.** (G) 3 hours any term.
Quantitative analysis of organic compounds. Prerequisite: Ch 227, 233, 432. Three three-hour laboratory periods. Associate Professor Pease.

Ch 434, 435, 436. **Organic Preparations.** (G) 1 or 2 hours each term.
The more important methods of synthesis, such as Grignard, Friedel-Craft's, Perkins' reaction, and others. Prerequisite: Ch 432 or equivalent. One three-hour laboratory period per hour of credit. Associate Professor Pease.

Ch 437, 438. **Organic Chemistry.** (G) 2 hours each term, fall and winter.
Continuation of Ch 432. Emphasis on the methods of synthesis, interpretation of reactions, and structure of organic compounds. Two lectures. Associate Professor Pease, Assistant Professor Ferguson.

Ch 440, 441, 442. **Physical Chemistry.** (g) 4 hours each term.
The more important principles of physical and electrochemistry; laboratory work in molecular-weight determinations, properties of liquids, conductance of solutions, velocity of reactions, and electrochemical measurements. Prerequisite: knowledge of analytical chemistry and the elements of calculus. Two lectures; 2 three-hour laboratory periods for laboratory and problem work. Mr. Ware.

Ch 443. **Chemical Literature.** (G) 1 hour fall.
Designed to train the advanced student in the use of the chemical literature and to instruct him in the character of various chemical journals, dictionaries, reference books, and other sources of information pertaining to

chemistry and related fields. Prerequisite: senior or graduate standing. Professor Gilbert.

Ch 445, 446. **Chemical Thermodynamics.** (G) 3 hours each term.

Application of the principles of thermodynamics to chemical phenomena; heat of reaction, free energy, activity, fungacity of gases, chemical equilibrium, entropy. Prerequisite: Ch 442. Professor Gilbert.

Ch 447. **Electrochemistry.** (G) 3 hours.

A lecture course dealing with theoretical and applied electrochemistry. A knowledge of thermodynamics is desirable preparation. Prerequisite: Ch 442. Professor Gilbert.

Ch 448, 449. **Colloidal Chemistry.** (G) 3 hours each term.

A study of the properties and preparation of substances in the colloidal state. Laboratory courses Ch 467 and 468 accompany this course. Prerequisite: three years of college chemistry. Three lectures. Assistant Professor Friedman.

Ch 450, 451, 452. **Biochemistry.** (G) 5 hours each term.

Fall: Chemical nature of proteins, carbohydrates, and fats occurring in biologically important systems. Winter: Digestion and metabolism of compounds important in nutrition; chemistry of respiration. Spring: Vitamin and hormone chemistry; basal metabolism. Prerequisite: Organic chemistry. Three lectures; 2 laboratory periods. Professor Butts.

Ch 453. **Plant Physiological Chemistry.** (G) 5 hours spring.

Prerequisite: Ch 451. Professor Jones.

Ch 454, 455, 456. **Agricultural Biochemical Methods.** (G) Hours to be arranged.

Offered as an aid to students planning to enter research in plant or animal industries. Laboratory methods in Ch 454 are general in scope and application; those in Ch 455 and Ch 456 are specific in application to groups of plant and animal compounds and to enzymes that accomplish transformations in living bodies. Prerequisite: suitable preparation in quantitative analysis and organic chemistry. Professor Jones.

Ch 457, 458. **Experimental Endocrinology.** (G) 3 hours each term, winter and spring.

Designed to acquaint the student with certain phases of the chemistry of the endocrine glands. Various ductless glands are extracted and the resulting solutions are assayed biologically. Prerequisite: organic chemistry, general zoology. One lecture; 2 three-hour laboratory periods. Professor Butts.

Ch 460, 461, 462. **Pulp and Paper Chemistry.** (G) 3 hours each term.

Chemistry of cellulose; fundamental chemical processes of the pulp and paper industry. Prerequisite: analytical and organic chemistry. Three lectures. Assistant Professor Friedman.

Ch 465. **Applied Electrochemistry.** (G) 3 hours fall.

Testing and use of coulometers; the characteristics of primary and secondary cells; the application of electrodeposition to electroanalysis and electroplating. One lecturer; 2 three-hour laboratory periods. Prerequisite: Ch 442. Mr. Ware.

Ch 466. **Advanced Electrochemistry and Electrometallurgy.** (G) Terms and hours to be arranged.

A laboratory course dealing with electrolytic preparation of chemical compounds and practice in electrometallurgy, and special problems in these fields. Prerequisite: Ch 465. Mr. Ware.

Ch 467, 468. **Colloidal Chemistry Laboratory.** (G) 1 hour each term. Assistant Professor Friedman.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

Ch 501. **Research.** Terms and hours to be arranged.

Ch 503. **Thesis.** Terms and hours to be arranged.
Qualified students will have all the facilities of the laboratory at their disposal and will receive the advice and assistance of the department.

Ch 505. **Reading and Conference.** Terms and hours to be arranged.

Ch 507. **Seminar.** 1 hour each term.
A reading knowledge of German and French is expected.

Ch 511, 512, 513. **Advanced General Chemistry.** 2 hours each term.
Theory and application of general chemistry; special topics, such as inorganic catalysts, double and complex compounds, geochemistry, metallurgical chemistry, and flotation of nonmetallics. Prerequisite: Ch 442. Assistant Professor West.

Ch 520, 521, 522. **Advanced Analytical Chemistry.** 3 hours each term.
Special analytical procedures adapted to those enrolling. Prerequisite: Ch 231, 232, 233. Associate Professor Mehlig.

Ch 530, 531, 532. **Advanced Organic Chemistry.** 2 hours each term.
Fall: Nitrogen compounds. Winter: Carbohydrates. Spring: Terpenes. The theoretical aspects of the subject emphasized by discussion of theories of valence, chemical reactivity, catalysis, etc., as these are related to particular groups of compounds. Prerequisite: Ch 432 or equivalent. Associate Professor Pease.

Ch 533, 534, 535. **Advanced Organic Chemistry.** 2 hours each term.
Fall: Molecular rearrangement, biphenyl isomerism, alicyclic compounds. Winter: Organic synthetic methods of theoretical and practical importance. Spring: Free radicals. Prerequisite: Ch 432 or equivalent. Assistant Professor Ferguson.

Ch 536, 537. **Organic Analysis.** 2 hours winter, 3 hours spring.
Qualitative tests and analysis of organic compounds and mixtures. Prerequisite: Ch 232, 432. One lecture, 1 three-hour laboratory period, winter term; 1 lecture, 2 three-hour laboratory periods spring term. Associate Professor Pease.

Ch 540, 541, 542. **Advanced Physical Chemistry.** 2 hours each term.
Atomic structure from the chemical standpoint; kinetic theory of gases; newer theories of solutions; phase rule and its applications. Prerequisite: Ch 442. Offered alternate years. Not offered 1942-43.

Ch 543, 544, 545. **Advanced Physical Chemistry.** 2 hours each term.
Solubility; properties of liquids, surface tension, dielectric constant, vapor pressure, and other topics; kinetics of chemical reactions; newer theories of valence; photochemistry. Prerequisite: Ch 442. Offered alternate years. Offered 1942-43. Professor Gilbert.

Ch 554. **Biochemical Preparations.** Terms and hours to be arranged.
Preparation, purification, and analysis of compounds of biological importance; chemical and biological resolutions. Prerequisite: Ch 432. Professor Butts.

Entomology

ENTOMOLOGY courses are planned to acquaint the student with the proper relationship of entomology to general agriculture and forestry, to train students for commercial honey production, to prepare students for state and Federal service in economic entomology, and to meet the needs of students from other departments who desire work in entomology. The department thus affords opportunity to major in entomology for a liberal-arts degree as well as to prepare for professional service in entomology or allied fields. Advanced work is offered in three fields: applied entomology, bee culture, and forest entomology.

Advanced courses are planned to equip students specializing in entomology with a fundamental ground work in the science sufficient to prepare them for effective service in applied entomology and to fit them for advanced research study.

The student who intends to engage in research work or college teaching should clearly appreciate the fact that the four-year curriculum does not give him adequate preparation for a career in these fields. Additional study at the graduate level of from one to three years is essential. Certain types of commercial and inspection work may not require more training than is represented by the bachelor's degree.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Ent 201, 202, 203. **General Entomology.** 3 hours each term.

Designed as basic instruction for students planning to take a major or a minor in entomology. Elementary work in morphology, taxonomy, physiology, general technique, and biology of insects. Two lectures; 1 three-hour laboratory period. Associate Professor Scullen.

Ent 223. **Elementary Entomology.** 3 hours winter.

A nontechnical cultural course designed primarily for prospective teachers of high-school biology and others interested in insects and their habits. Insects in their relation to human welfare, their collection, preservation, classification, and the rearing of living forms. Two lectures; 1 three-hour laboratory period. Associate Professor Scullen.

UPPER-DIVISION COURSES

Ent 314. **Principles of Economic Entomology.** 3 hours fall or winter.

Designed primarily for agriculture students. Typical economic insect forms in the principal orders and more important families; principles of insect-pest control. Prerequisite: Z 130 or 203. Two recitations; 1 three-hour laboratory period. Associate Professor Scullen.

Ent 321. **Principles of Forest Entomology.** 3 hours fall or spring.

A general introduction to entomology for forestry students. A survey of the forest losses due to insects, the groups responsible, and a consideration of typical examples of the various groups and methods of prevention and control. Prerequisite: one year of forestry, or Ent 314 or equivalent. Two lectures; 1 two-hour laboratory period. Associate Professor Chamberlin.

Ent 322, 323. **Forest Entomology.** 3 hours each term, winter and spring.

Intensive study of insects injurious to forests and forest products, forest-insect surveys, and the principles of forest-insect control. Prerequisite:

Ent 321. Two lectures; 1 two-hour laboratory period. Associate Professor Chamberlin.

Ent 335. **Practical Bee Culture.** 3 hours spring.
A practical course dealing with the habits and life history of the honey bee, the management of bees for honey production and the pollination of fruit and seed crops. Prerequisite: Ent 314. Two lectures; 1 three-hour laboratory period. Associate Professor Scullen.

Ent 341. **Aquatic Entomology.** 4 hours spring.
Classification of aquatic insects, their ecologies, life histories, and economic importance as food of game fishes; emphasis on the techniques of conducting lake and stream surveys. Prerequisite: Ent 201 or 314. One lecture or recitation; 2 three-hour laboratory periods or field work. Professor Mote.

Ent 351. **Historical Entomology.** 3 hours fall.
Insects of the ancients; early works on entomology; beginnings in America; early entomological workers in America; introduced pests; development of the Bureau of Entomology; early work in Oregon. Prerequisite: Ent 201 or equivalent. Associate Professor Scullen.

Ent 352. **Entomological Nomenclature and Literature.** 3 hours winter.
Rules, regulations, and practices in entomological nomenclature; the International Code; sources of entomological literature; Bureau of Entomology; periodicals and books; bibliographies. Prerequisite: Ent 201 or equivalent. Associate Professor Scullen.

Ent 373. **Entomological Technique.** 3 hours spring.
Designed to acquaint the student with methods of rearing living insects, collecting and preserving insects and the preparation of insect material for study. For major students in entomology and for prospective teachers of biology. The laboratory work is adapted to the needs of the student. Prerequisite: Ent 201, or 314, or 223, or 321. One lecture; 2 three-hour laboratory periods. Associate Professor Scullen.

Ent 401. **Research.** Approved problems carried on in library, laboratory, or field. Terms and hours to be arranged.

Ent 403. **Thesis.** Terms and hours to be arranged.

Ent 405. **Reading and Conference.** Terms and hours to be arranged.

Ent 407. **Seminar.** 1 hour each term.
Reading, discussing, and abstracting the leading articles on entomological topics as they appear in current scientific literature.

Ent 411. **Fruit Insects.** (G) 3 hours fall.
Major fruit insects and their control. Especially for students in horticulture and entomology. Prerequisite: Ent 314 or equivalent. Three two-hour laboratory periods. Professor Mote.

Ent 412. **Medical Entomology.** (G) 3 hours winter.
Brief consideration of the men instrumental in the study that gave rise to medical entomology; ways in which disease is transmitted by insects; insects responsible for diseases of man; more common disease parasites, their carriers, and possible means of prevention and control. Prerequisite: Ent 411. Two lectures; 1 three-hour laboratory period. Professor Mote.

Ent 413. **Field and Truck-Crop Insects.** (G) 3 hours spring.
Major field and truck-crop insects and their control. Especially for students in farm crops, vegetable crops, and entomology. Prerequisite: Ent 314, 412 or equivalent. Three two-hour laboratory periods. Professor Mote.

Ent 415. **Principles of Insect Control.** (G) 3 hours winter.
Pests of special groups, such as fruit insects, truck-crop insects, insects affecting man and animals, greenhouse and field-crop insects; control measures and principles. Prerequisite: Ent 314 or equivalent. Two lectures; 1 laboratory period. Professor Mote.

Ent 423. **Advanced Forest Entomology.** (G) 4 hours.
An intensive study of the bark beetles injurious to forest trees. Prerequisite: Ent 323 or equivalent. Two lectures; 1 laboratory period. Associate Professor Chamberlin.

Ent 431. **Biological Control.** (G) 3 hours spring.
Brief history of those who started this work, its possibilities and limitations; groups of insects that lend themselves to artificial propagation, examples of successes and failures, study of typical species in the various groups. Prerequisite: Ent 352. Two lectures; 1 three-hour laboratory period. Associate Professor Scullen.

Ent 451, 452, 453. **Insect Taxonomy.** (G) 3 hours each term.
The classification of insects of the several orders; intensive study of insects of selected groups; attention to phylogenetic relationships and distribution. Prerequisite: Ent 203 or equivalent. Two recitations; 1 three-hour laboratory period. Associate Professor Scullen.

Ent 471. **Insect Morphology.** (G) 5 hours fall.
Fundamentals of external and internal morphology and the adaptation of parts to their functions; histology, embryology, post-embryonic development and wing venation. Prerequisite: Ent 201, 202, 203. Three lectures; 2 three-hour laboratory periods. Associate Professor Scullen.

Ent 472. **Insect Physiology.** (G) 5 hours winter.
Life processes of insects, including nutrition, respiration, circulation, excretion, and reproduction. Prerequisite: Ent 471, Z 411. Three lectures; 3 two-hour laboratory periods. Associate Professor Scullen.

Ent 473. **Insect Ecology.** (G) 5 hours spring.
Environmental factors and their influence on insect development, distribution, and behavior. Prerequisite: Ent 203; plant ecology desirable. Three lectures; 2 three-hour laboratory periods. Associate Professor Scullen.

GRADUATE COURSES

Courses numbered 400-499 and designated *(g)* or *(G)* may be taken for graduate credit.

Ent 501. **Research.** Terms and hours to be arranged.

Ent 503. **Thesis.** Terms and hours to be arranged.

Ent 505. **Reading and Conference.** Terms and hours to be arranged.

Ent 507. **Seminar.** Terms and hours to be arranged.

Geology

GEOLOGY is the science of the earth. Some knowledge and appreciation of the earth on which we live is essential for those who wish to face intelligently the problems of modern life. The Department of Geology offers three types of majors: one intended for students who are interested in geology as part of a liberal education; one professional in economic geology; and one professional in paleontology. The general major affords opportunity for the student to make wide electives in other fields. The department is equipped to offer graduate work in geology and paleontology.

LOWER-DIVISION COURSES

G 201, 202, 203. **Geology.** 3 hours each term.
Introductory year sequence dealing with those processes of nature by which the surface of the earth has been built up, deformed, and torn down; the natural history and the occurrence of the common rocks and useful minerals; outline of the history of the earth and significant events in the history of life. Professor Allison.

G 204, 205, 206. **Geology Laboratory.** 1 hour each term.
Laboratory and field work to accompany G 201, 202, 203 for all students desiring a more intimate knowledge of geology.

UPPER-DIVISION COURSES

G 312, 313, 314. **Mineralogy.** 4 hours each term.
Physical and chemical methods useful in the recognition of materials of which the earth is composed. Crystallography and physical mineralogy; petrographic methods, emphasizing optical microphysical and microchemical techniques; descriptive mineralogy; special attention to application of methods of identification. Prerequisite: chemistry. Two lectures; 2 laboratory periods. Assistant Professor Wilkinson.

G 321. **Structural Geology.** 4 hours spring.
Study of origin, interpretation, and mapping of minor rock structures and joints, faults, and folds. Prerequisite: G 201, 202. Three lectures; 1 laboratory or field period. Professor Allison.

G 322. **Physiography.** 4 hours winter.
Principles of geomorphology or the development of the surface features of the earth by erosion, deposition, earth movements, and volcanism. Prerequisite: general geology. Three lectures; 1 laboratory or field period. Professor Allison.

G 323. **Stratigraphy.** 4 hours fall.
Genesis and subsequent history of stratified rocks, including a study of the geologic processes concerned with sedimentation and cementation. Prerequisite: G 201, 202, 203. Three lectures; 1 laboratory or field period. Professor Allison.

G 324. **Engineering Geology.** 3 hours winter.
The general field from the engineering standpoint. Open to other than engineering students. Professor Hodge.

G 330. **Life of the Past.** 3 hours fall.
General principles of the history of life as recorded in the fossil record; several groups of invertebrates studied as illustrations of biological prin-

ciples and for their relationships to higher animals. Prerequisite: one year of biology or geology. Professor Packard.

G 331. **Geologic History of Vertebrates.** 3 hours winter.

Brief consideration of the rise and development of the vertebrates with special attention to certain groups of ancient animals that once lived on the Pacific Coast. Prerequisite: one year of biology or geology. Professor Packard.

G 332. **Geologic History of Man.** 3 hours spring.

Physical and cultural development of the ancient types of men, as shown by their fossil remains, their implements and art. Prerequisite: one year of biology or geology. Professor Packard.

G 340, 341. **Invertebrate Paleontology.** 4 hours each term.

Major groups of fossil invertebrates and the characteristics of important West Coast genera. Prerequisite: general geology or one year of any biological science. Two class periods and 2 laboratory periods a week. (The third term of the year sequence is G 442.) Professor Packard.

G 350. **Rocks and Minerals.** 3 hours fall.

This course gives the student having a general interest in geology the opportunity to become acquainted with rocks and minerals without having to meet the requirements of the more technical courses. Can be combined with term courses in physiography and Oregon geology to form a junior sequence. Of interest to a student majoring in general science and especially useful to one expecting to teach general science. Assistant Professor Wilkinson.

G 352. **Geology of Oregon.** 3 hours spring.

Affords opportunity to obtain a general knowledge of the geology of the state without having to meet the technical requirements imposed for a professional geology major. Can be combined with term courses in rocks and minerals and physiography to form a sequence. Of interest to a student majoring in general science and especially useful to one expecting to teach general science. Prerequisite: upper-division standing. Professor Hodge.

G 355. **Economic Geology and Mineral Resources.** 3 hours fall.

An introductory general course dealing with the origin, occurrence, uses, industrial economics, world resources and strategy of petroleum, coal, metallic and nonmetallic minerals; ground water and water power. Some attention is given to northwestern geological resources and available mineral supplies for electro-chemical and electro-metallurgical industries. Recommended to chemists, engineers, economists, and general science students. Prerequisite: upper division standing. Professor Hodge.

G 380. **Advanced Field Geology.** 9 hours.

A general course in geologic mapping and surveying methods and an intensive study of a small area so chosen as to include a wide range of special problems. Conducted in a summer camp of four weeks; may be taken with full credit for a series of summers, as different area is studied each season. Prerequisite: at least one year of general geology.

G 401. **Research.** Terms and hours to be arranged.

G 403. **Thesis.** Terms and hours to be arranged.

G 405. **Reading and Conference.** Terms and hours to be arranged.

G 407. **Seminar.** Any term, 1 hour each term.

G 412, 413. **Petrography.** (g) 4 hours fall and winter.
Sedimentary, igneous and metamorphic rocks and ores are studied megascopically and microscopically. The objective is to train the student in the recognition, classification and interpretation of the materials forming the earth's crust. Prerequisite: G 312, 313, 314. Professor Hodge.

G 414. **Mineral Deposits.** (g) 4 hours spring.
Studies in the recognition, association, occurrence of minerals and the criteria for the recognition of origin, types and properties of mineral deposits. Prerequisite: G 412, 413. Professor Hodge.

G 424. **Advanced Paleontology.** (G) Terms and hours to be arranged.
Special work assigned to meet the requirements of the advanced student. Prerequisite: G 340, 341. Professor Packard.

G 431. **Geologic History of North America.** (G) 4 hours.
The geologic development of the North American continent. Prerequisite: stratigraphy. Professor Allison.

G 432. **Geologic History of the Pacific Coast.** (G) 4 hours.
The geologic history of the Pacific Coast of North America. Prerequisite: stratigraphy and paleontology. Professor Allison.

G 442. **Paleobotany.** (g) 4 hours spring.
Study of plants that are important from a paleobotanical standpoint; history of plants as revealed in the fossil record, and the relationship of the better known groups. Special study of the Tertiary floras of Oregon. Prerequisite: General geology or general botany. Two lectures; 2 three-hour laboratory periods. Associate Professor Sanborn.

GRADUATE COURSES

Courses numbered 400-499 and designated *(g)* or *(G)* may be taken for graduate credit.

G 501. **Research.** Terms and hours to be arranged.

G 503. **Thesis.** Terms and hours to be arranged.

G 505. **Reading and Conference.** Terms and hours to be arranged.

G 507. **Seminar.** Terms and hours to be arranged.

G 512, 513, 514. **Microscopy.** Hours to be arranged.
Use and theory of the microscope in the recognition and determination of the properties of organic and inorganic materials. Professor Hodge.

G 520. **Advanced Economic Geology.** Terms and hours to be arranged.
Special work assigned to meet the requirements of advanced students in metallic and nonmetallic mineral deposits. Professor Hodge.

G 580. **Graduate Field Geology.** Terms and hours to be arranged.
Advanced field problems assigned to meet the requirements of the graduate student. Staff.

Mathematics

THE courses in mathematics are designed to provide for the general student the training in rigorous thinking and analytical processes that is a fundamental part of a well-balanced education; to supply the mathematical preparation desirable for students in professional schools; to prepare prospec-

tive teachers; and finally to give advanced and graduate work for those who specialize in mathematics or science.

Sequences Satisfying Group Requirements. The following constitute sequences satisfying group requirements: (1) Forestry students—Mth 100, 106, 109. (2) Business Administration students—Mth 100, 108, 109. (3) Science students—Mth 100, 108, 109; Mth 100, 101, 102; Mth 101, 102, 103; Mth 201, 202, 203.

Statistics. The Department of Mathematics offers two types of courses in statistics: (a) The mathematical theory of statistics develops the theoretical foundations of applied statistics. It should be elected by prospective statistical analysts since only by a mastery of this background can they achieve the desired proficiency. It can profitably be elected by students majoring in mathematics who are interested in the pure mathematics involved. (b) Applied statistics emphasizes the use of the formulas and methods in the interpretation of statistical and experimental data. It gives the statistician practical experience in numerical computations.

Computational Service. The Department of Mathematics operates a computational service available to schools, departments, or staff members wishing assistance or advice in connection with mathematical problems, laborious calculations, or statistical analysis. Having calculating machines, mathematical tables, and other computational aids, as well as experience, the department can perform such work systematically and efficiently. The actual work is done by competent students in mathematics, who are paid for the service, and who incidentally obtain practical mathematical and statistical experience.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Mth 10. **Elementary Algebra.** 4 hours.

Mth 20. **Elementary Geometry.** 4 hours.

Mth 100. **Intermediate Algebra.** 4 hours.

Mth 101, 102, 103. **Elementary Analysis.** 4 hours each term.
Trigonometry, graphs, algebra, elements of calculus, and analytic geometry.

Mth 106. **Trigonometry.** 4 hours.

Mth 108. **Mathematics of Finance.** 4 hours.
Courses Mth 100, 108, 109, form a year sequence for students planning to major in business administration.

Mth 109. **Elements of Statistics.** 4 hours.
Courses Mth 100, 106, 109, form a year sequence for forestry freshmen.

Mth 201, 202, 203. **Differential and Integral Calculus.** 4 hours each term.
Prerequisite: Elementary Analysis or equivalent.

UPPER-DIVISION COURSES

Mth 311. **History of Mathematics.** 3 hours.
Brief history of our oldest science; its beginnings in relation to social problems; reciprocal effect of mathematics on society. For students pre-

paring to teach, this course should suggest lively approaches in presenting the subject and give a sense of the importance of mathematics for modern civilization. Professor Beaty.

Mth 341, 342. **Applied Statistics.** 3 hours each term.

For students in biological sciences and agriculture who lack the prerequisites for Mth 441, 442, 443. Not open to students having credit in Mth 109. Assistant Professor Kirkham.

Mth 405. **Reading and Conference.** Terms and hours to be arranged.

Professor Milne.

*Mth 411. **Theory of Equations and Determinants.** (G) 3 hours.

Properties and methods of solution of algebraic equations; brief study of determinants and their applications. Prerequisite: calculus. Associate Professor Williams.

*Mth 412. **Higher Algebra.** (G) 3 hours.

Determinants, linear dependence, matrices, linear transformations, invariants, and quadratic forms. Prerequisite: calculus. Associate Professor Williams.

*Mth 413. **Advanced Plane Analytic Geometry.** (g) 3 hours.

Prerequisite: calculus. Associate Professor Williams.

*Mth 414. **Solid Analytic Geometry.** (G) 3 hours.

Prerequisite: calculus. Associate Professor Williams.

*Mth 415. **Advanced Geometry.** (G) 3 hours.

Euclidean geometry from a modern point of view. Prerequisite: calculus. Associate Professor Williams.

*Mth 416. **Projective Geometry.** (G) 3 hours.

Introduction to analytic and synthetic projective geometry. Prerequisite: calculus. Associate Professor Williams.

Mth 417. **Actuarial Mathematics.** (g) 3 hours.

A course in algebra and probability. Recommended as preparation for actuarial examinations. Offered alternate years. Offered 1942-43. Prerequisite: calculus. Dr. Hammer.

Mth 421, 422. **Differential Equations.** (G) 3 hours each term.

Practical study of the solution of ordinary differential equations. Prerequisite: calculus. Professors Milne and Beaty, Dr. Hammer.

Mth 424. **Elementary Topology.** (G) 3 hours.

Simple introduction to combinatorial and point-set analysis situs: classification of surfaces; manifolds; fixed points of continuous mappings. Prerequisite: calculus. Dr. Sobczyk.

Mth 425. **Vector Analysis.** (G) 3 hours.

Prerequisite: calculus. Assistant Professor Hostetter.

Mth 426. **Mathematical Theory of Probability.** (G) 3 hours.

Methods of calculating probabilities with applications to scientific problems. Offered when sufficient demand. Prerequisite: calculus. Assistant Professor Kirkham.

* **Mth 412, 413, 414 offered 1941-42; Mth 411, 415, 416 offered 1942-43.**

Mth 427. **Applied Mathematics.** (G) 3 hours.
Problem course in applications of calculus, differential equations, and hyperbolic functions; special attention to the mathematical formulation of practical problems. Prerequisite: differential equations or consent of the instructor. Professor Beaty.

Mth 431, 432, 433. **Advanced Calculus.** (G) 3 hours each term.
The aim is twofold: (1) to examine critically some of the results of the calculus, (2) to study the calculus of several variables. Partial derivatives; gradient, change of variables, Jacobians, line integral, multiple integral, Green's Theorem, Gamma and Beta functions, development in series of orthogonal functions. Offered alternate years. Offered 1941-42. Prerequisite: elementary calculus. Dr. Manning.

Mth 435. **Numerical Calculus.** (G) 3 hours.
Finite differences, interpolation, numerical differentiation and integration, and numerical solution of differential equations. Prerequisite: differential equations. Professor Milne.

Mth 441, 442, 443. **Mathematical Theory of Statistics.** (G) 3 hours each term.
Mathematical derivation of the various formulas used in statistical analysis and some application of these formulas to practical problems. Prerequisite: calculus. Assistant Professor Kirkham.

Mth 451, 452. **Modern Algebra.** (G) 3 hours each term.
Recent theories in algebra, showing the variety and richness of possible mathematical systems; applications to the fields of analysis, geometry, physics, and philosophy. Offered alternate years. Offered 1942-43. Prerequisite: calculus and consent of instructor. Dr. Sobczyk.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

Mth 501. **Research.** Terms and hours to be arranged.

Mth 503. **Thesis.** Terms and hours to be arranged.

Mth 505. **Reading and Conference.** Terms and hours to be arranged.

Mth 507. **Seminar.** Terms and hours to be arranged.

Mth 511, 512, 513. **Functions of a Complex Variable.** 3 hours each term.
Introduction to analytic functions, fundamental for advanced study in mathematics. Offered 1942-43. Professor Milne.

Mth 514. **Calculus of Variations.** 3 hours.
Offered alternate years. Offered 1941-42. Assistant Professor Hostetter.

Mth 516. **Potential Theory.** 3 hours.
Offered on demand. Professor Milne.

Mth 521, 522, 523. **Differential Equations of Mathematical Physics.** 3 hours each term.
Ordinary and partial linear differential equations and boundary value problems, with applications. Offered alternate years. Offered 1941-42. Professor Milne.

Mth 531, 532, 533. **Advanced Analytical Mechanics.** 3 hours each term.

Generalized coordinates, Lagrange's equations, Hamilton's principle, Hamilton's canonical equations, contact transformations; such topics as special relativity, tensor analysis, statistical mechanics, the theory of the top. Offered 1942-43. Prerequisite: Mth 451, 452, 453, or equivalent.

Mth 541, 542. **Theory of Elasticity.** 3 hours each term.

Mathematical formulation of the problem of stress, strain, and deformation in elastic solids, with solutions in some cases of practical interest. Offered on demand.

Mth 544, 545. **Hydrodynamics.** 3 hours each term.

The mechanics of fluids, with special reference to liquids, but including also some applications to air and other gases. Offered on demand.

Mth 551, 552, 553. **Functions of Real Variables.** 3 hours each term.

Convergence, continuity, special functions, Riemann and Lebesque integrals, Fourier series, theory of Hilbert space. Offered alternate years. Offered 1941-42. Dr. Sobczyk.

Nursing Education

WHILE the first two years of the Nursing Education Degree Curriculum as given at the State College are devoted chiefly to general and basic subjects in preparation for professional work at the Medical School and in hospitals, two year sequences in the backgrounds of nursing are required. These courses are taught by a member of the nursing education faculty of the University of Oregon Medical School.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Nur 111, 112, 113. **Backgrounds of Nursing.** 2 hours each term.

The historic backgrounds of modern social and health movements, the relation of these to the evolution of nursing as a profession, and present aims and problems in nursing at home and abroad. Associate Professor Wheelock.

Nur 211, 212, 213. **Modern Nursing Problems.** 1 hour each term.

Continuation of Nur 111, 112, 113.

Physics

STUDENTS planning to major in physics should offer a maximum of high-school mathematics and physics for entrance. The lower-division program should include mathematics through the calculus, general chemistry, and ordinarily two years of physics. Those planning for graduate study and research should also lay the foundations of a reading knowledge of German or French, or both. In special cases courses in closely related departments, involving considerable study of physical principles, may be accepted as part of a major in physics. Undergraduate students may major in physics either as part of a liberal education or as preparation for professional service in physics and allied fields.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Ph 111, 112, 113. **Engineering Physics.** 3 hours each term.

Studies in general physics adapted to students in engineering. This sequence is started fall term and also winter term. One lecture; 2 recitations; 2 one-hour laboratory periods. Professor Weniger and others.

Ph 161. **Rudiments of Photography.** 2 hours any term.

A manipulation course intended for students not having the science prerequisites for Ph 361. Completion of this course does not admit to Ph 362. One lecture; 1 two-hour laboratory period. Assistant Professor Garman and others.

Ph 201, 202, 203. **General Physics.** 4 hours each term.

Mechanics, sound, heat, light, electricity and magnetism. Two lectures; 2 recitations; 1 two-hour laboratory period. Associate Professor Yunker.

Ph 204, 205, 206. **Astronomy and Meteorology.** 3 hours each term.

Descriptive rather than mathematical. Solar system; meteorology and the physics of the atmosphere (during winter when weather is not suitable for astronomical observations); types and groupings of stars. Students may enter any term. Prerequisite: one year of college physics. Professor Anderson.

Ph 211, 212. **Qualitative Physics.** 3 hours each term, fall and winter.

The "how" and "why" of the most important applications of mechanics to heat, sound, light, and electricity and magnetism. Five periods a week devoted to demonstration lectures or informal discussions. Dr. Reid.

Ph 214. **Household Physics.** 4 hours spring.

Principles of physics with special attention to applications in the home. Four demonstration lectures; 2 discussion periods. Dr. Reid.

UPPER-DIVISION COURSES

Ph 311, 312, 313. **Introduction to Modern Physics.** 3 hours each term.

A continuation of General (or Engineering) Physics. Chief discoveries since the closing years of the last century; kinetic theory, the electron, radiation, radioactivity; photoelectricity, thermionic emission, X-rays, electronic devices, gaseous conduction, artificial transmutation, cosmic rays. A student may enter any term. Prerequisite: one year of college physics. Two lectures; 1 two-hour laboratory period. Associate Professor Brady.

Ph 321, 322, 323. **Physical Measurements.** 3 hours each term.

Fall term: electrical measurements. One lecture; 2 two-hour laboratory periods. Winter term: two lectures; 1 two-hour laboratory period. Spring term: heat, including high temperature measurements. Two lectures; 1 two-hour laboratory period. A student may enter the fall or spring term. Prerequisite: one year of college physics; calculus. Assistant Professor Varner.

Ph 330. **Fundamentals of Radio.** 3 hours spring.

The underlying physical principles; present-day radio circuits; construction and use of transmitting and receiving equipment. Prerequisite: one year of college physics. One lecture; 2 two-hour laboratory periods. Associate Professor Yunker.

Ph 331, 332, 333. **Radio Communication.** 3 hours each term.

Theory of radio transmission and reception; vacuum tubes; radio and audio frequency measurements; special problems. Students desiring a course in

high-frequency measurements may register for Ph 332 only; a special laboratory section will be provided. Prerequisite: one year of college physics and consent of instructor. Two lectures or recitations; 1 two-hour laboratory period. Associate Professor Yunker.

Ph 343. **Acoustics.** 3 hours.
The acoustics of buildings. Three lectures; occasional laboratory. Prerequisite: one year of college physics. Assistant Professor Morgan.

Ph 361. **Photography.** 3 hours any term.
Theoretical and practical photography for the beginner; the hand camera, negative making, developing and printing, toning, enlarging, lantern slides. Prerequisite: college chemistry or physics or previous photographic experience, with consent of instructor. One lecture; 2 two-hour laboratory periods. Assistant Professor Garman and others.

Ph 362. **Photography.** 3 hours winter.
Commercial phases of photography: view cameras, copying, flashlights, indoor lighting, color correction, distant views, etc. Prerequisite: Ph 361. One lecture; 2 two-hour laboratory periods. Assistant Professor Garman.

Ph 363. **Photography.** 3 hours spring.
The making of pleasing pictures: composition, carbon and carbro printing, paper negatives, diffusion, enlarging negatives, etc. Prerequisite: Ph 361. One lecture; 2 two-hour laboratory periods. Assistant Professor Garman.

Ph 380. **Laboratory Arts.** Terms and hours to be arranged.
Construction, repair, and adjustment of physical apparatus; laboratory techniques. Prerequisite: one year of college physics. Lectures, assigned readings, and laboratory. Assistant Professor Varner.

Ph 396. **Practical Astronomy.** 3 hours.
Determination of time, latitude, longitude, and azimuth by astronomical methods. Prerequisite: Ph 206 and trigonometry. One lecture; 2 observation periods. Professor Anderson.

Ph 401. **Research.** Terms and hours to be arranged.

Ph 403. **Thesis.** Terms and hours to be arranged.

Ph 405. **Reading and Conference.** Terms and hours to be arranged.

Ph 407. **Seminar.** One hour each term.

Ph 461, 462, 463. **Advanced Photography.** (G) 3 hours each term.
Work in special fields such as color photography, photomicrography, microscopic motion pictures, miniature camera technique, etc. A student may enter any term. Prerequisite: Ph 362. One lecture; 2 two-hour laboratory periods. Assistant Professor Garman.

Ph 464. **The Physics of Light Production.** (G) 3 hours.
Radiation and the development of modern illuminants. Prerequisite: Ph 466 or EE 431. Two lectures; 1 two-hour laboratory period. Professor Weniger.

Ph 465, 466. **Light.** 3 hours winter and spring.
Geometric and physical optics. Prerequisite: Ph 321 and calculus. Two lectures; 1 two-hour laboratory period. Professor Weniger.

GRADUATE COURSES

Courses at the graduate level are given when warranted by demand. An appended date indicates that the course is offered only in alternate years.

Ph 501. Research. Terms and hours to be arranged.

Ph 503. Thesis. Terms and hours to be arranged.

Ph 505. Reading and Conference. Terms and hours to be arranged.

Ph 507. Seminar. Terms and hours to be arranged.

Ph 521, 522, 523. Introduction to Theoretical Physics. 3 hours each term. A mathematical treatment of the theories of classical physics. Required of all physics majors for the master's degree. Prerequisite: two years of physics; differential equations. Three lectures. Associate Professor Brady.

Ph 524, 525, 526. Advanced Mathematical Physics. Hours to be arranged. Lectures and assigned readings. The topics treated are varied from year to year to suit the needs of the students. Prerequisite: graduate standing and consent of instructor. Assistant Professor Morgan.

Ph 531, 532, 533. Advanced Electrical Theory. 3 hours each term. A mathematical discussion of the classical and modern theories of electricity. Prerequisite: Ph 322; differential equations. Offered 1942-43. Assistant Professor Varner.

Ph 537, 538, 539. Conduction of Electricity Through Gases. 3 hours each term.

Processes taking place at the electrodes, in the gas, and at the walls of the tube; glow, arc, and spark discharges. Prerequisite: Ph 311, 312, 313, 332, or equivalent. Two lectures; 1 three-hour laboratory period. Offered alternate years. Not offered 1942-43. Associate Professor Brady.

Ph 551, 552, 553. Theory of Heat. 3 hours each term.

Thermodynamics and the kinetic theory. Especially for students in physics and physical chemistry and those interested in industrial applications. Prerequisite: Ph 323; differential equations. Three lectures. Offered alternate years. Not offered 1942-43. Assistant Professor Varner.

Ph 561, 562, 563. Optics. 3 hours each term.

Physical optics; theory of optical instruments; spectroscopy. Prerequisite: Ph 466. Two lectures; 1 three-hour laboratory period. Offered 1942-43. Professor Weniger.

Ph 571, 572, 573. Modern Physical Theories. 3 hours each term.

Electron theory, relativity, the quantum theory, wave mechanics. Three lectures. Prerequisite: Ph 523. Offered 1942-43. Assistant Professor Morgan.

Ph 576. Quantum Mechanics. 3 hours.

Modern theories based on matrices, tensors, Schroedinger's equation, Heisenberg's principle, and Dirac's transformation theory. Three lectures. Prerequisite: Ph 573. Assistant Professor Morgan.

Ph 582. History and Philosophy of Physics. 3 hours winter.

Prerequisite: four years of physics. Physics staff.

Ph 591. Meteorology. 3 hours.

Air mass movements. Prerequisite: Ph 205 and calculus. Three lectures. Offered alternate years. Not offered 1942-43.

Ph 592. **Astrophysics.** 3 hours.
Stellar spectroscopy, photometry, and radiometry. Prerequisite: Ph 204, 206, 466. Three lectures. Offered alternate years. Not offered 1942-43.

Ph 593. **Geophysics.** 3 hours.
Prerequisite: G 321, Ph 321, and differential equations. Three lectures. Offered alternate years. Not offered 1942-43.

Science Education

PROFESSIONAL preparation for prospective teachers of science and mathematics is afforded by the Department of Science Education, which is a joint department within the School of Education and the School of Science. For information regarding specific requirements for the High School Teacher's Certificate, see pages 254-256.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

SEd 401. **Research.** Terms and hours to be arranged.

SEd 403. **Thesis.** Terms and hours to be arranged.

SEd 405. **Reading and Conference.** Terms and hours to be arranged.

SEd 407. **Seminar.** Terms and hours to be arranged.

Ed 408b, f, g. **Special Teaching Methods.** (See Ed 408, page 265.)

GRADUATE COURSES

SEd 501. **Research,** Terms and hours to be arranged.

SEd 503. **Thesis,** Terms and hours to be arranged.

SEd 505. **Reading and Conference.** Terms and hours to be arranged.

SEd 507. **Seminar.** Terms and hours to be arranged.

Zoology

UNDERGRADUATE students may major in zoology for a liberal-arts degree or as preparation for professional service in the field of biology. In the lower-division courses the purpose is to furnish the student with effective grounding in the principles of animal biology and in laboratory methods. These courses also form the basis for professional work in the applied fields of zoology. The upper-division courses provide for training in the special fields of the science, particularly the general and experimental phases of anatomy, physiology, parasitology, and pathology. Advanced study courses and seminars introduce the student to research and give opportunity for advanced work in selected subjects. For the master's degree, a summer at the Institute of Marine Biology is recommended, and for the doctor's degree it is required.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Z 130. Principles of Zoology. 3 hours spring.

Distribution, habits, and functions of animals with reference to their economic importance. Two lectures; 1 three-hour laboratory period. Professor Fasten and staff.

Z 201, 202, 203. General Zoology. 3 hours each term.

Introductory study dealing with principles of animal biology. For premedical students, prenursing students, pharmacy, physical education, psychology, fish and game management students, and others desiring a fundamental course in general zoology. Two lectures; 1 three-hour laboratory period. Professor Fasten and staff.

Z 204, 205, 206. Vertebrate Zoology. 4 hours each term.

Elements of comparative anatomy, gross and microscopic, and of vertebrate embryology. Prerequisite: Z 201, 202, 203. Two lectures; 6 hours laboratory. Assistant Professor Osborn.

Z 208, 209, 210. Elementary Human Anatomy. 3 hours each term.

For students in physical education, prenursing, and others desiring a course dealing with the organization of the human body. In the spring term applied phases of anatomy are considered. Prerequisite: Z 201, 202, 203. Two lectures; 1 laboratory period. Assistant Professors Osborn and Swan.

Z 211. Elementary Human Physiology. 5 hours spring.

For students in home economics, physical education, nursing education, and others desiring a general course in the principles of human physiology. Three lectures; 2 laboratory periods. Associate Professor Wulzen.

UPPER-DIVISION COURSES

Z 306, 307, 308. Physiology. 3 hours each term.

For students in home economics, pharmacy, physical education, prenursing, and others who desire a course in the functions of the various systems of the human body. In the spring term applied phases of physiology are considered. Z 306 and 307 satisfy the requirements of home economics students. Prerequisite: general zoology or consent of instructor. Two lectures; 1 laboratory period. Associate Professors Wulzen and Allman.

Z 313. Field Zoology. 3 hours spring.

The local vertebrates, their taxonomic arrangement, habits, and distribution. Prerequisite: Z 201, 202, 203. Two lectures; 3 hours of laboratory or field work. Associate Professor Gordon.

Z 314. Evolution and Eugenics. 3 hours fall.

The various ideas concerning the origin, development, and relation of organisms, with emphasis on human welfare. Prerequisite: Z 201, 202, 203, or consent of instructor. Professor Fasten.

Z 315. Genetics. 3 hours winter.

Heredity and variation in plants and animals; special emphasis on such topics as heredity versus environment, inheritance of acquired characteristics, the glands of internal secretion and development, Mendelian principles of heredity, newer developments in heredity, and heredity in man. Prerequisite: Z 201, 202, 203, or consent of instructor. Professor Fasten.

Z 321. **Economic Ornithology.** 3 hours fall.

Habits, life histories, and economic importance of northwestern birds with special reference to game and predatory birds. Prerequisite: Z 201, 202, 203, or consent of instructor. Two lectures; 1 three-hour laboratory period. Associate Professor Gordon.

Z 322. **Economic Mammalogy.** 3 hours winter.

Classification, distribution, life histories, and economic relationships of game, fur-bearing, and destructive mammals. Prerequisite: Z 201, 202, 203. Two lectures; 1 laboratory period. Associate Professor Gordon.

Z 323. **Biology of Fishes.** 3 hours spring.

General consideration of the morphology, taxonomy, physiology, development, and evolution of fishes. Two lectures; 1 laboratory period. Dr. Grobstein.

Z 401. **Research.** Terms and hours to be arranged.

Z 403. **Thesis.** Terms and hours to be arranged.

Z 405. **Reading and Conference.** Terms and hours to be arranged.

Readings and reports on special topics.

Z 407. **Seminar.** Any term, 1 hour each term. Professor Fasten.

Z 410. **Animal Ecology.** (g) 3 hours spring.

Animal associations and habitats; succession of animal communities; environmental factors; variation and regulation of animal numbers; movements of animals; social organization and behavior. Prerequisite: two years of biology, or consent of instructor. Offered alternate years. Offered 1942-43. Two lectures; 1 laboratory period. Associate Professor Gordon.

Z 411, 412, 413. **General Physiology.** (G) 3 hours each term.

The principles of physiology and their application to life processes in animals. Prerequisite: general zoology, general chemistry, and organic chemistry. Two lectures; 1 three-hour laboratory period. Associate Professor Wulzen.

Z 414. **Endocrinology.** (G) 3 hours fall.

A brief survey of the endocrine glands, with special emphasis on their role in reproduction, metabolism, and development. Prerequisite: Two years of zoology and general chemistry. Dr. Grobstein.

Z 431, 432. **Invertebrate Zoology.** (G) 4 hours each term, fall and winter.

The structure, classification, distribution, and life histories of the invertebrates. Two lectures; 2 laboratory periods. Prerequisite: two years of zoology. Associate Professor Gordon.

Z 475. **Histology.** (G) 3 hours fall.

Comparative study of the tissues of vertebrates. Prerequisite: Z 204, 205, 206, or consent of instructor. One lecture; 6 hours laboratory. Dr. Dornfeld.

Z 476. **Microtechnique.** (g) 3 hours winter.

Study and practice in the principal methods of preparing animal tissues for microscopic study. Prerequisite: two years of biology. One lecture; 6 hours laboratory. Dr. Dornfeld.

Z 477. **Experimental Embryology.** (G) 3 hours spring.

Fundamental nature and causes of development. Prerequisite: Z 204, 205, 206, or consent of instructor. One lecture; 6 hours laboratory work. Dr. Dornfeld.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

Z 501. **Research.** Terms and hours to be arranged.

Z 503. **Thesis.** Terms and hours to be arranged.

Z 505. **Reading and Conference.** Terms and hours to be arranged.

Z 507. **Seminar.** Terms and hours to be arranged. Professor Fasten.

Z 536. **Parasitology.** 3 hours.

The role played by animals in the production of disease. Prerequisite: Z 431, 432, or equivalent. Offered alternate years. Not offered 1942-43. Associate Professor Gordon.

Z 537. **Cytology.** 3 hours.

Structure and function of the cell with special reference to the behavior and distribution of chromosomes. Prerequisite: Z 475, 476, 477. Dr. Dornfeld.

Lower Division and Service Departments

Faculty

MAHLON ELLWOOD SMITH, Ph.D., Dean of Lower Division and Service Departments.

GERTRUDE FULKERSON, Secretary to the Dean.

ARTS AND LETTERS

English

SIGURD HARLAN PETERSON, Ph.D., Professor of English; Head of Department.

FREDERICK BERCHTOLD, A.M., Litt.D., Professor Emeritus of English.

MAHLON ELLWOOD SMITH, Ph.D., Professor of English.

JOHN M KIERZEK, Ph.D., Professor of English.

DANIEL THOMAS ORDEMAN, Ph.D., Associate Professor of English.

RALPH COLBY, Ph.D., Associate Professor of English.

GERTRUDE ELIZABETH MCELFRESH, A.M., Assistant Professor of English.

LAURIN BURTON BALDWIN, A.M., D.D., Assistant Professor Emeritus of English.

HERBERT BENJAMIN NELSON, M.A., Assistant Professor of English.

HERBERT ELLSWORTH CHILDS, Ph.D., Assistant Professor of English.

ROBERT RAY REICHART, Ed.D., Assistant Professor of English.

ELEANOR CALDWELL INGALLS, M.A., Instructor in English.

BEATRICE BUTLER BEEBE, M.A., Instructor in English.

GAINEFORD J HALL, M.A., Instructor in English.

*KENNETH MUNFORD, B.S., Instructor in English.

KARL GEORGE PETERSON, B.S., Instructor in English.

ARTHUR ALLEN ADRIAN, A.M., Instructor in English.

ROBERT LEONARD MAURER, M.A., Instructor in English.

FRED HARRIS YOUNG, B.A., Instructor in English.

THURMOND CHARLES JACKSON, M.A., Instructor in English.

Modern Languages

MELISSA MARGARET MARTIN, A.M., Professor of Modern Languages; Chairman of Department.

EDITH CARTER KUNEY, A.M., Associate Professor of Modern Languages.

MARY EUNICE LEWIS, Ph.D., Associate Professor of Modern Languages.

* On leave of absence 1941-42.

Speech

CHARLES BUREN MITCHELL, M.A., Professor of Speech; Head of Department.
EARL WILLIAM WELLS, M.A., J.D., Professor of Speech.
ELIZABETH MARIA BARNES, B.L.I., Associate Professor of Speech.
PAUL XENOPHON KNOLL, M.S., Assistant Professor of Speech.
DELOSS PALMER YOUNG, B.S., Assistant Professor of Speech and Dramatics.
CARLYN REO WINGER, M.A., Assistant Professor of Speech.
BENJAMIN MAXWELL MARSHALL, B.A., Instructor in Speech.

SOCIAL SCIENCE

Economics

MILTON NELS NELSON, Ph.D., Professor of Economics; Head of Department.
WILLIAM HENRY DREESEN, Ph.D., Professor of Economics.
ROBERT HORNIMAN DANN, M.A., Associate Professor of Economics.
PAUL LINCOLN KLEINSORGE, Ph.D., Assistant Professor of Economics.
ROBERT ADOLPH STEINER, M.B.A., Instructor in Economics.

History

EARNEST VANCOURT VAUGHN, Ph.D., Professor of History; In Charge of Department.
JOSEPH WALDO ELLISON, Ph.D., Professor of History.

Philosophy

ERNEST WILLIAM WARRINGTON, M.A., Professor of Philosophy; Head of Department.

Political Science

ULYSSES GRANT DUBACH, Ph.D., Professor of Political Science; Head of Department.
FRANK ABBOTT MAGRUDER, Ph.D., Professor of Political Science.
DAN WILLIAMS POLING, M.S., Assistant Professor of Political Science.

Psychology

OTHNIEL ROBERT CHAMBERS, Ph.D., Professor of Psychology; In Charge of Department.
JESSE FRANKLIN BRUMBAUGH, A.M., Professor Emeritus of Psychology.
JAMES WILSON SHERBURNE, Ph.D., Associate Professor of Psychology.
THEOPHILE STANLEY KRAWIEC, M.Sc., Instructor in Psychology.
WILLIAM BERKELEY SINGER, Ph.D., Instructor in Psychology.

Sociology

GLENN ALMER BAKKUM, Ph.D., Professor of Sociology; Chairman of Department.
ROBERT HORNIMAN DANN, M.A., Associate Professor of Sociology.

ARCHITECTURE AND ALLIED ARTS

Art and Architecture

JOHN LEO FAIRBANKS, Professor of Art and Architecture; Head of Department.

*Herbert Reeves Sinnard, M.S., R.A., Associate Professor of Architecture.

Ida Martha Matsen, A.M., Associate Professor of Art.

Dorothy Bourke Fox, B.A., Assistant Professor of Art.

*Theron Harms Egbert, B.Arch., Instructor in Art and Architecture.

A'leen Elizabeth Runkle, B.S., Instructor in Art.

Landscape Architecture

Arthur Lee Peck, B.S., B.A., Professor of Landscape Architecture; Head of Department.

Frederick Alexander Cuthbert, A.B., M.L.D., Associate Professor of Landscape Architecture.

William Dorr Legg, A.B., B.M., M.L.D., Assistant Professor of Landscape Architecture.

BUSINESS ADMINISTRATION

Milton Nels Nelson, Ph.D., Professor of Economics; Acting Head of Department.

Curtis Kelley, M.B.A., Associate Professor of Business Administration.

Frank Leslie Robinson, M.Acct., Associate Professor Emeritus of Accounting.

Jerome Lloyd LeMaster, LL.B., M.A., Associate Professor of Business Administration.

Willard Maxson Craig, M.B.A., LL.B., Assistant Professor of Business Administration.

Paul Lincoln Kleinsorge, Ph.D., Assistant Professor of Business Administration.

Gilbert Lee Gifford, M.B.A., Instructor in Business Administration.

Albert Harold Dehner, M.B.A., Instructor in Business Administration.

JOURNALISM

Fred Merle Shideler, M.S., Associate Professor of Journalism; In Charge of Department.

Charles Jarvis McIntosh, B.S., B.S.D., Professor Emeritus of Industrial Editing.

Tracy Worden Johnson, M.S., Assistant Professor of Journalism.

Adelaide Valeta Lake, M.A., Instructor in Journalism.

MUSIC

Paul Petri, Director of Music; Professor of Singing and Conductor of Choruses; Head of Department.

Harry Lynden Beard, M.A., Professor of Music; Conductor of R.O.T.C. Band.

Lillian Jeffreys Petri, Professor of Piano and Music Theory.

Delbert Warren Moore, B.A., Professor of Stringed Instruments; Conductor of Orchestras.

* On leave of absence.

FLORENCE BOWDEN, B.A., Instructor in Cello, Violin, and Fretted Instruments; Conductor of Mandolin and Guitar Club.

IRIS GRAY, B.Mus., Instructor in Piano.

RELIGION

ERNEST WILLIAM WARRINGTON, M.A., Professor of Religion; Head of Department.

General Statement

ALL departments of instruction at the State College not included in the major departments and schools, except the departments of Military Science and Tactics and Physical Education, are administered under the Dean of Lower Division and Service Departments. In this administrative unit are the several departments of arts and letters and social science, architecture and allied arts, business administration, journalism, music, and religion.

Under the plan adopted for the Oregon State System of Higher Education, major work in these fields is confined to the University. The work at the State College in these fields parallels the lower-division work at the University. Similarly, in certain fields in which major work is confined to the State College work is offered at the University as follows: in home economics, lower-division and service courses; in secretarial science, lower-division service courses. At each institution, in addition to the lower-division work, upper-division service courses are offered in the nonmajor departments for students in other fields.

While it is recommended that students intending to major in any of these fields enter the institution at which major work is offered at the beginning of the freshman year, they may, if they wish, complete the first two years of work in any of these fields at the nonmajor institution, and transfer to the major institution at the beginning of the junior year with fundamental requirements for upper-division work fully met.

In the organization and administration of the instruction in the nonmajor departments at the two institutions, the deans of the major schools serve as advisers to the end that the offerings shall bear a proper relation to the work of the major school. (See page 6.)

These fifteen departments offer work required or elected by students in the Lower Division of Liberal Arts and Sciences (pages 105-110) and in the professional schools. Year sequences, paralleled by similar sequences in science offered in the School of Science, are offered to meet "group requirements" in the fields of arts and letters and social science. Other courses meet elective and service needs of students enrolled in the major schools throughout the institution.

Arts and Letters

INSTRUCTION in this field, offered at Oregon State College through the departments of English, Modern Languages, and Speech, aims to help the student to think clearly, to read with discrimination, to express himself effectively, and to appreciate the masterpieces of literature.

The State College offers lower-division and service courses in arts and letters for students planning to major in this field at the University, and for students majoring in other fields.

English

THE Department of English offers instruction in literature and written English. The courses are intended to supply the training in writing necessary to every educated man, to afford a cultural background for those students who are limited to two years of work in the field of English, and to prepare liberal-arts students to major in English at the upper-division level. (Courses in speech, including platform and radio speaking, dramatics and interpretation, and speech correction, are offered in the Department of Speech.)

Literature. The study of English literature begins with an introduction in the form of either a historical presentation of the tradition of English literature or an examination of the motives and ideas of literature. This is followed by a more detailed study of periods, epochs, and centuries of English literary movements; a careful analysis of the chief literary forms such as the novel, drama, and poetry; and a more intensive study of the major authors.

Written English. The purpose of the study and practice of written English is technical accuracy in the fundamental forms of composition, the development of the power of expression, and the survey of special art forms such as versification, play writing, the essay, and short story.

English K. All entering students are required to take an examination in English. Those who fail in this examination are enrolled in a writing course called English K, the object of which is the diagnosis and correction of defects manifested in the placement examination. Those who pass the examination enter the regular freshman course (Eng 111, 112, 113).

COURSES IN LITERATURE

LOWER-DIVISION COURSES

Eng 101, 102, 103. **Literature Survey.** 3 hours each term.

History of English literature in general outline. Fall term: nineteenth century. Winter term: from the beginnings to the seventeenth century. Spring term: seventeenth and eighteenth centuries. Associate Professor Ordeman.

*Eng 104, 105, 106. **Introduction to Literature.** 3 hours each term.

Aim is to stimulate appreciation and criticism of literature. Study of prose in the first term, prose and some poetry in the second, and poetry in the third. The selections used, especially early in the year, are mostly contemporary or modern. The emphasis throughout is on ideas and motives. Professors Peterson and Kierzek, Associate Professors Ordeman and Colby, Assistant Professor Childs.

Eng 161. **American Literature.** 3 hours fall or spring.

American literature from its beginnings to the present day. Professor Peterson, Associate Professor Ordeman, Assistant Professor Childs.

* Students intending to major in English should take either Eng 101-103 or Eng 104-106.

Eng 201, 202, 203. Shakespeare. 3 hours each term.
The important historical plays, comedies, and tragedies. Courses in sequence but may be taken separately. Prescribed for major. Professor Smith.

Eng 231. Directed Recreational Reading. 1 or 2 hours.
Fiction, travel, adventure, biography, etc.; readings and discussions based on the principle of interest. Aims to serve as a guide to leisure reading. Intended for students in professional schools and for other students who have not taken and do not plan to take other courses in literature. Does not satisfy group requirements. Prerequisite: consent of instructor. Assistant Professor Childs.

Eng 261, 262. Individual Authors. 3 hours fall.
Each term devoted to the study of a single author—Browning 1941-42. (Eng 261, Browning; 262, Tennyson or another author—only one course given each year.) Professor Smith.

Eng 263. Great Books. 3 hours winter.
Some of the world's great books, including the *Bible,* the *Odyssey, Arabian Nights, Divine Comedy, Autobiography of Benvenuto Cellini, Don Quixote, Pilgrim's Progress, Gulliver's Travels,* and *Faust;* emphasis on the contribution each has made to western culture—that is, on elements of enduring greatness. Professor Smith.

Eng 264, 265, 266. Continental European Literature. 3 hours each term.
Continental European literature in approved translations—fall term, Romance literature; winter term, Germanic; spring term, Slavic. Lectures and reports. Associate Professor Colby.

Eng 271, 272, 273. Contemporary Literature. 3 hours each term.
The contemporary American novel; modern drama; American poetry. Professor Kierzek.

Eng 274. The Short Story. 3 hours spring.
The development of the American short story; analysis of recognized masterpieces as well as of the best present-day magazine stories, with the idea of developing critical taste in reading. Professor Peterson.

Eng 275. The Bible as Literature. 3 hours spring.
Designed to stimulate and enlarge appreciation of the art and beauty of the literature of the Bible. Questions of theology and dogmas of religion are avoided. Assignments include passages that fall under the chief literary types, such as folklore, storytelling, history, poetry, drama, wisdom literature, oratory, and the essay. Assistant Professor Baldwin.

Eng 276. The Novel. 3 hours winter.
A rapid survey of the development of the English novel. Through lectures and assigned readings, the aim is to enrich the student's background of knowledge in the field of the novel and thus to prepare him for critical appreciation of fiction. Professor Peterson.

COURSES IN WRITTEN ENGLISH

LOWER-DIVISION COURSES

English K. 1 hour fall or winter.
A one-term course in the mechanics of composition for those who fail to pass the English placement examination. The student must pass the English placement examination or English K before he is permitted to register for any other written English course. Three recitations.

Eng 111, 112, 113. **English Composition.** 3 hours each term.
The fundamentals of English composition and rhetoric, with frequent written themes in the various forms of discourse; special attention to correctness in fundamentals and to the organization of papers. Prerequisite: English placement examination. Professor Kierzek and staff.

Eng 118. **Technical Report Writing.** 3 hours fall or spring.
Study of a variety of technical reports with practice in writing them. As far as possible definite application of principles learned is made to specific needs and interests of students having papers in progress during the term. Prerequisite: Eng 111, 112, 113, or equivalent. Associate Professor Ordeman.

Eng 211. **Vocabulary Building.** 3 hours winter.
Advanced course in writing, the study and perfection of style and vocabulary; the analysis of various forms and models. Prerequisite: Eng 111, 112, 113. Associate Professor Ordeman, Assistant Professor Reichart.

Eng 213, 214, 215. **Short Story Writing.** 2 hours each term.
Designed to develop proficiency in the art of writing the short story. Courses in sequence but may be taken separately. Prerequisite: consent of instructor. Professor Peterson.

Eng 217. **Business English.** 3 hours any term.
A complete review and study of modern practices in business correspondence, organized primarily for students preparing for a business career; attention to the analysis and to the writing of all types of correspondence. Prerequisite: Eng 111, 112, 113. Assistant Professor Nelson.

Eng 218. **Creative Writing.** 3 hours winter.
A practical course in writing for those interested in the problems of creative expression in prose forms. Designed for those students in home economics, education, and other schools, who desire training and practice in such writing as may be called for in their vocational or cultural pursuits. Prerequisite: Eng 111, 112, 113.

UPPER-DIVISION SERVICE COURSE

Eng 324. **English Composition for Teachers.** 3 hours spring.
For students expecting to teach English in high schools. Practice in writing and a review of the rules of composition. Prerequisite: Eng 111, 112, 113. Assistant Professor Nelson.

Modern Languages

IN THE Department of Modern Languages instruction is offered in French, German, and Spanish. The lower-division and service courses in these languages are intended to meet the cultural needs of all students, to provide the foreign-language requirements found in scientific and technical curricula and needed in connection with various vocations, and to prepare students to major in one of these languages at the upper-division level.

Students who enter with one unit of high-school French, German, or Spanish and wish to continue the study of the language should register for First-Year French, First-Year German, or First-Year Spanish. Those entering with two units of entrance credit in a language should register for the second-year college course; those with three or more entrance units should register for the

course in the literature of the language. Students having other preparation and students entering from colleges offering more or fewer hours per week in a course should confer with the instructor.

COURSES IN GERMAN

LOWER-DIVISION COURSES

GL 1, 2, 3. First-Year German. 4 hours each term.*
Rudiments of the language; oral and written exercises; reading and translation of easy prose and poetry. Professor Martin and Associate Professor Lewis.

GL 4, 5, 6. Second-Year German. 4 hours each term.
Grammar, composition, and conversation; translation of standard German authors. Prerequisite: GL 1, 2, 3 or one year of college or two years of high-school German. Associate Professor Lewis.

GL 201, 202, 203. German Literature. 3 hours each term.
(Third-year German.) Advanced texts are used. Prerequisite: GL 4, 5, 6 or equivalent. Associate Professor Lewis.

UPPER-DIVISION SERVICE COURSES

(Courses 300-399 are open to lower-division students.)

GL 311, 312, 313. German Literature. 3 hours each term.
Advanced texts are used. Prerequisite: GL 4, 5, 6, or equivalent. Not open to students who have taken GL 201-203. Associate Professor Lewis.

GL 320, 321, 322. Scientific German. 3 hours each term.
Recommended to students interested in science or medicine. Articles on chemistry, physics, biology, anatomy, embryology, comparative anatomy, surgery, and the history of medicine are read, as well as current clinical literature. Prerequisite: consent of instructor. Associate Professor Lewis.

COURSES IN ROMANCE LANGUAGES: FRENCH

LOWER-DIVISION COURSES

RL 1, 2, 3. First-Year French. 4 hours each term.
Grammar, pronunciation, composition, conversation; translation of easy French prose and poetry. Associate Professor Kuney.

RL 4, 5, 6. Second-Year French. 4 hours each term.
Review of grammar; composition; conversation; reading of modern French authors. Prerequisite: RL 1, 2, 3 or one year of college or two years of high-school French or equivalent. Associate Professor Kuney.

RL 201, 202, 203. French Literature. 3 hours each term.
(Third-year French.) Reading of masterpieces of various periods; general survey of French literature. Prerequisite: two years of college French or the equivalent. Associate Professor Kuney.

RL 211, 212, 213. Directed Reading in French. 1 hour each term.
Reading in French in the field of the student's major. Open to students who have had the equivalent of second-year college French, and in approved cases to students majoring in science, after one year of college French. Enrollment limited. Associate Professor Kuney.

* A special section of GL 1, 2, 3 for engineering students is offered for 3 hours each term.

UPPER-DIVISION SERVICE COURSES

RL 311, 312, 313. **French Literature.** 3 hours each term.
(Third-year French.) Reading of masterpieces of various periods; general survey of French literature. Prerequisite: two years of college French or the equivalent. Not open to students who have taken RL 201-203. Associate Professor Kuney.

COURSES IN ROMANCE LANGUAGES: SPANISH

LOWER-DIVISION COURSES

RL 11, 12, 13. **First-Year Spanish.** 4 hours each term.
Grammar; composition; conversation; translation of easy prose. Professor Martin.

RL 14, 15, 16. **Second-Year Spanish.** 4 hours each term.
Review of grammar; composition; conversation; reading of modern Spanish authors. Prerequisite: RL 11, 12, 13 or one year of college or two years of high-school Spanish. Professor Martin.

RL 207, 208, 209. **Spanish Literature.** 3 hours each term.
(Third-year Spanish.) Reading of masterpieces of various periods; general survey of Spanish literature. Prerequisite: two years of college Spanish or the equivalent. Professor Martin.

RL 214, 215, 216. **Directed Reading in Spanish.** 1 hour each term.
Reading in Spanish in the field of the student's major. Open to students who have had the equivalent of second-year college Spanish. Enrollment limited. Professor Martin.

UPPER-DIVISION SERVICE COURSES

RL 341, 342, 343. **Spanish Literature.** 3 hours each term.
(Third-year Spanish.) Reading of masterpieces of various periods; general survey of Spanish literature. Prerequisite: two years of college Spanish or the equivalent. Not open to students who have taken RL 207-209. Professor Martin.

Speech

INSTRUCTION in speech has for its purpose to build strength of personality by aiding students in the development of clear, original thinking, and by giving training in the correlation, organization, and presentation of knowledge gained through study and experience. Much drill and criticism are given on organization of material, on platform work, and on the principles that underlie effective reading and speaking. The training goes far in helping to overcome self-consciousness and other emotional inhibitions, and in aiding to build up a strong personal address.

Courses in interpretation and community drama are conducted not only as a means of rounding out the speech training, but also as an aid to prospective teachers and other community leaders in the directing of plays and in the making of stage settings, costumes, and other equipment.

Courses in speech are required in a number of professional curricula. Such training is regarded as of great value to all students preparing for leadership in any field, including prospective teachers of vocational subjects, agricultural agents, home demonstration agents, club leaders, homemakers, and others. (For courses in written English see Department of English; for courses in literature see departments of English and Modern Languages.)

Many plays, intramural and intercollegiate debates, extempore speaking and oratorical contests take place on the campus each year, and much individual attention is given to students who wish to prepare for such work.

Speech Correction. A clinic is maintained by the department for those who are handicapped with the various speech impediments, such as stammering, lisping, nasality, and the like. Advice and treatment are given for both organic and functional difficulties. An attempt is made to understand the factors in the life of the individual that have caused any emotional difficulties, and when they are located an attempt is made to eradicate them. For each student wishing to take this work individual conferences are given during which his speech difficulties receive special consideration.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Sp 111, 112, 113. **Extempore Speaking.** 3 hours each term.

Practice in the development and presentation of original speeches on topics of special interest to the students; vocabulary building and pronunciation; some study of voice, gesture, bearing, and other elements of effectiveness in presentation; criticism on organization of material; organization is stressed. Practice in the construction and presentation of original speeches; study of techniques in the use of body and voice as elements of effectiveness in delivery; criticism on organization and presentation; delivery is stressed. Intensive drill in the technique of delivery, with a consideration of speeches for special occasions. Professors Mitchell and Wells, Assistant Professors Knoll and Winger, Mr. Marshall.

Sp 120. **Voice and Diction.** 3 hours spring.

Proper use of the vocal mechanism; tone production and the production of elemental speech sounds; phonetics as a basis for pronunciation and distinctness of utterance; vocabulary building; individual practice employing basic principles that underlie good speech for social, business, platform, and radio use. Associate Professor Barnes.

Sp 121. **Interpretation I.** 3 hours any term.

Analysis of material for thought content and purposes; study and application of principles involving emotional reactions that give color and interest to speech; expressive voice; correction of erroneous habits of speech; overcoming artificiality, affectation, and self-consciousness; development of poise and bodily release. Associate Professor Barnes, Assistant Professor Young.

Sp 122. **Interpretation II.** 3 hours any term.

Impersonation in its various forms; character analysis and characterization stressed through the study of the monolog and other forms of dramatic literature including short plays. Prerequisite: Sp 121. Associate Professor Barnes, Assistant Professor Young.

Sp 123. **Interpretation III.** 3 hours spring.

Interpretation of poetry; psychology of audience reaction to material presented; the speech chorus; advanced work in expressive voice. Prerequisite: Sp 120. Associate Professor Barnes.

Sp 211, 212, 213. **Oratory Squad.** 2 hours each term.

Preparation and delivery of original manuscript speeches. Consent of instructor must be obtained before registration. Credit in only one of these courses may be earned in any academic year. These courses are used

as a means of preparation for intercollegiate competition. Prerequisite: Sp 111, 221. Professors Mitchell and Wells.

Sp 214, 215, 216. **Extempore Speaking Squad.** 2 hours each term.

Intensive drill in extempore speaking in preparation for intercollegiate competition. Consent of instructor must be obtained before registration. Credit in only one of these courses may be earned in any academic year. Prerequisite: Sp 111, 112. Professor Mitchell, Assistant Professor Winger.

Sp 217, 218, 219. **Debating.** 2 hours each term.

Application of the principles of argumentation to debating; analysis and brief-drawing. Each student participates in several debates. Criticism on delivery and on the selection and handling of evidence in both constructive argument and refutation. Assigned readings. Credit in only one of these courses may be earned in any one year. Consent of instructor must be obtained before registering. Professor Mitchell, Assistant Professor Knoll.

Sp 220. **Argumentation.** 3 hours any term.

The theory of argumentation; practical work in brief-drawing, collection and handling of evidence, construction of argumentative speeches. Each student works out several briefs and delivers several speeches. Criticism on presentation and construction. Prerequisite: Sp 111. Assistant Professor Knoll.

Sp 221. **Speech Composition.** 3 hours fall.

Textbook work, study of models, lectures, composition exercises, the writing of a term speech. This course is maintained as an aid to a mastery of audience psychology and effective style in speaking. Prerequisite: Sp 111. Professor Wells.

Sp 231. **Parliamentary Procedure.** 3 hours fall or spring.

Principles of parliamentary usage applied in deliberative assembly, conference, symposium and panel discussion; assigned readings. Each student has opportunity to serve as chairman and secretary of several meetings during the term. Much practice is afforded in the conducting of various types of group discussions, in the presentation of motions, and impromptu speaking under the supervision of a critic. Assistant Professor Winger.

Sp 234, 235, 236. **Radio Speaking.** 3 hours each term.

Voice and diction as they pertain to speaking over the radio; study of the special techniques of radio; preparation of radio speeches and continuity; program building; practice before the microphone and in the broadcasting of dramatic and other types of material over KOAC. Prerequisite: Sp 111, 120, 121, or consent of instructor. Professor Mitchell.

Sp 244. **Stagecraft and Lighting.** 3 hours any term.

The problems involved in the construction of scenery and stage properties; lighting and lighting equipment; practical experience in lighting, stage management, and the construction of different types of settings, including the realistic and the suggestive. Assistant Professor Young.

Sp 247, 248, 249. **Community Drama.** 3 hours each term.

Designed to meet the needs of community leaders. The community-drama idea; plays suitable for use in school or community; the staff; make-up; fundamentals of stage technique and acting; modern tendencies in stage setting and costuming; directing and play production; laboratory work in conducting rehearsals and producing plays. Students are given actual experience in producing plays effectively at little expense. Plays are

produced at the end of each of the first two terms. Prerequisite: consent of instructor. Associate Professor Barnes.

Sp 250. **Speech Defects.** 3 hours spring.
Survey of organic and functional speech defects, their causes, diagnosis, and treatment. Intended primarily for students in home economics, particularly those specializing in child care and nursery-school work; for teachers and others whose careers necessitate an intelligent understanding of the speech problems of young children and adolescents. Direct value to any student in correcting his own defects and in finding a basis for continued self-improvement. Professor Wells.

Sp 251. **Workshop Theater Players.** 1 to 3 hours any term.
Credit is given for actual participation in campus production upon recommendation of the instructor in charge. Total credit not to exceed 6 hours. Professor Mitchell, Associate Professor Barnes, Assistant Professor Young, Mr. Marshall.

Social Science

KNOWLEDGE of the social sciences is essential for enlightened citizenship and for leadership in the political and economic life of our time. Instruction in this field is offered at Oregon State College through the departments of General Social Science, Economics, History, Philosophy, Political Science, Psychology, and Sociology.

The State College offers lower-division and service courses in the social sciences, not only for students planning to major in this field at the University, but also for students majoring in other fields.

General Social Science

CERTAIN phases of the instructional work in social science are of general character, being broader in scope and objectives than any of the departments. Instruction of this type is given through the survey for freshmen and sophomores, which aims to give the student a comprehensive view of social science as a division of knowledge. The subject matter is nontechnical and is adapted to the student interested in social science more as a cultural subject than for any other specific purpose. The survey may serve as satisfaction of a Lower-Division Social-Science group requirement but is not usually considered as prerequisite to advanced courses in specialized social sciences.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

SSc 101, 102, 103. **Background of Social Science.** 3 hours each term.
The factors and forces that constitute the make-up of society; the validity of the thought process and opinions of the students with respect to social phenomena are challenged; analysis of scientific methods and the possibilities and limitations of application in the social sciences. Attempt is made to acquaint the student with the findings of psychology in regard to bias

and prejudices, egoism of the crowd, habit responses, complexes, and factors of wise thinking. A survey is made of controls of society: government, economic factors, family, education, religion, and the social institutions generally. Insight, rather than mere information, is the aim of the course. Associate Professor Dann.

Economics

INSTRUCTION in the Department of Economics includes lower-division and service courses intended to serve the cultural and informational needs of all students interested in economic problems in relation to citizenship; to supply a lower-division foundation for law, business, or public service, or for majoring in economics at the upper-division level; and to meet the prescriptions found in professional curricula.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Ec 201, 202, 203. **Principles of Economics.** 3 hours each term.

The principles that underlie production, exchange, and distribution; practical problems, such as monetary and banking reform, trade regulations, taxation, labor movements, regulation of railways and public utilities.

Ec 211. **Outlines of Economics.** 4 hours any term.

Economic institutions and their relation to individual and group conduct; analysis of income flow and of the production, distribution and exchange of wealth; their impact upon the consumer under varying political-economic systems; brief survey of marketing, the pricing process, money, tariff, farm problems, labor, and business cycles. Recommended for students majoring in home economics. Not open to students planning to major in business administration. Mr. Steiner.

Ec 212. **Outlines of Economics.** 3 hours any term.

An abridgment of Ec 201, 202, 203. A rapid survey of the principles of economics and of economic institutions with special reference to the interests of students in the professional schools. Restricted to science and upper-division professional school students. Associate Professor Dann.

Ec 214. **Economic Development of the United States.** 4 hours winter.

Origin and development of economic institutions including industry, agriculture, commerce, transportation, labor, and finance. Analyzes the economic progress of the United States. Open to students who have completed a course in introductory economics. Four lectures. Mr. Steiner.

UPPER-DIVISION SERVICE COURSES

Prescribed in major curricula in degree-granting schools at the State College and also available as electives to students majoring in such schools.

Ec 413. **Money and Banking.** (g) 4 hours spring.

Money: the nature and functions of money; the factors affecting price, and their relation to business conditions; brief history of the various forms of money; present problems and conditions. Banking: functions of banks; history of banking, including our national banking system, with emphasis on the Federal Reserve Bank Act; comparison of our banking system with those of foreign countries. Open to students who have completed a course in introductory economics. Professor Dreesen, Mr. Steiner.

Ec 418. **Public Finance.** (g) 4 hours winter.

Public expenditures, local, state, and national; brief history of reforms calculated to secure efficiency in these expenditures; forms of taxes, customs, and fees whereby revenues are raised; present systems of land taxation studied in the light of proposed reforms; special attention to war finance; bonds versus taxes in public finance; management of national and local debts. Open to students who have completed a course in introductory economics. Professor Dreesen.

Ec 425. **Labor Problems.** (g) 4 hours spring.

The conditions under which laborers have worked since the advent of the industrial revolution. Topics especially emphasized are: trade union policies; strikes and lockouts; trade agreements; conciliation and arbitration; immigration; unemployment; women and children in industry; prison labor; industrial education, etc. Open to students who have completed introductory course in economics or sociology. Associate Professor Dann.

Ec 435. **Transportation.** (g) 4 hours winter.

Brief historical review of the development of systems of transportation; organization and financing of different systems; effect of competition in the railroad business; freight classification and the making of rates and fares; the necessity of government control and attempts at regulation by state and Federal governments. Open to students who have completed a course in introductory economics. Professor Dreesen.

Ec 440. **International Trade.** (g) 4 hours fall.

The theory of international trade; nature and effects of government interference in the form of bounties, subsidies, import and export duties; the commercial policies of the more important nations; consular service; foreign exchange and international banking systems; ocean routes and carriers; foreign trade organizations. Prerequisite: Ec 201, 202, 203, or Ec 211. Professor Dreesen.

Ec 475, 476, 477. **Current Economic Theory and Problems.** (g) 3 hours each term.

Economic theories and their application to current economic problems; the economics of recent developments in relation to selected topics such as value, price, distribution, money and credit, public credit and finance, foreign trade and exchange, international and intercommunity debtor-creditor problems, tariffs, imperialism, international and domestic cartels and trusts, marketing and transportation, and others. Open to students who have completed a course in introductory economics. Assistant Professor Kleinsorge.

GRADUATE SERVICE COURSES

Courses numbered 400-499 and designated (*g*) may be taken for credit toward a graduate minor.

History

HISTORY courses are intended to supply the necessary background for intelligent citizenship. The aim of the several courses is to afford an opportunity for a survey of world history and the development of western civilization together with a more detailed study of the English people, the British Empire, and the history of America from the earliest period to the present. The courses also prepare students to major in history at the upper-division level.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Hst 201, 202, 203. **History of Western Civilization.** 3 hours each term.

Survey of the origins and development of western civilization from early times to the present; particular attention to social, economic, and political factors, and the relation of the past to contemporary civilization. Professors Vaughn and Ellison.

Hst 204. **History of the Far East.** 3 hours.

The aim is to introduce students to the history, civilization, and political, economic, cultural, and social problems of the Far East. Professor Ellison.

Hst 207, 208. **England and the British Empire.** 3 hours each term fall and winter.

The constitutional and political history of England; the expansion and present position of the British Empire. Hst 207, 208 when followed by Hst 209 satisfy group requirement in Social Science. Professor Vaughn.

Hst 209. **The World Since 1914.** 3 hours spring.

The war and the problems of reconstruction in the light of their historical antecedents and causes studied with reference to evaluation of current events and sources. With Hst 207, 208, satisfies sophomore social-science group requirement. Professor Vaughn.

Hst 224, 225, 226. **History of American Civilization.** 3 hours each term.

The rise and development of American civilization from the beginning to the present; special attention to economic, social, and cultural life, political changes, and international relations. Professor Ellison.

UPPER-DIVISION SERVICE COURSE

Hst 377. **History of Oregon.** 3 hours winter or spring.

Aims to present a fairly detailed survey of the political, economic, social, and cultural development of Oregon and the Pacific Northwest from the beginning to the present. Lectures, readings, reports. Professor Ellison.

Philosophy

LOWER-division instruction in philosophy is intended both for students who anticipate more advanced study of philosophy and for those who desire a brief introductory study only.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Phl 211, 212, 213. **Practical Life Philosophies.** 2 hours each term.

Intended to develop in the student the habit of reflective thinking. The student is expected to examine his own evaluations of life and his judgments of human society. The starting point and constant reference of the instruction is to actual practical "life philosophies." The course examines and critically evaluates the American gospel according to Benjamin Franklin and Abraham Lincoln; contrasts the modern idealogies of the Nietzschean Superman or Dictator; Marxist socialism and Christian democracy; compares the fundamentals of Plato with the thinking of a present-day leader like Kagawa. Professor Warrington.

Political Science

THE courses in political science are designed primarily to prepare for intelligent citizenship and effective participation in public affairs; to give the student an active interest in the structure of political life and the operation of governments, and an understanding of current political questions; and to lay a foundation for majoring in political science at the upper-division level.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

PS 201, 202, 203. **Modern Governments.** 4 hours each term.

(1) American National Government with special attention to contemporary reforms; (2) State and Local Governments with attention to practical operation and contemporary reforms in Oregon; (3) European Governments, a comparative study of the principal European countries with particular attention to England, France, and Germany. Professor Magruder, Associate Professor LeMaster.

PS 212. **American National Government.** 3 hours any term.

An abridgment of PS 201. Restricted to professional-school students. Professors Dubach, Magruder, Associate Professor LeMaster, Assistant Professor Poling.

PS 231, 232, 233. **Current Affairs.** 2 hours each term.

The story of man's activities as told in the press and by telegraph, cable, and radio; major emphasis given to political and economic questions; outstanding developments in science, arts, and related fields. Individual current happenings are in every instance related to established principles and existing organizations. Open to students of freshman and sophomore standing only. Professor Dubach, Assistant Professor Poling.

UPPER-DIVISION SERVICE COURSES

Prescribed in major curricula in degree-granting schools at the State College and also available as electives to students majoring in such schools.

PS 415. **Municipal Government.** (g) 3 hours spring.

The organization, functions, and present-day problems of city and town government; the cities of the Northwest. Professor Magruder.

PS 417. **International Relations.** (g) 3 hours fall or winter.

Nature and history of international relations; the League of Nations and the World Court; political and economic realities affecting international interdependence; how the United States conducts her foreign affairs; how she deals with her protectorates; causes of international wars; general survey of contemporary world conditions. Professor Magruder.

PS 418. **Latin-American Relations.** (g) 3 hours fall or winter.

Critical study of resources, population, social and political movements; form of government, particularly emphasizing the effects on inter-American relationships. Professor Dubach.

PS 419. **Pacific Area Relations.** (g) 3 hours spring.

Races; trade conditions; Chinese-Japanese relations; Russo-Japanese affairs; the possessions of the United States in the Pacific. Professor Dubach.

GRADUATE SERVICE COURSES

Courses numbered 400-499 and designated *(g)* may be taken for credit toward a graduate minor.

Psychology

PSYCHOLOGY courses are intended to meet the needs of students desiring a knowledge of psychology as part of their general education or as a foundation for work in education or in child development; to prepare students to major in psychology at the upper-division level; and to meet the service needs of various schools and departments that require psychology as a part of their program of training.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Psy 111. **Mental Hygiene.** 3 hours any term.

The conditions of healthy mental development and of effective reactions to life and the college environment; the habits, attitudes, and reactions of the efficient mind. No credit is given to students who have taken Ed 102.

Psy 112, 113, 114. **Aids to Effective Thinking.** 3 hours each term.

An examination into the main travelways of human thinking (past and present) to reveal the modes, methods, illusions, and errors of the mind in attempting to solve the problems of life. The subject matter is analyzed, discussed, and critical thinking employed by students and instructor in evaluating the material through roundtable procedure. Any term's work may be taken independently of the other two. Professor Brumbaugh.

Psy 201, 202, 203. **Elementary Psychology.** 3 hours each term.

An introductory study of the material of general experimental psychology, learning, memory, perception, imagination, sensation, attention, reasoning, instinct, emotion, will, etc. First term not to be taken as independent unit meeting social science requirement for the Junior Certificate.

Psy 204, 205, 206. **Elementary Psychology Laboratory.** 1 hour each term.

An introduction to laboratory experimental methods. Operated in coordination with Psy 201, 202, 203, which must be taken at the same time or have been taken previously. One three-hour laboratory period each week.

Psy 212, 213, 214. **Modern Logic and Scientific Method.** 3 hours each term.

Revised use and application of syllogistic reasoning and the present elaboration of new investigational, logical methods of scientific procedure. All materials are subject to class roundtable discussion, with abundant examples and exercises employed. Any term's work may be taken independently of the other two. Professor Brumbaugh.

Psy 215. **Industrial Psychology.** 3 hours any term.

Brief course in application of psychology to industrial problems. Intended primarily for engineering students. Measurement and prediction of worker behavior; influencing workers' behavior; prediction and influencing behavior of groups both worker and public; principles of research in industrial psychology. Professor Chambers, Associate Professor Sherburne.

Psy 221, 222. **Outlines of Psychology.** 3 hours each term.

A study of the fundamental facts of human equipment and behavior; instinct, emotion, sensation, feeling, memory, imagination, suggestions, will, reason, and personality.

UPPER-DIVISION SERVICE COURSES

Psy 471, 472, 473. **Individual Differences.** (g) 3 hours each term.

Survey of various theories in regard to the origin of individual differences: sex, race, physical characteristics, mental organization, etc.; experimental evidence in regard to normal development of personality characteristics; influence of motives, environment, and culture on individual differences; importance of individual differences in personal, educational, and social adjustments; practical training for prospective teachers and parents in guiding and directing normal development. Professor Chambers, Associate Professor Sherburne.

GRADUATE SERVICE COURSES

Courses numbered 400-499 and designated (*g*) may be taken for credit toward a graduate minor.

Sociology

ALL the lower-division instruction in sociology, like that in the related social sciences, is intended to contribute to the task of training for good citizenship through a better understanding of the principles that govern human associations and relationships. Particular attention is given to attitudes and habits of mind and characteristic reactions to public events and social institutions. An insight is given into contemporary social problems. Fundamental instruction is provided for students who may later wish to major in sociology at the upper-division level. Courses are also designed to meet the needs of those who are majoring in home economics, engineering, education, and other fields.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Soc 201, 202, 203. **Elements of Sociology.** 3 hours each term.

Man's cultural heritage; man's social nature; forms of collective behavior; community and social organization; social interaction; social change and the effects of social change; a brief survey of social problems. Professor Bakkum, Associate Professor Dann.

Soc 211. **General Sociology.** 4 hours any term.

Analysis of the phenomena of group life, embracing social origins; a comparative study of group behavior and social institutions; a study of sociological principles and their application to modern social problems. Professor Bakkum, Associate Professor Dann.

Soc 212. **General Sociology.** 3 hours any term.

An abridgement of Soc 211. Restricted to science and upper-division professional and technical school students. Professor Bakkum.

UPPER-DIVISION SERVICE COURSES

Prescribed in major curricula in degree-granting schools at the State College and also available as electives to students majoring in such schools.

Soc 312. **The Family.** 3 hours winter.

A survey of the evolution of matrimonial institutions; the modern legal status of marriage; economic and social aspects of the modern family; women in industry and the new woman's movement in relation to the fam-

ily; a comparative study of the divorce problem. Open only to juniors and seniors. Associate Professor Dann.

Soc 314. **Educational Sociology.** 3 hours spring.

Analysis of the contributions of sociology to the study of educational problems and practices. Topics included are: social forces shaping the child; social forces affecting the teacher in the school and community; social relationships within school; relationships between school and community. Students in the School of Education may count this course toward the 36 required hours in education. Prerequisite: an introductory course in sociology. Professor Bakkum.

Soc 364. **Rural Sociology.** 3 hours fall.

Problems of rural life and rural institutions contrasted with the problems of urban living; attention to the community, the family, the school, the church, recreation, and welfare activities as they find their expression in the rural setting; opportunity for field observation of rural life. Professor Bakkum.

Soc 411, 412. **Social Problems.** (g) 2 or 3 hours each term, winter and spring.

Designed to orient the student in applied sociology. An analysis of current group disorganization, institutional decline, and social maladjustment of individuals; positive processes of reorganization and reconstruction; field observations of social problems. The contents of the work are varied from time to time to meet the needs of particular groups of students. Soc 411 is not prerequisite to Soc 412. Students in the School of Education whose work in either of the terms in this sequence covers social education may count 3 hours of credit so earned toward the 36 required hours of education, if approved by the dean. Prerequisite: basic work in general sociology. Professor Bakkum.

Soc 474. **Social Psychology.** (g) 3 hours fall.

Biological and social foundations of human behavior; individual factors of individual and social adjustments; behavior in presence of others; social psychology of institutions; social conflict, including delinquency patterns, race conflict, minority group problems, labor strikes, and war. Prerequisite: basic work in introductory psychology and introductory sociology. Professor Bakkum.

GRADUATE SERVICE COURSES

Courses numbered 400-499 and designated (*g*) may be taken for credit toward a graduate minor.

Architecture and Allied Arts

IN THE field of Architecture and Allied Arts Oregon State College offers instruction through two departments: Art and Architecture, and Landscape Architecture. The program of courses is intended, not only to lay the foundation for specialization in architecture and allied arts, but also to serve the needs of students majoring in other fields.

Art and Architecture

FUNDAMENTAL instruction in drawing, painting, architectural theory, design, composition, and color is offered in the Department of Art and Architecture, together with training in art appreciation. Students major-

ing in other fields may take art or architecture as a minor or as service courses, or students may pursue the courses in preparation for majoring in art or architecture at the University.* A joint curriculum in Structural Design in Architecture, with the first two years at the University and the last two years in the School of Engineering and Industrial Arts at the State College is described under SCHOOL OF ENGINEERING AND INDUSTRIAL ARTS.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

AA 111, 112. **Graphics I.** 2 hours each term.

First year. The principles of orthographic projection or descriptive geometry; application to the construction of plans and elevations; projections of points, lines, and planes; correct location of shades and shadows for design problems.

AA 114, 115, 116. **Survey of Creative Arts (Art Appreciation).** 1 to 3 hours each term.

The principles and practices of the arts. The aim is an understanding of why men had the urge to produce the arts in the first place; the types of usefulness the arts serve today; how function, color, scale, textures, and proportions enter into one's personal habits of appreciation. The three terms need not be taken in sequence.

AA 120. **Construction.** 1 hour spring.

Introduction to architectural elements by means of individual research and observation; sketching of existing examples; class discussion.

AA 160, 161, 162. **Color and Composition.** 3 hours each term.

Elementary study of relations of line, areas, mass, neutral values and color values for pictures, decorations, and interior schemes. Applies to both creative processes and appreciation. Adapted to needs of home economics group.

AA 178, 179, 180. **House Planning and Architectural Drawing.** 2 or 3 hours each term.

Small-house construction, detail drawing, and architectural drafting, with particular reference to the needs of students majoring in industrial arts.

AA 212. **Graphics II.** 2 hours.

Second year. Continuation of AA 112. Completion of the work in shades and shadows; practical methods of constructing perspectives.

AA 290. **Lower-Division Painting.** 2 or 3 hours each term, six terms.

First year: studies from still life, figure, and landscape; application of the principles of arrangement in relation to the background. Various mediums are employed. Second year: advanced studies from still life and from the human figure. Individual achievement in technique is encouraged.

AA 291. **Lower-Division Drawing.** 2 or 3 hours each term, six terms.

First year: analysis of forms by shading and perspective, leading to an understanding of essential structure; problems in simple and direct expression of structure, by use of different mediums, adapted to the needs of various groups. Second year: continued study of forms and combinations of forms; elementary study of the human figure; interrelationships of forms and adaptation to decoration.

* Under present budget conditions, however, the lower-division work is not completely parallel and such students may be required to take at the University certain required lower-division work not at present offered at the State College.

AA 295. **Lower-Division Decorative Design.** 2 or 3 hours each term, six terms.

First year: the principles underlying the various arrangements of lines, shapes, neutral tones and colors studied for purposes of decorative expression. Second year: further problems in decorative arrangements. The aim is to build up the student's capacities to plan a design for a given purpose and to carry out his design in material with increasing critical powers.

AA 297. **Lower-Division Architectural Design.** 1 to 5 hours each term. Fundamental principles of architectural design are studied by means of plans and renderings of architectural details.

Landscape Architecture

ALL instruction in landscape design is correlated with the instruction in closely related arts. In addition to the landscape courses, the student is instructed also in plant propagation, soils, surveying, and other practical phases of the profession. The campus constitutes an out-of-door living laboratory of unusual interest and value to students in landscape architecture.

Field Trip. It is recommended, but not required, that students take the departmental field trip of about one week. Parks, gardens, city planning, and other landscape projects are studied. The areas about Seattle, Portland, and San Francisco are visited in turn. Students majoring in the department have opportunities to speak before garden clubs and other organizations, and on radio garden programs.

Student Drawings and Models. All student drawings and models remain the property of the department.

Joint Major Curriculum. A five-year curriculum in landscape architecture involving attendance at both the State College and the University was established in 1932. A student may spend his first two years at the State College, completing during these years the required professional work offered at Corvallis, and transfer to the University for the last three years of professional work. A student may spend his first two years at the University, in which case he spends his third year at the State College, returning to the University for his last two years. Curricula for students who begin at the State College and for those who begin at the University are printed below.

FOR STUDENTS TAKING FIRST TWO YEARS AT STATE COLLEGE

First Year (State College)	Term hours F	W	S
Graphics (AA 111, 112, 212)	2	2	2
General Botany (Bot 201, 202, 203)	3	3	3
Home Ground Planning (LA 279)	---	3	---
History and Literature of Landscape Architecture (LA 356, 357, 358)	2	2	2
English Composition (Eng 111, 112, 113)	3	3	3
Lower-Division Architectural Design (AA 297)	2	---	---
Construction (AA 120)	---	---	1
[1]Group requirements in Language and Literature or Social Science	3	3	3
[2]Military Science (men) and Physical Education	2	2	2
	17	18	16

[1]Work in a foreign language is not required for the Bachelor of Landscape Architecture degree. Students wishing to earn the Bachelor of Arts degree will take a modern foreign language during their freshman and sophomore years, and will complete group requirements in Language and Literature or Social Science in the third or fourth year of the curriculum.

[2]General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education. Women take Social Ethics (PE 131) one term.

Second Year (State College)	Term hours F	W	S
Lower-Division Architectural Design (AA 297)	....	1	1
Lower-Division Landscape Design (LA 290)	2	2	2
Plane Surveying (CE 226, 223)	3	....	3
Plant Propagation (Hrt 311)	....	3	....
Maintenance and Construction (LA 359, 360, 361)	3	3	3
Plant Materials (LA 326, 327, 328)	3	3	3
Soils Improvement (Sls 215)	2	....	....
Military Science (men) and Physical Education	2	2	2
Electives	2	3	3
	17	17	17

Third Year (University)

Lower-Division Architectural Design continued, Lower-Division Drawing, Construction, Upper-Division Landscape Design, Plant Composition, and electives.

Fourth and Fifth Years (University)

Same as for Students Beginning at University (see below).

FOR STUDENTS TAKING FIRST TWO YEARS AT UNIVERSITY

First and Second Years (University)

Graphics, Architectural Design, Drawing, Landscape Architecture, Architectural History, Construction, Landscape Design, Botany, English Composition, group requirement and electives.

Third Year (State College)	Term hours F	W	S
Plant Materials (LA 326, 327, 328)	3	3	3
History and Literature of Landscape Architecture (LA 356, 357, 358)	2	2	2
Plane Surveying (CE 226, 223)	3	....	3
Maintenance and Construction (LA 359, 360, 361)	3	3	3
Plant Propagation (Hrt 311)	....	3	....
Soils Improvement (Sls 215)	2	....	....
Intermediate Landscape Design (LA 390)	3	*or* (3)	*or* (3)
Graphics II (AA 212)	....	....	2
Electives	....	4	3
	16	15	16

Fourth and Fifth Years (University)

Upper-Division Landscape Design, Architectural History, Construction, Plant Composition, City Planning, Office Practice, Field Practice, group requirement or electives.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

LA 179. Landscape Architecture (Descriptive). 2 hours fall.

A lecture course planned to introduce the student to the subject as it is applied to home-ground layouts, city parks, national parks, the wilderness areas, city planning, and modern garden cities; good taste and general information. No drawing. Assistant Professor Legg.

LA 279. Home Ground Planning. 2 or 3 hours any term.

Designed to fit the needs of all students. Definite principles controlling layout and organization of different kinds of property are introduced. Enough drafting is done so that the student will learn to express himself in a satisfactory manner. Study is made of problems in improvement work on home grounds, rural and urban. Two two-hour drafting periods; one lecture. Professor Peck.

LA 290. Lower-Division Landscape Design. 2 hours each term.

Design of small residence properties, the ordinary city lot, town-house property, and suburban residence properties involving not more than three acres. Prerequisite: LA 279. Associate Professor Cuthbert and Assistant Professor Legg.

UPPER-DIVISION COURSES

LA 326, 327, 328. **Plant Materials.** 3 hours each term.

Trees, shrubs, vines, and perennials and their uses in plant composition. Professor Peck.

LA 356, 357, 358. **History and Literature of Landscape Architecture.** 2 hours each term.

A lecture course, supplemented by directed reading and lantern slides; develops the story of gardens as an outgrowth or result of living conditions of the times from early Egyptian to the modern of America. The course builds up judgment and enables the student to become generally informed concerning private home grounds, parks, parkways, and recreation areas. Professor Peck.

LA 359, 360, 361. **Maintenance and Construction.** 3 hours each term.

Concise and practical knowledge of the maintenance of parks, estates, cemeteries, and golf courses; landscape construction work involving the handling of earth, such as golf-course construction, and the building of tennis courts, walks, roads, and water effects. Assistant Professor Legg.

LA 379. **Landscape Architecture.** 3 hours spring.

For forestry students. The arrangement of features and elements in ranger stations, recreation areas, state parks, overlooks, and summer-home sites; enough drafting to enable the student to express himself on paper by means of landscape plans; assigned readings. Prerequisite: LA 279. Two lectures; 1 two-hour drafting period. Professor Peck.

LA 382, 383, 384. **Layout of Small Properties.** 2 or 3 hours each term.

For students in landscape maintenance. The city lot, small suburban properties, and other graduated studies of ground arrangement; sketch plans, finished renderings, and contour problems. Two three-hour laboratory periods. Prerequisite: LA 279, 290. Assistant Professor Legg.

LA 390. **Intermediate Landscape Design.** 3 hours.

Continuation and enlargement of LA 290. Associate Professor Cuthbert, Assistant Professor Legg.

LA 392, 393, 394. **Planting Plans.** 2 hours each term.

For students in landscape maintenance. The drawing of planting plans; estimates of costs; construction and seasonal care of the planting areas worked up by students. Two three-hour laboratory periods. Prerequisite: LA 279, 326, 327, 328. Assistant Professor Legg.

Business Administration

COURSES in business administration are provided at Oregon State College permitting students in any of the major curricula to elect a minor in business and providing opportunity for students planning to major in business administration at the University to meet all lower-division requirements. Programs of study are worked out for lower-division students according to their special objectives. For courses in secretarial science, see DEPARTMENT OF SECRETARIAL SCIENCE.

Facilities. The instruction in business administration at the State College is centered in Commerce Hall, in which are located classrooms and laboratories

for instruction in business subjects. The same building houses the instructional work in secretarial science. The courses and laboratories teaching the use of mimeograph, duplicating, adding, computing, and bookkeeping machines are available to all students taking business courses.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

BA 111, 112, 113. **Constructive Accounting.** 4 hours each term.

An introduction to the field of accounting and business administration. Technique of account construction and preparation of financial statements; application of accounting principles to practical business problems; proprietorship from the standpoint of the single owner, the partnership, and the corporation. Required of all students planning to major and prerequisite to all advanced work in business administration.

BA 211. **Retail Accounting.** 3 hours fall.

Accounting records peculiar to retail stores; practice sets assigned for the purpose of familiarizing the student with the necessary forms and retail accounting routine. Prerequisite: BA 111, 112, 113. Assistant Professor Craig.

BA 212. **Principles of Cost Accounting.** 3 hours winter.

Basic principles of cost accounting, departmentalization, expense allocation, and the differences to be noted between accounting systems with which a cost system is tied in and accounting systems with no cost system involved; problems and practice sets to furnish the student with a working familiarity. Prerequisite: BA 111, 112, 113, or BA 385, 386. Assistant Professor Craig.

BA 213. **Analysis of Financial Statements.** 3 hours spring.

Managerial accounting, including accounting theory and practice for effective management and control of industrial and trading concerns; emphasis on the preparation, analysis, and interpretation of balance sheets and operating reports. Prerequisite: BA 111, 112, 113, or BA 385, 386. Assistant Professor Craig.

BA 214. **Federal and State Tax Forms.** 3 hours winter or spring.

For students who have had one year of accounting or its equivalent. Income and other tax laws, state and national; problems involving calculation and preparation of tax returns; special attention to exemptions and their part in the returns. Not open to students planning to major in business administration. Associate Professor Kelley.

BA 221. **Elements of Organization and Production.** 4 hours fall.

The principles of the science and philosophy of management as applied to industrial concerns; functional management, including time study records, standardization, and planning, as applied by Taylor and subsequent industrial managers. Required of all students planning to major in business administration. Associate Professor Kelley.

BA 222. **Elements of Finance.** 4 hours fall or winter.

A brief survey of financial institutions with attention to the possible use of each by the business man; further study of the financial problems involved in the launching of a business enterprise, expansion, budgetary control, credits and collections, borrowing and management of earnings. Required of all students planning to major in business administration. Prerequisite: BA 111, 112, 113, or equivalent. Mr. Dehner.

BA 223. **Elements of Marketing.** 4 hours any term.

Methods, policies, and problems involved in the marketing of producers' and consumers' goods; particular attention to functions of marketing and the market middlemen engaged in performing those functions; current trends in marketing of commodities and services; legislation particularly applicable in marketing field. Assistant Professor Kleinsorge.

*BA 256. **Business Law.** 4 hours any term.

An introductory course in business law correlating fundamental principles with selected cases and specially prepared problems illustrating their application to typical business situations. The history of legal systems and legal institutions; the source of obligations—contracts, torts, quasi contracts, domestic status, and trusts—with special attention to interpretation and discharge and incidental treatment of bankruptcy, suretyship, and insurance. Associate Professor LeMaster, Assistant Professor Craig, Mr. Dehner.

*BA 257. **Business Law.** 4 hours any term.

An intermediate course involving (1) agency—creation, operation, and discharge; (2) negotiable instruments—classification, creation, business uses, liabilities of primary and secondary parties, discharge, and incidental banking functions; (3) personal property—nature of, sale of, bailment and pledge of, conditional sale of, and mortgage of (i.e., chattel mortgages). Associate Professor LeMaster, Assistant Professor Craig, Mr. Dehner.

*BA 258. **Business Law.** 4 hours any term.

A concluding course dealing with (1) specialized business and business organization with primary attention to corporations and partnerships and incidental treatment of joint adventure, unincorporated nonprofit associations, business trusts, and joint stock companies; and (2) the law of real property including estates between vendor and vendee, mortgagor and mortgagee, landlord and tenant, and of the estate of the surviving spouse including dower, courtesy, and homestead. Associate Professor LeMaster, Assistant Professor Craig, Mr. Dehner.

UPPER-DIVISION SERVICE COURSES

BA 385. **Accounting for Technical Students.** 3 hours any term.

An abbreviated course covering the general principles of accounting, designed especially for nonbusiness students. Emphasis is placed on accounting principles rather than technique. The ultimate aim is to prepare the student to read and interpret accounting facts, rather than to construct accounts. Not open to students planning to major in business administration. Associate Professor Robinson, Mr. Gifford.

BA 386. **Accounting for Technical Students.** 3 hours winter or spring.

The accounting peculiar to partnerships and corporations; preparation, analysis, and interpretation of financial statements. Prerequisite: BA 385. Mr. Gifford.

BA 403. **Special Problems for Technical Students.** (g) 1 to 5 hours any term.

Opportunity to do supervised individual work in some field of special application and interest. Subjects chosen must be approved by the major professor. Prerequisite: senior or graduate standing. Staff.

* Special sections for technical students, carrying 3 hours credit each term, are offered as follows: BA 256 fall, BA 257 winter, BA 258 spring.

BA 413. **Production Management.** 4 hours fall.

An analysis of the problems of production, factory organization, and factory management, studied from the point of view of the production manager. Prerequisite: BA 221. Associate Professor Kelley.

BA 414. **Personnel Management.** (g) 4 hours fall.

Principles of scientific management, job analysis, systematic hiring, placing and promoting, methods of wage payment, turnover problems, labor's participation in management, the public's concern in such participation. Recommended for seniors in forestry and juniors and seniors in engineering and home economics who expect to employ and manage men or women. Associate Professor Kelley.

BA 463. **Investments.** (g) 3 hours spring.

A study of the special phases of investments; markets and the price of securities; their demand and supply; the computing of earnings; government, state, county, municipal, and corporation bonds and real estate loans as investment securities; the stock exchange. Prerequisite: BA 221, 222, 223.

BA 469. **Business and Agricultural Statistics.** (g) 3 hours spring.

Sources of business and agricultural statistics; study of statistical devices used in fields of business and agriculture, such as summary numbers, indices of trends, and seasonal variation; and problems involved in comparing statistical results. Consent of instructor must be obtained before registering.

BA 470. **Business Statistics.** (g) 3 hours winter.

A quantitative and theoretical study of business fluctuations; evaluation of nature, suggested causes, and remedies for cyclical perturbations; examination of types, methods and adequacy of economic and business forecasting. Prerequisite: consent of instructor.

BA 494. **Cost Accounting for Industrials.** (g) 3 hours spring.

The principles and methods of factory cost accounting, with application to practical problems; phases of industrial management necessary to the installation and operation of a modern cost system. Prerequisite: BA 386. Associate Professor Robinson, Assistant Professor Craig.

GRADUATE SERVICE COURSES

Courses numbered 400-499 and designated (*g*) may be taken for credit toward a graduate minor.

Journalism

ELEMENTARY courses in journalism, in addition to furnishing a certain cultural background in newspaper methods, are intended to introduce students to the fundamentals of news writing. These courses also enable students to get additional benefit from work on the DAILY BAROMETER, student newspaper, and serve to some extent as a training school in this work in an endeavor to keep student publications on a high plane. The Department of Journalism also gives instruction that is designed to train students in the professional schools to write competently for newspapers and magazines on the subjects or in the fields in which they are specializing. These courses are intended to meet the needs of a large number of persons who, either in public service or in private life, have occasion to prepare material for the press on industrial or technical subjects. Training is also offered in the popularization of scientific material for the press.

The lower-division courses permit a student to prepare to major in journalism at the University. A full journalistic training combined with a technical specialty may be arranged in a four- or five-year curriculum utilizing the facilities at both the University and the State College.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

J 111, 112. **Elementary Journalism.** 3 hours each term.

Fundamental principles of news writing. Intended to introduce to the students of the various technical schools the journalistic style of writing and to acquaint them with the workings of the press, both general and technical. J 111 is required for eligibility to the editorial staffs of student publications. J 111 offered each term; J 112, spring term. Special sections for professional schools where enrollment justifies. Associate Professor Shideler, Assistant Professor Johnson, Miss Lake.

J 211. **Copyediting.** 3 hours any term.

Copy reading, head writing, proof reading, and make-up. Actual experience is given in editing copy for publication. Required for all students in advanced positions on the Barometer. Prerequisite: J 111. Two lectures; 1 laboratory period. Professor McIntosh, Miss Lake.

J 223. **Editorial Writing.** 3 hours fall or spring.

Materials, style, and arrangement of periodical editorials; training in writing editorials; principles of policy and ethics; the make-up of the editorial page of farm and trade journals. Prerequisite: J 111. Associate Professor Shideler.

UPPER-DIVISION SERVICE COURSES

J 312. **Special Feature Articles.** 3 hours winter or spring.

Writing of special articles along the line of the student's own major; study of the media of such articles; practice in popularization of scientific material. Prerequisite: J 111. Assistant Professor Johnson.

J 313. **Public Information Methods.** 3 hours fall or spring.

Planning and executing of informational campaigns, through such media as newspapers, posters, radio, circular letters; methods of informing the public of public affairs and other enterprises in which it has an interest. Adapted to the special needs of students in science and the professional schools. Prerequisite: J 111. Associate Professor Shideler.

J 314. **Technical Writing.** 3 hours any term.

Writing and editing of popular and scientific bulletins; preparing reports and writing articles for scientific publications; preparing radio manuscripts. Intended primarily for research workers in the fields of agriculture, home economics, engineering, and other technical fields and for extension workers and college teachers in fields of agriculture and home economics. Prerequisite: J 111. Assistant Professor Johnson.

Music

STUDENTS may pursue music study at the State College as a part of a curriculum involving a major in another field, or they may prepare in the freshman and sophomore years to major in music at the University. Music is recognized at the State College as of fundamental value in the development of personality, enriching the life of every man or woman who

learns to appreciate it. In the education of every young woman preparing for homemaking, in supplementing the resources of the teacher and others, music is regarded as of special importance. The institution maintains a noteworthy program of musical activities, together with exceptional opportunities for music study. The faculty in music has been selected with great care, numbering among its members musicians of the highest rank, who, through study and concert work in the large musical centers of this country and Europe, bring to their students the highest ideals prevailing in these centers. The assistant instructors employ the same methods as their superiors, thus preparing the less advanced students for effective study under the principal instructors when they later enter upon more advanced study.

Training and experience in performance before the microphone of radio station KOAC are valuable features in all phases of the work.

Musical Activities. Musical organizations at the State College include the R. O. T. C. Band, the Co-Ed Band, the Orchestra, the Glee Club, and the Madrigal Club. Under the direction of the faculty in music a series of Sunday afternoon Vesper Concerts is presented throughout the college year. The Orchestra and the Glee Club give programs both entertaining and educational in character. Recitals by members of the faculty and by the more advanced students are also given.

Courses. Students enter the State College with varying degrees of proficiency in music. Consequently a considerable range of music courses has been provided. For students carrying a heavy program of required work, many of the courses permit carrying from one to three hours credit, while for students in curricula providing opportunity for more elective work, more credit may be carried with the approval of the Director, as determined by the individual student's previous preparation.

Students who have had sufficient preparation may pursue advanced study in music under one of the principal instructors. So far as their music work is concerned such students are artist students of the music faculty; they are registered in the State College only in so far as they may be pursuing regular courses, either as carrying a full major curriculum in one of the degree-granting schools or as optional or special students, not candidates for a degree.

Teaching Minor. Students who are preparing to enter some field of teaching for which training is given at the State College may take a minor in music designed to fit them to take charge of high-school choruses, bands, and orchestras in connection with their other teaching. For the minor see SCHOOL OF EDUCATION.

Applied Music. Courses are offered in all phases of applied music at the State College, including piano, singing, violin and violoncello, plectral instruments, and band instruments. Students may study any phase of applied music throughout four years, taking from one to four term hours in any term according to the course pursued. The maximum credit in applied music acceptable toward a B.A. or B.S. degree is twelve term hours.

Group instruction in voice, stringed instruments, and band instruments is available to students pursuing the minor norm in music in the School of Education (see courses Mus 191, 192).

PIANO. Instruction in piano is offered to meet the needs of students in various stages of proficiency from the beginner to the artist student. Thorough foundation in technique is developed on a highly scientific basis. Monthly group meetings of the more advanced students give an opportunity to accustom the

students to play before others. Students may take from one to six term hours each term and are required to devote from one to three hours daily to practice.

VOICE. Students who wish to develop their singing voices are offered excellent opportunity for instruction. Each student is treated individually and is assigned exercises and songs according to his stage of vocal development. For the more advanced students opportunity to sing before various campus audiences and over the radio is provided. Students may take from one to four term hours each term, requiring from one-half to two hours daily practice.

VIOLIN AND VIOLONCELLO. Instruction in violin and violoncello is available to suit the requirements of the student, from beginner to finished artist. To those of adequate ability opportunity is afforded to play in the symphony orchestra and in similar groups and to appear as soloists before various campus audiences and over the radio. Students may take from one to six term hours each term, requiring from one to three hours daily practice.

PLECTRAL INSTRUMENTS. Mandolin, guitar, and banjo instruction is available at reasonable cost. Students reaching a fair degree of proficiency have opportunity to join the Mandolin and Guitar Club, which meets weekly for ensemble playing. Students may take two term hours each term, requiring one hour daily practice.

BAND INSTRUMENTS. Courses in band instruments include cornet, trombone, clarinet, oboe, bassoon, baritone, saxophone, flute, Bb bass, Eb bass, drums, French horn, bells, and xylophone.

Regulations. Students are expected to consult the Director regarding regulations governing registration, attendance, public performance of music students, etc.

Equipment. The entire top floor of the Administration Building is devoted to studios, offices, and other needs of the work in music. Ample facilities for teaching and practicing are provided.

Tuition and Fees. Private lessons are one-half hour in length. Class lessons are fifty minutes in length. All fees are payable strictly in advance.

INDIVIDUAL INSTRUCTION	One term: One lesson a week	One term: Two lessons a week
Piano		
Mrs. Petri	$30.00	$60.00
Miss Gray	18.00	36.00
Voice		
Mr. Petri	30.00	60.00
Violin, Viola, Cello		
Mr. Moore	18.00	36.00
Miss Bowden	15.00	30.00
Banjo, Guitar, and other Small Strings		
Miss Bowden	15.00	30.00
Band Instruments		
Mr. Beard	15.00	30.00
Theory and Allied Subjects		
Private Instruction	30.00	60.00
*GROUP INSTRUCTION (see Mus 191, 192)		
Voice		
Mr. Petri	15.00	.....
Stringed Instruments		
Mr. Moore	7.50	.....
Band Instruments		
Mr. Beard	7.50	.....

* Group instruction is not given to classes of fewer than four, and is available only to students pursuing the music minor in Education.

	Two lessons a week
Piano Rental	
½ hour a day, a term (for voice students only)	$ 3.00
1 hour a day, a term	5.00
2 hours a day, a term	7.50
3 hours a day, a term	10.00
4 hours a day, a term	12.50

Orchestra Instruments Rental

Viola, cello, bassoon, and oboe are available for practice purposes for $3.00 per term for one hour weekly. Bassoon and oboe players must furnish their own reeds, and viola and cello students must replace broken strings with new ones. Any damage done to the instruments through carelessness or negligence of student must be replaced at student's expense.

Studio Rental

1 hour a day, a term (without use of piano) $2.50

DESCRIPTION OF COURSES

Mus 111, 112, 113. **Harmony I, II, III.** 3 hours each term.

Laws of overtone; origin and history of diatonic scale system; scale drills; melodic principles developed from tetrachord relations, and awakening of harmonic consciousness; triads, dominant and diminished seventh chords; recognition of by-tones; keyboard drills; ear drills; free harmonization of melodies; original melody writing; simple transposition and modulation.

Mus 121. **Appreciation of Music.** 1 hour any term.

Illustrated lectures, using the phonograph and other means to stimulate and arouse interest in good music. Elementary in nature. Required of home economics students; elective to others. Two lectures.

Mus 122, 123. **Appreciation of Music.** 1 hour each term, winter and spring.

Winter term: symphonic music; request numbers; general discussion. Spring term: grand operas; request numbers; general discussion. Two lectures.

Mus 127, 128, 129. **Music Survey.** 1 hour each term.

Intensive study of rhythm and melody writing or construction; study of acoustics; orchestral instruments; terminology and embellishments; song form, suite, sonata. Two lectures.

Mus 147, 148, 149. **Sightsinging and Ear Training.** 1 hour each term.

Writing from tonal dictation, singing melodies, rhythmic problems; rhythmic dictation. Two recitations.

Mus 190. **Individual Instruction.** 1 to 4 hours each term.

Individual instruction, any six terms, in piano, voice, violin, plectral instruments, and band instruments.

Mus 191. **Group Instruction in Voice.** 1 hour each term, two terms.

Open only to students pursuing the minor norm in music in the School of Education.

Mus 192. **Group Instruction in Stringed Instruments and Band Instruments.** 2 hours each term.

Group instruction is not intended to supplant individual instruction, but has its own advantages: economy, extra interest of those participating, the benefit of composition. Classes of four or more may be organized for any stringed instrument or band instrument.

Mus 211, 212, 213. **Harmony IV, V, VI.** 3 hours each term.

Continuation of Mus 113. Use of secondary chords in free harmonization of melodies; ear perception of these as substitutes for primary chords;

four-voice treatment of original melodies; free harmonization of melodies that modulate; ear drills in recognition of key changes; keyboard modulation from chord patterns. Two periods.

Mus 290. **The College Chorus.** 1 hour each term, three terms.

For students who can pass the necessary vocal test. Glee and Madrigal Clubs. Three periods.

Mus 291, 292, 293. **Orchestral Conducting (Elementary).** 2 hours each term.

A practical study of the elements of conducting. Organization and management of the amateur orchestra, progressive materials, studies in transposition, simple arrangements, manipulation of the various instruments, technique of the baton, and actual experience in orchestral conducting.

Mus 295. **Band.** 1 hour each term, three terms.

This organization is maintained for women students who have been active in their respective high-school bands and wish to continue with this type of musical expression. Open to all who can pass the necessary test. Two periods.

UPPER-DIVISION SERVICE COURSES

Mus 324, 325, 326. **Advanced Conducting and Orchestration.** 2 hours each term.

Further study of applied orchestral conducting, designed for the advanced student. The fine points of conducting, scoring, and arranging for full symphonic orchestra; thorough acquaintance with the literature suitable for such a group. An orchestra is made available for this study. Prerequisite: Mus 291, 292, 293. Professor Moore.

Mus 331, 332, 333. **Band Organizations.** 2 hours each term.

Designed to give the training and technique necessary to the band conductor. The technique and repertoire of band instruments; organizing and developing ensembles; band administration; instrumentation; elementary arranging; use of the baton. Professor Beard.

Mus 334, 335, 336. **Band Organization.** 2 hours each term.

Continuation of Mus 331, 332, 333. Organization and administration of the military and concert band; rehearsal methods; use of the baton; expression; grouping and coloring; score building and arranging; score reading; dictation; transposition; study of the various clefs; repertoire; program building. The student is given frequent opportunity to conduct the concert band in public performance of a standard overture or other composition of recognized merit. Prerequisite: Mus 331, 332, 333. Professor Beard.

Mus 390. **Individual Instruction.** 1 to 4 hours each term.

Continuation of Mus 190. Individual instruction, any six terms, in piano, voice, violin, plectral instruments, and band instruments.

Mus 391. **The College Orchestra.** 1 hour each term, three terms.

For students who play orchestral instruments and who can pass the necessary test. Three periods. Professor Moore.

Mus 433. **Glee Club Conducting.** 1 hour spring.

The elements of high school chorus conducting, including baton technique, study of choral arrangements suitable for high-school students, and other topics. For students who have completed all other requirements of a minor norm in music in the School of Education. Professor Petri.

Religion

ESTABLISHMENT of a chair of Religion was authorized in 1928, and the first courses were offered in the fall term of 1928-29. The Department of Religion is nonsectarian in spirit and organization.

The purpose of the Department of Religion is threefold:

(1) The courses in religion seek to develop an appreciation of the nature and processes of religion in the light of conditions affecting life today, thus enabling students to make such adjustments as will vitalize religion for them.

(2) The courses are determined for the most part by the needs of the larger group of students at the College, who are preparing for service in the fields of science, engineering, agriculture, home economics, teaching, etc.

(3) Special attention is given to the religious training of those students who anticipate lay-leadership in the churches of their local communities, as well as to those who plan to enter social service or the religious vocations, such as missionary work, the ministry, directors of religious education, pastor's assistant, professional leadership of religious organizations, etc.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

R 211. **The New Testament and Its Historical Background.** 2 hours winter.

Special attention is given to the times and conditions out of which the New Testament writings came and the problems that gave rise to the Christian movement. Professor Warrington.

R 220. **The Sermon on the Mount.** 1 hour fall.

Intensive study of a limited New Testament passage; the content of Jesus' teaching as embodied in the selected passage; the nontechnical method of Bible study. Professor Warrington.

R 225. **The Prophets and Their Message.** 1 hour spring.

The early Hebrew prophets as heralds of a new day, spokesmen of a new idealism; significance of the prophets and the value of their messages for the present day. Professor Warrington.

Eng 275. **The Bible as Literature.** 3 hours spring.

Given by the Department of English. Designed to stimulate and enlarge appreciation of the art and beauty of the literature of the Bible. Questions of theology and dogmas of religion are avoided. Assignments include passages that fall under the chief literary types, such as folklore, story telling, history, poetry, drama, wisdom literature, oratory, and the essay. Assistant Professor Baldwin.

UPPER-DIVISION COURSES

R 370. **Principles of Religious Leadership.** 2 hours spring.

Open only to those on the campus or in the local community who are engaged, during the term, in some religious activity. In the theory work consideration is given to the psychology of human nature, work with individuals, group thinking, social conditions determining program, value of social activities, place of the Bible in religious education, and similar topics. Professor Warrington.

R 461. **Religious Orientation.** 3 hours fall.

The present status of religion; the effect upon religious thought of the new scientific discoveries and significant trends in present-day life; the nature and function of religion in a world of change; the basis of authority in religion; evaluation of the concept of God. Professor Warrington.

R 462. **History of Great Religions.** 3 hours winter.

Comparative study of the religions that command a large following today, such as Hinduism, Buddhism, Confucianism, Judaism, Christianity, and Islam. Intended to introduce the student to the essential facts about each religion studied. Professor Warrington.

R 463. **Psychology of Religion.** 3 hours spring.

The bearing of psychology on religious thought and life; the effects on human personality of such religious processes as faith, prayer, worship; the function of these as noted in a study of such modern leaders as Gandhi, Schweitzer, and Kagawa. Professor Warrington.

School of Agriculture

Faculty

WILLIAM ALFRED SCHOENFELD, M.B.A., Dean of the School of Agriculture.
FREDERICK EARL PRICE, B.S., Assistant Dean of Agriculture.
ESTHER MCKINNEY, Accountant.

DIVISION OF AGRICULTURAL ECONOMICS

ERMINE LAWRENCE POTTER, M.S., Professor of Agricultural Economics; In Charge, Division of Agricultural Economics.

Agricultural Economics

MILTON NELS NELSON, Ph.D., Professor of Agricultural Economics.
DANIEL BARTON DELOACH, Ph.D., Associate Professor of Agricultural Economics.

Farm Management

DWIGHT CURTIS MUMFORD, M.S., Professor of Farm Management.
HENRY DESBOROUGH SCUDDER, B.S., Professor of Farm Management.
GUSTAV WESLEY KUHLMAN, Ph.D., Associate Professor of Farm Management.

DIVISION OF ANIMAL INDUSTRIES

PHILIP MARTIN BRANDT, A.M., Professor of Dairy Husbandry; In Charge, Division of Animal Industries.

Animal Husbandry

RAY GEORGE JOHNSON, B.S., Professor of Animal Husbandry.
ORAN MILTON NELSON, M.S., Professor of Animal Husbandry.
ALFRED WEAVER OLIVER, M.S., Associate Professor of Animal Husbandry.
BENJAMIN WILLIAM RODENWOLD, M.S., Assistant Professor of Animal Husbandry.

Dairy Husbandry

(Includes Dairy Manufacturing)

GUSTAV HANS WILSTER, Ph.D., Professor of Dairy Manufacturing.
IDWAL RALPH JONES, Ph.D., Professor of Dairy Husbandry.
HOWARD NOTSON COLMAN, B.A., B.S., Assistant Professor of Dairy Husbandry.
HAROLD PLYMPTON EWALT, B.S., Instructor in Dairy Husbandry.
HOLGER PETER CARL NIELSEN, Instructor in Dairy Manufacturing.

Fish and Game Management

ROLAND EUGENE DIMICK, M.S., Professor of Fish and Game Management.
FRANCIS PRIDAY GRIFFITHS, Ph.D., Assistant Professor of Fish and Game Management.
JAY B LONG, B.S., Instructor in Fish and Game Management.

Poultry Husbandry

HUBERT ELMER COSBY, Professor of Poultry Husbandry.
CLAYTON ERNEST HOLMES, Ph.D., Associate Professor of Poultry Husbandry.
WILBUR TARLETON COONEY, B.S., Instructor in Poultry Husbandry.

Veterinary Medicine

JAMES NIVEN SHAW, B.S., D.V.M., Professor of Veterinary Medicine.
ERNEST MILTON DICKINSON, D.V.M., M.S., Professor of Veterinary Medicine.
ROBERT WATSON DOUGHERTY, D.V.M., M.S., Assistant Professor of Veterinary Medicine.
MERWYN PIERCE CHAPMAN, D.V.M., Instructor in Veterinary Medicine.
KENNETH STANTON JONES, D.V.M., Instructor in Veterinary Medicine.

DIVISION OF PLANT INDUSTRIES

GEORGE ROBERT HYSLOP, B.S., Professor of Farm Crops; In Charge, Division of Plant Industries.

Farm Crops

DONALD DAVID HILL, Ph.D., Professor of Farm Crops.
ROBERT ESTES FORE, Ph.D., Associate Professor of Farm Crops.
HAROLD ETHAN FINNELL, M.S., Assistant Professor of Farm Crops.
LOUISA AMES KANIPE, B.S., Assistant Professor of Farm Crops.
LEROY ROBERT HANSEN, M.S., Instructor in Farm Crops.

Food Industries

ERNEST HERMAN WIEGAND, B.S.A., Professor of Food Industries.
THOMAS ONSDORFF, M.S., Associate Professor of Food Industries.
ROY EARL MORSE, M.S., Instructor in Food Industries.
JOHN BUSHNELL STEWART, B.S., Graduate Assistant in Food Industries.

Horticulture

WALTER SHELDON BROWN, M.S., D.Sc., Professor of Horticulture.
HENRY HARTMAN, M.S., Professor of Horticulture.
*WILLIS PIERRE DURUZ, Ph.D., Professor of Pomology.
ARTHUR GEORGE BRISTOW BOUQUET, M.S., Professor of Vegetable Crops.
ALFRED NATHAN ROBERTS, M.S., Instructor in Horticulture.
DONALD LOUIS RASMUSSEN, B.S., Graduate Research Assistant in Horticulture.

Soils

WILBUR LOUIS POWERS, Ph.D., Professor of Soils.
CHARLES VLADIS RUZEK, M.S., Professor of Soil Fertility.

* On leave of absence.

ROSCOE ELMO STEPHENSON, Ph.D., Professor of Soils.
EDWARD FRITCHOFF TORGERSON, B.S., Associate Professor of Soils.
LESTER WEAVER, B.S., Graduate Assistant in Soils.

AGRICULTURAL EDUCATION, ENGINEERING, AND EXTENSION METHODS

Agricultural Education

HEBER HOWARD GIBSON, A.M., Professor of Agricultural Education.
RUSSEL MONROE ADAMS, M.S., Supervising Teacher in Agricultural Education.

Agricultural Engineering

WILLIAM JAMES GILMORE, B.C.E., B.S., Professor of Agricultural Engineering.
CLYDE WALKER, M.S., Associate Professor of Agricultural Engineering.
*HERBERT REEVES SINNARD, M.S., R.A., Associate Professor of Agricultural Engineering.
RALPH NICHOLAS LUNDE, B.S., Assistant Professor of Agricultural Engineering.

Extension Methods

FRANK LLEWELLYN BALLARD, B.S., Professor of Extension Methods.
AZALEA LINFIELD SAGER, M.A., Professor of Extension Methods.

General Statement

UNDERGRADUATE curricula are offered in the School of Agriculture leading to the degree of Bachelor of Science or Bachelor of Agriculture, and graduate curricula are offered leading to the degree of Master of Science and Doctor of Philosophy. The curricula in agriculture are planned to prepare young men or women to be better farmers, stockmen, dairymen, poultrymen, or fruit or truck growers; to be efficient managers of farm or orchard properties, commercial creameries, cheese plants and ice-cream factories, market-milk plants, and other business enterprises in which a knowledge of practical and scientific agriculture is of value; to serve as agricultural advisers and land appraisers for banks, trust companies, land companies and realtors, as specialists in the United States Department of Agriculture or in agricultural colleges as teachers, investigators, extension specialists, county agricultural agents, 4-H club leaders, as teachers of agriculture in secondary schools, or in charge of control laboratories in manufacturing industries related to agriculture.

The curriculum in landscape construction and maintenance trains students for the practical application of landscaping principles to problems in the field, as in the management of estates, superintendency of cemeteries and parks, ornamental nursery-stock industry, teaching the practical phases of ornamental gardening, maintenance of golf courses, contracting and construction on new properties, and in other similar occupations.

The curriculum in agricultural engineering prepares for college extension, experiment station, and government work in agricultural engineering; sales and development work with manufacturers of implements such as tractors and farm

* On leave of absence.

equipment; agricultural specialists with building materials and equipment companies; the commercial field, including the farm implement and lumber retail business; teaching of vocational agriculture; service as managers or operators of farms where the knowledge of drainage, farm structures, and machinery and power equipment is important.

In the food industries curriculum the aim is to train students in the fields of canning, preserving, fruit juice and vinegar making, carbonated-beverage manufacturing, pickling, dehydrating, and the byproducts of these industries; and for service as buyers of raw materials, salesmen, food brokers, food inspectors, food chemists, food bacteriologists, food research workers, and instructors in foods.

The curriculum in agricultural technology leads to technical work in the industries handling agricultural and related products and to specialized lines in state or Federal research and regulatory work; to service as dairy or milling chemists, dairy or agricultural bacteriologists, insecticide, fertilizer, or seed analysts, transportation or refrigeration specialists, specialists in processing of agricultural products, nursery and quarantine inspectors, managers of warehouses or elevators, and plant explorers.

The Bachelor's Degree. The degree of Bachelor of Science or Bachelor of Agriculture is granted on the completion of any of the four-year curricula, which include a total of 192 term hours of credit (including Military Science and Physical Education). See page 76 for complete information.

Four-year undergraduate curricula are offered in general agriculture; in the broad fields of agricultural economics, animal industries, and plant industries; in agricultural education; in agricultural engineering; and in agricultural technology. In most of the curricula the student during his first year pursues a program of basic and introductory work called the common freshman year. In some curricula a common sophomore year is provided.

The several curricula, each leading to the degree of Bachelor of Science, are outlined as follows:

GENERAL AGRICULTURE

A four-year curriculum providing liberal opportunity for students to major in agriculture and carry a minor in some other field, such as business administration, social science, or education.....Page 197

AGRICULTURAL ECONOMICS

A four-year curriculum—common freshman and sophomore years; differentiated junior and senior curricula in AGRICULTURAL ECONOMICS and in FARM MANAGEMENT.....Pages 198-199

ANIMAL INDUSTRIES

Four-year curricula—common freshman and sophomore years; basic junior and senior curriculum, providing opportunity to major in ANIMAL HUSBANDRY, DAIRY PRODUCTION, or POULTRY HUSBANDRY, with an option in RANGE AND RANGE LIVESTOCK MANAGEMENT ..... Pages 199-201, 202
A four-year curriculum in DAIRY MANUFACTURING.....Pages 201-202
A four-year curriculum in FISH AND GAME MANAGEMENT.....Pages 202-203
A four-year curriculum in FISHERIES.....Pages 203-204

PLANT INDUSTRIES

Four-year curricula—common freshman and sophomore years; differentiated junior and senior curricula in FARM CROPS and in SOILS, with an option in SOIL CONSERVATION; and in HORTICULTURE (FRUIT AND VEGETABLE PRODUCTION AND DISTRIBUTION)....Pages 204-206, 207
A four-year curriculum in FOOD INDUSTRIES.....Pages 206-207
A four-year curriculum in LANDSCAPE CONSTRUCTION AND MAINTENANCE .....Page 208

Pretheological Major in Agriculture. In cooperation with the Conference on Relationships Between Colleges of Agriculture and Theological Seminaries, the School of Agriculture affords opportunity for students who are preparing to enter the rural "town and country" ministry to complete a major in agriculture before entering theological seminary. Such students may pursue the curriculum in General Agriculture, or any of the other curricula offered in the School of Agriculture, including in their program any specific requirements that may be made by the particular seminary that the student expects to enter after completing his undergraduate work. At least one basic course should be taken in each of the following fields: agricultural economics, economics, English literature, history and government, philosophy, speech, psychology, rural sociology, and sociology. Some of these subjects are required in the agriculture curricula; others may be chosen as electives.

Two-Year Curriculum. The School of Agriculture offers a two-year curriculum leading to a Certificate in Agriculture (see page 212). The purpose is to provide training for students who are farming or planning to engage in farming or in nontechnical phases of agriculture, who are unable to take a four-year curriculum. Students who have maintained a good scholarship standing through the two-year curriculum are in a good position to continue for two additional years and obtain the bachelor's degree.

Advanced Degrees. Opportunities are provided in all the departments of the School of Agriculture for graduates of the State College or other accredited colleges or universities to do graduate work leading to the degree of Master of Science. The degree of Doctor of Philosophy is offered in the Division of Agricultural Economics, the Division of Animal Industries, and the Division of Plant Industries. The requirements for advanced degrees are printed under GRADUATE DIVISION.

Annual Canners' and Frozen Food Packers' School. The annual Canners' and Frozen Foods Packers' School, established in 1921, has developed into a full two-week school and is the only course of its kind in the United States giving complete instruction in canning. It is designed primarily for those engaged in commercial canning, freezing, preserving, pickling, and allied industries. The registration includes owners, officers, foremen, mechanics, and all other workers in the industry as well as selling agents and representatives of allied industries. The course is usually given during the first two weeks in February.

Annual Short Course and Conference in Dairy Manufacturing. The short course and conference in dairy manufacturing is of special interest to butter makers and ice-cream makers. The annual convention of the Oregon Dairy Manufacturers Association is expected to be held during the short course. This course is usually held in February.

Curricula for Undergraduates

Common Freshman Year

Freshman curriculum for all students in four-year agriculture curricula except as indicated under certain curricula.

	Term hours		
	F	W	S
English Composition (Eng 111, 112, 113)	3	3	3
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
General Botany (Bot 201, 202)	3	3	---
Principles of Zoology (Z 130)	---	---	3
Elements of Agronomy (FC 111)	3	---	*or* (3)
Elements of Horticulture (Hrt 111)	(3)	---	*or* 3
[1]Introduction to Animal Husbandry (AI 121)	(3)	*or* (3)	*or* 3
[1]Introduction to Poultry Husbandry (AI 123)	---	3	---
Agricultural Resources (AEc 111)	3	---	---
Agricultural Engineering (AE 111)	(3)	*or* 3	---
[2]Physical Education	1	1	1
Military Science	1	1	1
	17	17	17

Curriculum in General Agriculture

B.S. Degree

(See Common Freshman Year, above.)

Sophomore Year

	Term hours		
	F	W	S
Principles of Economics (Ec 201, 202, 203)	3	3	3
Soils (Sls 211, 212)	3	3	---
Soil Drainage and Irrigation (Sls 213)	---	---	3
Principles of Farm Management (FM 211)	---	---	3
Forage and Root Crop Production (FC 211)	3	---	*or* (3)
General Bacteriology (Bac 204)	---	3	---
Introduction to Dairy Husbandry (AI 122)	---	3	---
Military Science	1	1	1
Physical Education	1	1	1
Electives	6	3	6
	17	17	17

Junior Year

Principles of Economic Entomology (Ent 314)	(3)	*or* 3	---
Elementary Journalism (J 111)	---	3	---
Extempore Speaking (Sp 111)	3	---	---
[3]Electives	12	9	14
	15	15	14

Senior Year

[4]Technical Writing (J 314)	---	3	---
American National Government (PS 212)	3	---	---
[3]Electives	12	12	14
	15	15	14

[1]Stock Judging I (AI 111) may be substituted for AI 121 or AI 123 by students who will major in animal industries who wish to qualify for the stock judging team. AI 121 and AI 123 must be taken in the sophomore year if not taken in the freshman year.

[2]General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education. Women take Social Ethics (PE 131) one term.

[3]Electives leading to specific objectives are chosen in conference with the Dean of Agriculture and must include a minimum of 36 hours in agriculture, 24 of which must be in upper division.

[4]Students desiring exemption from J 314 may apply to the Dean of Agriculture, whereupon arrangements will be made for a special examination.

Curricula in Agricultural Economics

B.S., B.Agr. Degrees[1]

Agricultural Economics *Farm Management*

(See Common Freshman Year, page 197.)

Sophomore Year

	Term hours F	W	S
Principles of Economics (Ec 201, 202, 203)	3	3	3
Agricultural Statistics (AEc 221)	....	3	....
Agricultural Economics (AEc 211)	....	....	3
Principles of Farm Management (FM 211)	....	....	3
Soils (Sls 211, 212)	3	3	....
Soil Drainage and Irrigation (Sls 213)	....	....	3
Forage and Root Crop Production (FC 211)	3	....	....
Introduction to Dairy Husbandry (AI 122)	....	3	....
General Bacteriology (Bac 204)	....	3	....
Elementary Journalism (J 111)	3	....	....
Military Science	1	1	1
Physical Education	1	1	1
Electives	3	....	3
	17	17	17

AGRICULTURAL ECONOMICS[2], AGRICULTURAL MARKETING[3]

Junior Year

	Term hours F	W	S
Extempore Speaking (Sp 111)	3	....	....
Technical Writing (J 314)	....	3	....
Principles of Agricultural Marketing (AEc 441)	4	....	....
Accounting for Technical Students (BA 385, 386)	....	3	3
Business Law (BA 256, 257)	3	3	....
American National Government (PS 212)	....	....	3
[4]Agricultural Prices (AEc 451)	....	....	3
Money and Banking (Ec 413)	....	....	4
Electives in Plant or Animal Industries or Military Science	3	3	3
Electives	3	4	....
	16	16	16

Senior Year

International Trade (Ec 440)	4	....	....
Farm Credits (AEc 431)	....	3	....
Public Land Policies (AEc 461)	3	....	....
[4]Marketing Organization (AEc 442)	....	....	3
Public Finance (Ec 418)	....	4	....
Current Economic Theory and Problems (Ec 475, 476, 477)	3	3	3
[5]Electives in Plant or Animal Industries or Military Science	3	3	3
Electives	3	3	7
	16	16	16

[1]For the B.S. degree students must take a total of at least 36 term hours in science or 36 term hours in social science.

[2]The curriculum outlined is intended as a suggestion rather than as a requirement and is modified to fit the needs and previous training of the individual student. Especial modifications are made for students desiring more intensive training in rural finance, marketing, cooperation, or land economics.

[3]The curriculum for students majoring in the marketing of agricultural products is given in cooperation with the production departments concerned. In general, students follow the curriculum outlined for agricultural economics, including courses in the handling, grading, and storage given in the production departments, and courses in accounting and advertising given in the Department of Business Administration. Students may major in marketing of fruits, vegetables, dairy products, poultry, livestock, or farm crops; with the approval of the production departments concerned.

[4]AEc 442 and AEc 451 are offered in alternate years, AEc 442 in even-numbered years and AEc 451 in odd-numbered years.

[5]Electives leading to specific objectives are chosen in conference with the head of the department and must include a minimum of 36 hours in agriculture.

FARM MANAGEMENT

Junior Year

	Term hours F	W	S
Farm Organization (FM 312)	3	....	....
Operation Efficiency (FM 313)	....	3	....
Enterprise Costs and Profits (FM 414)	....	....	3
Farm Accounting (FM 311)	3	....	....
Soil Physics Lectures (Sls 421)	3	....	....
Animal Breeding (AI 315)	....	3	....
Animal Nutrition (AI 411)	....	4	....
[1]Technical Writing (J 314)	3	....	....
Extempore Speaking (Sp 111)	....	....	3
Electives	3	5	9
	15	15	15

Senior Year

Enterprise Costs and Profits (FM 415)	....	2	....
Applied Farm Management (FM 411, 412)	3	3	....
Agricultural Land Economics (FM 420)	....	3	....
Agricultural Appraisal (FM 425)	....	....	3
Farm Credits (AEc 431)	....	3	....
Money and Banking (Ec 413)	....	....	4
Principles of Agricultural Marketing (AEc 441)	4	....	....
American National Government (PS 212)	3	....	....
Electives	5	4	8
	15	15	15

Curricula in Animal Industries[2]

B.S. Degree

Dairy Production — *Animal Husbandry*
Dairy Manufacturing — *Poultry Husbandry*
Fish and Game Management
Fisheries

Sophomore Year[3]

(See Common Freshman Year, page 197, taken by all students in animal industries except those in dairy manufacturing, fish and game management, and fisheries. For the freshman and sophomore curriculum in dairy manufacturing see page 201 and in fish and game management see pages 202-203.)

	Term hours F	W	S
Principles of Economics (Ec 201, 202, 203)	3	3	3
Organic and Agricultural Biochemistry (Ch 251)	5	....	....
General Bacteriology (Bac 204)	(3)	3	....
Principles of Farm Management (FM 211)	....	....	3
Soils (Sls 211, 212)	3	3	....
[4]Anatomy of Domestic Animals (VM 211)	3	....	....
Physiology of Domestic Animals (VM 221, 222)	....	3	3
Introduction to Dairy Husbandry (AI 122)	....	(3)	3
Stock Judging I (AI 111)	....	3	....
Physical Education	1	1	1
Military Science	1	1	1
[5]Electives	....	....	3
	16	17	17

[1]Students desiring exemption from J 314 may apply to the Dean of Agriculture, whereupon arrangements will be made for a special examination.

[2]At the graduate level major work is also offered in veterinary medicine.

[3]Students who will specialize in (1) the science phases of animal industries, or (2) range and range-livestock management may make certain substitutions in the curriculum in consultation with the head of the Division of Animal Industries.

[4]Students who intend to major in poultry husbandry should take Anatomy of the Fowl (VM 311) in place of VM 211.

[5]Animal husbandry majors will take Breeds of Livestock (AH 316), and dairy production majors will take Dairy Breed Types (DH 321).

ANIMAL HUSBANDRY

Junior Year[1]

	Term hours F	W	S
Forage and Root Crop Production (FC 211)	3	----	----
Livestock Breed Types (AH 211)	----	----	3
Animal Nutrition (AI 411)	4	----	----
Animal Breeding (AI 315)	----	3	----
Elementary Journalism (J 111)	----	3	----
Farm Livestock Management (AH 330, 331)	----	3	3
American National Government (PS 212)	----	3	----
Business Law (BA 256)	----	----	4
Extempore Speaking (Sp 111)	3	----	----
Farm Accounting (FM 311)	3	----	----
[2]Technical Writing (J 314)	----	----	3
Electives	3	3	3
	16	15	16

Senior Year[1]

Livestock Feeding (AH 412)	3	----	----
Reproduction Problems (AH 423)	----	3	----
Livestock Economics (AH 424)	----	----	3
Diseases of Livestock (VM 441, 442, 443)	3	3	3
Range Livestock Management (AH 419)	----	3	----
Seminar (AH 407)	1	1	1
Electives	8	5	8
	15	15	15

Options

Students specializing in *range and range-livestock management* are required to take the following courses.

Freshman Year

	Term hours F	W	S
General Botany (Bot 203)	----	----	3

Junior Year

Range and Pasture Botany (Bot 314)	----	3	----
Fish and Game Management (FG 351, 352)	3	3	----
Systematic Botany (Bot 313)	4	----	----
General Forestry (F 211)	3	----	----
Forest Administration (F 212)	----	3	----
Principles of Plant Ecology (Bot 341)	----	----	4

Senior Year

Public Land Policies (AEc 461)	3	----	----
Range Livestock Management (AH 419, 420)	----	3	3
Range Survey Methods (AH 333)	----	----	3
Range Improvement and Maintenance (FC 319)	----	3	----

DAIRY PRODUCTION[3]

Junior Year

Dairy Herd Management (DH 322)	----	3	----
Dairy Breed Types (DH 321)	----	----	3
Dairy Products Standards (DH 315)	----	----	1
Animal Nutrition (AI 411)	4	----	----
Animal Breeding (AI 315)	----	3	----
Farm Accounting (FM 311)	3	----	----
Forage and Root Crop Production (FC 211)	3	----	----
Elementary Journalism (J 111)	----	3	----
Extempore Speaking (Sp 111)	3	----	----
Business Law (BA 256)	----	----	4
Farm Livestock Management (AH 330, 331)	----	3	3
Electives	3	3	6
	16	15	17

[1]Students who will specialize in (1) the science phases of animal industries, or (2) range and range-livestock management may make certain substitutions in the curriculum in consultation with the head of the Division of Animal Industries.

[2]Students desiring exemption from J 314 may apply to the Dean of Agriculture, whereupon arrangements will be made for a special examination.

[3]Elective courses leading to production, agricultural teaching, research, extension, or commercial careers are chosen in conference with the head of the department. Certain substitutions for required courses may be requested.

Senior Year	Term hours F	W	S
Breeding Dairy Cattle (DH 421)	---	3	---
Dairy Cattle Feeding (DH 422)	---	---	3
Market Milk and Related Products (DH 410)	3	---	---
Milk Marketing (AEc 444)	---	3	---
Seminar (DH 407)	1	1	1
Utilization of Dairy Products (DH 430)	---	---	3
Diseases of Livestock (VM 441, 442, 443)	3	3	3
American National Government (PS 212)	3	---	---
[1]Technical Writing (J 314)	---	3	---
Electives	6	3	6
	16	16	16

DAIRY MANUFACTURING

Freshman Year			
English Composition (Eng 111, 112, 113)	3	3	3
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
Intermediate Algebra (Mth 100)	4	---	---
Elementary Analysis (Mth 101, 102)	---	4	4
Agricultural Resources (AEc 111)	3	---	---
Introduction to Dairy Husbandry (AI 122)	---	---	3
Stock Judging (AI 111)	---	3	---
[2]Physical Education	1	1	1
Military Science	1	1	1
	15	15	15

Sophomore Year			
General Physics (Ph 201, 202, 203)	4	4	4
Principles of Economics (Ec 201, 202, 203)	3	3	3
Organic and Agricultural Biochemistry (Ch 251)	5	---	---
Quantitative Analysis (Ch 254)	---	---	3
General Bacteriology (Bac 204)	---	3	---
Introduction to Poultry Husbandry (AI 123)	3	---	---
Extempore Speaking (Sp 111)	---	3	---
Elementary Journalism (J 111)	---	---	3
Business English (Eng 217)	---	3	---
Dairy Products Standards (DH 315)	---	---	1
General Hygiene (PE 150)	---	---	2
Physical Education	1	1	---
Military Science	1	1	1
	17	18	17

Junior Year			
Dairy Products Manufacturing (DH 312, 313, 314)	4	4	4
Dairy Bacteriology (Bac 411)	3	---	---
Dairy Chemistry (Ch 353)	---	---	3
Dairy Herd Management (DH 322)	---	3	---
Refrigeration and Cold Storage (ME 363)	---	---	3
Accounting for Technical Students (BA 385, 386)	3	3	---
American National Government (PS 212)	---	3	---
Business Law (BA 256)	3	---	---
Dairy Breed Types (DH 321)	---	---	3
Electives	3	3	3
	16	16	16

Senior Year			
Market Milk and Related Products (DH 410)	3	---	---
Milk Marketing (AEc 444)	---	3	---
Utilization of Dairy Products (DH 430)	---	---	3
Dairy Technology (DH 412, 413)	---	3	3
Seminar (DH 407)	1	1	1
Dairy Cattle Feeding (DH 422)	---	---	3
Principles of Agricultural Marketing (AEc 441)	4	---	---
Technical Writing (J 314)	3	---	---
Electives	6	9	6
	17	16	16

[1]Students desiring exemption from J 314 may apply to the Dean of Agriculture, whereupon arrangements will be made for a special examination.

[2]General Hygiene (PE 150), 2 term hours, is taken one term in place of Physical Education. Women take Social Ethics (PE 131) one term.

Recommended Electives

	Credits
Marketing Organizations (AEc 442)	3
General Advertising (SS 439)	3
Business Statistics (BA 470)	4
Dairy Bacteriology (Bac 412)	3
Research (DH 401)	3
Farm Credits (AEc 431)	3
Analysis of Financial Statements (BA 213)	3
Elementary Psychology (Psy 201)	3
Money and Banking (Ec 413)	4
General Sociology (Soc 211)	4
Animal Nutrition (AI 411)	4
Interpretation I (Sp 121)	3

POULTRY HUSBANDRY

Junior Year

	Term hours F	W	S
Poultry Housing (PH 331)	3	....	....
[1]Poultry Judging (PH 341)	....	2	....
Incubation and Brooding (PH 321)	....	....	4
Diseases of Poultry (VM 351)	....	....	4
Extempore Speaking (Sp 111)	....	....	3
Animal Nutrition (AI 411)	4	....	....
Animal Breeding (AI 315)	....	3	....
Farm Accounting (FM 311)	....	3	....
Anatomy of the Fowl (VM 311)	....	3	....
Forage and Root Crop Production (FC 211)	3	....	....
[2]Turkey Management (PH 351)	3	....	....
Elementary Journalism (J 111)	....	3	....
Electives	3	3	5
	16	17	16

Senior Year

Poultry Feeding (PH 411)	....	4	....
Marketing Poultry Products (PH 421)	4	....	....
Poultry Plant Management (PH 431)	....	....	4
Poultry Breeding (PH 441)	....	....	4
Seminar (PH 407)	1	1	1
American National Government (PS 212)	....	3	....
[3]Technical Writing (J 314)	3	....	....
Electives	7	6	5
	15	14	14

FISH AND GAME MANAGEMENT

Freshman Year

English Composition (Eng 111, 112, 113)	3	3	3
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
General Zoology (Z 201, 202, 203)	3	3	3
Wildlife Conservation (FG 251)	3	....	....
Elements of Agronomy (FC 111)	....	3	....
Introduction to Animal Husbandry (AI 121)	....	....	3
General Forestry (F 211)	3	....	....
Forest Administration (F 212)	....	3	....
Agricultural Engineering (AE 111)	....	....	3
[4]Physical Education	1	1	1
Military Science	1	1	1
	17	17	17

[1]Poultry Judging (PH 341) offered alternate years. Offered 1942-43.
[2]Turkey Management (PH 351) offered alternate years. Not offered 1942-43.
[3]Students desiring exemption from J 314 may apply to the Dean of Agriculture, whereupon arrangements will be made for a special examination.
[4]General Hygiene (PE 150), 2 term hours, is taken one term in place of Physical Education.

Sophomore Year	Term hours F	W	S
Economics and Social Science	3	3	3
General Botany (Bot 201, 202, 203)	3	3	3
Economic Ornithology (Z 321)	3	----	----
Economic Mammalogy (Z 322)	----	3	----
General Bacteriology (Bac 204, 205)	3	3	----
Biology of Fishes (Z 323)	----	----	3
Anatomy of Domestic Animals (VM 211)	3	----	----
Physiology of Domestic Animals (VM 221, 222)	----	3	3
Physical Education	1	1	1
Military Science	1	1	1
Electives	----	----	3
	17	17	17

Junior Year			
Range and Pasture Botany (Bot 314)	----	3	----
Principles of Plant Ecology (Bot 341)	----	----	4
Elementary Journalism (J 111)	3	----	----
Nutrition of Fish and Game (AI 410)	----	----	4
Extempore Speaking (Sp 111)	3	----	----
Fish and Game Management (FG 351, 352, 353)	3	3	3
Anatomy of the Fowl (VM 311)	----	3	----
Diseases of Game Birds (VM 355)	----	----	3
Parasitic Diseases of Domestic and Game Animals (VM 361)	----	4	----
Principles of Economic Entomology (Ent 314)	3	----	----
Electives	3	3	3
	15	16	17

Senior Year			
Wildlife Food Crops (FC 318)	3	----	----
Range Livestock Management (AH 419, 420)	----	3	3
Management of Game Birds (FG 451)	3	----	----
Management of Game Fish (FG 454)	----	3	----
Management of Big Game (FG 457)	----	3	----
Management of Fur Bearers (FG 460)	3	----	----
Animal Breeding (AI 315)	----	3	----
American National Government (PS 212)	----	----	3
Seminar (FG 407)	1	1	1
[1]Technical Writing (J 314)	3	----	----
Electives	3	3	5
	16	16	12

FISHERIES

Freshman Year			
English Composition (Eng 111, 112, 113)	3	3	3
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
General Zoology (Z 201, 202, 203)	3	3	3
Wildlife Conservation (FG 251)	3	----	----
Extempore Speaking (Sp 111)	----	3	----
Elementary Journalism (J 111)	----	----	3
Agricultural Engineering (AE 111)	----	----	3
Military Science and Tactics	1	1	1
[2]Physical Education	1	1	1
	14	14	17

Sophomore Year			
Principles of Economics (Ec 201, 202, 203)	3	3	3
Organic and Agricultural Biochemistry (Ch 251, 252)	5	3	----
Biology of Fishes (Z 323)	----	----	3
General Botany (Bot 201, 202, 203)	3	3	3
Vertebrate Zoology (Z 204, 205, 206)	4	4	4
Military Science and Tactics	1	1	1
Physical Education	1	1	1
	17	15	15

[1]Students desiring exemption from J 314 may apply to the Dean of Agriculture, whereupon arrangements will be made for a special examination.

[2]General Hygiene (PE 150), 2 term hours, is taken one term in place of Physical Education.

Junior Year	Term hours F	W	S
General Bacteriology (Bac 204, 205)	....	3	3
Fish and Game Management (FG 351, 352, 353)	3	3	3
Invertebrate Zoology (Z 431, 432)	4	4	....
Nutrition of Fish and Game (AI 410)	....	....	4
Aquatic Plants (Bot 321)	3	....	....
Commercial Fisheries (FG 464, 465, 466)	3	3	3
Electives	3	3	3
	16	16	16

Senior Year			
Principles of Food Preservation (FI 250)	3	....	....
Canning of Fish and Fish Products (FI 254, 255)	....	3	3
Management of Game Fish (FG 454, 455)	....	3	3
Histology (Z 475)	3	....	....
Physiology (Z 306, 307, 308)	3	3	3
Applied Statistics (Mth 341, 342)	....	3	3
Applied Fish and Game Ecology (FG 360)	....	3	....
Technical Writing (J 314)	3	....	....
Photography (Ph 361)	3	....	....
Electives	3	3	3
	18	18	15

Curricula in Plant Industries[1]

B.S. Degree

Farm Crops
Soils
Food Industries
Horticulture:
Fruit and Vegetable Production and Distribution
Landscape Construction and Maintenance

(See Common Freshman Year, page 197, taken by all students in plant industries except those in food industries and in landscape construction and maintenance. For the freshman and sophomore curriculum in food industries see pages 206-207. For the freshman and sophomore curriculum in landscape construction and maintenance see page 208.)

Sophomore Year	Term hours F	W	S
Soils (Sls 211, 212)	3	3	....
Soil Drainage and Irrigation (Sls 213)	....	....	3
Forage and Root Crop Production (FC 211)	3	....	....
Plant Propagation (Hrt 311)	....	3	....
Agricultural Engineering (AE 112)	....	....	3
Principles of Farm Management (FM 211)	....	....	3
Introduction to Dairy Husbandry (AI 122)	....	3	....
Organic and Agricultural Biochemistry (Ch 251)	5	....	....
Principles of Plant Physiology (Bot 331)	....	....	4
General Bacteriology (Bac 204)	....	3	....
Principles of Economics (Ec 201, 202, 203)	3	3	3
Military Science	1	1	1
Physical Education	1	1	1
	16	17	18

[1]The following curricula of the various departments of Plant Industries may be modified, with the permission of department heads, to meet the needs of students desiring specialization in any phase of work of the respective departments.

FARM CROPS

Junior Year

	Term hours F	W	S
Principles of Agricultural Breeding (FC 315)	3	....	....
Cereal Production Lectures (FC 322)	3	....	....
Cereal Morphology (FC 323)	2	....	....
Forage and Related Crops (FC 324)	....	....	3
Specialty Crops (FC 327)	....	3	....
Farm Accounting (FM 311)	....	3	....
Principles of Plant Pathology (Bot 351)	4	....	....
Principles of Economic Entomology (Ent 314)	....	3	....
Extempore Speaking (Sp 111)	....	....	3
Elementary Journalism (J 111)	....	3	....
[1]Electives	3	3	9
	15	15	15

Senior Year

Seminar (FC 407)	1	1	1
Crop Inspection (FC 411)	....	4	....
Seed Production (FC 414)	3	....	....
Plant Breeding (FC 415)	....	....	3
Crop Efficiency (FC 421)	....	....	3
Soil Physics Lectures (Sls 421)	3	....	....
Soil Fertility Lectures (Sls 424)	....	3	....
Animal Nutrition (AI 411)	4	....	....
Transportation (Ec 435)	....	4	....
Business Law (BA 256)	....	....	4
American National Government (PS 212)	....	....	3
[2]Technical Writing (J 314)	3	....	....
[1]Electives	1	3	3
	15	15	17

SOILS

Junior Year

Extempore Speaking (Sp 111)	3	....	....
Principles of Agricultural Breeding (FC 315)	3	....	....
Animal Nutrition (AI 411) *or* Fruit Production (Pom 415)	....	4	(4)
Farm Accounting (FM 311)	....	3	....
Farm Motors and Tractors (AE 311)	....	....	3
Irrigation Farming (Sls 311)	3	....	....
Western Land and Water Laws (Sls 411)	....	3	....
Soil Survey (Sls 432)	....	....	3
Soil Bacteriology (Bac 421)	....	....	4
Agricultural Land Economics (FM 420)	....	3	....
Principles of Economic Entomology (Ent 314)	....	3	....
Elementary Journalism (J 111)	3	....	....
Electives	3	....	6
	15	16	16

Senior Year

American National Government (PS 212)	....	3	....
Soil Physics Lectures (Sls 421)	3	....	....
Soil Physics Laboratory (Sls 422)	2	....	....
Soil Fertility Lectures (Sls 424)	....	3	....
Soil Fertility Laboratory (Sls 425)	....	2	....
Soil Management (Sls 428)	....	....	5
Irrigation Investigations (Sls 414)	3	....	....
Seminar (Sls 407)	1	1	1
[2]Technical Writing (J 314)	....	3	....
[1]Electives	6	3	9
	15	15	15

[1]Electives leading to production, agricultural teaching, research, extension, or commercial careers are chosen in conference with the head of the department.

[2]Students desiring exemption from J 314 may apply to the Dean of Agriculture, whereupon arrangements will be made for a special examination.

OPTION

Students majoring in agronomy or soils who desire to prepare for *soil-conservation* service should take the following courses.

Junior Year	Term hours F	W	S
Cover Crop and Soil-Erosion Prevention Plants (FC 320)	....	2	....
Climatology (Sls 319)	....	....	2
Geology (G 201, 202)	3	3	....
General Forestry (F 111)	3	....	....
Range Improvement and Maintenance (FC 319)	....	3	....
Soil Survey (Sls 432)	....	....	3
Principles of Plant Ecology (Bot 341)	....	4	....
Plane Surveying (CE 221)	3	....	....
Senior Year			
Range and Pasture Botany (Bot 314)	3	....	....
Agricultural Land Economics (FM 420)	....	3	....
Agricultural Appraisal (FM 425)	....	....	3
Silviculture: Forestation (F 343)	....	....	4
Soil Physics Lectures (Sls 421)	3	....	....
Soil Physics Laboratory (Sls 422)	2	....	....
Soil Conservation (Sls 413)	....	3	....
Soil Conservation Engineering (AE 471)	3	....	....
Economic Plant Adaptation (FC 418)	....	....	3
Field-Plot Technique (FC 416)	....	....	3

FOOD INDUSTRIES

Freshman Year

English Composition (Eng 111, 112, 113)	3	3	3
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
General Botany (Bot 201, 202)	....	3	3
General Physics (Ph 201, 202, 203)	4	4	4
Agricultural Resources (AEc 111)	3	....	....
Elements of Horticulture (Hrt 111)	....	....	3
Military Science	1	1	1
[1]Physical Education	1	1	1
	15	15	18

Sophomore Year

Principles of Food Preservation (FI 250)	3	....	....
Principles of Canning Fruits (FI 251)	....	3	....
Principles of Canning Vegetables (FI 252)	....	....	3
Principles of Plant Physiology (Bot 331)	....	....	4
Organic and Agricultural Biochemistry (Ch 251, 252)	5	3	....
General Bacteriology (Bac 204, 205, 206)	3	3	3
Principles of Economics (Ec 201, 202, 203)	3	3	3
Extempore Speaking (Sp 111)	....	3	....
Military Science	1	1	1
Physical Education	1	1	1
	16	17	15

Junior Year

Dehydration of Fruits and Vegetables (FI 331)	3	....	....
Food Technology (FI 321)	....	....	2
Pickles, Relishes, and Condiments (FI 341)	3	....	....
Vegetable Crops for Manufacturing (VC 322)	....	3	....
Fruit Production (Pom 415)	....	....	4
Refrigeration and Cold Storage (ME 363)	....	....	3
Principles of Plant Pathology (Bot 351)	4	....	....
Business Law (BA 256, 257)	....	4	4
Elements of Organization and Production (BA 221)	4	....	....
Elementary Journalism (J 111)	....	3	....
American National Government (PS 212)	....	3	....
Electives	3	3	3
	17	16	16

[1]General Hygiene (PE 150), 2 term hours, is taken one term in place of Physical Education.

Senior Year	Term hours F	W	S
Food Products Manufacture (FI 411)	3	----	----
Fruit Juice and Vinegar Manufacture (FI 351)	3	----	----
Commercial Jam and Jelly Manufacture (FI 352)	----	3	----
Preserves, Glacéd Fruits, and Candied Fruits (FI 361)	----	----	3
Frozen Foods (FI 412, 413)	----	3	3
Commercial Pomology (Pom 313)	3	----	----
[1]Technical Writing (J 314)	3	----	----
Transportation (Ec 435)	----	4	----
Accounting for Technical Students (BA 385)	----	----	3
Thesis (FI 403)	----	----	3
Seminar (FI 407)	1	1	1
Electives	3	5	3
	16	16	16

HORTICULTURE: FRUIT AND VEGETABLE PRODUCTION AND DISTRIBUTION[2]

Junior Year	Term hours F	W	S
Commercial Pomology (Pom 313)	3	----	----
Fruit Production (Pom 415)	----	----	4
Vegetable Production (VC 321)	----	3	----
Dehydration of Fruits and Vegetables (FI 331)	3	----	----
Principles of Plant Pathology (Bot 351)	4	----	----
Principles of Economic Entomology (Ent 314)	----	3	----
Principles of Agricultural Marketing (AEc 441)	4	----	----
[3]Marketing Organizations (AEc 442)	----	----	3
Elementary Journalism (J 111)	----	3	----
Accounting for Technical Students (BA 385)	----	3	----
Extempore Speaking (Sp 111)	----	----	3
Electives	3	3	6
	17	15	16

Senior Year			
American National Government (PS 212)	----	3	----
Systematic Pomology (Pom 417)	4	----	----
Pruning (Pom 431)	----	3	----
Spraying (Pom 419)	----	----	3
Vegetable Varieties (VC 423)	2	----	----
Vegetable Marketing (VC 424)	3	----	----
Handling and Distribution of Fruits (Pom 413)	----	3	----
Business Law (BA 256, 258)	4	----	4
Money and Banking (Ec 413)	----	----	4
Seminar (Hrt 407)	1	1	1
[1]Technical Writing (J 314)	----	3	----
Electives	3	3	4
	17	16	16

[1]Students desiring exemption from J 314 may apply to the Dean of Agriculture, whereupon arrangements will be made for a special examination.

[2]Other horticultural subjects may be chosen after reading the descriptions of these courses on pages 236-238 subject to the approval of the head of the department.

[3]May be taken in either the junior or senior year. Given alternate years.

HORTICULTURE: LANDSCAPE CONSTRUCTION AND MAINTENANCE[1]

Freshman Year	Term hours F	W	S
General Botany (Bot 201, 202, 203)	3	3	3
Home Ground Planning (LA 279)	----	3	----
History and Literature of Landscape Architecture (LA 356, 357, 358)	2	2	2
English Composition (Eng 111, 112, 113)	3	3	3
Construction (AA 120)	----	----	1
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
Trigonometry (Mth 106)	4	----	----
Elements of Horticulture (Hrt 111)	----	----	3
[2]Physical Education	1	1	1
Military Science	1	1	1
	17	16	17

Sophomore Year			
Lower-Division Architectural Design (AA 297)	1	1	1
Lower-Division Landscape Design (LA 290)	2	2	2
Plane Surveying (CE 226, 223)	3	----	3
Principles of Economic Entomology (Ent 314)	----	3	----
Soils (Sls 211, 212) Soil Drainage and Irrigation (Sls 213)	3	3	3
Principles of Economics (Ec 201, 202, 203)	3	3	3
House Planning and Architectural Drawing (AA 178, 179, 180)	3	3	3
Physical Education	1	1	1
Military Science	1	1	1
	17	17	17

Junior Year			
Plant Materials (LA 326, 327, 328)	3	3	3
Lower Division Architectural Design (AA 297)	1	----	2
Intermediate Landscape Design (LA 390)	3	3	3
Maintenance and Construction (LA 359, 360, 361)	3	3	3
Principles of Plant Pathology (Bot 351)	4	----	----
Plant Propagation (Hrt 311)	----	3	----
Principles of Plant Physiology (Bot 331)	----	----	4
Extempore Speaking (Sp 111)	3	----	----
Elementary Journalism (J 111)	----	3	----
Electives in Agriculture	----	2	2
	17	17	17

Senior Year			
Pruning (Pom 431)	----	3	----
Spraying (Pom 419)	----	----	3
Planting Plans (LA 392, 393, 394)	2	2	2
Layout of Small Properties (LA 382, 383, 384)	2	2	2
American National Government (PS 212)	3	----	----
Lawns and Turfs (FC 313)	2	----	----
Technical Writing (J 314)	----	3	----
General Floriculture (Hrt 316)	3	----	----
Greenhouse Crops (Hrt 313)	----	3	----
Nursery Management (Hrt 320)	----	----	3
Electives	3	3	6
	15	16	16

[1]The student is required to have one or more summers of practical experience in some one of the following or related fields: ornamental nursery; florist establishment; national, state, or municipal parks; roadway beautification; or large private grounds. Students desiring a degree in landscape architecture may qualify by taking additional work in the School of Architecture and Allied Arts at the University of Oregon or in some other institution where this degree is granted.

[2]General Hygiene (PE 150), 2 term hours, is taken one term in place of Physical Education.

Curriculum in Agricultural Education[1]

B.S. Degree

(See Common Freshman Year, page 197)

Sophomore Year	Term hours F	W	S
Principles of Economics (Ec 201, 202, 203)	3	3	3
Organic and Agricultural Biochemistry (Ch 251)	5	----	----
Introduction to Dairy Husbandry (AI 122)	3	----	----
General Bacteriology (Bac 204)	----	3	----
Principles of Farm Management (FM 211)	----	----	3
Farm Motors and Tractors (AE 311) *or* Automobile Mechanics (AE 312)	----	3	----
Forage and Root Crop Production (FC 211)	----	----	3
Soils (Sls 211, 212)	3	3	----
Military Science	1	1	1
Physical Education	1	1	1
Electives	----	----	6
	16	14	17

Junior Year			
Elementary Journalism (J 111)	----	3	----
Extempore Speaking (Sp 111)	----	----	3
Outlines of Psychology (Psy 211)	----	6	----
Educational Psychology (Ed 312)	----	----	3
Animal Nutrition (AI 411)	4	----	----
Diseases of Livestock (VM 341)	4	----	----
Blacksmithing (IA 352)	----	----	3
Electives	7	6	6
	15	15	15

Suggested Electives			
Soil Physics Lectures (Sls 421)	3	----	----
Soil Fertility Lectures (Sls 424)	----	3	----
Seed Production (FC 414)	3	----	----
Principles of Agricultural Breeding (FC 315)	3	----	----
Range Livestock Management (AH 419, 420)	----	3	3
Livestock Economics (AH 424)	----	----	3
Dairy Herd Management (DH 322)	----	3	----
Poultry Feeding (PH 411)	----	4	----
Vegetable Growing Practices (VC 323)	----	----	3

Senior Year			
Principles of Teaching (Ed 313)	3	----	(3)
Special Teaching Methods (Ed 408)	3	----	(3)
Supervised Teaching (Ed 415)	(6)	6	(6)
The Agriculture Curriculum (AEd 417)	----	(3)	3
Adult Education in Agriculture (AEd 418)	----	3	----
Rural Survey Methods (AEd 533)	----	----	3
Farm Organization (FM 312)	3	----	----
Enterprise Costs and Profits (FM 414)	----	----	3
Farm Mechanics (AE 221)	3	----	----
[2]Technical Writing (J 314)	----	----	3
American National Government (PS 212)	----	----	3
Electives	3	7	3
	15	16	18

Suggested Electives			
Applied Farm Management (FM 412)	----	3	----
Agricultural Appraisal (FM 425)	----	----	3
Farm Mechanics (AE 222)	----	3	----
Pruning (Pom 431)	----	3	----
Turkey Management (PH 351)	3	----	----
Marketing Poultry Products (PH 421)	4	----	----
Principles of Agricultural Marketing (AEc 441)	4	----	----
Rural Electrification (AE 331)	----	3	----
Forage and Related Crops (FC 324)	----	----	3

[1]Students who have had Smith-Hughes agriculture in high school may have greater freedom in choice of electives and, on the approval of the Dean of Agriculture, may be excused from certain introductory courses in agriculture ordinarily required in order to take advanced and additional work in the various departments.

[2]Students desiring exemption from J 314 may apply to the Dean of Agriculture, whereupon arrangements will be made for a special examination.

Curriculum in Agricultural Engineering

B.S. Degree

	Term hours		
Freshman Year	F	W	S
English Composition (Eng 111, 112, 113)	3	3	3
Elementary Analysis (Mth 101, 102, 103)	4	4	4
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
Agricultural Engineering Survey (AE 101)	2	....	....
Forging and Welding (IA 250)	2	....	....
Farm Mechanics (AE 221, 222)	....	3	3
Military Science	1	1	1
[1]Physical Education	1	1	1
	16	15	15
Sophomore Year			
Outlines of Economics (Ec 212)	3	....	....
General Sociology (Soc 212)	....	3	....
American National Government (PS 212)	....	....	3
Engineering Drawing (GE 111, 112)	2	2	....
House Planning and Architectural Drawing (AA 178)	....	....	2
Engineering Problems (GE 101, 102, 103)	2	2	2
Engineering Physics (Ph 111, 112, 113)	3	3	3
Farm Motors and Tractors (AE 311)	3	....	....
Automobile Mechanics (AE 313)	....	3	....
Farm Implements (AE 231)	....	....	3
Machine Shop Practice (IA 260)	....	....	2
Military Science	1	1	1
[1]Physical Education	1	1	1
	15	15	17
Junior Year			
NORM			
Plane Surveying (CE 226)	3	....	....
Principles of Farm Management (FM 211)	....	....	3
Rural Electrification (AE 331)	....	3	....
Pumps and Irrigation Equipment (AE 321)	....	....	3
Reading and Conference (AE 305)	1	1	1
Soils (Sls 211, 212)	3	3	....
Electives	3	3	3
	10	10	10
PROFESSIONAL OPTION			
Junior-Year Norm	10	10	10
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
Descriptive Geometry (ME 211)	3	....	....
Mechanics (ME 212, 213)	....	3	3
	17	17	17
VOCATIONAL OPTION			
Junior-Year Norm	10	10	10
Agricultural Resources (AEc 111)	3	....	....
Introduction to Dairy Husbandry (AI 122)	....	3	....
Elements of Agronomy (FC 111)	....	....	3
Electives	4	4	4
	17	17	17
Senior Year			
NORM			
Accounting for Technical Students (BA 385)	3	....	....
Business Law (BA 256)	....	....	4
Elementary Journalism (J 111)	....	3	....
Extempore Speaking (Sp 111)	3	....	....
[2]Technical Writing (J 314)	....	....	3
Elementary Hydraulics (CE 322)	....	3	....
Farm Structures (AE 461, 462)	3	3	....
Seminar (AE 407)	1	1	1
Electives	3	3	3
	13	13	11

[1]General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education.

[2]Students desiring exemption from J 314 may apply to the Dean of Agriculture, whereupon arrangements will be made for a special examination.

Professional Option	Term hours F	W	S
Senior-Year Norm	13	13	11
Steam, Air, and Gas Power (ME 346)	....	....	3
Industrial Electricity (EE 351)	3	....	....
Electives	....	4	1
	16	17	15

Vocational Option			
Senior-Year Norm	13	13	11
Forage and Root Crop Production (FC 211)	3	....	....
Soil Drainage and Irrigation (Sls 213)	....	....	3
Electives	....	4	1
	16	17	15

Curriculum in Agricultural Technology

B.S. Degree

Freshman Year	Term hours F	W	S
English Composition (Eng 111, 112, 113)	3	3	3
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
General Zoology (Z 201, 202, 203) *or* General Botany (Bot 201, 202, 203)	3	3	3
Elementary Analysis (Mth 101, 102, 103) *or* Lower-division agriculture courses	4	4	4
Electives (Lower-division agriculture courses)	2	2	2
[1]Physical Education	1	1	1
Military Science	1	1	1
	17	17	17

Sophomore Year			
Principles of Economics (Ec 201, 202, 203)	3	3	3
Principles of Agricultural Breeding (FC 315) *or* Animal Breeding (AI 315)	(3)	*or* 3	....
General Bacteriology (Bac 204)	....	3	....
Lower-division science elective (sequence courses)	3	3–5	3–8
Agriculture electives from courses numbered 211 to 299	....	4–6	4–9
Military Science	1	1	1
Physical Education	1	1	1
Electives	8	....	....
	16	16	16

Junior and Senior Years			
Extempore Speaking (Sp 111)	3	....	....
Elementary Journalism (J 111)	....	3	....
American National Government (PS 212)	3	....	....
[2]Technical Writing (J 314)	....	3	....
[3]Electives	25	25	30
	31	31	30

[1]General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education.

[2]Students desiring exemption from J 314 may apply to the Dean of Agriculture, whereupon arrangements will be made for a special examination.

[3]Not less than 24 hours of upper-division courses in agriculture including 3 hours of Seminar.

Two-Year Curriculum in Agriculture

Certificate in Agriculture

First Year	Term hours F	W	S
English Composition (Eng 111, 112, 113)	3	3	3
[1]Science	3	3	3
Elements of Agronomy (FC 111)	3	----	----
Elements of Horticulture (Hrt 111)	----	----	3
Introduction to Animal Husbandry (AI 121)	3	----	----
[2]Introduction to Poultry Husbandry (AI 123)	----	3	----
Current Affairs (PS 232)	----	2	----
Agricultural Engineering (AE 111)	3	----	----
Military Science	1	1	1
[3]Physical Education	1	1	1
Electives	----	4	6
	17	17	17

Second Year			
Principles of Farm Management (FM 211)	----	----	3
Soils (Sls 211, 212)	3	3	----
Plant Propagation (Hrt 311)	----	3	----
Forage and Root Crop Production (FC 211)	----	----	3
[2]Introduction to Dairy Husbandry (AI 122)	3	----	----
Agricultural Resources (AEc 111)	----	3	----
Diseases of Livestock (VM 341)	4	----	----
Farm Structures (AE 461) *or* House Planning and Architectural Drawing (AA 178)	3	----	----
American National Government (PS 212)	----	3	----
Public Speaking	----	----	3
Military Science	1	1	1
Physical Education	1	1	1
Electives	2	3	6
	17	17	17

Division of Agricultural Economics

THE Division of Agricultural Economics deals with the business, financial, and managerial phases of agriculture and agricultural business. The Department of Farm Management deals largely with the individual farm. The Department of Agricultural Economics deals with the broader economic phases of agriculture. No sharp line of distinction is drawn, however, between farm management and agricultural economics. Every effort is made, moreover, to coordinate the work in agricultural economics and farm management with that of the Plant Industries and Animal Industries divisions.

Agricultural Economics--Agricultural Marketing

THE Department of Agricultural Economics, including Agricultural Marketing, aims primarily to meet the needs of students interested in the business side of agriculture and its broader economic relationships, together with sufficient work in agricultural science and technique to give the student a scientific concept of the industry.

[1]Courses in the basic sciences may be selected from the following: Biological Science Survey, Physical Science Survey, Chemistry, Botany, Zoology, Entomology.

[2]Students especially interested in plant industries or some other phase of agriculture that does not require all three courses in animal industries may make a substitution.

[3]General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education.

The growth of agriculture into a vast commercial industry and the increasing maze of economic, financial, and marketing problems accompanying that development are opening up attractive opportunities to well-trained students in agricultural economics. The curriculum (page 198) not only affords excellent preparation for those who intend to farm and assume positions of business, educational, and community leadership, but also gives the basic training needed for professional careers as teachers, research workers, and extension specialists. It lays a foundation for a business career in connection with farmers' buying and selling associations, real-estate and farm-mortgage companies, banks, brokerage, jobbing, wholesale and retail houses, and expert business service for the agricultural field. It gives valuable training for positions in county agricultural extension work, both professional and commercial; chamber of commerce work; or professional work as adviser to business houses or railway companies where aggressive qualities of leadership and an intimate knowledge of town and country relations are required.

In order that the student may have ample opportunity to acquire the broad and liberal training requisite for entry into many of these occupations, ample electives are provided for in the junior and senior years.

The practical character of the instruction in agricultural economics is enhanced by the extension and research activities conducted by this department. Through the Agricultural Experiment Station investigations dealing with (a) rural taxation, (b) marketing, (c) transportation, and (d) economic trends and the market situation and outlook for Oregon's leading agricultural commodities are being conducted.

Through the Extension Service, market news and agricultural situation and outlook material are disseminated to farmers and others. Special attention is given also to the marketing, processing, and handling of agricultural commodities through both cooperative and private agencies. The department has leased-wire connections with the leading markets of the country, through which daily and even hourly market reports are received.

All of the work in agricultural economics is very closely coordinated with the work in agricultural production in the various other departments of the State College.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

AEc 111. **Agricultural Resources.** 3 hours fall or winter.

The agricultural resources of the world, with special reference to the resources of the United States and of the State of Oregon; a broad survey of agriculture, including soil, climate, topography, institutions, and population and their relation to present-day problems.

AEc 211. **Agricultural Economics.** 3 hours spring.

The major supply, demand, and foreign-trade problems of American agriculture; their underlying economic principles; especial attention to the economics of controlled production and controlled foreign trade. Prerequisite: at least two terms of Principles of Economics.

AEc 221. **Agricultural Statistics.** 3 hours winter.

Methods of analyzing, simplifying, and presenting statistical material; sources of business and agricultural statistics; study of statistical devices used in the fields of business and agriculture.

UPPER-DIVISION COURSES

AEc 312. **Agrarian Movements.** 3 hours spring.
Review of the fundamentals of cooperation; discussion of agrarian organizations such as the Grange, Farmers' Union, American Society of Equity, the Gleaners, Farm Bureau, Non-Partisan League, and cooperative organizations for production, distribution, consumption, and credit purposes. Prerequisite: AEc 211. Professor Nelson.

AEc 331. **Economic Development of Agriculture.** 3 hours spring.
History of the development of agriculture, of political economy as applied to agriculture, and of present-day agricultural problems. Prerequisite: Ec 203. Professor Potter.

AEc 405. **Reading and Conference.** Terms and hours to be arranged.

AEc 407. **Seminar.** 1 hour each term.

AEc 431. **Farm Credits.** (G) 3 hours winter.
Fundamental principles of credit and finance as applied to agriculture; credit requirements of agriculture; existing credit agencies; strength and weakness of present credit system. Prerequisite: Ec 203; junior or senior standing. Professor Potter.

AEc 441. **Principles of Agricultural Marketing.** (G) 4 hours fall.
The marketing of staples, semistaples, and perishable farm products, including the geographical location of producing areas; marketing routes from the producer to the consumer; types of middlemen, including cooperative marketing associations; marketing costs; standardization; factors influencing prices; general description of our whole marketing system as it exists today. Prerequisite: Ec 203. Professor Nelson.

AEc 442. **Marketing Organizations.** (g) 3 hours spring.
Principles of organization, management, and operation of cooperative marketing associations; application to the various types of agricultural commodities; emphasis on types of organization and methods of formation, financial and operating policies, membership relations, marketing machinery and functions, sales methods and policies, and public relations. Offered in even-numbered years only. Prerequisite: AEc 441. Professor Nelson.

AEc 443. **Commodity Marketing.** (G) 3 hours winter.
A study of the sources and conditions of supply of specific agricultural commodities or groups of commodities; the nature of demand; channels of distribution; the functions performed by the various market middlemen engaged in marketing specific agricultural commodities or groups of commodities; other practices and policies affecting the marketing process. Prerequisite: AEc 441, BA 223 or equivalent. One lecture; other hours by arrangement. Associate Professor DeLoach.

AEc 444. **Milk Marketing.** (G) 3 hours winter.
A study and analysis of the major problems of marketing fresh milk for human consumption. Study of the economics of milk marketing as affected by the economic and sanitary controls imposed by the state or federal government; special attention to state and federal milk control measures and their administration through the use of licenses, market quotas, pools, and price controls. Prerequisite: AEc 441, DH 410, or consent of instructor. Professor DeLoach.

AEc 451. **Agricultural Prices.** (G) 3 hours spring.
Aim is to analyze trends of farm and market prices, compare prices of agricultural commodities with nonagricultural products, and consider prices

in their relation to production and marketing programs. The state and national agricultural situation and outlook receive special attention. Offered in odd-numbered years only. Prerequisite: Ec 203 or 211, AEc 441. Professor Nelson.

AEc 461. **Public Land Policies.** (G) 3 hours fall.

Economic, legislative, and historical background of present public-land and range problems; factors governing public-land legislation and administration, Federal, state, and county; relation of public-land legislation and administration to land-use and to nonland-use factors. Professor Potter.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

AEc 501. **Research.** Terms and hours to be arranged.

AEc 503. **Thesis.** Terms and hours to be arranged.

AEc 505. **Reading and Conference.** Terms and hours to be arranged.

AEc 507. **Seminar.** 1 hour each term.

AEc 571. **Marketing Finance.** 4 hours spring.

Methods of financing agricultural marketing and marketing organizations, including financial structure, methods of raising capital, current financial operations, sources of credit and credit policies, and management of earnings; financial statements analyzed and interpreted; cooperative and noncooperative marketing enterprises in the fields of fruits, vegetables, dairy products, and poultry. Open only to students who have had satisfactory preparation in money and banking, rural finance, and accounting. Associate Professor DeLoach.

AEc 572. **Marketing Problems.** 3 or 5 hours spring.

Agricultural policy of the United States since the World War, particularly as it has affected the distribution of our national income; effects on the several producing groups, on those engaged in marketing farm products, and on consumers. Special problems are studied by students on seminar plan. Prerequisite: consent of instructor. Three periods. Associate Professor DeLoach.

Farm Management

FARM management deals with (1) the organization, equipment, and operation of the farm as a business enterprise; (2) the cost of production; and (3) agricultural land economics and appraisal. Its aim is to correlate and synchronize the operations in the various phases of production on the farm in such a way as to result in a smoothly running, efficient plant from which continuous maximum returns may be obtained. The curriculum in farm management (page 199) is designed to give the student a broad, well-rounded training in all the phases of agriculture that will prepare him for successful production, with emphasis laid upon those studies that will best fit him for successful management of the farm. The work also prepares students for professional work as farm managers and supervisors, county agriculturists, rural rehabilitation supervisors, extension specialists, Smith-Hughes teachers, farm appraisers, soil conservationists, agricultural statisticians, bank and railroad agriculturists, United States Department of Agriculture civil-service candidates, college instructors, and experiment-station research men.

Opportunity for graduate work leading toward the master's and doctor's degrees is well provided for in the upper-division and graduate courses offered by this department combined with the offerings of other departments appropriate for minors.

Candidates for the doctorate should be, of course, more fully qualified in advanced study in economics and related fields.

Equipment. The farm-management laboratory and seminar room is provided with drafting tables and instruments, surveying instruments, original data and record sheets, lantern slides and charts, and a periodical and bulletin reference library. Investigational work carried on in many different parts of the state affords the advanced student excellent opportunities for field work or thesis study.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSE

FM 211. **Principles of Farm Management.** 3 hours fall or spring.

Major factors affecting the labor income; types of farming; selection and purchase of the farm; capital investment and distribution; use of credit; size, quality and diversity of business; farm leases and rental methods; man- and horse-labor efficiency, farm-equipment costs and duty; farm and farmstead layout; cropping systems and crop rotations; cost of production; use of farm records and accounts; getting started in the farming business. Short field trips. (Fall section for upper-classmen and spring for sophomores.)

UPPER-DIVISION COURSES

FM 311. **Farm Accounting.** 3 hours fall or winter.

Drill in setting up and analyzing accounts for agricultural enterprises and for farms of different types, with emphasis on clarifying the student's understanding of inventories and debits and credits; preparation of different forms of summary statements of the year's business, adapted to reporting income tax, enterprise costs and profits, etc. For agriculture students only. One lecture; 1 recitation; 1 two-hour laboratory period. Prerequisite: FM 211. Associate Professor Kuhlman.

FM 312. **Farm Organization.** 3 hours fall.

Application of farm-management principles to the organization of the individual farm; methods of measuring the efficiency of any given farm; organizing a farm business; standards for farm planning; efficiency practices in production and operation; planning production programs, cropping systems, and fertility balances; labor problems; livestock, machinery, and building equipment; methods of increasing productive business; methods of financing, etc. Field trips. Prerequisite: FM 211. Two lectures; 1 three-hour laboratory period. Professor Scudder.

FM 313. **Operation Efficiency.** 3 hours winter.

Major attention is centered on efficiency in the use of labor and machinery and the arrangement and use of farm buildings on farms of different types and sizes; interpretation and use of outlook and other current economic information in its application to the individual farmer's problems in buying, advertising, and selling farm products. Two lectures; one 2-hour laboratory period. Professor Kuhlman.

FM 401. **Research.** Terms and hours to be arranged.

FM 405. **Reading and Conference.** Terms and hours to be arranged.

FM 407. **Seminar.** 1 hour each term.

FM 411, 412, 413. **Applied Farm Management.** (G) Hours to be arranged. Field work on individual problems, such as preparation of detailed organization and management plans for specific farms, efficiency testing of groups of farms; field studies of costs and profits of specific farm enterprises; field study of specific farm practices and their efficiency; studies in equipment and building improvement; farm-management factor studies, etc.; directed and reviewed through weekly round-table discussions. All laboratory and field work. Prerequisite: FM 211, 311 or equivalent. Professor Scudder.

FM 414. **Enterprise Costs and Profits.** (G) 3 hours spring.
Survey and comparison from the economic or cost-and-profit viewpoint of the major farm enterprises, particularly those of the Northwest and Pacific Coast, to give the student a needed basis for the correct selection of enterprises in different regions; importance of each enterprise; causes of failure; size, capital, labor, and maintenance requirements; production possibilities and markets; costs, prices, and profits; analyses of new or questionable enterprises; field study of major enterprises. Prerequisite: FM 211, 311 or equivalent. Three lectures. Professor Scudder.

FM 415. **Enterprise Costs and Profits.** (g) 2 hours winter.
Similar to FM 414 but covering other enterprises not discussed in FM 414. Two lectures. Professor Scudder.

FM 418. **Agricultural Land Use Planning.** (G) 2 hours spring.
Present and prospective conservation and land-planning programs will affect type of farming and farm organization. The purpose of this course is to outline the objectives and procedure followed in these programs and to appraise the probable effect of such programs on the organization and operation of Oregon farms. Prerequisite: Ec 203; FM 211, 311 or equivalent. Professor Mumford.

FM 420. **Agricultural Land Economics.** (G) 3 hours winter.
Applied economics of the subject, presenting an inventory of our agricultural land resources; bases and procedure in agricultural land classification, utilization, and disposal; costs and problems of land reclamation; land-settlement plans, procedure, and results; problems in land tenure and conservation; agricultural land values and appraisal methods. Prerequisite: Ec 203; FM 211, 311 or equivalent. Professor Scudder.

FM 425. **Agricultural Appraisal.** (G) 3 hours spring.
Field work in appraisal of farms of different types; appraisal of agricultural land areas; appraisal of farm enterprises; advanced commercial and Federal appraisal methods used and newer methods tested. Weekly field trips. Prerequisite: FM 414, 420, Sls 212, 213 or equivalent. Professor Scudder.

GRADUATE COURSES

Courses numbered 400-499 and designated *(g)* or *(G)* may be taken for graduate credit.

FM 501. **Research.** Terms and hours to be arranged.

FM 503. **Thesis.** Terms and hours to be arranged.

FM 507. **Seminar.** 1 hour each term.

FM 511. **Types and Systems of Farming.** Term and hours to be arranged.
Major types and systems of farming in Oregon, the Northwest, the Pacific Coast, the United States, and foreign countries; examination of the organi-

zation and management factors involved in different types and systems, such as land and other capital requirements, the labor program, land utilization, etc.; effect of different systems of farming on soil conservation, farm income, and standards of living, and on interregional competition. Prerequisite: Ec 203, AEc 211, 221, 441; FM 312, 414 or equivalent. Professor Scudder.

FM 512. **Farm Tenure and Administration.** Term and hours to be arranged. The different forms of tenure and changes in tenure in the United States and abroad and the effect on operator's income, standard of living, and opportunity; important factors in the organization and management of tenant farms and the improvement of farm-leasing forms and methods; administrative problems of tenant farming, corporation farming, and the problems involved in absentee ownership. Prerequisite: Ec 203; FM 211, 312 or equivalent. Associate Professor Kuhlman.

FM 514. **Advanced Agricultural Appraisal.** Term and hours to be arranged. Methods of appraising farm buildings; appraisal of reclamation district lands, such as irrigation, drainage, diked and logged-off lands, and of western range and submarginal lands; field work. Prerequisite: FM 418, 425 or equivalent. Professor Scudder.

FM 518. **Farm Management Research Methodology.** Term and hours to be arranged.

Methods of obtaining and determining costs of agricultural products, including the survey method; assembling, tabulating, analyzing, and interpreting cost data; cost record forms for different types of farms and enterprises and for cost surveys. Prerequisite: FM 311, 312, Ec 203, AEc 221 or equivalent. Associate Professor Kuhlman.

Division of Animal Industries

IN THE Division of Animal Industries are included the departments of Animal Husbandry, Dairy Husbandry (includes Dairy Manufacturing), Fish and Game Management, Poultry Husbandry, and Veterinary Medicine. Training for dairy manufacturing and for range and range-livestock management is also given through the curricula in this division.

The specialized producer of livestock products can no longer ignore relationship of competitive livestock industries to his own in the modern business scheme. One livestock product is easily substituted for another, and consumer demands are quick to reflect the change in prices of livestock commodities.

The instruction in animal industries is arranged not only to train students in their fields of special interest, but to make them sufficiently familiar with types of other livestock production to appreciate the importance of proper adjustment of production and marketing operations to competitive conditions. Liberal opportunity is provided for fundamental training in the several phases of agricultural economics—the technique of farm management, agricultural credits, rural finance, and agricultural trade, both international and domestic. Present economic conditions in agriculture demand such training. It is thus seen that the courses in animal industries not only train in economic and modern methods of production, but offer virile training to those with professional or business aims. Business involving the distribution of livestock products or the financing of livestock operations afford one of the greatest opportunities to the student of today. The intricate problems of marketing and distribution require more and more fundamental training in methods of production.

Courses in Animal Industries

BASIC and supplementary to the work of the several departments in the division, courses in animal industries are offered for both undergraduate and graduate students. The undergraduate courses are planned from the broad point of view of animal industries as a whole or are concerned with more than one field.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

AI 111. **Stock Judging I.** 3 hours winter.

The various types of farm animals studied by score cards and comparative methods, and the student is made familiar with the acceptable types of farm livestock for market and breeding purposes. Market types of feeder and fat livestock are considered. Beef cattle, dairy cattle, sheep, swine, and horses are studied.

AI 121. **Introduction to Animal Husbandry.** 3 hours any term.

National and state economic importance and geographical distribution of beef cattle, horses, swine, sheep, and goats; practical details of the correct feeding, care, management, and marketing of these animals and their products. Two lectures; 1 two-hour lecture-demonstration period.

AI 122. **Introduction to Dairy Husbandry.** 3 hours any term.

National and state economic importance and geographical distribution of dairy cattle; practical details of the current management practices of modern dairying. Special arrangements can be made to learn the operation of the Babcock test. Two lectures; 1 two-hour lecture-demonstration period.

AI 123. **Introduction to Poultry Husbandry.** 3 hours any term.

National and state economic importance and geographical distribution of poultry; practical details of the correct management practices of farm poultry and of the marketing of poultry products. Two lectures; 1 two-hour laboratory period.

UPPER-DIVISION COURSES

AI 315. **Animal Breeding.** 3 hours winter.

Principles of heredity as applied to the breeding of domestic animals and fowls.

AI 410. **Nutrition of Fish and Game.** 4 hours spring.

Chemical and physiological principles of nutrition of game and fur-bearing animals; function of the various classes of nutrients when taken into the animal body; chemical composition of feeds, energy values, and adaptability for the feeding of game animals. Professor Nelson.

AI 411. **Animal Nutrition.** (g) 4 hours fall or winter.

Chemical and physiological principles of animal nutrition; function of the various classes of nutrients when taken into the animal body; nutritive ratios; feeding standards; compounding ratios; feeds with special reference to chemical composition, energy values, and general adaptability to stock-feeding purposes. Prerequisite: Ch 251. Professor Nelson.

GRADUATE COURSES

Course AI 411 may be taken for graduate credit. Courses in animal husbandry, dairy husbandry (includes dairy manufacturing), fish and game management, and veterinary medicine numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

AI 501. **Research.** Terms and hours to be arranged.

AI 503. **Thesis.** Terms and hours to be arranged.

AI 505. **Reading and Conference.** Terms and hours to be arranged.

AI 507. **Seminar.** Terms and hours to be arranged.

AI 511. **Animal Nutrition.** 5 hours winter.

Critical review of the field of animal nutrition; nutritional research methods; energy concepts; protein metabolism; mineral and vitamin requirements; dietary deficiency disorders. Prerequisite: Ch 251, AI 411 or their equivalent. Professor Haag.

Animal Husbandry

COURSES in animal husbandry are planned to fit the student for the actual raising of livestock on the farm so that he may produce the highest grade of stock in the most economical and business-like manner. The student is thoroughly grounded in the underlying principles in order that he may successfully continue his study after leaving college, but the practical details are also thoroughly treated and a special effort is made to keep the students in close touch with the financial phases of the industry. Students who take this work as their specialty are expected not to devote their entire time to livestock; but, on the contrary, to familiarize themselves with veterinary science, crop production, soil fertility, range botany, and other phases of agriculture as well as general education subjects. Much work in economics and marketing is also expected.

Students majoring in animal husbandry (see curriculum, page 200) are given a very free range of electives so that they may fit their programs to their own particular needs. Special opportunity is afforded in this department in range and range-livestock management for students who wish to qualify as grazing specialists for Federal or other official positions, or who desire to engage in the operation of a range-livestock business.

Students not majoring in animal husbandry but desiring to elect some work in the department will be given careful attention to see that they get the work fitted to their individual needs.

Equipment. The equipment of the Department of Animal Husbandry consists essentially of livestock, barns, and the State College stock farms. The department maintains good representatives of all the leading breeds. The department has adequate equipment for the conduct of laboratory, lecture, and recitation work. Attention is called to courses and equipment in veterinary medicine (pages 228-229).

DESCRIPTION OF COURSES

LOWER-DIVISION COURSE

AH 211. **Livestock Breed Types.** 3 hours spring.

Judging of all kinds of livestock, particularly market types. Prerequisite: AI 111. Three two-hour laboratory periods.

AH 220. **Range and Range Livestock Management.** 3 hours fall.

General survey of the field of range and range livestock management primarily for forestry students who do not intend to major or minor in the field. Professor Johnson.

UPPER-DIVISION COURSES

AH 312. **Stock Judging II.** 4 hours fall.
Practical judging of all kinds of livestock, with trips to fairs and stock farms. Prerequisite: at least three credits in stock judging. Four two-hour laboratory periods. Assistant Professor Rodenwold.

AH 316. **Breeds of Livestock.** 3 hours spring.
Breeds of sheep, swine, horses, and beef cattle; their development, breeding, types, and best uses. Prerequisite: AI 111, AI 315, or FC 315. Two recitations; 1 two-hour laboratory period. Assistant Professor Rodenwold.

AH 319. **Livestock Practice.** 1 hour fall.
Laboratory practice in such work as dipping, dehorning, hoof trimming, shearing, horse training, and other common operations of the stock farm. (Note: The department reserves the right to limit the number of students in this course.) One three-hour laboratory period. Professor Nelson, Associate Professor Oliver.

AH 320. **Livestock Practice.** 2 hours spring.
A continuation of AH 319. Two three-hour laboratory periods. Professor Nelson, Associate Professor Oliver.

AH 326. **Meats.** 3 hours winter or spring.
Meats of all classes of meat animals; butchering; location and cutting of standard and retail cuts; judging meat raw and cooked; economics of meat production; sanitation and inspection; abattoirs, packing houses, and retail markets. One lecture or recitation; 2 three-hour laboratory periods. Associate Professor Oliver.

AH 330, 331. **Farm Livestock Management.** 3 hours winter and spring.
The handling of livestock on the farm and in the feed lot; consideration of proper land use in conjunction with adapted species of livestock, and available markets; methods of feeding for maintenance and fattening; selection of feeders, etc. Prerequisite: AI 411. Two lectures; laboratory work to be arranged. Associate Professor Oliver.

AH 333. **Range Survey Methods.** 3 hours spring.
Range-forage appraisal methods in use by Federal and state administrative and research agencies; supplemental lectures by field administrators and experiment-station staff members, outlining requirements expected of employees by their organizations. Mr. G. D. Pickford, range ecologist, United States Forest Service, will give two lectures. Through the courtesy of the Division of Grazing, United States Department of the Interior, a series of lectures is also offered, to be given by Hugh Bryan, chief of range improvements. Two one-hour lectures and one three-hour Saturday laboratory section. One-week field trip required. Prerequisite: AE 111, Bot 203 or their equivalent. Professor Johnson.

AH 401. **Research.** Terms and hours to be arranged.

AH 405. **Reading and Conference.** Terms and hours to be arranged.

AH 407. **Seminar.** Terms and hours to be arranged.

AH 412. **Livestock Feeding.** (G) 3 hours fall.
An advanced course in the feeding of horses, beef cattle, sheep, and swine. Special study of the practices of the best stockmen, and of investigations carried on by the various experiment stations. Students desiring to take only such parts of the course as relate to certain kinds of livestock are

permitted to do so by arrangement with the head of the department. Prerequisite: AI 411. Professor Nelson.

AH 418. **Wool and Mohair.** (G) 3 hours.

Wool and mohair, covering commercial value, physical and chemical structure, preparation and marketing, judging, sorting, grading, scouring, and principles of manufacture. Prerequisite: AH 316. Two lectures; 1 two-hour laboratory period. Professor Nelson.

AH 419, 420. **Range Livestock Management.** (G) 3 hours each term, winter and spring.

The handling of livestock on the range, proper control in numbers; distribution of stock; salting, watering, breeding, branding, etc.; control of livestock losses caused by poisonous plants and predatory animals; winter livestock husbandry in range territory. Prerequisite: AI 410 or 411 and Bot 314 or their equivalent. Professor Johnson.

AH 421. **Pedigree Study.** (g) Hours to be arranged, spring.

A laboratory study of the blood lines of the various breeds of livestock. Each student is expected to select one or two breeds as the basis for special study rather than to attempt to cover all breeds. Assistant Professor Rodenwold.

AH 423. **Reproduction Problems.** (G) 3 hours winter.

The breeding efficiency of livestock; the effect of nutritional, genetic, and physiological factors on reproduction; the care and management of young and breeding animals. The student has opportunity to observe and study animals during breeding, pregnancy, parturition, and suckling. Prerequisite: AI 315, 411. Assistant Professor Rodenwold.

AH 424. **Livestock Economics.** (G) 3 hours spring.

Management dealing with the economic and financial phases of livestock speculation; trends in livestock production and costs of production; marketing and financing in livestock enterprises. Prerequisite: AH 412. Assistant Professor Rodenwold.

GRADUATE COURSES

See Animal Industries, page 219.

Dairy Husbandry

At the present time there are approximately 26,000,000 dairy cows in the United States that return about one-fourth the gross national farm income. Of the one and one-third billion pounds of milk produced annually in Oregon, about 50 per cent is used for the manufacture of butter; about 15 per cent for cheese; and the remainder for fluid milk, ice cream, condensed milk, and other products. Since about one-third of the butter and three-fourths of the cheese manufactured are sold outside the state, it is necessary to employ high standards in producing milk and to efficiently manufacture and market the products.

The student who plans to major in dairy husbandry may elect either dairy production (pages 200-201) or dairy manufacturing (pages 201-202). The curriculum in dairy production is planned to give the student a broad education with emphasis on the basic sciences and in the selection, care, feeding, breeding, and management of dairy cattle, and the production and marketing of dairy products. The curriculum is planned that students may qualify for agricultural extension,

Smith-Hughes teaching, fieldmen or operators of testing associations, cooperative associations, and feed mills, and managers of state, Federal, and privately-owned dairy herds. The object of the four-year course in dairy manufacturing is to train students to become operators and technicians in dairy manufacturing plants; supervisors and inspectors; teachers or research workers in colleges and experiment stations. The freshman and sophomore years provide for a broad knowledge of chemistry, bacteriology, physics, and economics; the junior and senior years emphasize the training in the theory and practice of dairy science, accounting and business methods, and marketing.

Equipment. The department has a herd of more than 100 head of pure-bred dairy cattle representing three major dairy breeds. The animals are available for both instructional and experimental purposes and each year are used in teaching judging. The herd is being developed in such a way as to be of unusual value in illustrating the important points in breeding and handling dairy cattle. The herd is free from both tuberculosis and infectious abortion. The dairy barn is equipped with modern facilities for dairy-herd operations and for the production and handling of high-quality milk. The dairy farm includes about 50 acres of irrigated pasture, which is very important in dairy-herd operations.

The department has a well-equipped manufacturing laboratory. The manufacture of butter, ice cream, and cheese, and the handling of market milk, are carried on continuously on a commercial scale. The student thus has opportunity to see this work done under practical conditions, and he receives his systematic instruction under the same conditions.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

DH 312, 313, 314. **Dairy Products Manufacturing.** 4 hours each term.
Principles and practices of commercial manufacture of butter, cheese, casein, ice cream, and concentrated milk products. Two lectures; 1 five-hour and 1 three-hour laboratory period. Prerequisite: AI 122. Professor Wilster.

DH 315. **Dairy Products Standards.** 1 hour.
Critical study of butter, cheese, milk, and ice cream with score cards; discussion of defects and reasons therefor. One two-hour lecture and laboratory period. Professor Wilster.

DH 320. **Herd Record Systems.** 3 hours winter.
The operation of dairy herd improvement associations; the systems of official production records of the dairy cattle breed associations. Designed to train for the successful operation of dairy herd improvement associations and related record keeping systems. Prerequisite: AI 122. Three lectures. Assistant Professor Colman.

DH 321. **Dairy Breed Types.** 3 hours spring.
The correlation of the form of dairy cattle with milk production; gross breed characteristics; comparative judging, terminology of the show ring, and fitting for show. Prerequisite: AI 111. Three two-hour laboratory periods. Mr. Ewalt.

DH 322. **Dairy Herd Management.** 3 hours winter.
Breed characteristics, adaptability, and selection; selection of foundation animals; factors affecting growth and development of dairy heifers; factors influencing quality and quantity of milk; keeping of records; cost of production; management practices. Prerequisite: AI 411. Professor Jones.

DH 401. **Research.** Terms and hours to be arranged.

DH 405. **Reading and Conference.** Terms and hours to be arranged.

DH 407. **Seminar.** 1 hour each term.

DH 410. **Market Milk and Related Products.** (G) 3 hours fall.
The importance of market milk industry. Legal requirements for producing, handling and processing milk and related products. Approved methods of producing market milk and cream. Milk quality tests. Processing plant operations. Plant sanitation and efficiency. Prerequisite: DH 312, 313, 314, 322, or equivalent.

DH 412, 413. **Dairy Technology.** (G) 3 hours, winter and spring.
Analysis of dairy products; technical control of dairy plant operation; management problems; state laws and regulations governing the manufacture and marketing of butter, cheese, ice cream, condensed milk, and other dairy products; dairy plant construction; cost of manufacture of dairy products. Prerequisite: Ch 254, DH 410. One lecture, 1 recitation; 1 three-hour laboratory period.

DH 421. **Breeding Dairy Cattle.** (G) 3 hours winter.
Origin and development of dairy cattle; systems of breeding; study of inherited characteristics; pedigree study and analysis; progeny tests; planning the breeding program. Prerequisite: AI 315. Professor Jones.

DH 422. **Dairy Cattle Feeding.** (G) 3 hours spring.
Feeding standards and feed stuffs for dairy cattle; calf and heifer feeding; feeding the herd sire; feeding for milk production, and reproduction; feeding problems; technique for investigating feedstuff values and nutritional requirements. Prerequisite: AI 411. Professor Jones.

DH 430. **Utilization of Dairy Products.** (G) 3 hours spring.
An advanced study of milk, cream, butter, cheese, ice cream, condensed milk, and other dairy products; use and importance in human and animal nutrition; utilization in industry; physical properties of dairy products; chemical composition; factors causing variations. Prerequisite: senior standing and consent of instructor. Offered alternate years. Professor Wilster, Professor Jones.

GRADUATE COURSES

See Animal Industries, page 219.

Fish and Game Management

THE four-year curriculum in fish and game management, including those subjects having direct and practical application in wildlife conservation, together with basic and general studies, is designed to prepare students for any of the following and other fields of wildlife conservation: state and Federal service; land-using industries; management of fish and game for estates and for game and fish clubs; private fur and game farming. A special four-year curriculum is offered for students planning to enter the field of fisheries.

Many of the courses are valuable to students in allied fields who wish the practical aspects of wildlife conservation, especially in its correlation with the livestock industry, and with public land-use problems.

Strategically located for the study of wildlife, Oregon State College has within easy access state fish hatcheries, game farms and refuges, and fur farms. Most forms of Oregon's varied wildlife are within a few hours travel from Corvallis. Research work by the United States Fish and Wildlife Service and the Oregon State Game Commission conducted at the State College in cooperation with the Agricultural Experiment Station is of basic value to the instruction offered in this field.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

FG 251. **Wildlife Conservation.** 3 hours fall.

Wildlife as a valuable economic and social resource; the need of its conservation through scientific administration and manipulation.

FG 261. **Wildlife Technique.** 3 hours spring.

The collecting and preserving of wildlife specimens for scientific investigations; practice in the making of museum mounts of birds, mammals, and fish, and in rodent and predatory-animal control. Two lectures or recitations; 1 three-hour period in laboratory or field work.

FG 271, 272. **Fur Farming.** 3 hours each term, fall and winter.

The important fur-bearing mammals raised on fur farms; special attention to the practices of breeding, feeding, and sanitation; construction; marketing; judging of pelts and animals; business principles important in the fur-farming enterprises.

UPPER-DIVISION COURSES

FG 310, 311, 312. **Forest Wildlife Management.** 3 hours each term.

The theories and practices of game and fish management in forest areas; special attention to the measurement and diagnosis of productivity, the control of factors inimical to wildlife species, and environmental improvements for game and fish species. Mr. Long.

FG 341. **Fish and Game Law Enforcement.** 2 hours winter.

A survey of National and state game laws, including a critical study of law enforcement and scientific methods of evidence collection, preservation, and presentation. One lecture; 1 two-hour laboratory period. Assistant Professor Griffiths.

FG 351, 352, 353. **Fish and Game Management.** 3 hours each term.

The theories of game and fish management, game and fish administration in forest areas, wildlife refuges, state and national parks, submarginal areas, farm lands, etc.; special attention to the measurement of game and fish populations, methods of measurement and diagnosis of productivity, types of game refuges, control of hunting and fishing, parasite and predator control, control of water and food conditions, control of cover, and other techniques involving fish and game. Prerequisite: Z 203. Two lectures or recitations; 1 three-hour laboratory period or field work. Professor Dimick.

FG 360. **Applied Fish and Game Ecology.** 3 hours winter.

Techniques used in investigating ecological factors affecting birds, mammals, and fish; special attention to the making of chemical, physical, and statistical measurements of ecological factors important in wildlife management. Two lectures; 1 three-hour laboratory period. Professor Dimick, Assistant Professor Griffiths.

FG 401. **Research.** Terms and hours to be arranged.

FG 405. **Reading and Conference.** Terms and hours to be arranged.

FG 407. **Seminar.** Terms and hours to be arranged.

FG 451, 452. **Management of Game Birds.** (G) 3 hours each term, fall and winter.

Studies of game birds with special attention to their propagation on game farms and under natural conditions; their management in forest areas, wildlife refuges, submarginal lands, and agricultural areas. Prerequisite: Z 321, FG 352. Two lectures or recitations; 1 three-hour laboratory period or field work. Mr. Long.

FG 454, 455. **Management of Game Fish.** (G) 3 hours each term, winter and spring.

Studies of game fish with special attention to fish-hatchery methods, natural propagation, and methods of fish liberation. Much of the laboratory and field work is conducted at the Alsea Fish Hatchery. Prerequisite: Z 323, FG 353. Two lectures or recitations; 1 three-hour laboratory period or field work. Professor Dimick, Assistant Professor Griffiths.

FG 457, 458. **Management of Big Game.** (G) 3 hours each term, winter and spring.

The various species of game mammals; their habits, distribution, management under natural conditions; their economic values; laws for protection. Prerequisite: Z 322, FG 352. Two lectures or recitations; 1 three-hour laboratory period or field work. Professor Johnson, Mr. Long.

FG 460. **Management of Fur Bearers.** (G) 3 hours fall.

Fur-bearing animals with special attention to their management in forest areas, submarginal lands, and agricultural lands. Prerequisite: Z 322, FG 352. Two lectures or recitations; 1 three-hour laboratory or field period. Mr. Long.

FG 464, 465, 466. **Commercial Fisheries.** 3 hours each term.

Studies of the commercial fisheries of North America, with particular reference to the Pacific Coast; biologies of important species; economic values; methods of harvesting and regulating the fisheries resources. Prerequisite: FG 353. Two lectures or recitations; 1 three-hour laboratory or field trip. Professor Dimick.

GRADUATE COURSES

See Animal Industries, page 219.

Poultry Husbandry

POULTRY keeping as a specialized business has developed rapidly throughout the Northwest and especially in Western Oregon. Climatic conditions throughout the state are particularly adapted to successful breeding and raising of poultry.

With the development of the poultry industry in Oregon and throughout the country has come a demand for young men trained in the various lines of the industry. Besides the opportunities afforded in the actual work of poultry farming there is an increasing demand for properly qualified men for positions as government and experiment-station workers, as field men and poultry-feed

specialists with the larger feed companies, and for positions with packing houses and cooperative marketing associations.

In the major curriculum (page 202) poultry courses and elective subjects are so arranged that the student may receive training that will fit him for any of the lines of work mentioned.

Equipment. The Poultry Building contains well-equipped laboratories for incubation, judging, killing, and egg candling, in addition to modern refrigeration facilities for study of marketing problems. Different makes of incubators, including three mammoth machines, are available for student instruction as are also sets of charts, lantern slides, motion pictures and photographs that are used to illustrate the rarer breeds of fowls, types of poultry houses and equipment. Large flocks of White Leghorns and representatives of other common breeds are kept on a plant adjacent to the Poultry Building. This plant contains modern laying houses, an eight-room stationary brooder house, a ten-room breeder house, a granary equipped with feed-mixing machinery, and much other equipment suitable for use on practical poultry farms, all of which is available for instruction and experimentation.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

PH 321. **Incubation and Brooding.** 4 hours spring.

Principles and practices involved in natural and artificial incubation and brooding; the egg and its development; laboratory work in actual running of incubators and brooders. Opportunity is given when possible for students to work out some definite problem. Prerequisite: AI 123. Two recitations; 2 two-hour laboratory periods. Dr. Holmes.

PH 331. **Poultry Housing.** 3 hours fall.

Poultry-house types and housing problems; field trips to neighboring poultry farms. Prerequisite: AI 123. Two lectures; 1 three-hour laboratory period. Dr. Holmes.

PH 341. **Poultry Judging.** 2 hours winter.

Practical judging of all kinds of poultry. Judging teams for intercollegiate judging competitions are chosen largely from the members of this class. Prerequisite: AI 123. Two two-hour laboratory periods. Offered alternate years. Offered 1942-43. Professor Cosby.

PH 351. **Turkey Management.** 3 hours fall.

Practical details in the breeding, feeding, rearing, and marketing of turkeys. Prerequisite: AI 123. Two recitations; 1 two-hour laboratory period. Offered alternate years. Not offered 1942-43. Professor Cosby.

PH 403. **Thesis.** Terms and hours to be arranged.

PH 405. **Reading and Conference.** Terms and hours to be arranged.

PH 407. **Seminar.** 1 hour each term.

PH 411. **Poultry Feeding.** (g) 4 hours winter.

Feeds suitable for poultry; principles and practice of feeding breeding stock, feeding for egg production, and fattening for market; feeding young and growing chicks; feeding appliances; the compounding of rations. Pre-

requisite: AI 123, 411. Two recitations; 2 two-hour laboratory periods. Mr. Cooney.

PH 421. **Marketing Poultry Products.** (g) 4 hours fall.

Preparation of poultry and eggs for market; methods of storage and preservation; methods of marketing; laboratory work in killing, picking, grading, and shipping poultry; candling, grading, packing, and storing eggs. Prerequisite: AI 123. Two recitations; 2 two-hour laboratory periods. Mr. Cooney.

PH 431. **Poultry Plant Management.** (g) 4 hours spring.

Selection of the location, layout, and arrangement of buildings; study of records. Each student works out complete plans for the layout and management of a commercial poultry enterprise. Prerequisite: PH 321, 331, 411, 421. Two recitations; 2 two-hour laboratory periods. Mr. Cooney.

PH 441. **Poultry Breeding.** (G) 4 hours spring.

History of poultry breeds; study of breeding with special emphasis on the modes of inheritance of egg production; egg size, hatchability and other economically important characteristics. Prerequisite: AI 123, 315. Three lectures; 1 two-hour laboratory period. Dr. Holmes.

GRADUATE COURSES

See Animal Industries, page 219.

Veterinary Medicine

THE object of the courses in veterinary medicine is to help fit the student for the successful handling of livestock. Anatomy and physiology of domestic animals familiarize the student with the normal structures and functions of the animal body, thus laying a foundation for courses in judging, breeding, feeds and feeding, nutrition, and diseases of animals.

The work in diseases is taken up from the standpoint of the livestock owner. The students learn to recognize diseases, to care for sick animals, and to prevent disease through proper methods of sanitation and management. The importance of quarantine, the different methods of control and eradication of disease, and the role of the stock owners in maintaining this work are considered. The department does not train men to enter the veterinary profession.

Equipment. This department has its offices, physiological laboratory, and lecture rooms in the Poultry Building. The Veterinary Clinic building is equipped for dissection, autopsies, and clinics.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

VM 211. **Anatomy of Domestic Animals.** 3 hours fall.

A laboratory course in the anatomy of domesticated animals; special attention to the digestive systems of the horse and the cow; to the foot, the teeth, and the muscles of locomotion of the horse; complete dissection of the digestive, urinary, genital and respiratory systems; partial dissection of the circulatory, muscular, and nervous systems. Prerequisite: Z 130 or equivalent. Three two-hour laboratory periods.

VM 221, 222. **Physiology of Domestic Animals.** 3 hours each term, winter and spring.

The functions of the body; the physiological processes of all domestic animals with emphasis on the horse and the cow. Prerequisite: VM 211. Two lectures; 1 two-hour laboratory period.

UPPER-DIVISION COURSES

VM 311. **Anatomy of the Fowl.** 3 hours winter.

The structure of the body of the fowl. Two lectures; 1 two-hour laboratory period. Professor Dickinson.

VM 341. **Diseases of Livestock.** 4 hours fall.

A one-term course for students specializing in the plant group. The more common diseases, with methods of prevention and control. Professor Shaw.

VM 351. **Diseases of Poultry.** 4 hours spring.

The parasitic, infectious, and noninfectious diseases of poultry; emphasis on methods of prevention and control of the parasitic and infectious diseases; observations of autopsies, methods of diagnosis, and treatment of fowls. Three lectures; 1 two-hour laboratory period. Professor Dickinson.

VM 355. **Diseases of Game Birds.** 3 hours spring.

Similar to VM 351, but concerned with game birds. Two lectures; 1 two-hour laboratory period. Professor Dickinson.

VM 361. **Parasitic Diseases of Domestic and Game Animals.** 4 hours winter.

The intensive study of the common parasitic diseases of domestic animals. Two lectures; 2 two-hour laboratory periods. Professor Shaw.

VM 441, 442, 443. **Diseases of Livestock.** (g) 3 hours each term.

The parasitic, infectious, and noninfectious diseases of domesticated animals. Prerequisite: VM 221, 222, or equivalent. Two recitations; 1 two-hour laboratory period. Professor Shaw, Assistant Professor Dougherty.

GRADUATE COURSES

See Animal Industries, page 219.

Division of Plant Industries

THE Division of Plant Industries deals with the nation's major agricultural resources, the soils and their crops. The research, resident instruction, and extension work in plant industries is basic to practically all phases of general and specialized agriculture. It covers the nation's water and soil resources, their mapping, use, management, storage, processing, and preservation; and the plant resources that include the major basic food, forage, and clothing commodities and the food luxuries of the world's diet. Educational work conducted in this division is broad, covering ecological relationship, production, management, grading, preservation, manufacture, storage, transportation, and marketing of the food, forage, textile, and seed crops. Cereals, fruits, nuts, vegetables, ornamental plants, and the plant and soil phases of pasture, range, soil conservation, and wildlife work are given attention. Liberal opportunity is provided in

the curricula of this division for students to elect courses of their own choice with the guidance of the faculty. Special curricula are developed to suit the needs of those more mature students who have a definite objective in view. Students are encouraged to undertake individual work in connection with training for special state, Federal, or private positions.

Farm Crops

PROBLEMS of production, improvement, marketing, manufacture, and uses of each of the field crops produced for food, forage, textile, and special purposes are dealt with by this department. The purpose of the major curriculum (page 205) is primarily to teach students scientific, practical, and economical methods of crop production, marketing, and improvement that may be put into actual use on the farm. In addition the courses are so arranged that men may fit themselves for business positions in connection with the marketing of seeds and other farm crops; for civil service positions in agronomy, forage crops, soil conservation, range management, grain standardization, plant breeding, and crop marketing; and for experiment station, extension, and teaching work. The object is to develop men with broad training for leadership along agricultural and general lines and to provide scientific training such that graduates may succeed in the professional and technical agricultural fields. Considerable flexibility in electives together with the study of original problems is encouraged in order to meet special needs of individual students.

Farm-crops graduates occupy technical, commercial, and teaching positions involving considerable responsibility and are successful in farm operation. They are in Federal and state experimental and regulatory positions, several are county agents, others are in the seed and grain business, and some are in graduate study and teaching positions. The field is a large one and deals principally with well-known and staple crops that are constantly in use and in demand. Farm-crops work is closely related to six important fields: (1) the daily food supply of our human population, (2) the feed requirements of all classes of farm animals, (3) the growth of plants for textiles, (4) seed and special crops, such as drug plants, (5) plant problems of soil conservation, and (6) the range and wildlife food crops. Crops courses make practical application of scientific principles from such fields as soils, physics, chemistry, bacteriology, plant pathology, and plant physiology.

Equipment. The department has excellent recitation rooms, greenhouses, and well-equipped laboratories. The Experiment Station plots and farm fields afford superior opportunities for field study and make possible extensive collection of valuable material for class work. Federal cooperative investigations in seed testing, forage crop, fiber flax, cereals, and hops form a distinct instructional asset. A large collection of the best books, periodicals, etc., dealing with the subject, is available. Oregon State College is excellently equipped for grain and hay grading and seed-inspection work; the crop-inspection and grading work is a marked advance over anything heretofore offered.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

FC 111. **Elements of Agronomy.** 3 hours any term.

Fundamental principles of tillage and production, seed selection, identification, rotation, and economics of crop production, with special reference to

the cereals and related crops. In the winter term the work is adapted to the needs of students in fish and game management. Prerequisite to all farm-crops courses except FC 211, 311, 317, and 324. One lecture; 1 recitation; 1 two-hour laboratory period.

FC 211. **Forage and Root Crop Production.** 3 hours fall or spring.

Fundamental principles of economic production, rotation, storage, costs, marketing, uses, and improvement of the important forage and pasture crops and their seeds, and the root crops. Two lectures; 1 two-hour laboratory period.

UPPER-DIVISION COURSES

FC 311. **Potato Growing.** 3 hours winter.

Potato production; improvement; storage; cost; marketing; distribution; uses; experimental work; varietal studies; identification, judging, and scoring. One recitation; 1 two-hour laboratory period. Assistant Professor Finnell.

FC 313. **Lawns and Turfs.** 2 hours fall.

Varieties, characteristics, and adaptability of turf plants and seeds; seedbed preparation, seeding, fertilization, management, weed and pest control for lawns, golf courses, grass nurseries, playing and landing fields, parks, and other purposes. One recitation; 1 two-hour laboratory period. Assistant Professor Finnell.

FC 315. **Principles of Agricultural Breeding.** 3 hours fall.

The practical application of modern conceptions of breeding. Two lectures; 1 two-hour laboratory period. Associate Professor Fore.

FC 317. **Weed Eradication.** 3 hours spring.

Weed types and their habits of growth; weed legislation; practical methods of prevention, control, and eradication; special attention to noxious, persistent, perennial, and poisonous weeds of ranch and range. Two lectures, 1 two-hour laboratory period. Assistant Professor Finnell.

FC 318. **Wildlife Food Crops.** 3 hours fall.

Native and introduced food, forage, and cover plants for wildlife and game refuges, breeding areas, fur and game farms, etc.; seed and plant supplies and markets; production and management methods for maintaining the food supply. One lecture; 1 two-hour laboratory period. Mr. Hansen.

FC 319. **Range Improvement and Maintenance.** 3 hours winter.

Reseeding, improvement, care and maintenance of range, cut-over, overflow, marginal, and other lands used for grazing purposes. Prerequisite: FC 211 or equivalent. Two lectures; 1 two-hour laboratory period. Professor Hyslop, Mr. Hansen.

FC 320. **Cover Crop and Soil-Erosion Prevention Plants.** 2 hours winter.

Production, development, and maintenance of plants suited to soil, dike, and bank protection and to cover-cropping purposes; sand-dune control; cover crops for soil protection and building up organic content of tillable areas. One lecture; 1 two-hour laboratory period. Assistant Professor Finnell.

FC 322. **Cereal Production Lectures.** 3 hours fall.

Production and uses of cereals and allied grains; distribution; adaptability; ecological relationship; seed treatment; production methods; markets; manufacture and movement in commerce. Prerequisite: FC 111, Bot 202 or equivalent. Professor Hill.

FC 323. **Cereal Morphology.** 2 hours fall.
Laboratory and field studies of morphological and taxonomic characters on the common forms of cereals; methods of identification; and studies on seed structure in relation to the cereal manufacturing processes. Two two-hour laboratory periods. Professor Hill.

FC 324. **Forage and Related Crops.** 3 hours spring.
Special studies in the production, handling, marketing, and uses of forage and related plants; pasture development and management in humid areas and with irrigation; economy in hay making, storage, and transportation under special conditions; comparative use and cost of different forage crops. Prerequisite: FC 211 or equivalent. Two lectures; 1 two-hour laboratory period. Professor Hyslop, Mr. Hansen.

FC 327. **Specialty Crops.** 3 hours winter.
Principles of production, harvest, storage, distribution, marketing, and costs of specialties including hops, pyrethrum, drug, oil, and related plants. Prerequisite: Bot 203 or equivalent. Two lectures; 1 two-hour laboratory period. Assistant Professor Finnell.

FC 401. **Research.** Terms and hours to be arranged.

FC 403. **Thesis.** Terms and hours to be arranged.

FC 405. **Reading and Conference.** Terms and hours to be arranged.

FC 407. **Seminar.** 1 hour each term.

FC 411. **Crop Inspection.** (G) 4 hours winter.
The inspection, grading, and valuation of cereals, hay, forage, potatoes, beans, seeds, stock feeds, and miscellaneous agricultural commodities according to Federal, state, and other adopted standards; theory and practice of grade fixation and application. For persons buying or selling agricultural commodities, grain supervisors, samplers, inspectors, warehousemen, millers, and others. Prerequisite: FC 111, 211, 322, 323; Ch 251; or equivalents. Two lectures; 2 two-hour laboratory periods. Professor Hill.

FC 414. **Seed Production.** (G) 3 hours fall.
Principles and special methods of production, distribution, and use of seed crops of grasses, alfalfa, clover, and other forage legumes; field beans, horse-beans, soybeans, peas, and other food legumes; other special seed crops; seed inspection, seed certification, and seed legislation. Prerequisite: FC 111, 211, 322, 323; or equivalents. Two lectures; 1 two-hour laboratory period. Professor Hyslop, Assistant Professor Finnell.

FC 415. **Plant Breeding.** (G) 3 hours spring.
Practical application of genetics to improvement of field and horticultural plants; methods of breeding for yield, disease resistance, special qualities and special adaptations. For students wishing to prepare for research or for business in seed and plant production. Prerequisite: senior standing and consent of instructor. Two lectures; 1 two-hour laboratory period. Associate Professor Fore.

FC 416. **Field-Plot Technique.** (G) 3 hours spring.
Methods, theory, and technique of plot experiments and demonstrations with plants; recording of data, tabulation, biometrical and statistical analysis of results from field, plot, and nursery experiments. Designed for research, extension, Smith-Hughes, and other workers dealing with field plots and demonstrations. Prerequisite: senior standing and consent of in-

structor. Two lectures; 1 two-hour laboratory period. Professor Hill, Associate Professor Fore.

FC 417. **Plant Genetics.** (G) 3 hours winter.

The theory and technique of plant-inheritance studies; factor interaction, linkage, quantitative inheritance, interspecial crosses, sterility and other aspects of plant genetics. Designed primarily for students interested in a more detailed background for plant improvement. Prerequisite: FC 111, 211; Bot 202, 331; FC 315; or equivalents. Two lectures; 1 two-hour laboratory period. Associate Professor Fore.

FC 418. **Economic Plant Adaptation.** 3 hours spring.

The relationship of environment for special strains, varieties, and species of economic plants to practical production conditions. Prerequisite: FC 111, 211, 322, or 324; Bot 202, 331, 341; or equivalents. Two lectures; 1 two-hour laboratory period. Mr. Hansen.

FC 421. **Crop Efficiency.** (G) 3 hours spring.

The production, conditioning, storage, and marketing of farm crops; agricultural adjustment; comparison of methods leading to cheaper and more efficient production; cropping systems and crop rotations; crop specialization; warehousing problems; grade and standard fixation; export and import regulations; crop statistics, their value and use; disposal of crop by-products Prerequisite: FC 322, 323, 414; or equivalents. Professor Hyslop.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

FC 501. **Research.** Terms and hours to be arranged.

FC 503. **Thesis.** Terms and hours to be arranged.

FC 505. **Reading and Conference.** Terms and hours to be arranged.

FC 507. **Seminar.** 1 hour each term.

Food Industries

THE curriculum in food industries (pages 206-207) is designed to prepare the student to enter the fields of food technology and commercial food preservation and manufacturing, such as: canning; dehydration; preserving; pickling; maraschino cherry, fruit and vegetable juice, and vinegar manufacture; and the byproducts utilization of agricultural and marine crops. Students are also trained for positions such as food buyers; manufacturers, brokers, food inspectors, and food-research workers; and for positions as instructors in food preservation and manufacture. Much of the laboratory work is conducted on a scientific as well as a commercial scale, and the student is trained to operate and repair machinery and equipment used in food and byproducts manufacture.

Instruction includes lectures, laboratory exercises, visits to food plants, reading assignments, and problems. Special opportunity is afforded students of ability who wish to do research work on problems arising in food technology.

The annual Canners' and Frozen Food Packers' School affords an opportunity for students to hear and become acquainted with men who rank high in the food-preservation field. At this time and throughout the academic year

representatives of associated industries contribute valuable discussions and material for food-industries students.

Special courses covering preservation and utilization of fish and other marine products are available. These courses are designed particularly for students majoring in fish and game management.

Equipment. The Food Industries Building is equipped for study, research, and manufacture of canned fruits, vegetables, meats and fish, fruit juices, concentrates, carbonated beverages, vinegar, preserves, jams, jellies, condiments, sirups, vegetable oils, and byproducts of agricultural crops. The laboratories have complete commercial-canning equipment, fruit-juice presses, filters, pasteurizers, carbonating and bottling equipment, preserving, dehydration, and preparation machinery.

The scientific laboratories are equipped with all necessary instruments to make complete examinations and analysis of all food products. Specialized instruments for food sterilization with ultraviolet light are available.

Fish Research Laboratory. The Food Industries Laboratory at Astoria is a recently established branch research laboratory for the purpose of studying various problems in the preservation of marine and plant forms of foodstuffs. This building, approximately 50 by 80 feet, is a one-story tile and concrete structure with full, well-lighted basement and white enameled interior. It contains a large canning room, an analytical laboratory, a smoke house, a large preparation and examination room, two freezing rooms, a work shop, and offices.

Opportunity is given for research by undergraduate and graduate students majoring in the Food Industries department. Living facilities are provided graduate students in the laboratory at Astoria. A complete apartment is built into the building for students most interested in graduate studies in this field.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

FI 250. **Principles of Food Preservation.** 3 hours fall.

Fundamental principles involved in freezing, drying, concentrating, salting, smoking, fermenting, carbonating, and the use of heat, electricity, and chemical preservatives for the preservation of all types of foods. Two lectures; 1 two-hour laboratory period.

FI 251. **Principles of Canning Fruits.** 3 hours winter.

Fundamental principles of canning fruits; varieties; buying; handling before canning; grading; methods of preparation; blanching; siruping; water and steam exhausting; sealing; cooking; cooling; storage; causes of spoilage; judging canned foods; types of containers; marketing practices; working knowledge of methods used in commercial, farm, and home canning. Prerequisite: FI 250. Two lectures; 1 three-hour laboratory period.

FI 252. **Principles of Canning Vegetables.** 3 hours spring.

Continuation of FI 251, with application to vegetable canning and vegetable products. Retort installation, operation, and control; handling methods; heat penetration; time of cooking and thermal death points; vegetables canned by different methods and results compared; commercial plants visited for study. Prerequisite: FI 250, 251. Two lectures; 1 three-hour laboratory period.

FI 254, 255. **Canning of Fish and Fish Products.** 3 hours each term, winter and spring.

The fundamental principles of canning, heat penetration, thermal death points; the effect of acidity, vacuum, can fill, grading, seaming, cooking, storage, corrosion; canning of fish, clams, oysters, shrimp, etc. Prerequisite: FI 250, Bac 204. Two lectures; 1 two-hour laboratory period.

UPPER-DIVISION COURSES

FI 311. **The Canning Plant and Its Equipment.** 3 hours spring.

Economic phases of the canning plant; its location, general plan of construction; equipment; operation; training in designing plants and estimating costs; laboratory work on the construction, installation, operation, and adjustment of canning machinery; field trips to canneries to study their construction. Two lectures; 1 three-hour laboratory period. Associate Professor Onsdorff.

FI 321. **Food Technology.** 2 hours spring.

Commercial methods followed in the manufacture of such foodstuffs as fruit and vegetable byproducts, spices, condiments, flavoring extracts, sirups, leavening agents, animal foods; the use of sugars, vegetable cooking oils, flours, and cereals. Prerequisite: Ch 201, 202, 203. Professor Wiegand.

FI 331. **Dehydration of Fruits and Vegetables.** 3 hours fall.

Especially designed for students majoring in horticulture and farm crops. Actual drying of fruits and vegetables; all of the common types of driers and principles of dehydration; methods of testing for moisture and adulteration. Two lectures; 1 three-hour laboratory period. Professor Wiegand, Associate Professor Onsdorff.

FI 341. **Pickles, Relishes, and Condiments.** 3 hours fall.

Theory, principles, and practice in vinegar and salt pickling; making and packing of sour, sweet, and dill cucumber pickles; pickling of other products, such as onions, melon rinds, carrots, beets, crab apples, tomatoes; tomato products, salad dressings, relishes, and sauerkraut studied and manufactured; causes of spoilage and testing methods emphasized. Prerequisite: Ch 251. Two lectures; 1 three-hour laboratory period. Associate Professor Onsdorff, Dr. Harvey.

FI 351. **Fruit Juice and Vinegar Manufacture.** 3 hours fall.

Practical and scientific work in the handling of fruit juices; problems of filtration, sterilization, and bottling. Prerequisite: Bac 204, 205, 206; Ch 251; FI 252. Two lectures; 1 three-hour laboratory period. Professor Wiegand, Associate Professor Onsdorff.

FI 352. **Commercial Jam and Jelly Manufacture.** 3 hours winter.

Application of scientific principles of making jams and jellies from fresh and frozen fruits, correlated with laboratory practice and quantity manufacture; testing for yields, moisture content, pectin requirement, acidity, sugar, etc., stressed. Prerequisite: Ch 251; Bac 204, 205, 206; FI 252. Two lectures; 1 three-hour laboratory period. Associate Professor Onsdorff.

FI 361. **Preserves, Glacèd Fruits, and Candied Fruits.** 3 hours spring.

Manufacture of preserves, marmalades, conserves, maraschino cherries, glacèd fruits, and candied fruits. Prerequisite: Ch 251; Bac 204, 205, 206; FI 252, 352. Two lectures; 1 three-hour laboratory period. Professor Wiegand.

FI 401. **Research.** Terms and hours to be arranged.

FI 403. **Thesis.** Terms and hours to be arranged.

FI 405. **Reading and Conference.** Terms and hours to be arranged.

FI 407. **Seminar.** Terms and hours to be arranged.

FI 411. **Food Products Manufacture.** (G) 3 hours fall.
Physical, chemical and bacteriological principles involved in the preparation, preservation, and examination of fruit, vegetable, and food products. Prerequisite: Bac 206, Ch 252. One lecture; 2 two-hour laboratory periods. Professor Wiegand.

FI 412, 413. **Frozen Foods.** (G) 3 hours winter and spring.
The physical, chemical, bacteriological, and enzymatic changes occurring in products before, during, and after freezing; processing methods, storage, transportation, and distribution of frozen foods. Prerequisite: Ch 251; Bac 204, 205, 206 or equivalents. Two lectures; 1 two-hour laboratory period. Professor Wiegand, Associate Professor Onsdorff.

GRADUATE COURSES

Courses numbered 400-499 and designated *(g)* or *(G)* may be taken for graduate credit.

FI 501. **Research.** Terms and hours to be arranged.

FI 503. **Thesis.** Terms and hours to be arranged.

FI 505. **Reading and Conference.** Terms and hours to be arranged.

FI 507. **Seminar.** Terms and hours to be arranged.

Horticulture

INSTRUCTIONAL work covers the broad fields of production and marketing fruits and vegetables. It is designed to train students for fruit farming, fruit handlers and shippers, state and Federal inspectors, teachers in high schools and colleges, and investigators in fields of research.

The work in landscape maintenance lays the foundation for professional careers in laying out, planting, and superintending country and city homes, parks, and playgrounds, in nursery management, and in floriculture.

The courses cover general horticulture, pomology, vegetable crops, floriculture, and research. Much stress is placed upon the practical phases of all the work. Students are given field and laboratory exercises in all such operations as planting, seeding, budding, grafting, cultivating, thinning, spraying, harvesting, grading, and packing.

Equipment. The Horticulture wing of Agriculture Hall, modern greenhouses, orchards, and gardens, the large campus containing good plant material, and a very good library are at the service of the department. The laboratories are well equipped for giving instruction in spraying, plant propagation, fruit packing, vegetable grading and crating, and systematic pomology. There are large lecture rooms, and a photography room.

NOTE: *The courses in horticulture include the following groups, under each of which the respective courses are listed in numerical order: General Horticulture (including graduate and research courses), Pomology, Vegetable Crops. Descriptions of the principal courses in Landscape Construction and Maintenance are under Art and Architecture and Landscape Architecture, pages 177-181.*

COURSES IN GENERAL HORTICULTURE

LOWER-DIVISION COURSE

Hrt 111. **Elements of Horticulture.** 3 hours fall or spring.
Fruit growing from the farm and commercial standpoints; home vegetable growing and important truck crops; the fundamental phases of food preservation, including drying, and cider and vinegar manufacture, are included. Two lectures; 1 three-hour laboratory period.

UPPER-DIVISION COURSES

Hrt 311. **Plant Propagation.** 3 hours winter.
Different methods of propagating plants by seeds, cuttings, bulbs, tubers, budding and grafting. Students grow their own plants and keep records on them in greenhouse, nursery, and orchard. One lecture; 2 two-hour practicums. Mr. Roberts.

Hrt 312. **Greenhouse Construction and Management.** 3 hours fall.
Fundamental principles of greenhouse design and operation, including materials, equipment, heating, ventilation, watering, soils, soil sterilization, insecticides, and fumigation, as applied to greenhouse flower and vegetable crops. Two lectures; 1 two-hour laboratory period. Professor Bouquet.

Hrt 313. **Greenhouse Crops.** 3 hours winter.
Actual work in the greenhouse; propagation; culture; soils; ventilation; watering; heating; as wide a range of experience as possible in growing of plants used in the florist trade. Prerequisite: Hrt 311. One lecture; 2 three-hour laboratory periods. Professor Bouquet.

Hrt 316. **General Floriculture.** 3 hours fall.
Studies of annual, biennial, and perennial flowers with particular reference to their culture in city and rural home gardens. Two lectures; 1 two-hour laboratory period. Professor Bouquet.

Hrt 320. **Nursery Management.** 3 hours spring.
The nursery industry; organization, management, equipment, plants, planting, storage, protection, shipping, diseases and insects, and quarantine regulations; trips to nurseries. Prerequisite: Hrt 311. Two lectures; 1 laboratory period. Mr. Roberts.

Hrt 401. **Research.** Terms and hours to be arranged.

Hrt 403. **Thesis.** Terms and hours to be arranged.

Hrt 405. **Reading and Conference.** Terms and hours to be arranged.

Hrt 407. **Seminar.** Any term, 1 hour.

Hrt 411. **Methods of Research.** (G) 3 hours winter.
Methods and procedures in conducting investigative work; experimental design; statistical methods; analysis of research problems; reasoning and weighing of experimental evidence; construction of briefs and outlines; preparation of research manuscripts. Professor Hartman.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

Hrt 501. **Research.** Terms and hours to be arranged.

Hrt 503. **Thesis.** Terms and hours to be arranged.

Hrt 505. **Reading and Conference.** Terms and hours to be arranged.

Hrt 507. **Seminar.** Three terms, 1 hour each term.

COURSES IN POMOLOGY

UPPER-DIVISION COURSES

Pom 312. **History and Literature of Horticulture.** 3 hours winter.
History of horticulture; systematic survey of the literature of horticulture, acquainting the student with the various sources of horticultural knowledge. Mr. Roberts.

Pom 313. **Commercial Pomology.** 3 hours fall.
The problems of harvesting and handling fruits; physiology of ripening; maturity tests; methods of picking, cleaning, and packing, standardization, inspection, certification; loading for domestic and export markets. Two lectures; 1 two-hour laboratory period. Prerequisite: Hrt 111; Ec 201, 202, 203. Mr. Roberts.

Pom 321. **Fruits and Nuts of the World.** 3 hours winter.
Fruits and nuts of economic importance not commonly grown in Oregon, including almond, avocado, banana, Brazil nut, cashew, citrus fruits, date, fig, olive, papaya, pecan, persimmon, pineapple, and pomegranate; their botanical relationships, culture, history, present trade status, and possibilities of development in the United States and its possessions. Prerequisite: Hrt 111. Mr. Roberts.

Pom 341. **Small Fruits and Grapes.** 3 hours winter.
Problems connected with the soils and slopes, pruning, training, harvesting, packing, and marketing of such small fruits as the strawberry, currant, gooseberry, raspberry, blackberry, loganberry, cranberry; American and European grapes. Mr. Roberts.

Pom 413. **Handling and Distribution of Fruits.** 3 hours winter.
Continuation of Pom 313. Problems of transportation, distribution, marketing methods, storage and storage plant operation. Prerequisite: Pom 313. Professor Hartman.

Pom 415. **Fruit Production.** (G) 4 hours spring.
Principles and practices of fruit and nut growing as related to climate, soil, and water requirements; varieties, root stocks, planting systems, pollination, thinning, frost, pest control, and other practical problems. Prerequisite: Hrt 111. Three lectures; 1 three-hour laboratory period. Professor Brown.

Pom 417. **Systematic Pomology.** (G) 4 hours fall.
Descriptions, nomenclature, and classifications of fruits and nuts. The student studies a sufficient number of varieties to become acquainted with the more important groups, species, and varieties. One lecture; 1 recitation; 2 two-hour laboratory periods. Mr. Roberts.

Pom 419. **Spraying.** (g) 3 hours spring.
Principles underlying spraying practices, insect and disease control, sprays and their mixing, operation of spray pumps, gas engines, and electric motors; utilization of portable and stationary outfits, operation of small sprayers and dusters, spray nozzles, guns and rods, accessories; practice in orchard spraying. Prerequisite: Hrt 111. One recitation; 2 two-hour laboratory periods. Mr. Roberts.

Pom 431. **Pruning.** (g) 3 hours winter.

The fundamental principles underlying pruning, including bud studies, tree building, maintaining vigor of the tree, rejuvenation. Prerequisite: Hrt 111. Two lectures; 1 three-hour laboratory period. Professor Brown.

COURSES IN VEGETABLE CROPS

UPPER-DIVISION COURSES

VC 321. **Vegetable Production.** 3 hours fall or winter.

The principles and practices involved in growing vegetables, including such subjects as soils, fertilization, varieties, seeds, plant growing, distribution of crops, succession cropping, irrigation, pest control, planting, and cultivating. Prerequisite: Hrt 111. Two lectures; 1 two-hour laboratory period. Professor Bouquet.

VC 322. **Vegetable Crops for Manufacturing.** 3 hours winter.

Production and handling of vegetables for canning and freezing, including crops of special importance in the Northwest, such as asparagus, beans, beets, carrots, sweet corn, peas, pumpkin, and tomatoes. Especially for students majoring in vegetable crops and food industries. Two lectures; 1 two-hour laboratory period. Professor Bouquet.

VC 323. **Vegetable Growing Practices.** 3 hours spring.

Field and greenhouse work with lectures to acquaint the student with growing and management methods in the production of vegetables for market. Prerequisite: Hrt 111. Two lectures; 1 two-hour laboratory period. Professor Bouquet.

VC 325. **Vegetable Forcing.** 3 hours spring.

Commercial practices in growing vegetable crops and plants under glass, including tomatoes, cucumbers, and other plants; commercial greenhouse operations. Prerequisite: Hrt 111. Two lectures; 1 two-hour laboratory period. Professor Bouquet.

VC 423. **Vegetable Varieties.** (G) 2 hours fall.

Descriptions, nomenclature, and classifications of vegetables; a sufficient number of varieties of each vegetable studied so that the student may become acquainted with the more important groups of horticultural varieties; exercises in displaying and judging vegetables; assigned readings. Prerequisite: Hrt 111. Two two-hour laboratory periods. Professor Bouquet.

VC 424. **Vegetable Marketing.** (g) 3 hours fall.

Commercial practices of field harvesting, grading, and packing of vegetables; methods of marketing; car loading, mixed cars, transportation, and distribution of truck crops, such as onions, celery, peas, cabbage, cauliflower, melons, tomatoes. Lectures, farm and market visits, field work in loading and observation of car loads; assigned readings. Prerequisite: Hrt 111. Two lectures; 1 two-hour laboratory period. Professor Bouquet.

Soils

COURSES in soils include soil physics, soil drainage, irrigation, farming, soil fertility, soil surveying, soil biology, soil conservation, and soil management and utilization. The purpose of the major curriculum in soils (pages 205-206) is to give the student thorough training in fundamentals of

agriculture, making him competent to manage a farm or preparing him for positions in state or Federal service. The wealth of Oregon rests in her soil and water resources, and their intelligent development, management, and preservation. With the further extension of reclamation, there will be a greaater demand for men who have a knowledge of how most successfully and economically to use water that the engineer's canals and reservoirs provide. These men must know the best time, amount, and method of irrigation, and the effects of irrigation upon soils and crops. They should also know the relations between soils, soil waters, and drainage, and understand how to locate and construct drains and how to treat or fertilize the soil so as to obtain the highest possible efficiency for each unit of tilling or fertilizer employed.

The Department of Soils is well equipped for offering research work. The experiment fields, greenhouses, laboratories, and library, and the plans and methods used in soil, irrigation, and drainage investigations, afford valuable opportunities to graduate students.

Equipment. The soils laboratories are equipped with apparatus for complete study of physical and chemical properties of soils and problems of soil management. Laboratory desks are supplied with running water, gas, compressed air, and electricity. Soil surveying and mapping outfits, soil survey charts of the United States, and a collection of samples of the chief soil types of Oregon and the United States are available. The soil-preparation room is equipped with soil-grinding and sifting machinery, and space for drying, preparation, and storage of large quantities of the different soil types used in the laboratories. For field work in drainage and irrigation, surveying instruments, tiles, and ditching tools, weirs, flumes, hook gauges, water-stage register, electric pumping plant, etc., are available. Weather-recording instruments of different kinds supply equipment for the course in climatology. Laboratories and greenhouses afford opportunity for studies of the movement and retention of irrigation water in soil, the effects of irrigation upon soils and crops, the effect of tile drainage upon soils of different types, their rate of drainage, etc. The exhibits, displayed in cases and racks, include soil-sample collections, subsoil, hardpans, soil analysis, soil colors, soil drainage, and irrigation equipment. A well-stocked reference library is available.

On the State College farm the students build weirs, measure water, lay out distribution systems, make cement pipes for laterals, and test pumping machinery. On the drainage plots the rate of discharge is measured and the effect of drains and soil conditions on water table are studied. The Experiment Station farms at Corvallis and in other parts of the state, together with the cooperative trials in different counties, afford opportunity for field study of soil problems.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Sls 211, 212. **Soils.** 3 hours each term (Sls 211 fall or spring, Sls 212 winter). Origin, formation, and classification of soils; study of the physical properties of soil moisture, heat, and air; effects of tillage, drainage and irrigation; plant foods and soil fertility; fertilizers; crop rotations; manures; acid and alkali soils. Prerequisite: Ch 101, 102, 103. Two lectures; 1 three-hour laboratory period.

Sls 213. **Soil Drainage and Irrigation.** 3 hours spring.
Soil mapping, reclamation, and use; use of chain, level, and soil auger as applied to design; installation of the tile drains or irrigation systems;

their effect upon soils and crops; cost and benefits. Two lectures; 1 three-hour laboratory period.

Sls 214. **Forest Soils.** 3 hours spring.

Origin, development, characteristics, and classification of forest soils; relation to vegetation, moisture reaction and fertility; forest nursery soil management, use and conservation. Two lectures; 1 three-hour laboratory period.

Sls 215. **Soils Improvement.** 2 hours fall.

Soil-fertility gains and losses, maintenance, and improvement; effect of manures, fertilizers, and crop rotations on soil productiveness. Required of students in landscape architecture.

UPPER-DIVISION COURSES

Sls 311. **Irrigation Farming.** 3 hours fall.

Methods of obtaining, distributing, and conserving irrigation waters; handling of different crops under irrigation; costs and profits; duty of water in various districts of Oregon; water rights; field and laboratory studies of irrigation qualities of different soils; laying out of irrigation systems. Two lectures or recitations; 1 three-hour laboratory period. Professor Powers.

Sls 319. **Climatology.** 2 hours spring.

Practical meteorology; observing and recording local weather and forecasting; a study of the climate of Oregon and the effect of climate upon agriculture. One recitation; 1 two-hour laboratory period. Associate Professor Torgerson.

Sls 401. **Research.** 3 hours each term.

Soil, drainage, or irrigation work. The advanced student may study the various soil types of Oregon through mechanical or chemical analysis; may undertake field work in soil surveying and mapping; or, through wire-basket, pot-culture, and field-plot tests, may determine the effects of various systems of cropping or fertilizing, or of soil bacteria, upon soil fertility. Prerequisite: Sls 421, 424.

Sls 405. **Reading and Conference.** Terms and hours to be arranged.

Sls 407. **Seminar.** 1 hour each term.

Sls 411. **Western Land and Water Laws.** (g) 3 hours winter.

A brief history of the development of water laws; homestead laws, water rights, and irrigation codes in the different states, particularly in the Northwest and Oregon; appropriation, adjudication, and administration of water; reclamation and other Federal and state land acts affecting reclamation development; organization and administration of irrigation districts and projects; water users' associations, etc.; discussion of public questions relating to reclamation. Professor Powers.

Sls 413. **Soil Conservation.** (g) 3 hours winter.

Climate, topography, and soil in relation to erosion; its causes, types, and importance; soil mapping; methods of control. For those who may enter the soil conservation service. Two recitations; 1 three-hour laboratory period. Associate Professor Torgerson.

Sls 414. **Irrigation Investigations.** (G) 3 hours fall.

Irrigation literature and methods of irrigation investigation; field and laboratory studies of irrigation experiments; calculation of depth of water applied and of the most economical production thereby obtained; costs and profits connected with irrigation; analysis of data and preparation of a

thesis. Field examinations are made, where possible, of some of the largest projects in the state. One lecture; 2 three-hour laboratory periods. Professor Powers.

Sls 421. **Soil Physics Lectures.** (g) 3 hours fall.
Origin, formation, physical composition, and classification of soils; soil moisture, surface tension, osmosis, capillarity, diffusion, aeration, temperature, and the resulting alteration in crop-producing power. Prerequisite: Sls 212, 213. Professor Stephenson.

Sls 422. **Soil Physics Laboratory.** (g) 2 hours fall.
Supplemental to Sls 421. Laboratory determination and comparison of physical properties of various soil types; physical effects of mulches, rotations, and cropping; soil sampling and judging; mechanical analysis of soils. Two three-hour laboratory periods. Professor Stephenson.

Sls 424. **Soil Fertility Lectures.** (g) 3 hours winter.
Composition and values of fertilizers and barnyard and green manures; maintenance and improvement of fertility; effect of the various crops and different systems of farming upon the fertility of the soil; crop rotations and fertility in different sections of the state and the United States. Prerequisite: Sls 421. Professor Ruzek.

Sls 425. **Soil Fertility Laboratory.** (g) 2 hours winter.
Laboratory work accompanying Sls 424. Two three-hour laboratory periods. Professor Ruzek.

Sls 428. **Soil Management.** (G) 5 hours spring.
Occurrence, composition, characteristics, productivity, plant-food requirements, comparative values, and management of different soil types. Prerequisite: Sls 424. Two recitations; 3 three-hour laboratory periods. Professor Powers.

Sls 431. **Soils of Oregon.** (g) 2 hours winter.
The distinguishing characteristics of the various soil types of Oregon. Prerequisite: Sls 212. Associate Professor Torgerson.

Sls 432. **Soil Survey.** (G) 3 hours spring.
For the advanced student who desires preparation for service at state experiment stations or in the Government Bureau of Soils. Classification of soils and soil areas of the United States, of Oregon, and of the Northwest; much work in making regular and completed soil surveys of assigned areas, including field trips of inspection, with a report thereon. Prerequisite: Sls 421 or 424, 431. One recitation; 2 three-hour laboratory periods. Associate Professor Torgerson.

GRADUATE COURSES

Courses numbered 400-499 and designated *(g)* or *(G)* may be taken for graduate credit.

Sls 501. **Research.** Terms and hours to be arranged.

Sls 503. **Thesis.** Terms and hours to be arranged.

Sls 505. **Reading and Conference.** Terms and hours to be arranged.

Sls 507. **Seminar.** 1 hour each term.

Sls 511. **Pedology.** 3 hours spring.
Advanced soil classification and morphology. Soil-forming processes; evolution of soil profiles; principles of soil classification and utilization; distri-

bution of soils of the United States in relation to vegetation and crops, geology, physiography, and climate. Limited to advanced and graduate students. Two recitations; 1 three-hour laboratory period. Professor Powers.

Sls 512. **Soil Colloids.** 2 hours fall.

Physical chemistry of soils with special reference to the nature and function of soil colloids, soil acidity, absorption, and base exchange. Limited to advanced and graduate students. Professor Stephenson.

Sls 513. **Plant Nutrition.** 2 hours winter.

Soil, water, and plant relationships; external factors that are controllable by agricultural practices; character of the soil solution in relation to the nutrient requirements of plants. Limited to advanced and graduate students. Professor Powers.

Sls 514. **Soil Organic Matter.** 2 hours winter.

Soil organic matter and humification processes; chemical and physical properties of humus; effect on soil reaction; biological processes and nutrient-supplying power of the soil; relation of humus to soil conservation and to plant growth and adaptation. Professor Stephenson.

Agricultural Education, Engineering, Extension Methods

THE departments of Agricultural Education, Agricultural Engineering, and Extension Methods are administered in close relation to the three divisions of the School of Agriculture. Preparation for professional service as agricultural educator, agricultural engineer, or agricultural extension worker involves fundamental training in agricultural economics, animal industries, and plant industries, supplemented by special preparation in the particular field of professional specialization.

Agricultural Education

THIS department is responsible for the training of teachers and supervisors of agriculture in secondary schools, for all-day students, part-time and evening schools for both young and adult farmers, and the training for leadership in rural life and education. Special attention is given to the training of teachers, directors, supervisors, and teacher trainers as provided for by the Federal laws for vocational education commonly known as the Smith-Hughes Act and the George-Deen Act. Included within the scope of this department's work are certain field, research, and extension activities involving the preparation of instructional material for the use of agriculture instructors in cooperation with various staff members of the School of Agriculture.

The Department of Agricultural Education is a joint department within both the School of Agriculture and the School of Education.

Requirements for Teaching Agriculture. Teachers of agriculture need to have a fundamental knowledge and a high level of doing ability in most of the departmental fields of the School of Agriculture. At the beginning of

his college course the prospective teacher should advise with the head of the Department of Agricultural Education regarding the courses he should select in each of the fields of agriculture. Certain qualifications essential in teaching vocational agriculture should be considered by the student in conference with the head of this department when applying for admission into this field of teaching.

Requirements in Agriculture:

(1) Graduation from a college of agriculture of standard rank.

(2) The course requirements in agriculture and education (for Smith-Hughes teaching) can be met in either of two ways: first, by majoring in the Agricultural Education curriculum (page 209), which includes requirements in both agriculture and education; or, second, by pursuing one of the three other curricula in agriculture in the sophomore year and one of the major curricula in General Agriculture, Agricultural Economics, Animal Industries, or Plant Industries during the junior and senior years. The latter plan will be approved, provided sufficient electives are available for meeting the course requirements in agriculture as outlined in the Agricultural Education curriculum on page 209, as well as the requirements in education.

(3) 80 to 90 term hours of special work in agriculture are required. The student's choice of courses should depend somewhat on his previous training and experience and the recommendations of the head of the department. The suggested sequence and distribution of courses are given in the Agricultural Education curriculum on page 209. Regardless of the department in which the student majors he should have a minimum of subject-matter courses in the respective departments distributed as follows:

(a) 10 hours in Animal Husbandry
(b) 6 hours in Dairy Husbandry
(c) 6 hours in Poultry Husbandry
(d) 4 hours in Veterinary Medicine
(e) 9 hours in Soils
(f) 12 hours in Farm Crops
(g) 6 hours in Horticulture
(h) 6 hours in Agricultural Economics and Marketing
(i) 12 hours in Farm Management
(j) 18 hours in Agricultural Engineering

(4) Requirements for certification of agricultural instructors:

(a) Vocational certificate. The four-year curriculum in Agricultural Education, page 209, is designed to fulfill the requirements for this certificate.

(b) Secondary school certificate. The requirements for this certificate are given on pages 254-256.

For more specific information regarding the methods of meeting the requirements for both types of teaching certificates in the field of agricultural education, confer with head of the department.

Graduate Study and Apprentice Teaching. As the demands on teachers of agriculture the country over are becoming more exacting each year additional work after graduation in the fields of agriculture and education is desirable, and in certain states, including Oregon and Washington, is required for

the secondary school certificate. To meet this demand, a fifth year of graduate work including apprentice teaching is available for a limited number of graduates of approved standing. The plan provides for the location of apprentice teachers in high-school centers near Corvallis where they may acquire credit, both by work at the College and in the field, toward a master's degree.

General Electives. Certain courses are open to all students in agriculture and others who are interested in training for leadership in rural life. Special attention is called to Ed 341, Rural Education.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

Ed 341. **Rural Education.** 3 hours winter.

Open to prospective high-school teachers and others who desire some foundation for a philosophy of rural life and training for leadership in rural education. New methods of utilizing the student's rural, social, and economic environment as a means of vitalizing different phases of the high-school instruction, achieving social objectives of education, and increasing farm, home, and town-country efficiencies; various forms of continuation and rural extension education for out-of-school youths and adults. Students actively participate in planning and executing studies and programs in rural education. Prerequisite: junior standing. Professor Gibson.

AEd 401. **Research.** Terms and hours to be arranged.

AEd 403. **Thesis.** Terms and hours to be arranged.

AEd 405. **Reading and Conference.** Terms and hours to be arranged.

AEd 407. **Seminar.** Hours to be arranged, two terms.

Ed 408a. **Special Teaching Methods.** 3 hours any term.

AEd 417. The **Agriculture Curriculum.** (G) 3 hours winter or spring.

Determining course content and evaluating types of course organization with reference to the objectives to be attained in the field of agriculture in secondary schools. Prerequisite: Ed 313. Professor Gibson.

AEd 418. **Adult Education in Agriculture.** (G) 3 hours winter.

Problems and procedures in developing programs for both young and adult farmer groups. Students in this course participate in recruiting, organizing, and teaching evening classes in the vicinity of Corvallis. Prerequisite: Ed 313; AEd 417. Professor Gibson.

GRADUATE COURSES

AEd 501. **Research.** Terms and hours to be arranged.

AEd 503. **Thesis.** Terms and hours to be arranged.

AEd 505. **Reading and Conference.** Terms and hours to be arranged.

AEd 507. **Seminar.** Terms and hours to be arranged.

AEd 516. **Extension Course in Teacher Training.** Hours to be arranged, any term.

Teachers of vocational agriculture in service who cannot be relieved of their professional duties to pursue courses that are offered in the summer

sessions may make use of the course to continue their professional improvement. Personal conferences, follow-up instruction, and supervision, supplemented by correspondence and reports. Prerequisite: Ed 311, 312, 313; 328. Professor Gibson.

AEd 533. **Rural Survey Methods.** 3 hours spring.

The technique of making agricultural and rural educational surveys; methods of analyzing, interpreting, and using the material and results as a basis for evaluating and formulating programs in agricultural education; field studies required. Open to graduates with teaching experience and seniors by special permission. Prerequisite: Ed 311, 312, 313; 328. Professor Gibson.

Agricultural Engineering

THIS department offers two types of instruction: (1) a major curriculum in agricultural engineering (pages 210-211) and (2) service courses for students majoring in other departments. The major curriculum offers the student two options. The professional option provides training for the student planning to qualify for civil service examinations, or other fields where extensive technical training is needed. The vocational option is designed to train the student who is interested in farming, extension work, Smith-Hughes vocational agriculture teaching, farm implement sales, lumber and building materials retailing in rural communities, or other work requiring a wider knowledge of agriculture, with less emphasis on the technical phases of engineering. In both options the sciences fundamental to engineering and agriculture, including mathematics, physics, chemistry, and economics, serve as a basis for practical work in agriculture and agricultural engineering. Opportunity is given to elect nontechnical work of cultural value.

The increasing importance of modern machinery and equipment in reducing cost of production, together with the improvement of rural living conditions, demands, in any branch of agriculture, a more complete and effective grasp of agricultural engineering. Students majoring in other departments who recognize the need for a knowledge of farm mechanics, implements, tractor, and automobile mechanics, building materials and structures, and modern home conveniences may elect courses pertaining to these subjects.

Equipment. Up-to-date equipment and demonstration material is loaned to the institution by the leading manufacturers and distributors of the Northwest for study and operation by the students. The farm motors laboratory contains several makes and types of stationary gas engines, cut-away automobile and tractor motors, and accessories, such as carburetors, magnetos, and air cleaners. A Prony brake for determining the horsepower output of stationary engines and sectionized automobile chassis parts are also included.

The tractors and automobile repair laboratory is well equipped with modern tools and testing equipment for complete instruction in repair work of all kinds. A number of tractors, of both wheel and crawler types, are loaned annually to the department for instruction purposes.

A well-lighted drafting room with modern equipment is available for students studying farm structures. A number of model farm buildings and various samples of building materials are used to supplement the study of actual buildings on the college and neighboring farms.

Courses in farm construction and general farm repairs are taught in laboratories equipped for the purpose. Farm water systems, centrifugal and turbine

pumps for irrigation pumping, spray pumps, and similar equipment are also available for instruction purposes.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

AE 101. **Agricultural Engineering Survey.** 2 hours fall.

Designed as an orientation course for freshmen majoring in agricultural engineering, this course deals with the various fields of agricultural engineering, their requirements, and the ability and training best suited for each. Two two-hour periods.

AE 111, 112. **Agricultural Engineering.** 3 hours each term.

Principles of mechanics, hydraulics, and electricity as applied to farm problems; mathematics essential to agriculture. Designed to teach general agriculture students the more important principles involved in application of engineering to agricultural problems, through survey of the field of agricultural engineering. Spring term especially for students in fish and game and range management. One lecture; 2 two-hour laboratory periods.

AE 221, 222. **Farm Mechanics.** 3 hours two terms.

Farm drawing, reading blueprints, and estimating materials and costs; study of materials and their uses; selection and care of tools; construction of farm appliances involving both wood and metal work; farm equipment repairs. The first term is devoted primarily to acquiring basic information and skills, followed by additional practice in these skills in the second term. Prerequisite: IA 250 or equivalent. One recitation; 2 three-hour laboratory periods.

AE 231. **Farm Implements.** 3 hours spring.

The latest horse- and tractor-drawn farm implements, plows and their adjustments and hitches, cultivating machinery, seeding and planting machines, hay- and grain-cutting machines, and manure spreaders; fences and roads; adjustment of machines. One recitation; 2 two-hour laboratory periods.

UPPER-DIVISION COURSES

AE 311. **Farm Motors and Tractors.** 3 hours any term.

The principle, construction, operation, and adjustment of farm motors and accessories, carburetors, magnetos, ignition, governing, cooling, and lubricating systems; fuels and oils; testing, timing, and trouble hunting of farm gas motors, such as are used in the tractor, truck, automobile, and stationary outfits. Two recitations; 1 three-hour laboratory period. Assistant Professor Lunde.

AE 312. **Automobile Mechanics.** 3 hours any term.

The automobile and its parts; their functions, adjustment and simple repairs; advantages and disadvantages of different features in automobile construction; latest developments in the automotive field. Designed for the student who wishes to understand the principles of automobile operation together with simple repairs and adjustments that the operator of an automobile may have occasion to make. In the fall term a *special section of this course carrying 2 hours credit* is offered for women students (1 recitation, 1 two-hour laboratory period). Two recitations; 1 three-hour laboratory period. Assistant Professor Lunde.

AE 313. **Automobile Mechanics.** 3 hours any term.

Practical work in overhauling and repairing automobiles, tractors, and trucks, involving disassembling and assembling of parts, testing for and

locating troubles, making replacements and repairs. Lectures, demonstrations, class discussions, and laboratory work. Prerequisite: AE 311 or 312. One recitation; 2 three-hour laboratory periods. Assistant Professor Lunde.

AE 314. **Automobile Mechanics.** 3 hours spring.

(Advanced course.) A continuation of AE 313 for students who wish to acquire additional skill and information relative to automobile repairing and overhauling, especially those intending to teach automobile mechanics. Prerequisite: AE 313. Two recitations; 1 three-hour laboratory period. Assistant Professor Lunde.

AE 321. **Pumps and Irrigation Equipment.** 3 hours spring.

The study, operation, and testing of different types of pumps, irrigation equipment, and farm water supply systems, farm spray pumps and equipment. Prerequisite: AE 111 or equivalent. Two recitations; 1 three-hour laboratory period. Associate Professor Walker.

AE 331. **Rural Electrification.** 3 hours winter.

Uses of electricity on the farm; farm electric plants; rural line extension policies; farm wiring; farm electric motors and equipment such as water heaters, cooling, sterilizing, and refrigerating equipment. Prerequisite: AE 111 or equivalent. Two lectures; 1 three-hour laboratory period. Associate Professor Walker.

AE 341. **Use of Explosives.** 2 hours winter.

The use of explosives in removing stumps and boulders; stump burning and charpitting; the use of explosives in ditch and rock blasting. Taught jointly by the departments of Agricultural Engineering, Civil Engineering, and Logging Engineering. One recitation; 30 hours of laboratory and field work arranged during the term. Professors Gilmore, Glenn, and Patterson.

AE 401. **Research.** Terms and hours to be arranged.

AE 405. **Reading and Conference.** Terms and hours to be arranged.

AE 407. **Seminar.** Terms and hours to be arranged.

Prerequisite: fourteen term hours in agricultural engineering or equivalent.

AE 461, 462, 463. **Farm Structures.** 3 hours each term.

First term: fundamental principles involved in the organization, layout, and construction of farm buildings, with sufficient drafting to enable the student to interpret drawings and blueprints. Second and third terms: planning of farm buildings, building materials, types of construction, lighting, ventilating, heating, equipment; estimating costs, writing specifications, and analyzing the structural elements in farm-building design. One lecture; 2 three-hour laboratory periods. Associate Professor Sinnard.

AE 471. **Soil Conservation Engineering.** 3 hours fall.

Agricultural-engineering phases of soil-erosion control, including methods of constructing dams and terraces, terracing machinery, mapping, measurement of run-off, and similar problems. For students specializing in soil conservation. One lecture; 1 recitation; 1 three-hour laboratory period. Associate Professor Walker.

GRADUATE COURSES

AE 501. **Research.** Terms and hours to be arranged.

AE 503. **Thesis.** Terms and hours to be arranged.

AE 505. **Reading and Conference.** Terms and hours to be arranged.

AE 507. **Seminar.** Terms and hours to be arranged.

Extension Methods

INSTRUCTION in this department is intended to supplement that of the subject matter departments in the training of students for positions as county agents, home demonstration agents, 4-H club agents, extension specialists, and for similar types of work in which extension methods are commonly used.

The extension worker must be well trained not only in the subject matter of his field but also in the methods by which extension work is successfully carried on. He must be able to give or know how to obtain authoritative advice for his community or county on any problems that may arise related to his field of service. He must know and practice the technique of platform speaking and demonstration, radio speaking, how to conduct discussions, and how to support the extension program by effective publicity. Excellent opportunities for combining a major in agriculture or home economics with training in journalism, speech and dramatics, economics, sociology, and other departments, supplemented by work in extension methods, should materially assist in meeting the need for better training on the part of extension workers.

This department is a joint department within both the School of Agriculture and the School of Home Economics.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

EM 405. **Reading and Conference.** Hours to be arranged, any term.

EM 411, 412. **Extension Methods.** (G) 3 hours each term, two terms.
Intensive study of the history and present organization of extension work; training in the most successful methods employed by extension specialists, county agricultural agents, home demonstration agents, 4-H club leaders, and agricultural workers in commercial fields. For senior or graduate students only. Professor Ballard.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

School of Education

Faculty

JAMES RALPH JEWELL, Ph.D., LL.D., Dean of the School of Education; Director of High-School Teacher Training.

CARL WALTER SALSER, Ed.M., Assistant Dean of the School of Education.

CLYTIE MAY WORKINGER, Placement Secretary.

RUTH LANO, Secretary, School of Education.

Education

CARL WALTER SALSER, Ed.M., Professor of Education; Head of Department.

*HARRY CASE SEYMOUR, State Leader of 4-H Club Work.

*CHARLES BUREN MITCHELL, M.A., Professor of Speech.

CLAIR VAN NORMAN LANGTON, Dr.P.H., Ed.D., Professor of Physical Education.

OTHNIEL ROBERT CHAMBERS, Ph.D., Professor of Psychology.

†HERBERT REYNOLDS LASLETT, Ph.D., Professor of Educational Psychology.

ERNEST WILLIAM WARRINGTON, M.A., Professor of Philosophy and Religion.

FRANK WINTHROP PARR, Ph.D., Professor of Secondary Education; Director of Supervised Teaching.

RILEY JENKINS CLINTON, Ed.D., Professor of Education.

FREDERICK MAURICE HUNTER, Ed.D., LL.D., Professor of Education.

EVA M SEEN, Ed.D., Professor of Physical Education for Women.

GLENN ALMER BAKKUM, Ph.D., Professor of Sociology.

*MELISSA MARGARET MARTIN, A.M., Professor of Modern Languages.

*EARL WILLIAM WELLS, M.A., J.D., Professor of Speech.

GRANT ALEXANDER SWAN, B.S., Assistant Professor of Physical Education.

JAMES WILSON SHERBURNE, Ph.D., Associate Professor of Psychology.

WALTER FRASER MCCULLOCH, M.S., Assistant Professor of Forestry.

ROBERT RAY REICHART, Ed.D., Assistant Professor of Educational Psychology.

WILLIAM CURTIS REID, Ph.D., Instructor in Physics.

Agricultural Education

HEBER HOWARD GIBSON, A.M., Professor of Agricultural Education; Head of Department.

RUSSEL MONROE ADAMS, M.S., Supervising Teacher in Agricultural Education.

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* Associate Faculty for 1942-43: Teacher training is an enterprise in which many different departments have a share. The President of the State College, at the request of the School of Education, appoints each year certain faculty members from other schools on the campus to serve also as associate and advisory members of the School of Education faculty.

† On leave of absence.

Commercial Education

BERTHA WHILLOCK STUTZ, M. S., Associate Professor of Secretarial Science.
MINNIE DEMOTTE FRICK, B.S., Associate Professor of Secretarial Science.
BETTY JELINEK MCGLASSON, B.S., Supervising Teacher in Commercial Education.

Home Economics Education

FLORENCE BLAZIER, Ph.D., Professor of Home Economics Education; Head of Department.
BERTHA KOHLHAGEN, M.S., State Supervisor and Teacher Trainer in Vocational Home Economics.
MAY DU BOIS, M.S., Assistant Professor of Home Economics Education.
EMMAJEAN STEPHENS PETERSON, M.S., Supervising Teacher in Home Economics Education.
*ESTHER WOOD BODNER, B.S., Supervising Teacher in Home Economics Education.
EVELYN SWAIM, M.S., Supervising Teacher in Home Economics Education.
HARRIET KLEINSORGE TURNER, M.S., Supervising Teacher in Home Economics Education.

Industrial Education

GEORGE BRYAN COX, M.S., Professor of Industrial Education; Head of Department.
*ORVILLE DANIEL ADAMS, M.S., Associate Professor of Vocational Education.
OSCAR INGAL PAULSON, B.S., Acting Associate Professor of Vocational Education.
EDWIN DAVID MEYER, M.S., Assistant Professor of Industrial Education.
BRUCE JACKSON HAHN, M.S., Supervising Teacher in Industrial Education.
*NEIL EDMUND SALING, B.S., Supervising Teacher in Industrial Education.

Science Education

ELMO NALL STEVENSON, Ed.D., Professor of Science Education; Head of Department.
†WINFRED MCKENZIE ATWOOD, Ph.D., Professor of Plant Physiology.
†WILLIAM DONALD WILKINSON, Ph.D., Associate Professor of Geology.
HENRIETTA MORRIS, Sc.D., Associate Professor of Hygiene.

General Statement

ALL professional preparation for teaching within the State System of Higher Education, except preparation for strictly elementary-school teaching, is organized under the School of Education. The school is concerned especially with the preparation of teachers for the high schools of Oregon, and with the promotion of high standards of secondary education.

* On leave of absence.
† Associate Faculty 1942-43.

The School of Education operates on both the University and the State College campuses. Preparation for high-school teaching in the various fields is divided between the two institutions in accordance with the allocation of major curricula. The director of high-school teacher training, with offices at Eugene, has administrative control over all high-school teacher education within the State System.

At the State College are given major curricula preparing for teaching of biological science, general science, physical science, mathematics, agriculture, home economics, industrial arts, secretarial science, and approved combinations of subjects, and for educational and vocational guidance.

At the University are given general education courses, professional work in educational administration, and major curricula preparing for teaching of literature, languages, social sciences, biological science, general science, physical science, mathematics, arts, business administration, music, physical education, and approved combinations of subjects. The University also offers training to prepare teachers for work with atypical children.

In planning its curricula the School of Education has recognized three qualifications for a good teacher: (1) mastery of subject matter; (2) an understanding of child and adolescent psychology, and of professional problems and techniques; (3) a broad and liberal education.

Admission. High-school graduates who plan to teach may enroll in the School of Education as freshmen. In this way requirements will be most easily and certainly met, an adviser will be available at all times, proper teaching fields will be chosen, and the most valuable supporting courses will be selected and worked into the student's program. This means the best possible basis for recommendation and placement at graduation. Junior-college graduates from accredited institutions enter the School of Education as juniors and may complete the work in two years for the B.A. or B.S. degree. Students having had one year in junior college enter as sophomores in the School of Education. Lower-Division students who complete the first two years of college work at the State College or the University, or at other accredited institutions, enter the School of Education as juniors. These students ordinarily will have one or two of their teaching fields under way and will experience little difficulty in selecting a major or two minors. Graduates of the Colleges of Education who have completed two years of work will enter the School of Education as third-year students; those who have completed three years of work will ordinarily enter as seniors. Such students ordinarily receive full credit for all work taken in the colleges except that not more than 9 hours of credit are allowed for practice teaching from the colleges of education. Graduates of two-year colleges of education are likely to be deficient one or two terms in English and occasionally one or more terms in science. As soon as these courses have been made up the student receives the Junior Certificate and full junior standing.

Facilities. The central offices, lecture rooms and laboratories, and rooms and facilities for the testing and advisory service of the School of Education are located in the newly remodeled, fire-proof and modernized Education Hall. The building also houses the departments of Psychology, Philosophy, Religion, Geology, and Mathematics. Special provisions are made for testing and advisory work, film projection, and radio reception. Supervised teaching is carried on in both the senior high school and the junior high school of Corvallis, and in neighboring high schools including Albany, Oregon City, and Philomath.

Baccalaureate Degrees. Students majoring in education may become candidates for the following baccalaureate degrees: Bachelor of Arts, Bachelor of Science, and Bachelor of Education. For each of these degrees the student must fulfill all State College requirements for these degrees, besides major requirements. For the B.A. degree 36 term hours in arts and letters, including a minor in one of the modern languages, must be completed; for the B.S. degree 36 term hours of science or 36 term hours of social science are required.

Special Requirements. Candidates for a bachelor's degree in the School of Education must submit: (a) 36 term hours in education and psychology, of which at least 24 term hours must be in upper-division or graduate education courses; (b) for recommendation for a high-school teaching certificate, one major or two minors in teaching fields (see pages 256-261).

Outlines of Psychology (Psy 221, 222, or Psy 201, 202, 203, or equivalent) is prerequisite to all upper-division education courses.

A scholarship average within the upper 50 per cent of the State College grade range ordinarily is prerequisite to registration for upper-division teacher training courses. In admitting students into these courses, the faculty of the School of Education gives additional consideration to psychological rating, teaching personality, and in doubtful cases to marked improvement in scholarship during the sophomore or junior year.

In the case of first courses in science or foreign languages, an entire year sequence must be completed (e.g., Ch 101, 102, 103) before credit is allowed. A student with a minor in a modern language may, upon application to the dean's office, be excused from taking literature.

Graduate Work. Graduate work in education, leading to the Master of Arts, Master of Science, Master of Education, and Doctor of Education degrees, is offered at the State College through the Graduate Division. For an M.A. or M.S. degree, the student must complete a graduate major in education and a minor in a subject-matter field; for the M.A. degree a reading knowledge of a relevant foreign language is required. For the Ed.M. the candidate must have had at least two years of successful teaching experience. Candidates for the Ed.D. degree must have a record of successful teaching experience. They will ordinarily include in their programs intensive work in statistics and research. Reading knowledge of French, German, or other languages may be required if it is regarded as essential to the student's program. The program of study for each candidate for the Ed.D. degree is carefully planned and integrated with the aim of preparing men and women for immediate, effective, professional service in administrative, supervisory, and advanced teaching positions in the fields allocated at the State College. The regulations governing graduate study are stated under GRADUATE DIVISION in this Catalog.

Supervised Teaching. The School of Education provides an opportunity for supervised high-school and junior high-school teaching in all the major fields allocated at the State College. Supervised teaching cannot be done at the State College in fields in which the State College does not offer major work, except that students minoring in physical education may do their supervised teaching in physical education when approved by the director of supervised teaching. Student teachers observe teaching by expert instructors, study model lesson plans, work out their own lesson plans under the guidance of the supervisors, and teach high-school classes under close supervision. Credit for supervised teaching is granted only on the approval of the director of supervised teaching.

Guidance Clinic, Testing and Advisory Service. Members of the education faculty, supplemented by several members from other schools on the campus, constitute a guidance clinic and give much of their time to individual work with students. Frequent meetings of the clinic are held throughout the academic year. The services of the clinic are open and easily available to students in any school on the campus. The testing and advisory service conducted by the Guidance Clinic enables students to take various tests of aptitudes and ability and to have expert assistance in interpreting results.

Educational and Vocational Guidance. Under the organization plan of the State System of Higher Education, training for educational and vocational guidance is allocated to the State College. The major curriculum in guidance, counseling, and personnel work (see pages 262-263) extending through five or more years leads to baccalaureate and advanced degrees and prepares students for service as counselors, deans of girls, deans of boys, teachers of occupations courses, and for other phases of personnel work. Observation and supervised practice in counseling and guidance are provided. Students in this major are, as a rule, expected to prepare themselves in at least one teaching field and preferably in two as entrance upon student counseling and personnel work is through experience and success in the high-school or junior-college classroom. Experience in fields of work other than teaching is desirable for all counselors and personnel workers.

Teacher Placement Service. A Placement Service is maintained by the School of Education for the placement of graduates of the State College who are prepared and qualified to teach in the secondary schools. The Placement Service compiles and makes available to school officials full information concerning the preparation and experience of graduates who desire teaching positions. The Placement Service also furnishes students information concerning the certification requirements and school laws of other states, and will recommend graduates for certification in other states, on the endorsement of the Dean of the School of Education and the State College Registrar. The following fees are charged by the Placement Service:

Registration fee	$3.00
Charge for late registration	1.00
Charge for late payment of registration fee	1.00
Credential fee	.25
Credential fee for out-of-state certification	2.00

State Teacher's Certificate

ALL teachers in the high schools of the state of Oregon must hold a high-school teacher's certificate, issued by the State Superintendent of Public Instruction. To be eligible for a one-year certificate after February 10, 1943, graduates of the State College must satisfy the following requirements:

(1) A total of 45 term hours of college work after meeting the requirements for the baccalaureate degree.*

(2) A minimum of 40 term hours of work in education, 15 term hours of which must be in upper-division or graduate courses taken after meeting the

* For persons applying for a certificate prior to February 10, 1943, the requirement is 30 term hours after meeting the requirements for the baccalaureate degree.

requirements for the baccalaureate degree.* This work must be distributed as follows:

	Term hours
Secondary Education (Ed 311)	3
Educational Psychology (Ed 312)	3
Principles of Teaching (Ed 313)	3
Special Teaching Methods (Ed 408)	3
Supervised Teaching (Ed 415)	6
Oregon School Law and Oregon System of Education (Ed 316)	2
Advanced overview of education (Ed 511, Ed 543, Ed 546)	3
Electives in education	17

(3) Oregon History (Hst 377), 3 term hours.

(4) A minimum of 3 term hours in General Psychology. (Either Psy 201, 202, 203 or Psy 221, 222 are prerequisite to Ed 312).

Ed 311, 312, 313, and 415 must be taken in residence—they cannot be taken by correspondence.

Under regulations adopted by the Oregon State Board of Education in January 1941, new teachers employed in approved high schools may be assigned to teach only in those subject fields in which they have completed adequate college preparation. The State Board of Education has set the following minimum standards of subject preparation:

ENGLISH: 36 term hours, including at least 9 term hours in composition and rhetoric (it is recommended that a substantial amount of work in speech be included in this training). LANGUAGE: the equivalent of 30 term hours of college preparation in each language taught (high-school credits evaluated in terms of college hours may be accepted in meeting the minimum requirements). SOCIAL STUDIES: 36 term hours, including at least 18 term hours in American and European or world history, and a total of at least 10 term hours in two or more of the following subjects—government, economics, sociology, geography. MATHEMATICS: 15 term hours of college mathematics. COMMERCE: *Shorthand*, 18 term hours (may include high-school or business-college work evaluated in terms of college hours or equivalent performance standards); *Typing*, 6 term hours (may include high-school or business-college work); *Bookkeeping, Business Training, Commercial Law*, 24 term hours in accounting and business administration. NATURAL SCIENCE: *Elementary Science*, 24 term hours in the natural sciences, including at least 9 term hours in physical science and 9 term hours in biological science; *Biology*, 18 term hours; *Physics*, 12 term hours; *Chemistry*, 12 term hours. PHYSICAL EDUCATION AND HEALTH EDUCATION: 12 term hours in physical education and 12 term hours in health education. INDUSTRIAL ARTS: 24 term hours. HOME ECONOMICS: 24 term hours. AGRICULTURE: 24 term hours.

To be recommended by the State College for a teaching position, a student in satisfying the minimum subject requirements in the fields in which he intends to teach must take certain specified courses. These courses are listed on pages 256-261.

Believing that a broad knowledge in the fields of English, social studies, mathematics, natural science, and the fine arts should be a part of the equipment of every teacher, whatever his subject field, the State Board of Education has recommended that, beginning with the school year 1943-44, the college preparation of all new teachers employed in state-approved high schools should include the following:

ENGLISH: 24 term hours in literature, composition, speech, dramatics. SOCIAL STUDIES: 24 term hours in history, political science, economics, sociology, geography, philosophy. (A maximum of 6 term hours in library science may be applied toward satisfying the recommendation in English or social studies.) SCIENCE AND MATHEMATICS: 17 term hours, including 9 hours in biological science and 8 hours in physical science and mathematics or in either of these fields. ARTS AND CRAFTS: 6 term hours in music, or in plastic, graphic, or industrial arts (equivalent performance standards may be accepted if approved by the teacher-training institution).

Students wishing to qualify for certification and placement should confer with the members of the faculty of the School of Education not later than the end of the second term of their sophomore year.†

* For persons applying for a certificate prior to February 19, 1943, the requirement is 37 term hours in education, 9 hours after meeting the requirements for the baccalaureate degree.

† Attention is called especially to the fact that a minimum scholarship average within the upper 50 per cent of the State College grade range is expected before registration for upper-division teacher training courses. See SPECIAL REQUIREMENTS, page 253.

Application for certification must be made to the State Superintendent of Public Instruction. An official record of the applicant's preparation, required as a basis for certification, will be submitted to the State Superintendent by the State College Registrar, on request.

The holder of a one-year state certificate, after six months' successful teaching experience in this state and on the recommendation of the city school superintendent or county school superintendent under whose supervision the applicant last taught, will receive a five-year state certificate authorizing him to teach in the high schools or junior high schools of this state.

A five-year certificate may be renewed when the holder thereof has taught successfully for a period of 24 months during the life of such certificate, or has completed 15 term hours in courses approved by the State Board of Education in a standard college or university. When a teacher who is regularly employed by a school board has been granted a leave of absence by such board, the school months included in such leave of absence shall be counted the same as months of teaching in determining eligibility for renewal of a five-year certificate.

The holder of a one-year state certificate, or a five-year state certificate, or a state life certificate, is authorized to act as city superintendent of the schools of any city.

The following fees are payable to the State Superintendent of Public Instruction at the time the application for certification is made:

One-year certificate	$2.00
Five-year certificate	2.00
Renewal of five-year certificate	2.00

Subject Preparation

IN ORDER to be recommended by the State College for a teaching position a graduate must have prepared himself, through suitable College courses, for the teaching of at least two subjects. To ensure better opportunities for placement, it is desirable that students intending to teach qualify for the supervision of at least one extracurricular activity and, if possible, for teaching in a third subject field.

One of the student's subject fields must be a field which is allocated as a major to Oregon State College and in which the State College offers supervised teaching, namely: agriculture, biological sciences, general science, home economics, industrial arts, mathematics, physical sciences, or secretarial science. Exceptions to this requirement may be made in the case of students transferring from other institutions, who have completed courses in special methods and supervised teaching before entering the State College.

Listed below are courses which the State College requires for minimum subject preparation in the several teaching fields; these requirements satisfy the subject-preparation standards of the State Board of Education (see page 255). It is important to note, however, that they satisfy the *minimum* requirements only. Where majors are outlined the major (including upper-division work) should be chosen in preference to the minor, particularly by students who plan to teach in other states. Students should consult members of the faculty of the schools or departments in which they are taking subject-preparation courses concerning additional courses they should elect to strengthen their preparation.

Certain subject-matter courses that do not satisfy major or minor requirements are of great help to teachers (for example, work in oral English, extem-

pore speaking, journalism, economics, sociology, and political science). Students preparing to teach in junior or senior high schools are advised and urged to take J 111, Elementary Journalism, and J 313, Public Information Methods. All high-school teachers will find these courses valuable in connection with high-school newspaper work and in connection with school news in the newspapers of the local community. Students should consult members of the faculty of the School of Education concerning such supplementary training that would be of particular value in relation to their individual training programs.

The approved majors and minors in teaching fields are classified in two groups: I. Majors and minors; II. Minors. Students who present two minors instead of a major must include one minor in the first of these groups.

I. Majors and Minors

A student seeking a high-school teacher's certificate must select either a major or a minor in this group.

Agriculture

	Term hours For major	For minor
Physical Science	12	9
Biological Science	12	9
Electives in Agriculture	12	9
	36	27

The major and minor in agriculture are for prospective teachers of general agriculture and are designed to serve the following purposes: (1) to provide high schools of moderate size with teachers prepared to teach a combination of courses in the fields of agriculture and natural science; (2) to familiarize prospective teachers of the natural sciences with concrete situations, materials, and problems in agriculture and rural life valuable in vitalizing the instruction; (3) to prepare teachers who can offer a separate course in agriculture for farm boys mainly for its vocational and vocational-guidance values.

Biological Science

General Zoology	9	9
General Botany	9	9
Entomology (Elementary or General)	3–6	3
Bacteriology (Elementary or Principles)	3–6	3
Electives in field of biology (6-9 hours in upper division)	12–6	----
	36	24

Or *Human Biology*

General Zoology	9
Evolution and Eugenics	3
Genetics	3
Principles of Bacteriology	3
Physiology	9
Elementary Human Anatomy	9
	36

Or *Health Education*

Elementary Human Anatomy (Z 208, 209, 210)	9
Elementary Human Physiology (Z 211)	5
General Bacteriology (Bac 204, 205)	6
Nutrition (HAd 225)	3
Health Education (Ed 351, 352)	6
School Health Problems (Ed 421, 422, 423)	6
	35

Physical Science Survey is recommended to accompany Biological Science major, and Biological Science Survey is recommended to accompany Physical Science major, unless the student is minoring in the opposite field.

General Science

	Term hours For major	Term hours For minor
Biological Science Survey	12	12
Physical Science Survey	12	12
Electives in biological or physical science	9	9
Biological or physical science (upper-division)	9	----
	42	33

Specific courses or areas covered by survey courses may be substituted in either major or minor. Desirable electives are: Elementary Entomology, Principles of Bacteriology, Photography, Astronomy, Geology of Oregon, Field Geology, Ornithology, Evolution and Eugenics.

Home Economics

Foods (FN 220, 221, 222 for students electing chemistry; FN 211, 212, 213 for those not electing chemistry)	9	9
Nutrition (FN 225)	3	3
Textiles (CT 250, 211, 212 for students electing specified art courses; CT 250, 217, 218, 219 for those not electing specified art courses)	9	9
Child Development (HAd 311, 312)	6	6
Household Management (HAd 340)	4	4

Electives from at least two of the following groups totaling 14 hours:

A. *Foods*

B. *Clothing*

C. *Household Administration*

Food Purchasing (FN 411), 3 hours Experimental Cookery (FN 435), 3 hours Quantity Cookery and Catering (IEc 311), 3 hours Cafeteria Management (IEc 320), 3 hours Feeding the Family (FN 325), 2 hours Food Demonstrations (FN 413), 3 hours Food Management (FN 412), 3 hours House Furnishing (CT 231), 3 hours Applied Design (CT 335), 3 hours Costume Design (CT 311), 3 hours Clothing (CT 312), 3 hours House Furnishing (CT 331), 3 hours House Furnishing (CT 431), 3 hours Consumer Buying in Clothing and Textiles (CT 350), 3 hours All courses in the Department of Household Administration are open to those who have completed a minor in home economics, but the following are particularly recommended in the order named: Home Management (HAd 350), 3 hours Family Relationships (HAd 422), 3 hours Child Development (HAd 413), 3 hours	14	----
	45	31

Industrial Arts

Methods in Woodworking (IA 112, 113)	6	6
Engineering Drawing (GE 111, 112, 113)	6	6
Lower-Division Drawing (AA 291)	3	3
Wood Turning (IA 220)	2	2
Machine and Tool Maintenance (IA 325)	2	2
Fiber Furniture Weaving (IA 326)	2	2
Millwork—Machine Woodwork (IA 311)	3	3
Wood and Metal Finishing (IA 316)	2	2
Industrial Arts Organization (Ed 330)	----	2
The General Shop and Its Problems (IEd 473)	2	2
Furniture Construction (IA 313) *or* Carpentry (IA 333)	2–3	----
Occupational Analysis (IEd 472)	3	----
Written and Visual Teaching Aids (IEd 474)	3	----
Shop Planning and Organization (IA 411)	3	----
Electives in general metal work, or additional courses in woodwork and drawing subjects	6	5
	45–46	35

See page 275 for a statement of objectives controlling the major and minor. The major outlined is a basic major with woodworking emphasis. Students desiring a different combination, or help on individual problems, should confer with the head of the Department of Industrial Arts. See page 275 for statement of the three types of program offered. Students who wish to teach industrial arts in states that demand additional certification requirements should refer to the professional-technical curriculum for industrial-arts education (pages 290-291) and should confer with the head of the Department of Industrial Arts.

Mathematics

	Term hours For major	Term hours For minor
Elementary Analysis (Mth 101, 102, 103) or equivalent	12	12
Differential and Integral Calculus or equivalent	12	12
Upper-division approved mathematics courses	12	----
	36	24

For three terms of Calculus students may substitute two terms of Calculus and one term of either Modern Geometry, Higher Algebra, or Theory of Equations and Determinants.

Physical Science

General Chemistry	15	12–15
General Physics	12	12
Geology (Oregon)	----	3
Geology (Oregon or General)	3–9	----
Electives in the field of physical science (upper-division)	6–3	----
	36–39	27–30

Biological Science Survey is recommended to accompany Physical Science major, and Physical Science Survey is recommended to accompany Biological Science major, unless the student is minoring in the opposite field. Suggested electives for major are: Photography, Astronomy.

Secretarial Science

Stenography (SS 111, 112, 113)	9	9
Typing (SS 121, 122, 123)	6	6
Constructive Accounting (BA 111, 112, 113)	12	----
Applied Stenography (SS 211, 212, 213)	9	9
Office Procedure (SS 311)	5	5
Business Law (BA 256)	4	----
	45	29

Students who have had one year or more of typing or shorthand will receive advanced standing according to ability shown in placement test provided by the Department of Secretarial Science.

II. Minors

Art

	Term hours for minor
Survey of Creative Arts (Art Appreciation) (AA 114, 115, 116)	9
Lower-Division Drawing (AA 291)	3
Lower-Division Decorative Design (AA 295)	3
Color and Composition (AA 162)	3
Elective courses in Commercial Design, Crafts, House Planning, Block Printing, Drawing	6
	24

Business Administration

Constructive Accounting (BA 111, 112, 113)	12
Elements of Marketing (BA 223)	4
Business Law (BA 256)	4
Elements of Organization and Production (BA 221)	4
	24

English and Speech

	Term hours for minor
English Composition (Eng 111, 112, 113) or equivalent	6–9
Literature Survey (Eng 101, 102, 103) *or* Introduction to Literature (Eng 104, 105, 106) *or* other Literature courses	9
Two terms of Shakespeare	6
English Composition for Teachers (Eng 324)	3
American Literature (Eng 161)	3
Electives	9–6
	36

Students especially interested in speech or oral English may substitute for courses in the English minor (with the exception of Shakespeare and English Composition for Teachers) certain courses in Extempore Speaking, Interpretation, Speech Composition, Community Drama, and Stagecraft and Lighting. Students may include 9 hours of journalism instead of speech. Such substitutions must have the approval of the student's adviser and the dean's office.

French

RL 1, 2, 9 (first year), or equivalent, and the following courses:	
Second-Year French (RL 4, 5, 6)	12
French Literature (RL 311, 312, 313)	9
Elements approved by department	6

German

GL 1, 2, 3 (first year), or equivalent, and the following courses:	
Second-Year German (GL 4, 5, 6)	12
German Literature	9
Electives approved by department	6

Music

Band

Music Survey (Mus 127, 128, 129)	3
Harmony I, II, III (Mus 111, 112, 113)	9
Band Organization (Mus 331, 332, 333)	6
Band Organization (Mus 334, 335, 336)	6

Orchestra

Music Survey (Mus 127, 128, 129)	3
Harmony I, II, III (Mus 111, 112, 113)	9
Orchestral Conducting (Elementary) (Mus 291, 292, 293)	6
Advanced Conducting and Orchestration (Mus 324, 325, 326)	6
	24

Glee Club and Chorus

Music Survey (Mus 127, 128, 129)	3
Harmony I, II, III (Mus 111, 112, 113)	9
Individual Instruction (Voice) (Mus 190—2 terms) *or* Group Instruction in Voice (Mus 191—2 terms)	2
Glee Club Conducting (Mus 433)	1
College Chorus (Mus 290—6 terms)	6
Sightsinging and Ear Training (Mus 147, 148, 149)	3
	24

Any one of the three groups of courses—Band, Orchestra, Glee Club and Chorus—satisfies the requirements for a minor in music. For students who expect to lead glee clubs and choruses in high schools, previous piano training is essential and unless the student has had this preparation, additional work in piano may be needed. If the student is competent in accompanying, this can be adjusted.

Physical Education

Term hours for minor

Men

Introduction to Physical Education (PE 121, 122, 123)	6
Technique of Gymnastics (PE 174)	2
Technique of Football, Track, and Field (PE 175)	2
Technique of Minor Sports (PE 176)	2
Technique of Baseball and Basketball (PE 276)	2
Technique of Boxing and Wrestling (PE 275)	2
Technique of Swimming, Tennis, and Golf (PE 274)	2
Coaching of Football (PE 347) Coaching of Basketball (PE 346) Coaching of Baseball (PE 348) Coaching of Track and Field (PE 349) — Three courses selected from this group	6
Minimum hours for recommendation to coach one or more sports in connection with other teaching work	24

All teachers of physical education in Oregon are also required to have at least 12 hours in health education. Courses in health education include: PE 221; PE 358; Ed 351, 352; Ed 421, 422, 423; Bac 204, 205, 206; Bac 350; Bac 461; FN 225; HAd 225. Students interested in teaching Physical Education or Biological Science, or both, may include a minor in health education.

Women

Introduction to Physical Education (PE 121, 122, 123)	6
Physical Education Technique (Women) (PE 343, 344, 345)	9
Electives approved by the department, chosen from the following: Organization and Administration (PE 423), 3 hours Supervised Teaching (Ed 415), 3 hours Tests and Measurements in Physical Education (PE 422), 3 hours School and Community Club Work (Ed 425), 3 hours Principles of Physical Education (PE 421), 3 hours	9
	24

Social Science

History of Western Civilization (Hst 201, 202, 203)	9
History of American Civilization (Hst 224, 225, 226)	9
A minimum of five hours each from at least two of the following: Principles of Economics (Ec 201, 202, 203), Modern Governments (PS 201, 202, 203), Elements of Sociology (Soc 201, 202, 203)	10
Electives in political science, economics, or sociology	8
	36

Spanish

RL 11, 12, 13 (first year), or equivalent, and the following courses:

Second-Year Spanish (RL 14, 15, 16)	12
Spanish Literature (third year) (RL 341, 342, 343)	9
Electives approved by department	6

Professional Curricula in Education

B.A., B.S., Ed.B., M.A., M.S., Ed.M., Ed.D. Degrees

STUDENT'S BASIC PROGRAM

THE following program of study shows the work that should be followed by students who are intending to become high-school teachers or whose special interest lies in the field of guidance, counseling, and personnel. Related work in other schools outside the School of Education is shown only when it is necessary in building the proper curriculum.

MAJORS	MAJOR IN GUIDANCE, COUNSELING, AND PERSONNEL WORK	MINORS	MINORS
In which observation, supervised teaching, and apprentice teaching may be done at the State College.	*Including observation and supervised practice at the State College.*	*In which observation, supervised teaching, and apprentice teaching may be done at the State College.*	*In which observation (but not supervised teaching) is provided at the State College*
Agriculture Biological Science General Science Home Economics Industrial Arts Mathematics Physical Science Secretarial Science	The major in Guidance, Counseling, and Personnel Work should be accompanied by a major or two minors in teaching fields.	Agriculture Biological Science General Science Home Economics Industrial Arts Mathematics Physical Education Physical Science Secretarial Science	Art Business Administration English (Speech, Journalism) French German Music Social Science Spanish

Freshman Year[1]

	Term hours F	W	S
Required:			
English Composition (Eng 111, 112, 113)	3	3	3
Laboratory Science or Mathematics	3	3	3
Military Science (men)	1	1	1
Physical Education	1	1	1
Recommended electives:			
Courses in teaching field	3	3	3
Methods of Study (Ed 101)	3	*or* (3)	*or* (3)
Mental Hygiene (Ed 102)	(3)	*or* 3	*or* (3)
Choosing a Vocation (Ed 104)	....	....	2
Art, Foreign Language, Music, Speech, etc.	2	2	3
	16	16	16

Sophomore Year[1]

Required:			
[2]Elementary Psychology (Psy 201, 202, 203)	3	3	3
Literature	3	3	3
Extempore Speaking (Sp 111)	(3)	*or* 3	*or* (3)
History of Oregon (Hst 377)	....	(3)	*or* 3
Military Science (men)	1	1	1
Physical Education	1	1	1
Recommended electives:			
Courses in teaching field	3	3	3
Education as a Profession (Ed 211), Art Appreciation, Debate, Dramatics, Family Relationships, Journalism, Music Appreciation, Political Science, Religion, Sociology, etc.	5	2	2
	16	16	16

Junior Year[1]

Required:			
Secondary Education (Ed 311)	3	....	....
Educational Psychology (Ed 312)	....	3	....
Principles of Teaching (Ed 313)	....	....	3
Outlines of Economics (Ec 211 or 212)	4–3	....	....
General Sociology (Soc 212 or 211)	....	4–3	....
American National Government (PS 212)	....	....	3

[1]See GENERAL NOTES on page 263.
[2]Or Psy 221, 222, 3 hours each term for two terms.

Recommended electives:	Term hours F	W	S
Courses in teaching field	6	6	6
Educational Sociology, Economics, Health Education, Marketing Organizations, Military Science, Public Information Methods, etc	3–4	3–4	4
	16	16	16

Senior Year[1]

Required:			
Special Teaching Methods (Ed 408)	3 *or*	3 *or*	3
Supervised Teaching (Ed 415)	3–9	3–9	3–9
Oregon School Law and Oregon System of Education (Ed 316) (may be taken fifth year)	2 *or*	2 *or*	2
Recommended electives:			
Measurements in Secondary Education (Ed 416); School Health Problems (Ed 421, 422, 423); School and Community Club Work (Ed 425); Conservation Education (Ed 427); Construction and Use of Visual Aids (Ed 431); History of Education (Ed 440); Psychology of Childhood (Ed 460); Adolescence: Growth and Development of the Individual (Ed 461); The Junior High School (Ed 470); Guidance and Personnel Practices (Ed 485); Current Occupational Trends (Ed 486); Civic Education (Ed 489); Character Education (Ed 490); Group Thinking (Ed 491); Organization and Supervision for High-School Teachers (Ed 498); Military Science	4–10	4–10	4–10
	16	16	16

Fifth Year

See pages 254-256 for requirements for a State Teacher's Certificate after February 10, 1943. Fifth-year students meeting certification requirements are not required to qualify for a master's degree. In some cases such students may qualify for a second bachelor's degree. For most high-school positions, however, a master's degree is desirable. Students preparing to enter counseling, guidance, and personnel work should qualify for a master's degree. See Graduate Study below.

GRADUATE STUDY

Students may pursue graduate study in the School of Education for a master's or doctor's degree as preparation for junior or senior high-school, junior-college, or college teaching in fields allocated as majors at the State College, or for counseling, guidance, and personnel work in secondary schools or in colleges. The programs of graduate students are in all cases worked out on an individual basis, in terms of the needs and objectives of the student, and in accordance with the regulations of the Graduate Division.

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[1]General Notes

a. The recommended electives for freshmen and sophomores are designed to broaden the experience and preparation of students. Early attention should be given to the fullest preparation in a major subject and one or two minor subjects, chosen from the lists of available majors and minors. (The courses required for the various majors and minors are listed on pages 256-261. Some preparation in an additional field should be included if possible and also one or more extracurricular activities. The School of Education provides a large number of electives in each term of the four-year program for the bachelor's degree. The fifth year required for the master's degree or High School Teacher's Certificate, or both, is practically all elective.

b. In the freshman year General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education. Women take Social Ethics (PE 131) one term.

c. Emphasis in the junior year should continue on subject-matter preparation. Each subject included in the student's program should be carefully planned with a faculty adviser. By the student's senior year most of the subject-matter preparation should have been completed and special attention should be given to the professional courses in education.

d. Students who decide to take a B.S. or B.A. degree without a High School Teacher's Certificate may complete the requirements for graduation in four years, omitting Supervised Teaching and all Methods courses. Summer session attendance may be used to reduce the time or the term load. Students who plan carefully may complete the regular work for the bachelor's degree and also the additional credits for a High School Teacher's Certificate in four years' time by using one or two summer sessions.

e. Students looking forward to work as counselors, deans of girls, deans of boys, teachers of occupations courses, and to other phases of personnel and guidance work in connection with the public schools and other social agencies and organizations should include the following courses: Ed 416, 461, 485, 486, 487, 527; Soc 314.

Education

INSTRUCTION given in education covers the principles and the technique of teaching at the secondary and college levels, educational psychology, special methods in teaching the various major subjects in which the State College gives teacher training, the history and philosophy of education, guidance, counseling, and personnel work.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Ed 101. **Methods of Study.** 3 hours any term.

Specific methods of study as applied to various subject-matter fields; the general principles of note-taking; study schedule; fixing study habits; evaluation of the various broad fields of human learning. Professor Parr.

Ed 102. **Mental Hygiene.** 3 hours any term.

The conditions of healthy mental development and normal reactions to life and the college environment; the habits, attitudes, and proper functioning of a normal mind. Professor Chambers.

Ed 104. **Choosing a Vocation.** 2 hours spring.

Elective mainly for freshmen and sophomores undecided as to the work for which they should prepare. Undertakes systematically to assist students in studying the vocational openings and also their own personal abilities and characteristics, using tests, occupational reports, interviews, visits, clinical recommendations and all other helps in securing full information. Final vocational decision, of course, is left wholly to the individual student. Professor Salser.

Ed 211. **Education as a Profession.** 2 hours spring.

Teaching as a life work; the essential qualities of a good teacher; the teacher and the community; opportunities in departmental teaching, administration and supervision, research, adult education, vocational education; rewards, advantages, and disadvantages. Not offered 1942-43. Professor Parr.

UPPER-DIVISION COURSES

See Special Requirements, page 253.

Ed 311. **Secondary Education.** 3 hours any term.

The problems of the high school from the standpoint of the teacher; aims, functions, and characteristics. Prerequisite: Psy 201, 202, 203, or Psy 221, 222. Professor Parr.

Ed 312. **Educational Psychology.** 3 hours any term.

The laws of learning and their application to the classroom; motivation in learning; transfer of training; memory; forgetting; psychology of secondary school subjects. Prerequisite: Psy 201, 202, 203, or Psy 221, 222. Assistant Professor Reichart.

Ed 313. **Principles of Teaching.** 3 hours any term.

Application of laws of psychology to teaching; significance of individual differences; types of learning; aims and functions of secondary education; socialization; supervised study; measuring results. Prerequisite: Ed 311, 312. Professor Clinton.

Soc 314. **Educational Sociology.** 3 hours spring.

The field of sociology from the educational point of view; social institutions in their origin and development; social activities in their relation to institutions and the indivdual; social control or the molding of social institutions and the directing of social activities; different methods of social investigation and their comparative results. Students in the School of Education may include this course in the required 36 hours of education if approved in advance by the dean of education. Prerequisite: an introductory course in sociology. Professor Bakkum.

Ed 316. **Oregon School Law and Oregon System of Education.** 2 hours any term.

The Oregon school system and the laws on which it is based; problems of Oregon schools and plans proposed for their solution; the course of study and trends in educational development in the state. Prerequisite: junior standing. Professor Clinton.

Ed 330. **Industrial Arts Organization.** 2 hours winter.

Selection and organization of subject matter for shop work and drawing courses in secondary schools; evaluation of jobs, projects, and class problems of several types and the formulation of general plans for teaching industrial arts subjects. Prerequisite: Ed 313 and junior standing.

Ed 341. **Rural Education.** 3 hours winter.

Open to all students, prospective high-school teachers and others alike, who desire to acquire some foundation for a philosophy of rural life and training for leadership in rural education. New methods of utilizing the student's rural, social, and economic environment as a means of vitalizing different phases of the high-school instruction, achieving social objectives of education, and increasing farm, home, and town-country efficiencies; various forms of continuation and rural extension education for out-of-school youths and adults. Students actively participate in planning and executing studies and programs in rural education for high-school pupils, out-of-school youths, and adults. Prerequisite: junior standing. Professor Gibson.

Ed 351. **Health Education.** 3 hours fall.

The fundamental philosophy and principles of health education with emphasis on organization and administration of health education. Provision is also made for students interested in adult health education. Associate Professor Morris.

Ed 352. **Health Education.** 3 hours winter.

Continuation of Ed 351. Emphasis on the subject matter of health instruction and its use in secondary schools and in adult health education. Prerequisite: Ed 351. Associate Professor Morris.

Ed 401. **Research.** Terms and hours to be arranged.

Ed 403. **Thesis.** Terms and hours to be arranged.

Ed 405. **Reading and Conference.** Terms and hours to be arranged.

Ed 407. **Seminar.** 1 or 2 hours any term.

Prerequisite: Ed 311, 312, 313. Professor Salser and staff.

Ed 408. **Special Teaching Methods.** 3 hours any term.

Problems and methods in selecting and organizing materials for instruction; comparison and evaluation of methods, laboratory techniques, supplies, equipment; economy of time and materials. Courses include: (a) agricul-

ture, (b) biological science, (c) commerce, (d) home economics, (e) industrial arts, (f) mathematics, and (g) physical science. Prerequisite: Ed 311, 312, 313. (Six hours maximum allowed toward certification.)

Ed 415. **Supervised Teaching.** 3 to 9 hours.

Experience in classroom procedures along the lines of the student's academic preparation and interests. Prerequisite: Ed 311, 312, 313. Professor Parr.

Ed 416. Measurement in Secondary Education. (G) 3 hours any term.

The construction and desirable uses of various standard tests and scales for measuring achievement in secondary-school subjects. Such elements of statistical method are given as are necessary for intelligent use of the tests. Prerequisite: Ed 311, 312, 313, or equivalent. Professor Clinton.

Ed 421, 422, 423. **School Health Problems.** (G) 2 hours each term.

The various factors in the maintenance of the health of school children. Fall: prevention and control of communicable diseases in relation to the school child. Winter: school sanitation; planning, proper construction, and care of school buildings. Spring: the factors affecting the health of the school child; the health of the teacher; the hygiene of carrying out various phases of instruction. Prerequisite: Ed 311, 312, 313. Professor Langton.

Ed 425. **School and Community Club Work.** (G) 3 hours winter.

A cooperative effort to prepare teachers and others for effective club work and community leadership. Specialists in 4-H Club work and others assist through giving lectures in their respective fields. (Students in this course may work in a chosen field under specialists, such as 4-H Club, Boy Scouts, etc., registering in Ed 405 for 1 hour additional credit.) Prerequisite: Ed 311, 312, 313. Professor Seen.

Ed 427. **Conservation Education.** (G) 3 hours spring.

Primarily intended to give teachers an understanding of how Oregon's renewable resources affect the welfare of the state; the responsibility of citizens in conserving these resources through wise use. Prerequisite: Ed 311, 312, 313. Assistant Professor McCulloch.

Ed 431. **Construction and Use of Visual Aids.** (G) 3 hours winter.

Systematic study of the film, the slide, the chart, and other forms of supplementary visual materials; selection and use of such materials to best advantage; operation of projectors and other visual equipment. Prerequisite: Ed 311, 312, 313, or equivalent. Dr. Reid.

Ed 440. **History of Education.** (G) 3 hours fall.

A general review of the growth and development of education and its relation to the civilization of the times, with particular reference to the educational philosophies of Plato, Aristotle, Renaissance educators, Comenius, Locke, Rousseau, Pestalozzi, Froebel, Herbart, Herbert Spencer, and Dewey. Prerequisite: Ed 311, 312, 313. Professor Warrington.

Ed 460. **Psychology of Childhood.** (G) 3 hours fall or spring.

The mental development of the child; native responses; play, self-assertion, instinctive social attitudes; speech; emotions; simple mental processes; complex mental processes; mental organization. Prerequisite: Ed 311, 312, 313. Assistant Professor Reichart.

Ed 461. **Adolescence: Growth and Development of the Individual.** (G) 3 hours winter.

The processes through which the normal human being reaches maturity, acquires effective use of his bodily equipment and learning capacity, and

makes satisfactory personal and social adjustments; the important physical, mental, and moral changes necessary to adolescence; educational implications of recent studies in this field. Prerequisite: Ed 311, 312, 313. Assistant Professor Reichart.

Ed 464. **Vocational Legislation and Administration.** (G) 3 hours.
The problems of organization and administration of vocational education. Intended primarily for graduate students with extended teaching experience and with the necessary technical training in agriculture, homemaking, distributive occupations, or trade and industrial subjects to qualify for possible administrative or supervisory service in vocational education. Prerequisite: Ed 488 or equivalent. Extramural or summer session. Associate Professor Paulson.

Ed 470. **The Junior High School.** (G) 3 hours fall or winter.
The relationship between the junior high school and the guidance movement; the purposes and opportunities of the junior-high-school years, including the activities and organizations. Certain outstanding junior high schools are studied. Prerequisite: Ed 461 or equivalent. Professor Salser.

Ed 480. **The Conference Method in Vocational Education.** (G) 3 hours.
Designed to develop ability in conference leading. The technique of conference leading; actual practice in conducting conferences on assigned topics. Prerequisite: Ed 408e or consent of instructor. Two two-hour conference periods. Extramural or summer session. Associate Professor Adams.

Ed 485. **Guidance and Personnel Practices.** (G) 3 hours fall.
An introduction to the field of guidance and counseling. The development of the guidance movement; means and methods of assisting students with their personal and vocational problems and the policies necessary on the part of the school. Prerequisite: Ed 311, 312, 313. Professor Salser.

Ed 486. **Current Occupational Trends.** (G) 3 hours winter.
The recent and rapidly increasing materials available in the occupational and vocational world; interpretations of present trends; attention to sources of such material and to their relative value and usefulness for high-school and college students. Prerequisite: Ed 311, 312, 313. Professor Salser.

Ed 487. **Counseling.** (G) 3 hours spring.
Aims to give prospective counselors, administrators, teachers, and parents an acquaintance with mental, achievement, trade, and other tests; practice in the administration of such tests; problems of classification; methods used in educational and vocational counseling. Prerequisite: Ed 485 or 486. Professor Salser.

Ed 488. **Philosophy of Vocational Education.** (G) 3 hours winter.
The place and need of vocational education in a democracy, with special attention to the evolution of the philosophy of vocational education as a phase of the general education program. Prerequisite: Ed 311, 312, 313, or equivalent. Associate Professor Adams.

Ed 489. **Civic Education.** (G) 3 hours fall or spring.
The school as an instrument of society for transmitting its social inheritance; analysis of school organization, administration, school subjects, methods of instruction, extra-school activities, and methods of discipline with reference to their contribution to training for citizenship. Prerequisite: Ed 311, 312, 313, or equivalent. Professor Salser.

Ed 490. **Character Education.** (G) 3 hours any term.

Place of character in the social purposes of education; distinction between training and instruction; dynamic function of the feelings; conditioning of interests; function of ideals; formation of habits; integration of habits and attitudes; analysis of typical procedure. Prerequisite: Ed 311, 312, 313. Professor Warrington.

Ed 491. **Group Thinking.** (G) 3 hours spring.

Nature and method of democratic participation in group thought-life; the habit of reflective group thinking; forming reasoned judgment on public affairs; how diversified groups may confer in cooperative efforts to discover new roads to new and better goals; technique of leadership in such a group-thinking process. Prerequisite: Ed 311, 312, 313. Professor Warrington.

Ed 492. **Character Education Problems.** (G) 3 hours.

The bearing of social change on conduct; democratic participation in group thought-life; how to build the habit of group thinking; how to develop facility in forming reasoned judgment; the study of the technique of leadership in the group-thinking process; examination of successful plans now in use; application to program building and the selection of activities. Offered at present in summer session only. Prerequisite: Ed 490. Professor Warrington.

Ed 497. **Adult Education.** (G) 3 hours fall.

Development, methods, and results of adult education; the part played by public schools, extension instruction, vocational measures and methods, industrial and commercial organizations, workers' colleges, churches, clubs, radio, and other forms of adult learning. For teachers and other community leaders and workers. Prerequisite: Ed 311, 312, 313. Professor Warrington.

Ed 498. **Organization and Supervision for High-School Teachers.** (G) 3 hours winter.

Given from the standpoint of the high-school teacher, who must understand administrative organization as well as the methods and purposes of supervision. Administrative organizations and supervisory plans are treated as they involve the classroom teacher. Prerequisite: Ed 311, 312, 313. Professor Clinton.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

Ed 501. **Research.** Terms and hours to be arranged.

In addition to the regular courses listed, members of the staff supervise research and investigation by qualified graduate students. Registration by permission of the staff member or members in whose field the investigation lies. Prerequisite: graduate standing in Education. See also AEd 501, CEd 501, HEd 501, IEd 501, SEd 501.

Problems in Adult Education—Professor Warrington.
Problems in Curriculum and Instruction—Professor Parr.
Problems in Educational Psychology—Assistant Professor Reichart.
Problems in Guidance—Professor Salser.
Problems in History or Philosophy of Education—Professor Salser and Assistant Professor Reichart.
Problems in Measurements—Professor Clinton.
Problems in Secondary Education—Professor Parr.
Problems in Higher Education—Professors Salser and Parr.
Problems in Social or Moral Education—Professor Warrington.

Ed 503. **Thesis.** Terms and hours to be arranged.

Ed 505. **Reading and Conference.** Terms and hours to be arranged.

Ed 507. **Seminar.** Terms and hours to be arranged.

Ed 511. **Recent Educational Trends and Problems.** 3 hours.

A critical survey of important trends, problems, and developments in all fields of education but with particular reference to the high school. The course devotes itself to the evaluation of movements, specializations, and opportunities for service. Open to graduate students and qualified seniors. Prerequisite: 24 hours of upper-division Education including supervised teaching. Professor Salser and staff.

Ed 512. **Introduction to Thesis Writing.** 2 hours fall.

Provided and recommended for students in the School of Education who are candidates for an advanced degree; open also to graduate students in other schools. Finding materials; thesis organization; types of research suited to problems; bibliography. Does not take the place of individual direction and supervision of theses by various major professors in whose fields students choose to write their thesis. Prerequisite: graduate standing. Professor Clinton.

Ed 517. **Statistical Methods in Education.** 3 hours winter or spring.

The fundamental elements only of statistical methods designed to furnish the basis for a scientific procedure in educational measurements; methods of treating collective facts, average facts, and correlated facts, as applied to giving and scoring tests, finding costs, etc. Prerequisite: Ed 416. Professor Clinton.

Ed 522. **Foreign School Systems.** 3 hours winter.

A comparative study of education in France, Germany, Great Britain, and Denmark; experiments such as those in Russia and Italy; attention devoted mainly to the developments since the World War and to the extent and effectiveness of vocational education in the countries studied. Prerequisite: Ed 440. Not offered 1942-43.

Ed 524. **Curriculum Construction.** 3 hours winter.

The problems of building junior and senior high-school curricula; curriculum theories and policies since 1900; principles for selecting and organizing subject matter; courses of study in various fields; principles of curriculum organization; type of programs; important studies in the field. Prerequisite: Ed 311, 312, 313, or equivalent. Professor Parr.

Ed 526. **Construction and Use of Objective Examinations.** 3 hours winter or spring.

Principles and statistics involved in the selection of test items; validity and reliability; the various types of examinations, their validity, reliability, directions for administering, directions for scoring, keys, and methods of grouping results. Prerequisite: Ed 416. Professor Clinton and Assistant Professor Reichart.

Ed 527. **Tests and Their Social Uses.** 3 hours spring.

The application of mental-test results to cultural, moral, social, and educational problems; the basic principles leading to improvement; special consideration to the problems of adjustment of students in their scholastic and personal activities. Prerequisite: Ed 416. Professor Clinton and Assistant Professor Reichart.

Ed 535. **Psychological Aspects of Vocations.** 3 hours.

Some basic psychological principles applied to: (1) choice or avoidance of occupations, (2) aiding others to choose or avoid occupations, (3) adjust-

ing or aiding others in adjusting to occupational conditions and demands, and (4) alteration of occupational conditions and demands to meet human needs. Prerequisite: Ed 311, 312, 313. Professor Chambers.

Ed 543. **History of American Education.** 3 hours spring.

Lectures, reports, and discussions treating the intellectual development of America with special reference to education. Knowledge of American history a requisite. Prerequisite: Ed 311, 312, 313, or equivalent. Assistant Professor Reichart.

Ed 546. **Philosophy of Education.** 3 hours winter.

The broad fundamental principles and problems of education, with some attempt at their solution; meaning of philosophy; philosophy of education; principal rules and formulae; value of a correct philosophy of education for the teacher and school administrator. Prerequisite: Ed 311, 312, 313. Professor Warrington.

Ed 555. **College and University Teaching.** 3 hours spring.

Mental tests in their application to college situations; objective examination; other movements in the field of college teaching. The lectures and problems studied are outlined by the members of the faculty best equipped to present them. Prerequisite: graduate standing in education. Two recitations. Professor Parr.

Ed 561. **Advanced Educational Psychology.** 3 hours.

Experimental material that seems most useful and relevant to educational psychology. Open to graduate students with preliminary training in education and psychology. Prerequisite: graduate standing in education. Assistant Professor Reichart.

Agricultural Education

THIS department is responsible for the training of teachers and supervisors of agriculture in secondary schools, for all-day students, part-time and evening schools for both young and adult farmers, and the training for leadership in rural life and education. Special attention is given to the training of teachers, directors, supervisors, and teacher trainers as provided for by the Federal laws for vocational education commonly known as the Smith-Hughes Act and the George-Deen Act. Included within the scope of this department's work are certain field, research, and extension activities involving the preparation of instructional material for the use of agriculture instructors in cooperation with various staff members of the School of Agriculture.

The Department of Agricultural Education is a joint department within both the School of Agriculture and the School of Education.

Requirements for Teaching Agriculture. Teachers of agriculture need to have a fundamental knowledge and a high level of doing ability in most of the departmental fields of the School of Agriculture. At the beginning of his college course the prospective teacher should advise with the head of the Department of Agricultural Education regarding the courses he should select in each of the fields of agriculture. Certain qualifications essential in teaching vocational agriculture should be considered by the student, in conference with the head of this department, when applying for admission into this field of teaching. Students interested in Smith-Hughes agriculture see footnote on page 209.

Requirements in Agriculture:

(1) Graduation from a college of agriculture of standard rank.

(2) The course requirements in agriculture and education (for Smith-Hughes teaching) can be met in either of two ways: first, by majoring in the Agricultural Education curriculum, page 209, which includes requirements in both agriculture and education; second, by pursuing one of the three other curricula in agriculture in the sophomore year and one of the major curricula in General Agriculture, Agricultural Economics, Animal Industries, or Plant Industries, during the junior and senior years. The latter plan will be approved provided sufficient electives are available for meeting the course requirements in agriculture as outlined in the Agricultural Education curriculum (School of Agriculture, page 209) as well as the requirements in education.

(3) 70 to 80 term hours of special work in agriculture are required. The student's choice of courses should depend somewhat on his previous training and experience and the recommendations of the head of the department. The suggested sequence and distribution of courses are given in the Agricultural Education curriculum on page 209. Regardless of the department in which the student majors he should have courses in the respective departments distributed as follows:

(a) 10 hours in Animal Husbandry
(b) 6 hours in Dairy Husbandry
(c) 6 hours in Poultry Husbandry
(d) 4 hours in Veterinary Medicine
(e) 9 hours in Soils
(f) 12 hours in Farm Crops
(g) 6 hours in Horticulture
(h) 6 hours in Agricultural Economics and Marketing
(i) 12 hours in Farm Management
(j) 18 hours in Agricultural Engineering

(4) Requirements for Certification of Agricultural Instructors:

(a) Vocational Certificate. The four-year curriculum in Agricultural Education, page 209, is designed to fulfill the requirements for this certificate.

(b) Secondary school certificate. The requirements for this certificate are given on pages 254-256.

For more specific information regarding the methods of meeting the requirements for both types of teaching certificates in the field of Agricultural Education, confer with the head of the department.

Graduate Study and Apprentice Teaching in Agricultural Education. As the demands on teachers of agriculture the country over are becoming more exacting each year additional work after graduation in the fields of agriculture and education is desirable, and in certain states, including Oregon and Washington, is required for the secondary school certificate. To meet this demand, a fifth year of graduate work including apprentice teaching is available for a limited number of graduates of approved standing. The plan provides for

the location of apprentice teachers in high-school centers near Corvallis where they may acquire credit, both by work at the College and in the field, toward a master's degree.

General Electives. Certain courses are open to all students in agriculture and others who are interested in training for leadership in rural life. Special attention is called to Ed 341, Rural Education.

DESCRIPTION OF COURSES*

UPPER-DIVISION COURSES

AEd 401. **Research.** Terms and hours to be arranged.

AEd 403. **Thesis.** Terms and hours to be arranged.

AEd 405. **Reading and Conference.** Terms and hours to be arranged.

AEd 407. **Seminar.** Hours to be aranged, two terms.

Ed 408a. **Special Teaching Methods.** (See Ed 408, page 267.) Professor Gibson.

AEd 417. **The Agricultural Curriculum.** (G) 3 hours, winter or spring. Determining course content and evaluating types of course organization with reference to the objectives to be attained in the field of agriculture in secondary schools. Prerequisite: Ed 313. Professor Gibson.

AEd 418. **Adult Education in Agriculture.** (G) 3 hours winter. Problems and procedures in developing programs for both young and adult farmers groups. Students in this course participate in recruiting, organizing, and teaching evening classes in the vicinity of Corvallis. Prerequisite: Ed 313, AEd 417.

GRADUATE COURSES

AEd 501. **Research.** Terms and hours to be arranged.

AEd 503. **Thesis.** Terms and hours to be arranged.

AEd 505. **Reading and Conference.** Terms and hours to be arranged.

AEd 507. **Seminar.** Terms and hours to be arranged.

AEd 516. **Extension Course in Teacher Training.** Hours to be arranged, any term.

Teachers of vocational agriculture in service who cannot be relieved of their professional duties to pursue courses that are offered in the summer session may make use of this course to continue their professional improvement. Personal conferences, follow-up instruction, and supervision, supplemented by correspondence and reports. Prerequisite: Ed 311, 312, 313. Professor Gibson.

AEd 533. **Rural Survey Methods.** 3 hours spring.

The technique of making agricultural and rural education surveys; methods of analyzing, interpreting, and using the material and results as a basis for evaluating and formulating programs in agricultural education; field studies required. Open to graduates with teaching experience and seniors by special permission. Prerequisite: Ed 311, 312, 313. Professor Gibson.

* See also courses in the Department of Education, especially Ed 341.

Commercial Education

IN conjunction with the Department of Secretarial Science the School of Education is able to meet the demand for well-prepared teachers of commercial branches in secondary schools. In the selection of their collegiate courses in both secretarial science and education, students should advise with the School of Education. (The term hours in education required for a certificate to teach in accredited high schools are indicated on pages 254-256.)

DESCRIPTION OF COURSES*

CEd 401. **Research.** Terms and hours to be arranged.

CEd 403. **Thesis.** Terms and hours to be arranged.

CEd 405. **Reading and Conference.** Terms and hours to be arranged.

CEd 407. **Seminar.** Terms and hours to be arranged.

Ed 408c. **Special Teaching Methods.** (See Ed 408, page 265.) Associate Professor Stutz.

GRADUATE COURSES

CEd 501. **Research.** Terms and hours to be arranged.

CEd 503. **Thesis.** Terms and hours to be arranged.

CEd 505. **Reading and Conference.** Terms and hours to be arranged.

CEd 507. **Seminar.** Terms and hours to be arranged.

CEd 541. **Current Practices in Typewriting.** 3 hours fall.
Principles underlying the development of typing skills; motivation, supplementary materials, and special devices. Prerequisite: Ed 408c and teaching experience in typing. Associate Professor Stutz.

CEd 542. **Current Practices in Shorthand.** 3 hours winter.
Correct writing habits; correlation of sound and symbol response and the development of supplementary material through word and sentence building and transcription technique. Prerequisite: Ed 408c and experience in teaching stenography. Associate Professor Stutz.

CEd 543. **Problems in Commercial Education.** 3 hours spring.
Recent and current trends in the commercial curriculum in high school; evaluation of debatable methods and available research studies. Prerequisite: Ed 408c and teaching experience in commercial subjects. Associate Professor Stutz.

Home Economics Education

PROFESSIONAL training for prospective teachers of home economics is afforded by the Department of Home Economics Education, which is a joint department within both the School of Home Economics and the School of Education. Any student in the School of Home Economics having a scholarship record below average should confer with the Dean of the School of Home Economics before registering for teacher-training work. (For information regarding the specific requirements for the State Teacher's Certificate see pages 254-256.)

* See also courses in the Department of Education.

DESCRIPTION OF COURSES*

UPPER-DIVISION COURSES

HEd 401. **Research.** Terms and hours to be arranged.

HEd 403. **Thesis.** Terms and hours to be arranged.

HEd 405. **Reading and Conference.** Terms and hours to be arranged.

HEd 407. **Seminar.** Terms and hours to be arranged.

Ed 408d. **Special Teaching Methods.** (See Ed 408, page 265.) Professor Blazier.

HEd 412. **Organization and Administration of Homemaking Education.** (G) 3 hours any term.

Typical organizations of homemaking departments on both the vocational and nonvocational basis with particular attention to equipment and management. Prerequisite: Ed 408d. Professor Blazier.

HEd 413. **The Supervision of Home Projects.** (G) 2 hours spring.

The use of home projects in home economics instruction with field work in supervision of home projects. Prerequisite: Ed 408d. One recitation; 1 two-hour laboratory period. Professor Blazier.

HEd 420. **Community Problems in Nutrition.** (G) 3 hours winter.

Nutrition problems facing the high-school teacher in her contacts with the community. Field work will consist of individual and group projects worked out in cooperation with agencies interested in a nutrition-health program. Prerequisite: FN 321, Ed 313. Two recitations; 1 laboratory period. Assistant Professors Garrison and Roberts.

HEd 440. **Adult Education in Home Economics.** (G) Hours to be arranged, winter.

Problems in the adult-education program authorized under the Smith-Hughes Act; field work in promoting, organizing, observing, and teaching adult classes. Prerequisite: HEd 412. Professor Blazier.

GRADUATE COURSES

Courses numbered 400-499 and designated *(g)* or *(G)* may be taken for graduate credit.

HEd 501. **Research.** Terms and hours to be arranged.

HEd 503. **Thesis.** Terms and hours to be arranged.

HEd 505. **Reading and Conference.** Terms and hours to be arranged.

HEd 507. **Seminar.** Terms and hours to be arranged.

Industrial Education

JOINTLY with the Department of Industrial Arts, the Department of Industrial Education trains teachers and supervisors in industrial-arts education and in trade and industrial (Smith-Hughes vocational) education. While the department is organized as a part of the School of Education, and offers no technical courses or curricula of its own, it makes use of such courses in other schools and departments as serve its needs. Special attention is called to the joint administration of curricula for teacher training in industrial-arts education and in vocational trade and industrial education. The Department of Industrial Arts (School of Engineering) is responsible for the

* See also courses in the Department of Education.

general curricula and technical training, while the Department of Industrial Education (School of Education) is responsible for the professional teacher-training courses and applied pedagogy.

Three Programs Available. Three intensities of training are open to those interested in industrial-arts education:

(1) The four-year professional-technical program, leading to the degree of Bachelor of Science or Bachelor of Industrial Arts, meets certification requirements of any state in the Union except those requiring graduate study as a prerequisite to certification. In such cases it furnishes an excellent foundation for the required graduate study, which may be completed at Oregon State College or elsewhere. (See pages 290-291.)

(2) The teaching major in industrial arts affords an opportunity for approximately half the training in technical industrial-arts subject matter that is available to the student in the four-year professional-technical program. It provides a program suited to the needs of teachers in the smaller schools of the state. It is also adapted to the needs and interests of those who transfer to Oregon State College from normal schools, teachers colleges, and universities with two years of nontechnical training. (See pages 258-259.)

(3) The minor is intended as a background for superintendents, principals and others who desire a speaking acquaintance with industrial arts techniques and objectives, and for those who plan to teach industrial arts under very limited conditions. Recommendation as a teacher on the basis of an industrial arts minor will be limited accordingly, usually embracing only elementary woodworking and drawing instruction in schools not qualified for a more extensive program. (See pages 258-259.)

Graduate Study in Industrial Education. Many school systems, and some state departments of education, now require all teachers to present graduate study or a master's degree as a principal prerequisite to a teaching credential for the secondary schools. Since the demands upon teachers the country over are becoming increasingly more exacting each year, graduate work in industrial education brings its proportional rewards and is usually necessary for those who desire to enter the fields of supervision, administration, or teacher-education. Programs of study leading to the degree of Master of Arts, Master of Science, or Master of Education are outlined by this department for industrial-arts or industrial-education students and teachers with approved graduate standing.

Special Certificate for Two-Year Vocational Teacher Training. Provision is also made for the issuance of special certificates upon the completion of a special two-year curriculum by those who are graduates of an accredited high school or who are past 21 years of age. These special certificates fall under two classifications, as follows:

(1) To journeymen of the various trades who can meet the foregoing requirements and who desire to prepare themselves as trade teachers in accordance with the provisions of the Smith-Hughes Vocational Education Act.

(2) To others, whether tradesmen or not, who can meet the foregoing requirements and who desire preparation for the teaching of related or general continuation subjects or both.

Extramural Courses. Through cooperation with the State Board for Vocational Education and through the establishment of extension centers, pro-

vision is made whereby certain courses of this department are offered as extramural courses. Classes are taught in Portland on occasion, and other extension centers may be established as need warrants. This is especially true of those courses for the training of journeymen as vocational-industrial teachers, for the training of teachers in general continuation subjects, and for graduate or undergraduate courses adaptable to the professional advancement of the teacher in service. For further information concerning extramural courses consult the head of the Department of Industrial Education.

DESCRIPTION OF COURSES*

UPPER-DIVISION COURSES

IEd 401. **Research.** Terms and hours to be arranged.

IEd 403. **Thesis.** Terms and hours to be arranged.

IEd 405. **Reading and Conference.** Terms and hours to be arranged.

IEd 407. **Seminar.** Terms and hours to be arranged.

Ed 408e. **Special Teaching Methods.** (See Ed 408, page 265.)

IEd 470. **History of Manual and Industrial Education.** (G) 3 hours fall or winter.

Historical developments in manual and industrial education, from the philosophies of leaders from the middle ages to the present time—Socrates, Plato, Rousseau, Pestalozzi, Froebel and John Dewey—in terms of present-day aims of industrial-arts and vocational-industrial education. Prerequisite: Ed 313, 408e. Assistant Professor Meyer.

IEd 471. **Teaching Supplementary Subjects.** (G) 3 hours.

Selection of content in mathematics, drawing, and science, for presentation as supplementary subjects in the Smith-Hughes vocational program; methods of organizing and presenting this subject matter in trade and industrial classes. Prerequisite: suitable preparation in mathematics, drawing, and science, and consent of instructor. Extramural or summer session. Associate Professor Adams and staff.

IEd 472. **Occupational Analysis.** (G) 3 hours fall.

The breaking down, by analysis, of an occupation, trade, or job into its component subdivisions, blocks, operations, and teaching units; occupational analysis as a basis for planning a teaching procedure. Prerequisite: Ed 313, 408e. Assistant Professor Meyer.

IEd 473. **The General Shop and Its Problems.** (G) 2 hours fall.

The "general shop" type of organization; the reasons for its existence; its advantages and limitations; its probable future; content and organization of subject matter and methods of presentation and class control for general shop teaching. Prerequisite: Ed 311, 312, 313, 330. Professor Cox.

IEd 474. **Written and Visual Teaching Aids.** (G) 3 hours winter or spring.

Types of instruction sheets and visual aids as a means to more efficient teaching in large and diversified classes; evaluation of available materials; practice in the construction of diagrams, charts, models, and instruction sheets. Prerequisite: IEd 473 or equivalent. Professor Cox.

* See courses in the Department of Education, especially Ed 330, and courses in technical subject matter in the Department of Industrial Arts, pages 312-316.

IEd 475. **Project Analysis and the Contract Plan.** (G) 2 hours.
Selection and analysis of projects suitable for various types of shop teaching; study of the contract plan; practice in the technique of preparing contracts; suggestions for their use in industrial-arts classes. Prerequisite: IEd 473 or equivalent. Professor Cox.

IEd 478. **Cooperative Part-Time Education.** (G) 3 hours.
Federal and state laws affecting part-time schools; types of pupils; desirable characteristics of teachers; work of the coordinator; individual practice and follow-up; cooperation with outside organizations. Prerequisite: Ed 488 or equivalent. Extramural or summer session. Associate Professor Adams and staff.

IEd 482. **Supervision of Industrial Education.** (G) 2 hours.
Specific problems of supervision in the field of industrial education, with reference to both the trade and industrial and the industrial-arts education groups. Intended primarily for graduate students with extended teaching experience as a background. Prerequisite: Ed 464, 488. Extramural or summer session. Associate Professor Adams and staff.

IEd 484. **Industrial Education and Changing Conditions.** (G) 3 hours.
Current developments in industry, and trends in state and Federal programs for industrial education, with special reference to the administration of vocational-industrial education under the George-Deen Act. Prerequisite: Ed 488 or equivalent. Extramural or summer sessions. Associate Professor Adams.

IEd 485. **Labor, Industry, and the Apprenticeship Program.** (G) 3 hours.
The problems of labor and industry as they are reflected in the Federal and state apprenticeship program and the regulations related thereto. Prerequisite: Ed 488 or equivalent. Extramural or summer session. Associate Professor Adams.

IEd 494. **Problems of Coordination.** (g) 3 hours.
Designed to meet the needs of vocational coordinators, supervisors, and industrial instructors in coordinating the training programs of students employed as part-time industrial workers. Selection of trainees, selection of industrial shops for the practical training program, preparation of vocational memorandums and apprentice indentures; adjusting related class work and work experience; adjusting working conditions to meet regulations of local, state, and Federal agencies. Prerequisite: IEd 478 and Ed 488, or their equivalent. Associate Professor Adams or Associate Professor Paulson.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

IEd 501. **Research.** Terms and hours to be arranged.

IEd 503. **Thesis.** Terms and hours to be arranged.

IEd 505. **Reading and Conference.** Terms and hours to be arranged.

IEd 507. **Seminar.** Terms and hours to be arranged.

Science Education

PROFESSIONAL preparation for prospective teachers of science and mathematics is afforded by the Department of Science Education, which is a joint department within the School of Education and the School of Sci-

ence. For information regarding specific requirements for the High School Teacher's Certificate, see pages 254-256.

DESCRIPTION OF COURSES*

UPPER-DIVISION COURSES

SEd 401. Research. Terms and hours to be arranged.

SEd 403. Thesis. Terms and hours to be arranged.

SEd 405. Reading and Conference. Terms and hours to be arranged.

SEd 407. Seminar. Terms and hours to be arranged.

Ed 408b. Special Teaching Methods. (See Ed 408, page 265.) Professor Stevenson.

Ed 408f. Special Teaching Methods. (See Ed 408, page 265.) Professor Stevenson.

Ed 408g. Special Teaching Methods. (See Ed 408, page 265.) Professor Stevenson.

GRADUATE COURSES

SEd 501. Research. Terms and hours to be arranged.

SEd 503. Thesis. Terms and hours to be arranged.

SEd 505. Reading and Conference. Terms and hours to be arranged.

SEd 507. Seminar. Terms and hours to be arranged.

* See also courses in the Department of Education.

School of Engineering and Industrial Arts

Faculty

RICHARD HAROLD DEARBORN, A.B., E.E., Dean of the School of Engineering and Industrial Arts.

BESSIE MARIE SKAALE, B.S., Secretary to the Dean.

Chemical Engineering

GEORGE WALTER GLEESON, Ch.E., Professor of Chemical Engineering; Head of Department.

EDWARD GIBSON LOCKE, Ph.D., Assistant Professor of Chemical Engineering.

EDWARD ANNE MURRAY, M.S., Instructor in Chemical Engineering.

DAVID THEODORE HOLMLUND, B.S., Research Fellow in Chemical Engineering.

Civil Engineering

CHARLES ARTHUR MOCKMORE, C.E., Ph.D., Professor of Civil Engineering; Head of Department.

*JAMES RINALDO GRIFFITH, C.E., Professor of Structural Engineering.

BURDETTE GLENN, M.S., Professor of Highway Engineering.

GLENN WILLIS HOLCOMB, M.S., Professor of Civil Engineering.

SAMUEL MICHAEL DOLAN, C.E., Associate Professor of Civil Engineering.

IVAN FREDERIC WATERMAN, C.E., Associate Professor of Civil Engineering.

FRED MERRYFIELD, M.S., Associate Professor of Civil Engineering.

RUPERT ALRED WANLESS, B.S., Assistant Professor of Civil Engineering; Chairman of General Engineering.

GERARD JOSEPH CAVANAGH, B.S., Instructor in Civil Engineering.

MARTIN PORTMAN COOPEY, B.S., Instructor in Civil Engineering.

DICK WINFIELD EBELING, B.S., Graduate Assistant in Civil Engineering.

REX ALFRED ELDER, B.S., Graduate Assistant in Civil Engineering.

CONDÉ BALCOM MCCULLOUGH, C.E., LL.B., D.Engr., Visiting Lecturer in Highway Economics and Structures.

Electrical Engineering

FRED ORVILLE MCMILLAN, M.S., Professor of Electrical Engineering; Head of Department.

LAWRENCE FISHER WOOSTER, M.S., Professor of Applied Electricity.

ARTHUR LEMUEL ALBERT, M.S., E.E., Professor of Communication Engineering.

* On leave of absence.

EUGENE CARL STARR, E.E., Professor of Electrical Engineering.
BEN HODGE NICHOLS, M.S., Associate Professor of Electrical Engineering.
HAROLD COCKERLINE, B.S., Associate Professor of Electrical Engineering.
GRANT STEPHEN FEIKERT, M.S., E.E., Assistant Professor of Electrical Engineering.
*FREDERICK ALTON EVEREST, E.E., Assistant Professor of Electrical Engineering.
HENDRIK JACOB OORTHUYS, M.S., Instructor in Electrical Engineering.
WILSON STANLEY PRITCHETT, B.S., Graduate Assistant in Electrical Engineering.
EUGENE FREDERICK GRANT, B.S., Graduate Assistant in Electrical Engineering.
WILLIAM HERBERT HUGGINS, B.S., Research Associate in Electrical Engineering.

Mechanical Engineering

SAMUEL HERMAN GRAF, M.E., M.S., Professor of Mechanical Engineering; Head of Department.
WALLACE HOPE MARTIN, M.E., M.S., Professor of Heat Engineering.
MARK CLYDE PHILLIPS, B.M.E., Professor of Mechanical Engineering.
CHARLES EDWIN THOMAS, M.M.E., Professor of Engineering Materials.
BENJAMIN FRANKLIN RUFFNER, Aero.E., M.S., Professor of Aeronautical Engineering; Coordinator of Civilian Pilot Training.
WILLIAM HOWARD PAUL, M.S., Professor of Automotive Engineering.
JAMES CAREY OTHUS, M.E., M.S., Associate Professor of Mechanical Engineering.
EARL CLARK WILLEY, M.S., Assistant Professor of Mechanical Engineering.
ARTHUR DOUGLAS HUGHES, M.S., Assistant Professor of Mechanical Engineering.
*THOMAS RICHARDSON PALMERLEE, A.M., Instructor in Mechanical Engineering.
DALIMIL KYBAL, M.S., Instructor in Mechanical Engineering.
THOMAS JONES ZILKA, B.S., Graduate Assistant in Mechanical Engineering.
JACK WENDELL SIEGEL, B.S., Research Fellow in Mechanical Engineering.

Mining Engineering

GEORGE WALTER GLEESON, Ch.E., In Charge of Mining Engineering.
RICHARD KIDDER MEADE, B.S., Instructor in Mining Engineering.

Industrial Arts

GEORGE BRYAN COX, M.S., Professor of Industrial Arts; Head of Department; Director of Engineering Shops.
EDWIN DAVID MEYER, M.S., Assistant Professor of Industrial Arts Education.
WILLIAM HAMILTON HORNING, Assistant Professor of Industrial Arts.
DONALD LYMAN MASON, B.S., Instructor in Industrial Arts.
ASA AUSTIN ROBLEY, B.S., Instructor in Industrial Arts.
MILTON CONWELL SHEELY, B.S., Instructor in Industrial Arts.

* On leave of absence.

WILLIAM FREDERICK ENGESSER, B.S., Instructor in Industrial Administration.
ALFRED CLINTON HARWOOD, Mechanician.

Curricula in Engineering and Industrial Arts

B.A., B.S., B.I.A., M.A., M.S.,
Ch.E., C.E., E.E., M.E., Min.E. Degrees

Chemical Engineering
Civil Engineering
Electrical Engineering
Mechanical Engineering
Mining Engineering
Industrial Administration
Industrial Arts Education

FOUR-YEAR curricula leading to baccalaureate degrees are offered in the School of Engineering as follows: a general curriculum in Chemical Engineering; a general curriculum in Civil Engineering with options in Highway Engineering and Business; a general curriculum in Electrical Engineering with options in Power, Communication, and Business; a general curriculum in Mechanical Engineering with options in Aeronautical Engineering and Business; a general curriculum in Mining Engineering; curricula in Industrial Administration and Industrial Arts Education.

Requirements for Graduation. In each of the four-year curricula offered in the School of Engineering the fulfillment of the Lower-Division group requirements for professional schools is prescribed. The student must complete the upper-division work as outlined or elected in the Engineering School with the approval of the department head and the dean.

For a bachelor's degree, a total of 204 term hours including the required work in physical education and military science is required. For the degree of Bachelor of Science at least 36 term hours of science are required. As outlined the engineering and industrial-administration curricula include science requirements beyond this minimum. The industrial-arts education curriculum does not specify 36 hours of science; students must elect sufficient science for a Bachelor of Science degree or they may take the degree of Bachelor of Industrial Arts.

For the degree of Bachelor of Arts a minimum of 36 hours of arts and letters, including two years of a foreign language, is required. It is not possible, as a rule, for engineering students to meet the requirements for a Bachelor of Arts degree in engineering in four years. Students who spend more than four years for their undergraduate work may qualify for the Bachelor of Arts degree. Students who meet the requirements for both degrees and submit a total of 237 term hours may, on approval, receive both the Bachelor of Arts and the Bachelor of Science degrees.

The requirements for the M.A., M.S., Ch.E., C.E., E.E., M.E., and Min.E. degrees are printed under GRADUATE DIVISION.

Curricular Organization. The curricula offered in the Engineering School are organized into the following curricular groups:

A. Chemical Engineering and Mining Engineering as four-year sequence curricula.

B. Civil, Electrical, and Mechanical Engineering including a common freshman curriculum and differentiated sophomore and upper-division curricula in these three fields.

C. Industrial Administration and Industrial-Arts Education.

Engineering curricula are organized about four general fields of knowledge or training, and the sequence of courses in each curriculum is determined for the purpose of developing strong continuity in the various fields. The four fields are: (1) general engineering science and technology; (2) mathematics and physical science; (3) language, literature, English, and social science; and (4) military education, physical education, and free electives.

Exploratory Contacts. The lower-division curricula insofar as possible have been arranged to afford early contact with engineering training for those who are undetermined in the selection of a major engineering field.

Curricular groups A and B as listed above are differentiated by their primary foundations in chemistry and physics. An undecided student who desires exploratory contact with chemical engineering should register in curricular group A, for should he decide after the first term to investigate curricular group B, he may do so without increasing his undergraduate period of training. One who, on the contrary, explores curricular group B and decides at the end of his freshman year to transfer to curricular group A will find his training necessarily extended beyond four years.

As one and one-half years of algebra and one year of geometry are required for entrance to the engineering curricula (industrial-arts education excepted), students who have not completed these requirements and desire a degree in engineering must spend more than four years for graduation. The program of such students in the freshman year includes the mathematics that they lack, together with other freshman courses excepting those technical courses for which mathematics is prerequisite.

A. Chemical and Mining Engineering

CHEMICAL ENGINEERING

Freshman Year	Term hours F	W	S
Chemical Engineering Survey (ChE 111, 112, 113)	1	1	1
Principles of Chemistry (Ch 201, 202, 203)	4	4	4
Elementary Analysis (Mth 101, 102, 103)	4	4	4
English Composition (Eng 111, 112, 113)	3	3	3
Engineering Drawing (GE 111, 112)	2	....	2
Machine Shop Practice (IA 260) *or* Forging and Welding (IA 250)	....	2	....
General Hygiene (PE 150)	....	....	2
Military Science	1	1	1
[1]Physical Education	1	1	....
	16	16	17

Sophomore Year			
Chemical Technology (ChE 211)	2	....	....
Industrial Stoichiometry (ChE 212, 213)	....	2	2
Advanced Qualitative Analysis (Ch 231)	4	....	....
Quantitative Analysis (Ch 232, 233)	....	4	4
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
Engineering Physics (Ph 111, 112, 113)	3	3	3
Military Science	1	1	1
Physical Education	1	1	1
Social Science or Language and Literature	3	3	3
	18	18	18

[1]General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education.

Junior Year	Term hours F	W	S
Industrial Chemical Calculations (ChE 311, 312, 313)	4	4	4
Organic Chemistry (Ch 430, 431, 432)	4	4	4
Physical Chemistry (Ch 440, 441, 442)	4	4	4
Mechanics (Statics) (ME 212)	3	....	....
Strength of Materials (ME 311)	....	3	....
Materials of Engineering (ME 316)	....	....	3
[1]Electives	3	3	3
	18	18	18

Senior Year			
Unit Operations (ChE 411, 412, 413)	3	3	3
Manufacturing Processes (ChE 441, 442, 443)	3	3	3
Chemical Engineering Laboratory (ChE 414, 415, 416)	3	3	3
Industrial Electricity (EE 354, 355)	3	3	....
Chemical Plant Design (ChE 433)	....	....	4
Electives	3	4	3
	15	16	16

MINING ENGINEERING

Freshman Year			
Principles of Chemistry (Ch 201, 202, 203)	4	4	4
Elementary Analysis (Mth 101, 102, 103)	4	4	4
English Composition (Eng 111, 112, 113)	3	3	3
Engineering Drawing (GE 111, 112, 113)	2	2	2
General Hygiene (PE 150)	....	....	2
Military Science	1	1	1
[2]Physical Education	1	1	....
	15	15	16

Sophomore Year			
Engineering Physics (Ph 111, 112, 113)	3	3	3
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
Advanced Qualitative Analysis (Ch 231)	4	....	....
Quantitative Analysis (Ch 232)	....	4	....
Assaying (Met 263)	....	....	3
Geology (G 201, 202, 203)	3	3	3
Geology Laboratory (G 204, 205, 206)	1	1	1
Military Science	1	1	1
Physical Education	1	1	1
	17	17	16

Junior Year			
Mineralogy (G 312, 313, 314)	4	4	4
Mechanics (Statics) (ME 212)	3	....	....
Strength of Materials (ME 311)	....	3	....
Fluid Mechanics (CE 341)	....	3	....
Plane Surveying (CE 226)	3	....	....
Fire Assaying (Met 471, 472)	2	2	....
Mine Surveying (MiE 453)	....	....	3
Mineral Dressing (Met 481, 482)	3	3	....
Mining Machinery, General Mining Operations (MiE 433)	....	....	3
Mineral Dressing Laboratory (Met 483)	....	....	3
[1]Electives	3	3	5
	18	18	18

[1]Advanced Military Science may be elected only if the social science requirements have been completed. If GL 1, 2, 3 has already been completed, Scientific German (GL 320, 321, 322) should be elected.

[2]General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education.

Senior Year	Term hours F	W	S
Mining Methods (MiE 441)	3	....	....
Mine Development (MiE 442)	....	3	....
Mine Exploration (MiE 443)	....	....	3
General Metallurgy (Met 461)	3	....	....
Metallurgy of Base and Precious Metals (Met 462)	....	4	....
Stratigraphy (G 323)	4	....	....
Physiography (G 322)	....	4	....
Structural Geology (G 321)	....	....	4
Mine Plant Design (MiE 463)	....	....	2
Outlines of Economics (Ec 212), American National Government (PS 212), and other Social Science	3	3	3
[1]Electives	5	4	6
	18	18	18

B. Civil, Electrical, and Mechanical Engineering

COMMON FRESHMAN YEAR

Engineering Problems (GE 101, 102, 103)	2	2	2
Engineering Drawing (GE 111, 112, 113)	2	2	2
Elementary Analysis (Mth 101, 102, 103)	4	4	4
Engineering Physics (Ph 111, 112, 113)	3	3	3
English Composition (Eng 111. 112, 113)	3	3	3
Military Science	1	1	1
[2]Physical Education	1	1	1
	16	16	16

CIVIL ENGINEERING

Sophomore Year

Plane Surveying (CE 221, 222, 223)	3	3	3
Descriptive Geometry (CE 211)	3	....	....
Field Curves (CE 231)	....	3	....
Mechanics (CE 212. 213)	....	3	3
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
American National Government (PS 212)	3	....	....
General Sociology (Soc 212)	....	....	3
Military Science	1	1	1
Physical Education	1	1	1
	18	18	18

Junior Year

NORM

Strength of Materials (CE 351, 352)	3	3	....
Structural Analysis (CE 382)	....	4	....
Reinforced Concrete (CE 383)	....	....	4
Fluid Mechanics (CE 311)	3	....	....
Advanced Hydraulics (CE 312)	....	3	....
Hydraulic Machinery (CE 313)	....	....	3
Roads and Pavements (CE 333)	....	....	3
Curves and Earthwork (CE 332)	....	....	3
Material of Engineering (ME 316)	3	....	....
Industrial Electricity (EE 356)	3	....	....
Outlines of Economics (Ec 212)	....	3	....
	12	13	13

GENERAL AND HIGHWAY OPTIONS

Junior-Year Norm	12	13	13
Electives	4	4	4
	16	17	17

BUSINESS OPTION

Junior-Year Norm	12	13	13
Accounting for Technical Students (BA 385, 386)	3	3	....
Cost Accounting for Industrials (BA 494)	....	....	3
Extempore Speaking (Sp 111)	3	....	....
Elective	....	....	1
	18	16	17

[1]Nine credit hours of Social Science must be elected during junior and/or senior year.
[2]General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education.

Senior Year

NORM	Term hours F	W	S
Structural Engineering (CE 481), Structural Design (CE 482)	4	4	....
Estimating and Cost Analysis (CE 460)	....	....	3
Masonry and Foundations (CE 472)	....	4	....
Sanitary Engineering (CE 412)	3	....	....
Contracts and Specifications (CE 427)	....	....	3
Steam, Air, and Gas Power (ME 346)	....	....	3
Engineering Geology (G 324)	....	3	....
	7	11	9

GENERAL OPTION			
Senior-Year Norm	7	11	9
Building Design (CE 483)	....	....	4
Hydrology (CE 411)	3	....	....
Structural Materials Laboratory (ME 415)	....	3	....
Electives	7	4	4
	17	18	17

HIGHWAY OPTION			
Senior-Year Norm	7	11	9
Highway Engineering (CE 421, 422)	4	3	....
Economics of Highway Transportation (CE 425)	....	....	3
Highway Materials Laboratory (ME 414)	3	....	....
Electives	4	4	4
	18	18	16

BUSINESS OPTION			
Senior-Year Norm	7	11	9
Hydrology (CE 411)	3	....	....
Business Law (BA 256, 257, 258)	3	3	3
Personnel Management (BA 414)	4	....	....
Merchandising and Selling (SS 436)	....	3	....
Money and Banking (Ec 413)	....	....	4
Elective	....	1	....
	17	18	16

STRUCTURAL DESIGN IN ARCHITECTURE OPTION

B.S. Degree at University

Freshman and Sophomore Years (University)

The freshman and sophomore years in this curriculum are taken at the University in the School of Architecture and Allied Arts. It is recommended that the student in his freshman and sophomore years take the following courses, with such additions as may best fit individual cases: graphics, drawing or architectural modeling, architectural design, construction, elementary analysis, general physics, calculus, and architectural history. Students also take English composition, physical education, and the lower-division group requirements in arts and sciences.

Junior Year (State College)	Term hours F	W	S
Plane Surveying (CE 221, 222, 223)	3	3	3
Strength of Materials (CE 351, 352)	3	3	....
Structural Analysis (CE 382)	....	4	....
Reinforced Concrete (CE 383)	....	....	4
Materials of Engineering (ME 316)	3	....	....
Structural Materials Laboratory (ME 415)	....	3	....
Practical Electricity (IA 370)	3	....	....
Welding Practice (IA 350)	....	....	1
Forging and Welding (IA 250)	....	....	2
Electives	5	3	7
	17	16	17

Senior Year (State College)	Term hours F	W	S
Structural Engineering (CE 481), Structural Design (CE 482)	4	4	....
Building Design (CE 483)	....	....	4
Masonry and Foundations (CE 472)	....	4	....
Fluid Mechanics (CE 311)	3	....	....
Estimating and Cost Analysis (CE 460)	....	....	3
Steam, Air, and Gas Power (ME 346)	....	....	3
Heating and Air Conditioning (ME 461)	....	....	3
Industrial Electricity (EE 356)	3	....	....
Electives	7	9	3
	17	17	16

ELECTRICAL ENGINEERING

Sophomore Year

Introduction to Electrical Engineering (EE 201, 202, 203)	4	4	4
Plane Surveying (CE 226)	....	....	3
Machine Shop Practice (IA 260)	2	....	....
Forging and Welding (IA 250)	....	2	....
Foundry Practice (IA 240)	....	....	2
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
Elementary Journalism (J 111)	3	....	....
Extempore Speaking (Sp 111)	....	3	....
Military Science	1	1	1
Physical Education	1	1	1
	18	18	18

Junior Year

NORM

Electrical Engineering (EE 311, 312, 313)	3	3	3
Electrical Engineering Laboratory (EE 321, 322, 323)	3	3	3
Mechanics (ME 212, 213)	3	3	....
Materials of Engineering (ME 316)	....	....	3
Heat Power Engineering (ME 331, 332)	3	3	....
Fluid Mechanics (CE 341)	....	....	3
	12	12	12

POWER AND COMMUNICATION OPTION

Norm	12	12	12
Accounting for Technical Students (BA 385)	3	....	....
American National Government (PS 212)	....	3	....
Outlines of Economics (Ec 212)	....	....	3
[1]Electives	3	3	3
	18	18	18

BUSINESS OPTION

Norm	12	12	12
Accounting for Technical Students (BA 385, 386)	3	3	....
Cost Accounting for Industrials (BA 494)	....	....	3
Electives	2	2	1
	17	17	16

Senior Year

NORM

Electrical Engineering (EE 411, 412, 413)	3	3	3
Electrical Design (EE 414, 415, 416)	1	1	1
Seminar (EE 407)	1	1	1
	5	5	5

POWER OPTION

Senior-Year Norm	5	5	5
Electrical Engineering Laboratory (EE 421, 422, 423)	3	3	3
Electrical Transients (EE 451)	3	....	....
High-Voltage Engineering (EE 452, 453)	....	3	3
Electives	5	5	5
	16	16	16

[1]It is recommended that students selecting the Communication Option elect Radio Communication (Ph 331, 332, 333) in either the junior or the senior year.

COMMUNICATION OPTION	Term hours F	W	S
Senior-Year Norm	5	5	5
Communication Engineering (EE 461, 462, 463)	3	3	3
Vacuum Tubes and Circuits (EE 464, 465)	3	3	....
Engineering of Sound Systems (EE 466) *or* Radio Engineering (EE 467)	....	....	3
[1]Radio Engineering Practices (EE 481, 482, 483) *or* electives	1	1	1
[2]Electives	4	4	4
	16	16	16
BUSINESS OPTION			
Senior-Year Norm	5	5	5
Electrical Engineering Laboratory (EE 421, 422, 423)	3	3	3
Vacuum Tubes and Circuits (EE 464)	3	....	....
Illumination (EE 431, 432)	....	3	3
Merchandising and Selling (SS 436)	....	3	....
Business Law (BA 256, 257, 258)	3	3	3
Outlines of Economics (Ec 212)	3	....	....
Money and Banking (Ec 413)	....	....	4
	17	17	18

MECHANICAL ENGINEERING

Sophomore Year

Descriptive Geometry (ME 211)	3	....	....
Mechanics (ME 212, 213)	....	3	3
Plane Surveying (CE 226)	3	....	....
Foundry Practice (IA 240)	2	....	....
Machine Shop Practice (IA 260)	....	2	....
Forging and Welding (IA 250)	....	....	2
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
American National Government (PS 212)	....	3	....
General Sociology (Soc 212)	....	....	3
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
Military Science	1	1	1
Physical Education	1	1	1
	17	17	17

Junior Year

NORM			
Heat Engineering (ME 321, 322, 323)	4	4	4
Mechanical Laboratory (ME 351, 352, 353)	2	2	2
Strength of Materials (ME 314, 315)	3	3	....
Mechanism (ME 312)	....	3	....
Outlines of Economics (Ec 212)	....	....	3
	9	12	9
GENERAL OPTION			
Junior-Year Norm	9	12	9
Materials of Engineering (ME 316)	3	....	....
Fuels and Lubricants (ME 325)	....	....	3
Fluid Mechanics (CE 341), Hydraulic Machinery (CE 342)	3	3	....
Accounting for Technical Students (BA 385)	....	....	3
Electives	3	3	3
	18	18	18
AERONAUTICAL OPTION			
Junior-Year Norm	9	12	9
Materials of Engineering (ME 316)	....	....	3
Aerodynamics (ME 342)	....	3	....
Aeropropulsion (ME 343)	....	....	3
Fluid Mechanics (CE 341)	3	....	....
Differential Equations (Mth 421)	3	....	....
Electives	3	3	3
	18	18	18

[1]It is recommended that students especially interested in radio engineering as a career elect Radio Speaking (Sp 234, 235, 236).

[2]It is recommended that students selecting the Communication Option elect Radio Communication (Ph 331, 332, 333) in either the junior or the senior year.

BUSINESS OPTION	Term hours F	W	S
Junior-Year Norm	9	12	9
Materials of Engineering (ME 316)	....	....	3
Fluid Mechanics (CE 341), Hydraulic Machinery (CE 342)	3	3	....
Accounting for Technical Students (BA 385, 386)	3	3	....
Cost Accounting for Industrials (BA 494)	....	....	3
Electives	3	....	3
	18	18	18

Senior Year

NORM

Machine Design (ME 411, 412)	3	3	....
Modern Materials (ME 421)	3	....	....
Industrial Engineering (ME 473)	....	....	3
	6	3	3

GENERAL OPTION

Senior-Year Norm	6	3	3
Machine Design (ME 413)	....	....	3
[1]Power-Plant Engineering (ME 431, 432)	3	3	....
Mechanical Laboratory (ME 451, 452)	2	2	....
[1]Mechanical Laboratory (ME 453)	....	....	2
Gas Technology (ME 422)	....	3	....
Industrial Instrumentation (ME 476)	....	....	3
Industrial Electricity (EE 351, 352, 353)	3	3	3
Electives	3	3	3
	17	17	17

AERONAUTICAL OPTION

Senior-Year Norm	6	3	3
Airplane Design (ME 441, 442, 443)	3	3	3
Aeronautical Laboratory (ME 456, 457)	2	2	....
Advanced Aerodynamics (ME 446)	....	....	3
Structural Analysis (CE 382. 485)	4	3	....
Electricity in Aeronautics (EE 358)	....	3	....
Airway Communication Systems (EE 359)	....	....	3
Electives	3	3	4
	18	17	16

BUSINESS OPTION

Senior-Year Norm	6	3	3
Mechanical Laboratory (ME 451, 452)	2	2	....
Gas Technology (ME 422)	....	3	....
Industrial Electricity (EE 351, 352, 353)	3	3	3
Business Law (BA 256, 257, 258)	3	3	3
Merchandising and Selling (SS 436)	....	3	....
General Advertising (SS 439)	....	....	3
Investments (BA 463)	....	....	3
Electives (technical)	3	....	2
	17	17	17

[1]Students interested in automotive engineering may substitute ME 491, 492, 493 for ME 431, 432, 453.

C. Industrial Administration and Industrial-Arts Education[1]

INDUSTRIAL ADMINISTRATION

Freshman Year

See COMMON FRESHMAN YEAR, page 284.

Sophomore Year

	Term hours F	W	S
Foundry Practice (IA 141)	3	----	----
Forging and Welding (IA 152)	----	3	----
Machine Shop (IA 163)	----	----	3
Pattern Making (IA 111)	3	----	----
Introduction to Scientific Management (IA 265)	----	----	3
Descriptive Geometry (ME 211)	3	----	----
Mechanics (ME 212, 213)	----	3	3
Differential and Integral Calculus (Mth 201, 202)	4	4	----
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
Outlines of Economics (Ec 212)	----	3	----
American National Government (PS 212)	----	----	3
Military Science	1	1	1
Physical Education	1	1	1
	18	18	17

Junior Year

Time and Motion Study (IA 366, 367)	3	3	----
Production Planning and Control (IA 360)	----	----	3
Millwork—Machine Woodwork (IA 311)	3	----	----
Machine Shop Practice (IA 261)	----	2	----
Industrial Electricity (EE 351, 352, 353)	3	3	3
Materials of Engineering (ME 316)	3	----	----
Mechanism (ME 312)	----	3	----
Labor Problems (Ec 425)	----	----	4
Economic Development of the United States (Ec 214)	----	4	----
[2]Machine and Tool Maintenance (IA 365) *or* Machine and Tool Maintenance (IA 325)	2	----	----
[2]Brass and Alloy Foundry (IA 343) *or* Commercial Woods (WP 331)	----	----	2–3
[2]Machine Shop (IA 362) or elective	----	----	2
Electives	3	3	3–2
	17	18	17

Senior Year

NORM

Quantitative Management (IA 462, 463)	3	3	----
Accounting for Technical Students (BA 385, 386), Cost Accounting for Industrials (BA 494)	3	3	3
Business Law (BA 256, 257)	3	3	----
Elements of Marketing (BA 223)	----	----	4
Welding Practice (IA 350)	----	1	----
	9	10	7

METALS OPTION

Senior-Year Norm	9	10	7
Production Machine Work (IA 363)	3	----	----
Machine Drawing (IA 263)	----	----	3
Metallography and Pyrometry (ME 481)	3	----	----
Industrial Instrumentation (ME 476)	----	----	3
Electives	3	6	3
	18	16	16

[1]Under Department of Industrial Arts see statement of objectives controlling the make-up of curricula in industrial-arts education and industrial administration, and the types of training for which they are designed (pages 317-318).

[2]IA 343, 362, 365 are required for metals option; IA 325 and WP 331 are required for woodworking option.

WOODWORKING OPTION	Term hours F	W	S
Senior-Year Norm	9	10	7
Carpentry (IA 333)	----	3	----
Wood and Metal Finishing (IA 316)	----	----	2
Lumber Seasoning (WP 494)	4	----	----
Lumber Merchandising (WP 496)	----	----	4
Electives	3	5	3
	16	18	16

INDUSTRIAL-ARTS EDUCATION[1]

Freshman Year

Pattern Making (IA 111)	3	----	----
Methods in Woodworking (IA 112, 113)	----	3	3
Foundry Practice (IA 141)	3	----	----
Forging and Welding (IA 152)	----	3	----
Machine Shop (IA 163)	----	----	3
Engineering Drawing (GE 111, 112, 113)	2	2	2
English Composition (Eng 111, 112, 113)	3	3	3
Lower-Division Courses in Science Group	3–4	3–4	3–4
Military Science	1	1	1
[1]Physical Education	1	1	1
	16–17	16–17	16–17

Sophomore Year

Machine and Tool Maintenance (IA 325 or 365)	2	----	----
Lower-Division Drawing (AA 291)	3	----	----
Lower-Division Decorative Design (AA 295)	----	3	----
Sheet-Metal Work (IA 380) *or* Lower-Division Decorative Design (AA 295—second course)	----	----	3
House Planning and Architectural Drawing (AA 178)	3	----	----
House Planning and Architectural Drawing (AA 179) *or* Descriptive Geometry (CE 211)	----	3	----
House Planning and Architectural Drawing (AA 180) *or* Machine Drawing (IA 263)	----	----	3
Modern Governments (PS 201, 202)	4	4	----
Outlines of Psychology (Psy 211)	----	----	6
Business English (Eng 217) *or* Elementary Journalism (J 111)	3	----	----
Extempore Speaking (Sp 111)	----	3	----
Parliamentary Procedure (Sp 231)	----	----	3
Military Science	1	1	1
Physical Education	1	1	1
Technical electives	----	2	----
	17	17	17

Junior Year

Millwork—Machine Woodwork (IA 311) *or* Production Machine Work (IA 363)	3	----	----
Carpentry (IA 333)	----	3	----
Wood and Metal Finishing (IA 316)	----	----	2
Automobile Mechanics (AE 312, 313, 314)	3	3	3
Educational Psychology (Ed 312)	3	----	----
Industrial-Arts Organization (Ed 330)	----	2	----
Special Teaching Methods (Ed 408e)	----	----	3
Secondary Education (Ed 311)	3	----	----
Principles of Teaching (Ed 313)	----	3	----
Measurement in Secondary Education (Ed 416)	----	----	3
Technical electives	2	3	3
General electives	3	3	3
	17	17	17

[1]Technical option to be selected according to intended goal.

[2]General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education.

Senior Year	Term hours F	W	S
Practical Electricity (IA 370)	3	....	....
Stagecraft and Lighting (Sp 244) *or* Public Information Methods (J 313)	....	3	....
Materials of Engineering (ME 316) *or* Commercial Woods (WP 331)	....	....	3
The General Shop and Its Problems (IEd 473)	2	....	....
Written and Visual Teaching Aids (IEd 474)	....	3	....
Shop Planning and Organization (IA 411)	....	....	3
Occupational Analysis (IEd 472)	3	....	....
Supervised Teaching (Ed 415)	....	3	3
History of Manual and Industrial Education (IEd 470)	3	....	....
History of Oregon (Hst 377)	....	3	....
Oregon School Law and Oregon System of Education (Ed 316)	....	....	2
Technical electives	3	2	2
Electives	3	3	4
	17	17	17

General Engineering

ENGINEERING courses required in the common freshman year for civil, electrical, and mechanical engineering are grouped in the Department of General Engineering. The courses are taught by members of the civil, mechanical, and electrical engineering departmental staffs who for purposes of coordination and unified effort work as a committee in planning and supervising the instruction.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

GE 101, 102, 103. **Engineering Problems.** 2 hours each term.

Lectures and problems dealing in an elementary way with the general field of engineering. The aim is fourfold: to inform the student concerning the problems and occupations in the various engineering fields; to develop an appreciation of the close relationship between the units of engineering curricula; to assist the student in the acquisition of elementary knowledge in the fields of civil, mechanical, and electrical engineering; and to train the student in engineering habits of thinking and expression. Parallel with Ph 111, 112, 113. One lecture; 2 two-hour problem periods.

GE 111. **Engineering Drawing.** 2 hours fall or winter.

Training in the use of drafting instruments and in the art of lettering; introduction to elementary principles of orthographic projection. Intended for students who have had no previous college training in mechanical drawing. The instruments and materials for this course cost about $30.00. The instruments are used in all later drawing courses. Three two-hour drawing periods.

GE 112. **Engineering Drawing.** 2 hours winter or spring.

Continuation of orthographic projection; methods of dimensioning and checking drawings; use of auxiliary planes of projection; section drawings; isometric drawing; working drawings of machine parts; tracings from drawings. Prerequisite: GE 111 or equivalent. Three two-hour drawing periods.

GE 113. **Engineering Drawing.** 2 hours spring or fall.

A continuation of GE 112. Standard fasteners; intersection and development; mechanical perspective; freehand orthographic and perspective sketching; practical application of drawing principles to working drawings; use of charts and diagrams. Prerequisite: GE 112. Three two-hour drawing periods.

Chemical Engineering

"Chemical engineering, as distinguished from the aggregate number of subjects comprised in courses of that name, is not a composite of chemistry and mechanical and civil engineering, but itself a branch of engineering, the basis of which is those unit operations which in their proper sequence and coordination constitute a chemical process as conducted on the industrial scale." *Adopted by The American Institute of Chemical Engineers, 1922.*

THE curriculum in chemical engineering is designed to give a broad training in the principles fundamental to chemical industry. It aims to lay a foundation for responsible work in laboratory and plant, and to prepare the student for graduate work in either chemical engineering or chemistry. The course is equally applicable in preparation for research, design, control, operation, or technical sales. The student is first given a thorough foundation in chemistry, mathematics, English, and physics. This is followed by professional subject matter that falls into three groups: (1) courses that provide a knowledge of the more advanced principles of chemistry; (2) courses in engineering subjects; and (3) courses that deal with chemical engineering as a separate entity. The last group includes a thorough study of the unit operations of chemical engineering and their applications to chemical processes.

The course is designed to give a broad training in fundamentals, rather than specialized training for a narrow field. A corresponding breadth of opportunity is presented, including the entire field of chemical industry as well as allied lines. Many positions of responsibility, particularly in research and development work, demand a more extensive training than can be given in four years, and students with the proper qualifications are advised to pursue graduate work leading to advanced degrees.

Since chemical engineering is a group A sequence, particular attention is directed to the remarks under *Exploratory Contacts.*

Equipment. The Department is located in Chemistry Hall, where laboratory facilities have been provided for instruction in both unit operations and manufacturing processes. Laboratories have been designed to facilitate pilot plant studies of typical chemical problems. Instruments commonly employed to obtain engineering data are available, as well as an adequate supply of the usual reagents and chemical apparatus. Special laboratories are available for advanced projects.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

ChE 111, 112, 113. **Chemical Engineering Survey.** 1 hour each term.

The profession of chemical engineering; engineering procedures and methods. One lecture; 1 two-hour computation period.

ChE 211. **Chemical Technology.** 2 hours fall.

Fundamentals of chemical engineering; graphical analysis; instrumentation; control of process variables; applications in the solution of typical problems. One lecture; two recitations.

ChE 212, 213. **Industrial Stoichiometry.** 2 hours each term, winter and spring.

Quantitative interpretation and application of physical and chemical data to various industrial chemical processes. One lecture; two recitations.

UPPER-DIVISION COURSES

ChE 311, 312, 313. **Industrial-Chemical Calculations.** 4 hours each term. Applications of chemical and chemical-engineering principles to industrial processes and problems. Chemical-engineering thermo-dynamics is emphasized. Three lectures; 1 three-hour computation period. Assistant Professor Locke.

ChE 401. **Research.** Terms and project to be arranged.

ChE 403. **Thesis.** Terms and hours to be arranged.

ChE 405. **Reading and Conference.** Terms, hours, and subject to be arranged.

ChE 407. **Seminar.** 1 hour any term.

ChE 411, 412, 413. **Unit Operations.** (g) 3 hours each term.
Quantitative treatment of the unit operations of chemical engineering; application of the fundamental principles of the operations to typical engineering problems. Three lectures; 1 two-hour computation period. Professor Gleeson.

ChE 414, 415, 416. **Chemical Engineering Laboratory.** (g) 3 hours each term.
Quantitative laboratory study of the unit operations of chemical engineering; emphasis placed on preparation of technical reports. One lecture; 1 four-hour laboratory period. Assistant Professor Locke, Mr. Murray.

ChE 421, 422, 423. **Industrial Chemistry.** (g) 2 hours each term.
A sequence designed for nonchemical-engineering majors. Treatment is quantitative but restricted to the most important chemical engineering principles as applied to industrial chemical processes. Prerequisite: consent of instructor. Mr. Murray.

ChE 433. **Chemical Plant Design.** (g) 4 hours spring.
Problems in the design of a chemical plant and chemical-engineering equipment; application of the fundamentals of mechanics, materials of engineering, and the unit operations to selected problems; design-room procedures emphasized. Reports required. Two lectures; 2 two-hour computation periods. Professor Gleeson.

ChE 441, 442, 443. **Manufacturing Processes.** (g) 3 hours each term.
Industrial technique employed in the solution of problems typical of organic and inorganic process industries; emphasis placed on the development of a commercial chemical process; the application of fundamentals of physical chemistry, including reaction kinetics, thermodynamics, and catalysis. Materials of construction, process variables, and economic factors are particularly stressed. Two lectures, 1 recitation. Assistant Professor Locke.

ChE 445. **Process Laboratory.** (G) 3 hours spring.
Laboratory study of selected unit processes. Designed to emphasize the fundamentals of the subject. Prerequisite: organic chemistry. One lecture; 1 four-hour laboratory period. Staff.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

ChE 501. **Research.** Terms and hours to be arranged.

ChE 503. **Thesis.** Terms and hours to be arranged.

ChE 505. **Reading and Conference.** Terms and hours to be arranged.

ChE 507. **Seminar.** Terms and hours to be arranged.

ChE 511. **Industrial Plastics.** 3 hours fall.

Classification of modern plastics, their preparation, properties, and special fields of application; commercial processes of manufacture as well as fabrication. Prerequisite: Ch 430, 431, 432, or equivalent. Mr. Murray.

ChE 512. **Economic Balance.** (G) 3 hours winter.

Solution of typical chemical engineering and applied chemistry problems from the standpoint of economic considerations; optimum conditions of design and operation determined from cost studies and probable returns. Two lectures, 1 recitation. Professor Gleeson.

ChE 513. **Petroleum Refining.** (G) 3 hours spring.

Processes by which crude petroleum is converted into commercial products; special attention to application of fundamental operations of absorption, distillation, cracking, etc. Two lectures; 1 recitation. Professor Gleeson.

Civil Engineering

THE curriculum in civil engineering is organized to train young men in those principles of engineering science and technology that are basic and common to the fields of geodesy and surveying, highways, railroads, irrigation and drainage, river and harbor improvements, structures, hydraulics, sanitation, and municipal engineering, and to permit some latitude of choice in the three general fields of structures, hydraulics, and highways. The civil engineer's problems in the development of the Northwest are directly related to the structural, hydraulic, and highway fields. The curriculum is planned to prepare graduates for advancement to responsible positions in these fields.

Highway engineering is offered as an option in the civil-engineering curriculum and is differentiated from that curriculum only in the senior year. The aim in these courses is to meet the demand in this state and throughout the Northwest for men equipped to take charge of road and street construction and maintenance work.

Thorough theoretical instruction is accompanied by as much laboratory and field practice as possible. In the study of highways, special reference is made to the conditions and needs of Oregon.

Equipment. The department is provided with quarters and equipment for adequately and thoroughly performing its work. The third floor of Apperson Hall is devoted to classrooms and drawing rooms. A large room on the ground floor of Industrial Arts Building houses the surveying instruments, and the entire middle third of the Engineering Laboratory is occupied by hydraulic equipment. The equipment of the instrument room consists of 25 transits, 25 levels, and 7 plane tables, together with the necessary auxiliary supply of stadia, level, and line rods, hand levels, tapes, and other minor equipment.

The equipment of the hydraulic laboratory is adequate for the execution of all basic experimental work in the field of hydraulic engineering. The machinery installed is modern and complete. It is extensive enough so that all the theoretical studies of the classroom may be verified by the performance of machines in the laboratory. Classified on the factors of quantity of water, pressure under which water is available, square feet of floor space, and value of equipment, it ranks among the leading hydraulic laboratories of the United

States. The major items of the equipment are two direct-connected 8-inch centrifugal pumps operated by 40-horsepower motors; a 35-inch Pelton impulse wheel with oil-pressure governor; a 14-inch spiral-cased Francis-type reaction turbine with Pelton governor; a large pressure tank five feet in diameter by twenty feet high; and two 16,000-pound capacity weighing tanks mounted upon direct reading scales.

The department is equipped with modern testing laboratories, including the best cement and highway-testing machinery, thus affording students in civil engineering the opportunity of studying by direct observation and experiment the strength and properties of the various engineering materials.

The structural division is equipped with the most modern apparatus for the mechanical analysis of statically indeterminate structures including a twelve-gage, three-microscope Beggs Deformeter set, and a Gottchalk Continostat.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

CE 211. **Descriptive Geometry.** 3 hours fall or winter.

Principles of orthographic projection; applications to the graphical solution of engineering problems. Prerequisite: GE 112. One recitation; 2 three-hour drawing periods.

CE 212. **Mechanics (Statics).** 3 hours fall or winter.

Applied mechanics for engineering students; forces and force systems with reference to the equilibrium of rigid bodies, including simple framed structures; methods of finding centers of gravity and moments of inertia and their practical applications; numerous problems having engineering application. Prerequisite: differential calculus. One recitation; 2 two-hour computing periods.

CE 213. **Mechanics (Dynamics).** 3 hours winter or spring.

Continuation of CE 212. Principles and problems in kinetics; force as a factor causing motion; work, energy, friction, and impact studied and illustrated by means of numerous problems. Prerequisite: CE 212. One recitation; 2 two-hour computing periods.

CE 221. **Plane Surveying.** 3 hours fall.

Theory, use, and adjustment of level and transit; measurement and subdivision of land. One recitation; 2 three-hour periods field work.

CE 222. **Plane Surveying.** 3 hours winter.

Continuation of CE 221. Surveying problems as related to subdivision of public land, farm and city surveying; special problems and methods; further practice in use of instruments; note-keeping. Prerequisite: CE 221. One recitation; 2 three-hour periods field work.

CE 223. **Plane Surveying.** 3 hours spring.

Use of stadia and of plane table; topographical mapping and drawing; determination of meridian by stellar and by solar observation. Prerequisite: CE 222. One recitation; 2 three-hour field periods.

CE 226. **Plane Surveying.** 3 hours fall or spring.

Theory, use, and adjustment of engineer's level and transit. One recitation; 2 three-hour periods field work.

CE 231. **Field Curves.** 3 hours winter.

Instruction and field work in simple curves and compound curves as related to railroads, highways, and canals. Prerequisite: CE 221. Two recitations; 1 three-hour period field work.

UPPER-DIVISION COURSES

CE 311. **Fluid Mechanics.** 3 hours fall or winter.
Principles underlying the application of mechanics to compressible and incompressible fluids; laboratory measurements of pressure and flow of fluids in closed and open channels. Prerequisite: CE 212; Mth 203. Two recitations; 1 three-hour laboratory period. Professor Mockmore, Associate Professor Merryfield, Assistant Professor Wanless.

CE 312. **Advanced Hydraulics.** 3 hours winter.
Continuation of CE 311. Special hydraulic problems, including the laws of hydraulic similitude. Prerequisite: CE 311. One recitation; 2 two-hour laboratory periods. Professor Mockmore, Associate Professor Merryfield.

CE 313. **Hydraulic Machinery.** 3 hours spring.
Operation, characteristics, efficiency, theory, design, and installation of pumps and turbines; laboratory studies. Planned particularly for civil-engineering students. Prerequisite: CE 311. Two recitations; 1 three-hour laboratory period. Associate Professor Merryfield.

CE 321. **Advanced Surveying.** 3 hours fall.
Precise leveling, triangulation, base-line measurement, stellar and solar observations, aerial mapping. Prerequisite: CE 223. One recitation; 2 three-hour periods field work. Associate Professor Waterman, Mr. Coopey.

CE 322. **Elementary Hydraulics.** 3 hours winter.
Principles underlying pressure and flow of water; laboratory measurements of flow through orifices, weirs, pipes, and open channels. Planned particularly for agricultural-engineering students. Prerequisite: Mth 103. Two recitations; 1 three-hour laboratory period. Professor Mockmore, Associate Professor Merryfield.

CE 331. **Navigation.** 3 hours spring.
Fundamental laws of navigation; longitude, latitude, spherical trigonometry; commercial flight routes; flight instruments. Associate Professor Merryfield.

CE 332. **Curves and Earthwork.** 3 hours spring.
Instruction and field work in easement, and parabolic curves as related to railroads, highways, and canals; complete survey of a transportation line; reconnaissance, preliminary, and location surveys; estimates of quantities. Prerequisite: CE 231. One recitation; 2 three-hour periods field work. Professor Glenn.

CE 333. **Roads and Pavements.** 3 hours spring.
Fundamental principles of location, construction, and maintenance of roads; materials used in road and street building. Professor Glenn.

CE 341. **Fluid Mechanics.** 3 hours any term.
Similar to CE 311 for students in electrical, mining, and mechanical engineering. Prerequisite: CE 212 or ME 212; Mth 203. Two recitations; 1 three-hour laboratory period. Associate Professor Merryfield, Mr. Cavanagh.

CE 342. **Hydraulic Machinery.** 3 hours winter.
Application of the principles of hydraulics to the performance and design of pumps and turbines and the layout of pumping and power plants. Prerequisite: CE 311 or 341. Two recitations; 1 three-hour laboratory period. Associate Professor Merryfield.

CE 351, 352. **Strength of Materials.** 3 hours each term, fall and winter.
General principles of mechanics applied to the elements of engineering structures to determine their strength and fitness; tensile and crushing strengths of various engineering materials; stresses in beams and girders under different systems of loading and support; supporting strength of columns; application of torsion to shafts. Prerequisite: CE 212 or ME 212; Mth 203. One recitation; 2 two-hour computing periods. Associate Professor Waterman.

CE 362. **Modern Construction Methods.** 2 hours winter.
Modern methods of earth moving; economic haul for various types of equipment; use of explosives in construction. Modern methods of handling and transporting construction equipment and materials. Prerequisite: CE 351, ME 316. One lecture; 30 hours laboratory arranged during the term. Professor Glenn.

CE 382. **Structural Analysis.** 4 hours fall or winter.
Graphical and algebraic analysis of statically determined structures such as simple beams, cranes, roof and bridge trusses. Aeronautical-option students study airplane drag and fuselage trusses. Prerequisite: CE 212 or ME 212. Two recitations; 2 two-hour laboratory periods. Professors Holcomb and Glenn, Assistant Professor Wanless.

CE 383. **Reinforced Concrete.** 4 hours spring.
Study and design of the elements of reinforced concrete including beams, slabs, girders, and columns by various methods such as the transformed sections, graphical, and commercial short-cut methods. Prerequisite: CE 351, 382. Two recitations; 2 two-hour laboratory periods. Professor Holcomb, Associate Professor Waterman.

CE 401. **Research.** Terms and hours to be arranged.

CE 403. **Thesis.** Any term, hours to be arranged.

CE 405. **Reading and Conference.** Terms and hours to be arranged.

CE 407. **Seminar.** 1 hour fall and winter.
Professor Mockmore.

CE 408. **Nomography.** 1 hour spring.
Study and application of the laws affecting the construction of nomographic charts and the derivation of equations by such devices. Graphical and mathematical methods are applied to three and four variable equations. One recitation. Professor Mockmore.

CE 411. **Hydrology.** (G) 3 hours fall.
Precipitation, storage, and run-off; field studies in standard methods of measurement. Two recitations; 1 three-hour laboratory period. Professor Mockmore.

CE 412. **Sanitary Engineering.** (G) 3 hours fall.
Fundamental processes and operations of the conditioning of water as applied to water supply and sewage disposal. Prerequisite: CE 311. Two recitations; 1 three-hour laboratory period. Associate Professor Maryfield.

CE 413. **Sanitary Engineering Laboratory.** (G) 3 hours winter.
Laboratory practice in standard methods of water and sewage analysis; special attention to examination of polluted waters, sewage influents and effluents, and industrial wastes; tests on rivers to determine degree of pollution; tests on water treatment and sewage treatment plants to determine

efficiencies. Prerequisite: senior standing. One recitation; 2 three-hour laboratory periods. Associate Professor Merryfield.

CE 421. **Highway Engineering.** (g) 4 hours fall.
Highway and street design—theory of structural design for rigid slab and flexible type pavement; subgrade stabilization; drainage design; methods of construction and maintenance of various types of roads; cost data; study of modern highway research. Prerequisite: CE 333. Two recitations; 2 three-hour laboratory periods. Professor Glenn.

CE 422. **Highway Engineering.** (g) 3 hours winter.
Traffic surveys; methods of modern traffic control: signals, signs, zoning, intersection design, traffic routing, etc.; highway safety: accident records, characteristics of accident driver's, operator's qualifications, motor vehicle laws, pedestrian control. Prerequisite: CE 333. Two recitations; 1 three-hour laboratory period. Professor Glenn.

CE 425. **Economics of Highway Transportation.** (G) 3 hours spring.
Economics of highway planning—fundamentals in highway economics; cost, benefit, and revenue factors; motor vehicle operation costs; economic theory of highway development and extensions. Prerequisite: CE 333. Three recitations. Professor Glenn.

CE 426. **Highway Administration and Finance.** (G) 3 hours spring.
Development of highway systems; organization of state and national highways; principles of highway finance; Federal aid; technical functions of various highway units. Prerequisite: CE 333. Professor Glenn.

CE 427. **Contracts and Specifications.** (g) 3 hours spring.
General principles and laws of contracts as applied to engineering. Assistant Professor Wanless.

CE 438. **Municipal Engineering and City Planning.** (G) 3 hours spring.
Modern city streets, boulevards, and transportation systems; drainage and sanitation; water supply; lighting. Professor Glenn.

CE 451. **Water-Power Engineering.** (G) 3 hours any term.
Development of water power; storage and load; characteristics of modern turbines; selection of turbines; practical problems in design. Prerequisite: CE 313, or 342. One recitation; 2 three-hour laboratory periods. Professor Mockmore.

CE 452. **Water Supply.** (G) 3 hours any term.
Quality and quantity of water necessary for a municipal supply and of works for its collection, purification, and distribution. Two recitations; 1 three-hour laboratory period. Associate Professor Merryfield.

CE 454. **Sewage Disposal.** (G) 3 hours spring.
The several processes for the disposal and treatment of sewage; problems and considerations encountered in the design and operation of sewage-treatment plants. Prerequisite: CE 311. Two recitations; 1 three-hour laboratory period. Associate Professor Merryfield.

CE 460. **Estimating and Cost Analysis.** (g) 3 hours spring.
Procedure in quantity surveying; general and detailed considerations in establishing unit prices; subcontracts, overhead cost and profits; methods of preparing estimates in construction. Two recitations; 1 three-hour laboratory period. Professor Mockmore.

CE 472. **Masonry and Foundations.** (g) 4 hours winter.

Study and design of masonry foundations, walls, piers, dams, and arches. Prerequisite: CE 383. Two recitations; 2 three-hour laboratory periods. Associate Professor Waterman.

CE 481. **Structural Engineering.** (g) 4 hours fall.

Study and design of elements of riveted steel including members in tension, compression, and in flexure, with their connections; consideration to the design and detail of riveted-steel structures such as industrial roof trusses, and plate-girder bridges. Prerequisite: CE 351, 382. Two recitations; 2 three-hour laboratory periods. Professor Holcomb.

CE 482. **Structural Design.** (g) 4 hours winter.

Study and design of timber members in tension, compression, and flexure, with their connections; consideration to the design and details of simple timber structures such as roof and bridge trusses. Prerequisite: CE 351, 382. Two recitations; 2 three-hour laboratory periods. Professor Holcomb.

CE 483. **Building Design.** (G) 4 hours spring.

Study and design of building elements constructed of welded steel and reinforced-brick masonry; methods of such fabrication and construction. Prerequisite: CE 472, 481. Two recitations; 2 three-hour laboratory periods. Professor Holcomb.

CE 485. **Structural Analysis.** (G) 3 hours winter.

Study and stress analysis of statically indeterminate structures such as continuous beams and rigid frames; mechanical and algebraic methods of analysis. Prerequisite: CE 382. One recitation; 2 three-hour laboratory periods. Professor Holcomb.

CE 486. **Indeterminate Structures.** (G) 3 hours spring.

Elastic deflections and methods of analysis of statically indeterminate stresses. Prerequisite: CE 382. Two recitations; 1 three-hour laboratory period. Professors Mockmore and Holcomb.

CE 487. **Structural Stresses.** (G) 2 hours winter.

Modern methods of stress analysis applied to space frames and continuous frames; study of space frames by means of tension coefficients; analysis of continuous frames by distributed moments, with particular attention to haunched beams and continuous viaducts. Prerequisite: senior standing. One lecture; 1 three-hour laboratory period. Professor Holcomb.

CE 488. **Mechanical Methods of Stress Analysis.** (G) 2 hours winter or spring.

Theory and use of Beggs Deformeter, wire models, and the Gottschalk Continostat applied to the solution of stresses in continuous frames. Prerequisite: senior standing. 2 three-hour laboratory periods. Professor Holcomb.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

CE 501. **Research.** Terms and hours to be arranged.

CE 503. **Thesis.** Terms and hours to be arranged.

CE 505. **Reading and Conference.** Terms and hours to be arranged.

CE 507. **Seminar.** Terms and hours to be arranged.

Electrical Engineering

THE curriculum is designed to train the young engineer in the fundamental principles of electrical engineering. Both electrical theory and practice are presented by means of lectures, recitations, laboratory courses, and inspection trips. Experience with actual conditions can be acquired only in the field during vacation and after graduation. For this reason, and in order to afford mutual contact between the student and the men in his profession, the student is urged to spend his vacation periods in some phase of electrical industry.

As noted on pages 286-287 the work in the senior year is divided into the Power, Communication, and Business options. The student selects the program in which his interests lie.

The Power Option includes courses dealing with machines and electronic devices for generating, transmitting, distributing, and utilizing electrical energy. Emphasis is placed on the technical problems involved in high-voltage transmission.

The Communication Option provides courses for the students whose interests are in the field of wire communication, radio, sound reproduction, television, and related work. Instruction is available to seniors particularly interested in radio broadcasting to enable them to qualify for a government license.

The Business Option offers courses in business administration and law for those students whose interests lie in the field of management rather than in the more technical fields.

Equipment. The electrical-engineering laboratories are located in Apperson Hall. Laboratory equipment is available for demonstrating and verifying the fundamental electrical principles and theory and also for original research in some of the important fields. This equipment is located in the electric-power, communications, electrical-measurements, high-voltage, standardizing, and battery laboratories.

The power laboratory is equipped with alternating and direct-current machinery, control equipment, artificial three-phase power transmission lines, and electronic power apparatus.

The communications laboratory is well provided with equipment for making studies involving currents, voltages, and frequencies of the magnitudes used in both wire and wireless communication; for studying radio and television apparatus, electronic devices, electroacoustic equipment, and similar apparatus. Standardized oscillators and measuring equipment are available for studying frequencies from 20 to 50,000,000 cycles per second. The facilities of Radio Station KOAC, including the 5,000-watt Western Electric transmitter with directional antenna array, and the extensive sound-amplifying equipment of the State College group-address systems are also available for instructional and experimental purposes.

The measurements laboratory has adequate facilities designed for laboratory work on basic electrical theory during the sophomore year.

The high-voltage laboratory is equipped with apparatus for 60-cycle potentials up to 200,000 volts and impulse or "lightning" voltage waves of adjustable shape and magnitude up to 600,000 volts. This laboratory is also provided with a high-voltage Dufour cathode-ray oscillograph, sphere gap voltmeters, surge-voltage recorders, high-voltage rectifiers, and other apparatus necessary for the usual high-voltage tests.

The standardizing laboratory is provided with instruments for the precise measurement of potential, current, and power over wide ranges and for the standardization and calibration of electrical measuring instruments and meters.

The battery laboratory contains both lead-acid and alkaline storage batteries and charging equipment for maintenance and testing.

Oscillographs and oscilloscopes of the Duddell type and also of the high-voltage and low-voltage cathode-ray types are available for the study of transients and other phenomena in any of the laboratories.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

EE 201, 202, 203. **Introduction to Electrical Engineering.** 4 hours each term.

Fundamental electrical phenomena and their relation to electrical engineering. Prerequisite: Mth 103, Ph 113, GE 103, or instructor's approval. One lecture; 2 two-hour computation periods; 1 three-hour laboratory period. Professor Cockerline.

UPPER-DIVISION COURSES

EE 311, 312, 313. **Electrical Engineering.** 3 hours each term.

The electrical circuit; direct- and alternating-current machines, their basic theory and characteristics. Professor Wooster.

EE 321, 322, 323. **Electrical Engineering Laboratory.** 3 hours each term.

A laboratory course coordinated with EE 311, 312, 313. One lecture; 1 three-hour laboratory period. Professor Starr.

EE 351, 352, 353. **Industrial Electricity.** 3 hours each term.

Fundamental electrical principles and electrical equipment emphasizing the applications to industry. A service course for engineering students. Prerequisite: Junior Certificate. Two lectures; 1 three-hour laboratory period. Mr. Oorthuys.

EE 354, 355. **Industrial Electricity.** 3 hours fall and winter.

Direct and alternating current circuits and machines. Designed especially for chemical engineering students and others whose schedules permit taking two terms of electrical work. Prerequisite: Junior Certificate. Two lectures; 1 three-hour laboratory period. Professor Wooster.

EE 356. **Industrial Electricity.** 3 hours fall.

Abbreviated course covering direct and alternating current circuits and machines. Designed especially for civil engineering students and others whose schedules permit taking only one term of electrical work. Prerequisite: Junior Certificate. Two lectures; 1 three-hour laboratory period. Professor Wooster.

EE 358. **Electricity in Aeronautics.** 3 hours winter.

Fundamentals of electrical engineering as applied to aircraft and aerial navigation. Special attention to instruments; circuits; starting, lighting, and ignition systems. Prerequisite: Junior Certificate. Two lectures; 1 three-hour laboratory period. Mr. Pritchett.

EE 359. **Airway Communication Systems.** 3 hours spring.

Systems of electrical communication used in air transportation. Prerequisite: Junior Certificate. Two lectures; 1 three-hour laboratory period. Professor Albert, Mr. Pritchett.

EE 401. **Research.** Terms and hours to be arranged.

EE 403. **Thesis.** 3 hours each term.

EE 405. **Reading and Conference.** Terms and hours to be arranged.

EE 407. **Seminar.** 1 hour each term.
Presentation of abstracts and discussion of articles in the current engineering literature. One two-hour period. Professor McMillan.

EE 411, 412, 413. **Electrical Engineering.** (g) 3 hours each term.
Analysis of electric-power generation, transmission, and distribution with special reference to economic and financial problems. Professor Dearborn.

EE 414, 415, 416. **Electrical Design.** (g) 1 hour each term.
Design and computations supplementary to EE 411, 412, 413. One three-hour computation period. Associate Professor Nichols.

EE 421, 422, 423. **Electrical Engineering Laboratory.** (G) 3 hours each term.
Advanced studies of direct- and alternating-current machinery and electronic power apparatus to determine their fundamental characteristics and to coordinate them with theory including generation, regulation, transmission, conversion, rectification, and control of alternating currents. Particular emphasis is placed on applications to electric power systems. One lecture; 1 three-hour laboratory period. Professor Starr.

EE 431, 432. **Illumination.** (G) 3 hours each term, winter and spring.
Light sources and their application to exterior and interior illumination. Professor Wooster.

EE 442. **Electrical Transportation.** (g) 3 hours winter.
Application of electricity to street and interurban transportation; traffic conditions; rolling stock; speed time curves. Associate Professor Cockerline.

EE 451. **Electrical Transients.** (G) 3 hours fall.
A theoretical and experimental study of both direct- and alternating-current single-energy and double-energy transients in circuits and machines having both fixed and variable circuit parameters. Two lectures; 1 four-hour laboratory period. Professor McMillan.

EE 452, 453. **High-Voltage Engineering.** (G) 3 hours each term, winter and spring.
Experimental investigation and study of dielectric phenomena in high-voltage engineering. Special attention to the electric field, the ionization and conduction of electricity through gases, corona problems encountered in high-voltage power transmission, and the characteristics of liquid and solid dielectrics. Two lectures; 1 four-hour laboratory period. Professor McMillan.

EE 455. **Electrical Characteristics of Transmission Circuits.** (G) 3 hours winter.
Transmission theory; electrical characteristics of transmission lines including power limits and system stability, and electrical networks. Two lectures; 1 three-hour laboratory period. Professors McMillan and Starr.

EE 461, 462, 463. **Communication Engineering.** (G) 3 hours each term.
Fundamental theory of electrical communication; commercial telephone, telegraph, radio, and television systems. Special attention to communica-

tion instruments and measurements; design of equipment; long-line transmission theory, networks, and wave filters. Two lectures; 1 three-hour laboratory period. Professor Albert.

EE 464, 465. **Vacuum Tubes and Circuits.** (G) 3 hours each term, fall and winter.

Thermionic vacuum tubes, phototubes, and other electronic devices and their uses in electrical circuits. Two lectures; 1 three-hour laboratory period. Professor Albert.

EE 466. **Engineering of Sound Systems.** (G) 3 hours spring.

Microphones, amplifiers, loud speakers, and other similar apparatus; engineering problems involved in the design, installation, and operation of sound systems, including broadcast studios. Two lectures; 1 three-hour laboratory period. Professor Albert.

EE 467. **Radio Engineering.** (G) 3 hours spring.

Advanced course in radio engineering including the design and testing of modern transmitters, receivers, antenna systems, and associated equipment used in radio, facsimile, and television. Prerequisite: EE 313, 462, 465. Two lectures; 1 three-hour laboratory and computation period. Mr. Pritchett.

EE 473. **Electrical Problems.** (G) 3 hours spring.

Advanced problems in electrical engineering, unbalanced circuits, symmetrical components, and equivalent networks. Professor Wooster.

EE 481, 482, 483. **Radio Engineering Practices.** 1 hour each term.

Engineering and operating practices employed in modern radio broadcasting. Radio Station KOAC, employing a 5,000-watt transmitter with directional antenna array operating on 550 kc., is used as a practical laboratory, and the instruction is given by the engineer-in-charge. Prepares for the examination that must be passed to obtain the first-class radio-telephone operator's license issued by the Federal Communications Commission. Open to seniors in electrical engineering, and to others with adequate preparation. One lecture; 1 two-hour laboratory period. Assistant Professor Feikert.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

EE 501. **Research.** Terms and hours to be arranged.

EE 503. **Thesis.** Terms and hours to be arranged.

EE 505. **Reading and Conference.** Terms and hours to be arranged.

EE 507. **Seminar.** Terms and hours to be arranged.

Mechanical Engineering

THE curriculum in mechanical engineering is planned to prepare young men for useful and responsible positions in power plants, various manufacturing enterprises, oil refineries, the metal industries, heating and ventilating, refrigerating, air conditioning, and in the aeronautical and automotive industries.

Equipment. The department has drafting and computing rooms supplied with the necessary desks, boards, and lockers. The laboratories are equipped

for tests and demonstrations in steam, gas, and aeronautical engineering, and on engineering materials. This equipment is located in the Engineering Laboratory, Mines Building, and the old power house.

The steam laboratory contains two turbines and four engines of different types, installed in such a way that complete tests for economy and efficiency can be made. Other steam engines, permanently installed, are used for the more elementary work. A horizontal water-tube boiler furnishes the steam for laboratory purposes and for heating the building, and is provided with the necessary facilities for testing. The college heating plant, consisting of three 5,000-square-foot boilers and necessary auxiliaries, is also provided with testing facilities.

A special laboratory has been equipped for tests on domestic heating, ventilating, and air-conditioning apparatus. Several small boilers fired by oil burner, coal stoker, and sawdust burner have been provided and fitted for experimental tests and research. A gas-fired air-conditioning unit is also available.

The internal-combustion engine laboratory contains gas and gasoline engines, two semi-Diesels, a full Diesel connected to generator, a four-cylinder 120-horsepower two-stroke-cycle oil engine, both fully equipped for testing, a 100-horsepower Sprague electric dynamometer, and automobile engines installed with necessary facilities for complete tests for economy and efficiency. Several other gasoline engines are available for the more elementary work, together with the usual accessories, auxiliaries, and instruments for testing and analysis of tests; also a standard ASTM-CFR fuel test unit equipped for both gasoline and Diesel oil rating.

The aeronautical laboratory includes a selection of aircraft engines, both air and water cooled; a complete airplane of the Navy fighter type; and numerous wing panels, tail surfaces, instruments, and miscellaneous airplane parts. Two small smoke tunnels for the study of air flow are also available.

Approximately 14,000 square feet of floor space is devoted to engineering materials affording separate laboratories for structural materials, cement and concrete, bituminous and nonbituminous highway materials, soil mechanics, photoelasticity, oils, fuels, and the microscopic examination, radiography, spectrum analysis, and heat treatment of metals. The equipment is modern and is well arranged for the work of instruction and research.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

ME 211. **Descriptive Geometry.** 3 hours fall.

Theory and problems on the projection of points, lines, surfaces, and solids. The work is made as practical as possible so as to reveal to the student its value in solving drafting-room problems. Prerequisite: GE 111, 112. One recitation; 2 three-hour drawing periods. Professor Phillips, Assistant Professor Willey.

ME 212. **Mechanics (Statics).** 3 hours fall or winter.

Forces and force systems with reference to the equilibrium of rigid bodies; simple framed structures; methods of finding centers of gravity and moments of inertia and their practical applications: numerous problems having engineering application. Prerequisite: differential calculus. Two recitations; 1 two-hour computing period. Professor Thomas, Associate Professor Othus.

ME 213. **Mechanics (Dynamics).** 3 hours winter or spring.

Continuation of ME 212. Principles and problems in kinetics; force as a factor causing motion; work, energy, friction, and impact studied and illus-

trated by means of numerous problems. Prerequisite: ME 212. Two recitations; 1 two-hour computing period. Associate Professor Othus, Mr. Kybal.

UPPER-DIVISION COURSES

ME 311. **Strength of Materials.** 3 hours winter.

General principles of mechanics applied to the elements of engineering structures to determine their strength and fitness; tensile and crushing strength of various engineering materials; stresses in beams and girders under different systems of loading and support; supporting strength of columns; application of torsion to shafts in transmission of power. Prerequisite: ME 212. Two recitations; 1 two-hour computing period. Professor Thomas.

ME 312. **Mechanism.** 3 hours winter.

Mechanical movements; velocity ratios; transmission of motion by link works; gearing, cams, and belting. One recitation; 2 three-hour laboratory periods. Professor Phillips.

ME 314, 315. **Strength of Materials.** 3 hours fall and winter.

Course content similar to ME 311 with the addition of stresses in curved beams, impact stresses, eccentric loading, and theories of failure. Prerequisite: ME 213. Two recitations; 1 two-hour computing period. Professor Thomas, Mr. Kybal.

ME 316. **Materials of Engineering.** 3 hours any term.

Materials of engineering construction with special references to the methods and specifications adopted by the American Society for Testing Materials and other national engineering organizations. One lecture; 1 three-hour laboratory period. Professor Thomas, Mr. Kybal.

ME 321, 322, 323. **Heat Engineering.** 4 hours each term.

Combustion and boilers; thermodynamic processes involved in the transformation of heat energy into work; steam cycles; gas laws; air-compressor cycle; gas and vapor mixtures; internal-combustion engine cycles; steam turbines; refrigeration cycle; and problems involving special applications of thermodynamic principles. Prerequisite: Mth 202; Ph 113; Ch 103. Three recitations; 1 three-hour problem or laboratory period. Professors Martin and Paul, Assistant Professor Hughes.

ME 325. **Fuels and Lubricants.** 3 hours fall or spring.

Brief survey of the preparation and processing of solid and liquid fuels and the refining of petroleum for production of motor fuels and lubricants. Calorimeter and other standard tests on fuels, including octane and cetane rating on gasoline and Diesel oil; tests on bearings and lubricants. Prerequisite: ME 321, 322 or equivalent. Two lectures; 1 three-hour laboratory period. Professor Paul.

ME 331, 332. **Heat Power Engineering.** 3 hours each term, fall and winter.

Brief descriptive survey of the heat power plant and principal auxiliaries; physical properties and laws of gases; application to the air compressor, air motor, automobile engine, and Diesel engine; introduction to study of vapors; use of steam tables, humidity, steam cycles; a flow sheet for a modern central station sketched; function of each piece of equipment; fuels; combustion; evolution of the boiler furnace; types and characteristics of boilers; furnace and boiler efficiency; superheaters; economizers; air pre-heaters; feed water heaters; condensers; heat transfer; flow of gases and vapors; steam turbines; power-plant piping. Prerequisite: Mth 202, Ph 113. Two recitations; 1 three-hour computation or laboratory period. Assistant Professor Hughes.

ME 342. **Aerodynamics.** 3 hours winter.
Elementary aerodynamic theory and phenomena; characteristics of airfoils and airfoil combinations; factors affecting stability, control, and performance. Prerequisite: junior standing. Professor Ruffner.

ME 343. **Aeropropulsion.** 3 hours spring.
Screw propeller theories; factors influencing selection of engines, propellers, and power-plant accessories for specific airplane; power-plant installation. Prerequisite: ME 342. Two recitations; 1 three-hour laboratory period. Professor Ruffner.

ME 346. **Steam, Air, and Gas Power.** 3 hours spring.
Elementary principles of thermodynamics; properties of steam; fuels and their combustion; boilers; and auxiliaries. Prerequisite: GE 101, 102; Mth 202. Two recitations; 1 three-hour computation or laboratory-demonstration period. Assistant Professor Hughes.

ME 351, 352, 353. **Mechanical Laboratory.** 2 hours each term.
Basic sequence in machine testing. Proper application of instruments such as gages, engine indicators, planimeters, calorimeters, gas analyzers, flow meters, and dynamometers; tests of common machines and the interpretation of test results; preparation of the usual types of engineering reports. Must be taken parallel to ME 321, 322, 323. One recitation; 1 three-hour laboratory period. Assistant Professor Hughes.

ME 363. **Refrigeration and Cold Storage.** 3 hours spring.
Principles and practice of refrigeration and cold storage. An elementary course specially planned to meet the needs of students in dairy manufacturing, horticulture, food industries, and other industries that use refrigeration. Prerequisite: algebra and elementary physics. Two recitations; 1 three-hour computation or laboratory period. Professor Martin.

ME 401. **Research.** Terms and hours to be arranged.

ME 403. **Thesis.** 3 hours any term.

ME 405. **Reading and Conference.** Terms and hours to be arranged.

ME 407. **Seminar.** 1 hour spring.

ME 411, 412, 413. **Machine Design.** (g) 3 hours each term.
Application of the principles of mechanism, mechanics, and strength of materials to design of machine elements; problems involving riveted joints; screws; shafts and shafting; belt and rope drive; pulleys; gearing; bearings; machine frames; analysis of force and energy problems; fly-wheels; engine balancing; dynamic loads; vibrations; computations and drawings necessary to the design of one or more complete machines. Prerequisite: ME 315. One recitation; 2 three-hour design periods. Associate Professor Othus.

ME 414. **Highway Materials Laboratory.** (g) 3 hours fall.
Particularly for students specializing in highway engineering. Different road and paving materials and binders tested and their relative values determined; sheet-asphalt mixtures and bituminous mortars studied to determine the effects of various changes in the grading of the aggregates; samples of various types of roads and pavements analyzed for density, composition, and grading, with special reference to their conformity with specifications. One lecture; 1 four-hour laboratory period. Professor Thomas.

ME 415. **Structural Materials Laboratory.** (g) 3 hours winter.
Plain and reinforced concrete beams and columns; methods of reinforcing; design of concrete mixtures; stress distribution under unsymmetrical loads;

riveted and welded joints; thermal conductivity of concrete; stresses in structures by strain gage. Prerequisite: ME 316. One lecture; 1 four-hour laboratory period. Professor Thomas.

ME 416. **Stress Analysis.** (G) 3 hours fall.

Designed to give a working knowledge of methods of solving problems in strength of materials that the usual methods of analysis will not satisfy. Emphasis on localized stresses and statically indeterminate conditions. Prerequisite: ME 315. Professor Ruffner.

ME 417, 418. **Photoelasticity.** (G) 3 hours each term, winter and spring.

Experimental determination of stresses in components of mechanisms and structures by use of photoelastic methods; theory and operation of apparatus with laboratory exercises to illustrate. Prerequisite: ME 316, 416. One lecture, 1 four-hour laboratory period. Professor Ruffner.

ME 419. **Soil Mechanics.** (g) 3 hours spring.

Evaluation and utilization of soil materials for engineering applications, with special reference to highway subgrades, earth-dam construction, and foundation support. Prerequisite: ME 316, CE 351, ME 311 or 314. One lecture, 1 four-hour laboratory period. Professor Thomas.

ME 421. **Modern Materials.** (G) 3 hours fall.

Late developments in engineering materials by critical reviews of recent and current literature; light and other special alloys; welding; surface processing for hardness, corrosion resistance, and appearance; endurance limits and creep; heat treating and fabrication; special properties and their applications in design. Prerequisite: ME 311, or 314, 316. Professor Graf.

ME 422. **Gas Technology.** (G) 3 hours winter.

Manufactured and natural gas production, transmission, and distribution; industrial applications; problems of the industry including some reference to rate making and regulation. Prerequisite: senior standing. Professor Graf.

ME 431, 432. **Power-Plant Engineering.** (g) 3 hours each term, fall and winter.

Performance of steam and internal-combustion engine power plants from the design standpoint; heat transfer in engineering apparatus; selection of equipment to secure proper unification and efficient operation as well as economic balance. Prerequisite: ME 323. Two recitations; 1 three-hour problem or design period. Professor Martin.

ME 441, 442, 443. **Airplane Design.** (g) 3 hours each term.

Design of airplanes for specific duties; estimation of weights, balance, stability, and performance; computation of loadings and design of major structural parts. Prerequisite: ME 342. One recitation; 2 three-hour laboratory periods. Professor Ruffner.

ME 446. **Advanced Aerodynamics.** (G) 3 hours spring.

Fundamental theory of fluid flow, infinite and finite wing theory as developed by Kutta-Joukowski, Prandtl, and others. Prerequisite: ME 342. Professor Ruffner.

ME 451, 452. **Mechanical Laboratory.** (g) 2 hours each term, fall and winter.

Testing of steam turbines, heating and ventilating equipment, a complete boiler plant, and internal-combustion engines; fundamentals of boiler-water treatment and control; calculation and analysis of test results; preparation

of reports. Prerequisite: ME 353. One four-hour laboratory period. Professor Martin, Assistant Professor Hughes.

ME 453. **Mechanical Laboratory.** (g) 2 hours spring.

Special problems selected on basis of interest of student and equipment available. Prerequisite: ME 452. Periods arranged according to project. Assistant Professor Hughes.

ME 456, 457. **Aeronautical Laboratory.** (g) 2 hours each term, fall and winter.

Visual studies of flow about wings, fuselages, and other bodies; calibration of aeronautical instruments; aerodynamic and structural tests of airplane parts; elements of wind tunnel testing. Prerequisite: ME 342, 353. One four-hour laboratory period. Professor Ruffner.

ME 461. **Heating and Air Conditioning.** (G) 3 hours spring.

Modern methods of heating, ventilating, and air conditioning; approved systems of heating by means of air, steam, and hot water; methods of computing radiating surface; effective methods of ventilation; general design, construction, and operation of heating and air-conditioning plants. Prerequisite: ME 323. One recitation; 2 three-hour laboratory periods. Professor Phillips.

ME 462. **Refrigeration.** (G) 3 hours spring.

Thermodynamics of refrigeration; systems in use and principal characteristics of each; fundamentals of design; principal applications with special reference to the industries of the Northwest. Prerequisite: ME 323. Two recitations; 1 three-hour laboratory period. Professor Martin.

ME 473. **Industrial Engineering.** (G) 3 hours spring.

Especially arranged for engineering students. Various industrial organization systems and their methods of operation, including apprenticeship courses, labor problems, and process work; problems of engineering contracts and specifications; engineering phraseology; modern legal standards. Professor Graf.

ME 476. **Industrial Instrumentation.** (G) 3 hours spring.

Basic principles of apparatus for measurement, or both measurement and control of pressure, temperature, speed, process duration, dimensional tolerances, fluid flow, liquid level, moisture content, gas composition, and solution concentration; instruments demonstrated and specific industrial applications discussed. Prerequisite: senior standing. Lecture and demonstration. Professor Graf.

ME 481. **Metallography and Pyrometry.** (G) 3 hours fall or spring.

Designed to give a working knowledge of the methods of study of structure of metals and alloys. Correlation of thermal and mechanical treatment with structure and physical properties of iron and steel; calibration and use of various types of pyrometers; heat treatment; preparation of specimens; etching; studying structure under the microscope; making photomicrographs; physical tests, whenever possible, to show the effects on strength, ductility, hardness, or other mechanical properties of the different thermal treatments or other industrial processes. Prerequisite: ME 316. One lecture; 1 four-hour laboratory period. Professors Graf and Thomas.

ME 482. **Metallography.** (G) 3 hours winter.

Alloy equilibrium diagrams; preparation of difficult specimens; high-power photomicrography; correlation of thermal, electrical, and magnetic properties of iron and some of its alloys with micro-structure; dilatometry as related to heat-treatment; structure and treatment of special steels and

other alloys; metal radiography. Prerequisite: ME 481. One lecture; 1 four-hour laboratory period. Professor Graf.

ME 491, 492, 493. **Automotive Engineering.** (G) 3 hours each term.
Fall: correlation of fuel and lubricant characteristics with engine performance; fuel induction systems, interpretation of exhaust gas analyses, and power-plant testing. Winter: automobile body and chassis engineering; tractive resistance. Spring: fleet operation, maintenance, and economics. Prerequisite: ME 321, 322, 323. Two lectures; 1 three-hour laboratory of problem period. Professor Paul.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

ME 501. **Research.** Terms and hours to be arranged.

ME 503. **Thesis.** Terms and hours to be arranged.

ME 505. **Reading and Conference.** Terms and hours to be arranged.

ME 507. **Seminar.** 1 hour each term.

C. A. A. Civilian Pilot Training

The courses of study, prescribed by the Civil Aeronautics Administration for the flight training program authorized by the Civilian Pilot Training Act of 1939, are restricted to students of sophomore rank or above in the primary course, and junior rank or above in the secondary course and require: approval of the Coordinator of Civilian Pilot Training, successfully passing the prescribed physical examinations, and payment of a special fee of $25.00 for the primary course and $34.00 for the secondary course. Scheduled ground school instruction is given on the campus, and flying lessons are given at a nearby airport. The primary course leads to a private pilot certificate of competency.

CA 241. **Primary Civilian Pilot Training.** 6 hours fall or winter.
History of aviation; civil air regulations; navigation; meteorology; parachutes; aircraft and theory of flight; engines; instruments; radio uses and forms; individual flying instruction. Professor Ruffner in charge.

CA 341. **Advanced Civilian Pilot Training.** 12 hours fall or spring terms.
The course of study is prescribed by the Civil Aeronautics Administration for the secondary training of students who have completed the Primary Civilian Pilot Training course (CA 241). Subject matter includes theoretical and practical treatment of aerodynamics and aircraft structures; navigation by dead reckoning, celestial navigation, and use of radio; theoretical and practical treatment in the subjects of aircraft engines and propellers; maintenance of flight and engine instruments, and aircraft maintenance. Individual flying instruction will be given. Professor Ruffner in charge.

Mining Engineering

INSTRUCTION in mining engineering, first developed in connection with the other engineering work, was organized in the School of Mines in 1913. In 1932, in the reorganization of the Oregon higher education program the School of Mines was discontinued and the work in mining engineering was made service work in the School of Engineering. On January 27, 1942, major work

in mining engineering was restored on the same basis as in the other departments of the School of Engineering.

The courses in mining engineering are designed to give the student a knowledge of the fundamental principles involved in the exploitation of mineral deposits. A study is made of the type of machinery used, plant design, details of operation, management, and the economic aspects involved. Metallurgy courses are designed especially to acquaint the student with the general problems involved in a beneficiation of our nonmetallic and metallic products. Methods of concentration, smelting, and other means of extraction and refining are studied, along with the efficient use of fuels and refractories. Enough laboratory work is included to enable the student to apply the theories discussed in the classroom. Emphasis is laid on fundamental principles and economics of operation.

Equipment. The department has lecture rooms, laboratories, and offices in the Mines Building. The assaying and metallurgical laboratories are equipped with the necessary apparatus for conducting experimental metallurgical operations. Ore-dressing laboratories affording modern metallurgical testing equipment are located in the basement. Class and drafting-room facilities are available in this building.

COURSES IN METALLURGY

LOWER-DIVISION COURSES

Met 263. **Assaying.** 3 hours spring.
Commercial methods of wet and dry assay of ores, metallurgical products. Prerequisite: Ch 233 or equivalent. One recitation; 2 three-hour laboratory periods.

UPPER-DIVISION COURSES

Met 461. **General Metallurgy.** (g) 3 hours fall.
Properties of metals, alloys, fuels, refractories; pyrometallurgy, hydrometallurgy, electrometallurgy; general operations. Prerequisite: Ch 233 or equivalent.

Met 462. **Metallurgy of the Base and Precious Metals.** (g) 4 hours winter.
Metallurgy of gold, silver, copper, lead, and zinc; iron and steel. Prerequisite: Met 461.

Met 471, 472. **Fire Assaying.** (g) 2 hours each term, fall and winter.
Sampling ores; testing reagents; fire assay methods for precious and base metals. Prerequisite: Met 263; G 312 prerequisite or parallel. One lecture; 2 three-hour laboratory periods.

Met 481, 482. **Mineral Dressing.** (g) 3 hours each term, fall and winter.
Principles of crushing and concentrating minerals; various treatment processes and machinery. Prerequisite: Met 263; G 312 prerequisite or parallel.

Met 483. **Mineral Dressing Laboratory.** (g) 3 hours spring.
Laboratory methods of mineral dressing. Prerequisite: Met 482. One lecture; 2 three-hour laboratory periods.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) may be taken for graduate credit.

COURSES IN MINING ENGINEERING

LOWER-DIVISION COURSES

MiE 141, 142. **Mineral Industry Survey.** ½ hour each term, winter and spring.
Engineering problems an integral part of a general survey of our mining resources.

MiE 243. **Excavation, Explosives, and Blasting.** 3 hours spring.
Special methods of surface excavations.

UPPER-DIVISION COURSES

MiE 401. **Research.** (g) Terms and hours to be arranged.

MiE 403. **Thesis.** (g) Terms and hours to be arranged.

MiE 405. **Reading and Conference.** (g) Terms and hours to be arranged.

MiE 407. **Seminar.** (g) 1 hour each term.

MiE 433. **Mining Machinery, General Mining Operations.** (g) 3 hours spring.
Machinery and equipment required in mining operations; their application to specific field uses. Students should consult with the department before registering. Prerequisite: GE 111, 112, 113.

MiE 441. **Mining Methods.** (g) 3 hours fall.
General consideration of the elements of mining and methods used to develop and mine mineral deposits. Prerequisite: GE 111, 112, 113.

MiE 442. **Mine Development.** (g) 3 hours winter.
Mine development methods with reference to specific mining operations concerning mining costs and machinery. Prerequisite: MiE 441.

MiE 443. **Mine Exploration.** (g) 3 hours spring.
Mine exploration and examination with reference to mine organization, mining law, sampling and valuation, and exploration methods. Prerequisite: MiE 442. Two recitations; 1 three-hour laboratory period.

MiE 453. **Mine Surveying.** (g) 3 hours spring.
Surveying problems met with in mining-engineering practice; determination of true meridian. Prerequisite: CE 221, GE 111, 112, 113. One lecture; 2 three-hour laboratory periods.

MiE 461. **Mine Economics and Mining Law.** (g) 3 hours fall.
Mining costs and legal phases. Students should consult with the department before registering.

MiE 462. **Mine and Power Equipment.** (g) 3 hours winter.
Mining machinery, power installation, their correlation. Students should consult with the department before registering. Prerequisite: MiE 433.

MiE 463. **Mine-Plant Design.** (g) 2 hours spring.
Advanced problem study. Students should consult with the department before registering. Prerequisite: MiE 433, 442. Two three-hour laboratory periods.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) may be taken for graduate credit.

Industrial Arts

INDUSTRIAL education aims to aid in the promotion of industry by providing technical training for those who plan to follow industrial careers and for those who expect to teach industrial-arts subjects. In meeting these aims and purposes, the work of the department falls under three main divisions:

(1) Industrial-Arts Education: preparing teachers of industrial subjects.
  (a) Industrial-arts teachers in secondary schools.
  (b) Trade and industrial instructors.

(2) Industrial Administration: preparing for service as junior executives in industry.
  (a) Technical operations, sales, and service.
  (b) Production management.

(3) Service courses in shop work for engineering students.

Training in technical operations and the technology of industrial processes is fundamental in all three fields and forms the main part of the work of the first two years in groups (1) and (2) above. Each of these two fields of major choice offers many specific objectives through different avenues of training.

The Curriculum in Industrial Education (pages 290-291) is designed to give the type of training required for successful teaching in the public schools and for entrance into college teaching. The work of the last two years is given over mainly to the science and philosophy of education and to applied principles of pedagogy. These courses are based upon and interpreted through the technical background formed during the first two years. While a strong motivating thread of technical training is present throughout the four-year curriculum, during the junior and senior years notable opportunity is provided for election of both technical and nontechnical subjects that will meet needs of students following different avenues of training. At least one minor norm must be elected in another field.

The Curriculum in Industrial Administration, pages 289-290, is designed to train the student in the principles and practice of Industrial Engineering. Manufacturing progress, through its intensive development, has brought *production* and *least-cost* into positions of major importance. The situation thus created demands organized information. This information rests securely in an accepted body of principles and practices whereby orderly, effective operation can plan for and maintain a system that will insure optimum production and least cost. This curriculum is designed to meet the increasing demand for workers and managers in industry who are trained in the basic sciences and in the fundamentals of scientific management, and who through their knowledge of technical processes and scientific management can progress more quickly and efficiently into junior executive positions.

Facilities. The Department of Industrial Arts is housed in the Industrial Arts Building and the Foundry. Both are modern, well-lighted structures, with a combined floor space of approximately twenty-five thousand square feet. The principal subdepartments include Drafting, Woodwork and Furniture Construction, Millwork in Wood, Wood and Metal Finishing, Pattern Making, Foundry, Forging and Welding, Machine Shop, and Sheet Metal. Each of these subdepartments is provided with individual shops of ample size and is equipped along modern and approved lines. In addition the facilities and equipment of

other departments, such as Art and Architecture, Agricultural Engineering (Farm and Automobile Mechanics), Technical Forestry, Mechanical Engineering, the School of Science, and the Corvallis Public Schools contribute toward the enrichment of curricular opportunities for industrial-arts students. The supervised teaching for those majoring in industrial-arts education is done in the Corvallis Public Schools. The program for the last two years of work in industrial-arts education is administered jointly with the Department of Industrial Education (see SCHOOL OF EDUCATION).

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

IA 111. **Pattern Making.** 3 hours fall.

Fundamentals of pattern making; relation of pattern making to drafting, design, foundry and machine-shop operation. One lecture; 6 laboratory hour-periods.

IA 112, 113. **Methods in Woodworking.** 3 hours each term, winter and spring.

Woodworking, with special reference to tool technique, applied design, and craftsmanship in new and individual projects. Primarily an elementary course, with incidental reference to course outlines and methods of teaching, illustrated by the technique used. Prerequisite: IA 111 or approval of the department. One lecture; 6 laboratory hour-periods.

IA 141. **Foundry Practice.** 3 hours fall.

Constitution, properties, and design limitations of castings in gray iron, malleable iron, and steel; methods used in the production of castings. One lecture; 2 three-hour laboratory periods.

IA 152. **Forging and Welding.** 3 hours winter.

Bending, shaping, upsetting, and welding of iron; hardening and tempering steel; brazing; elementary acetylene and electric welding; suggestions for care of equipment and for organization of instructional materials. One lecture; 2 three-hour laboratory periods.

IA 163. **Machine Shop.** 3 hours spring.

Use of basic machine tools; suggestions for courses of study and teaching. One lecture; 2 three-hour laboratory periods.

IA 220. **Wood Turning.** 2 hours winter.

Tool processes and lathe technique; designing, turning, and finishing of individual projects of merit. Prerequisite: IA 111, 112, or equivalent. One lecture, 5 laboratory hour-periods.

IA 240. **Foundry Practice.** 2 hours any term.

Introductory course for engineering students covering constitution properties, and design limitations of castings in iron and steel; practice in foundry methods. Not open to students majoring in industrial arts. One lecture; 1 four-hour laboratory period.

IA 250. **Forging and Welding.** 2 hours any term.

Principles and practice of forging and welding, including gas, electric, thermit, and hammer welding, in line with modern manufacturing processes. Intended primarily for engineering students. Not open to students majoring in industrial arts. One lecture; 1 four-hour laboratory period.

IA 260. **Machine Shop Practice.** 2 hours any term.

Manipulation of basic machine tools, with prescribed projects. Correlation of engineering, managerial, and manufacturing problems. Not open to stu-

dents majoring in industrial arts. One lecture; 1 four-hour laboratory period.

IA 261. **Machine Shop Practice.** 2 hours winter.
Manipulation of basic machine tools with individual projects. Survey of machines used for quantity production. Prerequisite: IA 163 or 260. One lecture; 1 four-hour laboratory period.

IA 263. **Machine Drawing.** 3 hours spring.
Application of the elements of machine design through the designing and drawing of machine parts, jigs, and special fixtures. Given in cooperation with the machine shop and intended primarily for industrial-arts students. One lecture; 8 drafting hour-periods.

IA 265. **Introduction to Scientific Management.** 3 hours spring.
History, development, and scope of scientific management. Laws of scientific management as applied to manufacturing. Three lectures.

UPPER-DIVISION COURSES

IA 311. **Mill Work—Machine Woodwork.** 3 hours fall.
A production course in machine woodworking in which jobs are selected and the class personnel so organized that the work follows closely those methods used in factory production. Prerequisite: IA 111 or 112 or equivalent. Three three-hour laboratory periods. Assistant Professor Meyer.

IA 312. **Furniture Design.** 2 hours fall.
A study of types and periods of furniture and an application of the principles of design to the technique of furniture and cabinet drawing. Prerequisite: GE 112, AA 295 or equivalent. One lecture, 5 laboratory hour-periods. Mr. Robley.

IA 313, 314. **Furniture Construction.** 2 hours each term, winter and spring.
The designing and construction of furniture and cabinet work, according to the needs and ability of the individual student. Prerequisite: IA 311, 312. Six laboratory hour-periods. Assistant Professor Meyer.

IA 315. **Upholstering and Seat Weaving.** 2 hours spring.
A study of typical upholstering processes including the construction of frames and foundations with and without springs. Seat and panel weaving. Prerequisite: IA 112 or equivalent. One lecture; 5 laboratory hour-periods. Assistant Professor Meyer.

IA 316. **Wood and Metal Finishing.** 2 hours spring.
A study of materials, processes, and methods of application on old and new work for both wood and metal surfaces; brush and spray application of all types of finishing materials; special attention to the modern lacquer and synthetic finishes for both furniture and automobile work. Prerequisite: IA 112 or equivalent. One lecture; 5 laboratory hour-periods. Assistant Professor Meyer.

IA 321. **Wood Turning.** 1 hour winter.
Advanced course. A continuation of IA 220. Emphasis upon more intricate cuts and turning processes, special chucking devices and fancy turning. Prerequisite: IA 220. One three-hour laboratory period. Assistant Professor Meyer.

IA 325. **Machine and Tool Maintenance (Wood Shop).** 2 hours fall.
Methods of care and maintenance of woodworking tools, machines, and supplementary equipment; band-saw brazing, saw sharpening, sharpening and setting of planer, jointer, tenoner, and shaper knives, and the repair

and maintenance of hand tools. Prerequisite: IA 111 or 112 or equivalent. Two lectures; 4 laboratory hour-periods. Assistant Professor Meyer.

IA 326. **Fiber Furniture Weaving.** 2 hours winter.

The construction of frames and the weaving of art-fiber furniture, with suggestions for the use of this material in public-school teaching. Prerequisite: IA 112 or equivalent. Six laboratory hour-periods. Professor Cox.

IA 332. **Pattern Making.** 2 hours winter.

Advanced course. A continuation of IA 111, with emphasis upon the problems in the making of patterns for more complicated machine parts and upon factors influencing production cost of these parts. Six laboratory hour-periods. Assistant Professor Meyer.

IA 333. **Carpentry.** 3 hours winter.

The fundamentals of house carpentry, involving discussion of forms and foundations and the practical application of problems in framing, use of steel square, exterior and interior finish, and estimating. Prerequisite: IA 112. One lecture; 6 laboratory hour-periods. Assistant Professor Meyer.

IA 342. **Foundry Practice.** 2 hours winter.

A study of equipment used in school and home work shops, including sources of materials, construction of furnaces, sand conditioning, and ornamental pattern construction. Prerequisite: IA 141 or 240. One lecture, 1 four-hour laboratory period. Mr. Mason.

IA 343. **Brass and Alloy Foundry.** 2 hours spring.

Making ornamental castings of brass, bronze, and aluminum; molding, melting, pouring, cleaning, polishing, and coloring projects of individual choice. Prerequisite: IA 141 or 240. One lecture; 1 four-hour laboratory period. Mr. Mason.

IA 350. **Welding Practice.** 1 hour any term.

The problems of electric and acetylene welding, with reference to intricate and specialized operations. Conducted on an investigational basis. Prerequisite: IA 152 or 250. One lecture; 2 laboratory hour-periods. Assistant Professor Horning.

IA 352. **Blacksmithing.** 3 hours spring.

Farm blacksmithing problems, including the usual basic operations in forging and welding. Intended primarily for Vocational Agriculture majors. One lecture; 2 three-hour laboratory periods. Assistant Professor Horning.

IA 353. **Ornamental Iron Work.** 2 hours spring.

Craftsmanship in wrought-iron work; designing and making of wrought-iron furnishings, lamps, light fixtures, etc. Prerequisite: IA 152 or 250. Six laboratory hour-periods. Assistant Professor Horning.

IA 357. **Metal Crafts.** 3 hours spring.

Diversified metal crafts; advanced sheet-metal work, metal spinning, and craft work in iron, copper, and Britannia metal; processes applied to projects of practical value and artistic merit. Prerequisite: AA 295; IA 343, 353, or 380. One lecture; 6 laboratory hour-periods. Mr. Robley.

IA 360. **Production Planning and Control.** 3 hours spring.

Departmental organization and structure, their function and intercorrelation. Codification and symbolization. Materials control and handling. Machine capacity. Routing, scheduling, dispatching, and inspecting. Plant location and layout. Construction and application of special charts and graphs to problems of planning and control. Prerequisite: AA 295; IA 366, 367. One lecture; 2 three-hour laboratory periods. Mr. Engesser.

IA 362. **Machine Shop.** 2 hours spring.
Manipulation of basic machine tools and the performance of operations requiring accomplished skills; individual projects and problems; application of jigs, fixtures, and dies used in modern manufacturing industries. Prerequisite: IA 261. One lecture; 5 laboratory hour-periods. Mr. Sheely.

IA 363. **Production Machine Work.** 3 hours fall.
Problems in design of tools, jigs, fixtures, and dies in relation to quantity production; individual problems and projects in tool design and die making. Prerequisite: IA 261 and 362. One lecture; 6 laboratory hour-periods. Mr. Sheely.

IA 365. **Machine and Tool Maintenance (Machine Shop).** 2 hours fall.
Maintenance and repair problems for mechanical equipment. Methods and procedures in tool and cutter sharpening. Prerequisite: IA 163 or 260. Two lectures; 4 laboratory hour-periods. Mr. Sheely.

IA 366, 367. **Time and Motion Study.** 3 hours fall and winter.
The principles, aims, and application of time and motion study; job analysis and standardization, formula construction, wage payment systems, motion economy methods; job evaluation; merit rating. Prerequisite: IA 265. One lecture; 2 three-hour laboratory periods. Mr. Engesser.

IA 370. **Practical Electricity.** 3 hours fall.
Electrical wiring problems, including signal, light, and power circuits, and a study of underwriters' specifications for electrical installation; designing and making electrical projects suited for use in public-school teaching. One lecture; 6 laboratory hour-periods. Professor Cox.

IA 380. **Sheet-Metal Work.** 3 hours winter.
Projects in sheet-metal work and pattern drafting involving the fundamental machine and hand-tool operations; equipment and supplies needed in the school shop. Prerequisite: GE 112. One lecture; 6 laboratory hour-periods. Mr. Robley.

IA 405. **Reading and Conference.** Terms and hours to be arranged.

IA 407. **Seminar.** 2 hours winter.
Prerequisite: senior standing. Mr. Engesser.

IA 411. **Shop Planning and Organization.** (G) 3 hours spring.
Planning and organizing the physical plant for different types of school shops. Prerequisite: Ed 415. One lecture; 6 laboratory hour-periods. Professor Cox.

IA 462, 463. **Quantitative Management.** (G) 3 hours each term, fall and winter.
IA 462: Quantitative analysis and the economic optimum selection of machines, equipment, and labor. IA 463: Quantitative methods of control in the fields of inverse relationships, least-cost combinations in purchasing quantities and seasonal production. Prerequisite: calculus and IA 360, 366, 367. Three lectures. Mr. Engesser.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit. Graduate courses in industrial education are listed under SCHOOL OF EDUCATION.

IA 505. **Reading and Conference.** Terms and hours to be arranged.
Professor Cox and staff.

School of Forestry

Faculty

EARL GEORGE MASON, M.F., Acting Dean of the School of Forestry; Professor of Forestry.

GEORGE WILCOX PEAVY, M.S.F., Sc.D., LL.D., Dean Emeritus of the School of Forestry; Professor of Forestry.

ADELAIDE SIMPSON, Secretary to the Dean.

Logging Engineering

HENRY RICHARD PATTERSON, B.S., Professor of Logging Engineering; Head of Department.

CLARENCE JOSEPH BUDELIER, B.S., Instructor in Logging Engineering.

Technical Forestry

THURMAN JAMES STARKER, B.S., Professor of Forestry; Head of Department.

HARRY IRA NETTLETON, M.S.F., Assistant Professor of Forestry.

WALTER FRASER MCCULLOCH, M.S., Assistant Professor of Forestry.

GEORGE HARWOOD SCHROEDER, M.S., Assistant Professor of Forestry.

CHARLES HERBERT WILLISON, JR., M.F., Assistant Professor of Forestry.

CLARENCE WILFRED RICHEN, B.S., Instructor in Forestry.

HENRY JAMES VAUX, M.S., Instructor in Forestry.

JOHN TUCKER, B.S., Graduate Assistant in Technical Forestry.

EUGENE MCKEOWN, B.S., Graduate Assistant in Technical Forestry.

LESTER DUNN, B.S., McDonald Fellow in Forestry.

Wood Products

ROBERT MURRAY EVENDEN, M.S., Assistant Professor of Wood Products.

GLENN VOORHIES, M.S., F.E., Assistant Professor of Wood Products.

RUDOLPH JOSEPH JANECEK, M.S.F., Instructor in Wood Products.

General Statement

OREGON'S immense timber resources and the vast area of land within the state suited to no other use than the continued production of timber crops impose upon the Oregon State School of Forestry the obligation to train men to manage these great properties for continuous maximum production, and economical and efficient utilization of product. Oregon has an interest in forestry greater than any other state in the Union. The state has within its limits an area of 28,000,000 acres that, because of peculiarities of soil, topography, and climate, appear to be permanently classified as forest land. It has the largest amount of standing timber possessed by any state and it produces

more lumber annually than any other. These facts indicate the importance of the obligation of the school to the state.

Majors. The School of Forestry offers curricula in three distinct fields of the forestry profession: logging engineering, technical forestry, and wood products. Each of the undergraduate curricula leads to the degree of Bachelor of Science or Bachelor of Forestry.

Logging Engineering. The logging engineer is the product of the Pacific Northwest. Farsighted men in the industry, realizing the peculiar engineering requirements of their business, requested the School of Forestry to train men for service in this branch of the lumber industry. The Department of Logging Engineering was organized in response to this request. The logging engineer is trained in timber appraising, in topographic surveying in rough country, in the preparation of topographic and relief maps from field data, in the location and construction of logging roads, in bridge design, and in making topographic logging plans. The four-year curriculum in Logging Engineering was prepared in consultation with some of the ablest timbermen in the state.

Technical Forestry. In technical forestry the school has a dual responsibility. It has its obligation to the Federal Government in training men to be of service in helping to manage the National Forests and other federally owned forest lands. Its more immediate obligation is to the State of Oregon in preparing men to aid in solving the forestry problems that are involved chiefly in the forestation and protection of the commonwealth's privately and publicly owned timberlands.

A major option is offered in FOREST RECREATION, preparing students for professional and administrative service in the development and use of national and state forests for recreational purposes. Students in this option pursue the regular technical forestry curriculum except during the junior year when they follow a special program of study.

Wood Products. Today the field of utilization of products of the forests includes a wide variety of manufacturing processes. The problems of the men in these fields involve efficient plant design, organization and management of the plant, seasoning of wood, product improvement and development, human efficiency, and scientific merchandising. With these problems in mind and in response to demands of the lumber industry for men trained in wood products a carefully chosen group of courses is offered.

Four-Year and Five-Year Curricula. In the freshman and sophomore years all students in forestry pursue the same program of studies, following which they may elect one of the three majors on either a five-year or a four-year basis.

FOUR-YEAR CURRICULA (B.S., B.F. DEGREES). For the bachelor's degree the student is required to complete 204 term hours of collegiate work. Every student before graduation must have completed the requirement of 9 term hours in each of two groups in liberal arts and sciences. For the Bachelor of Science degree the student must present 36 term hours of science. A minimum of 70 professional hours is required by the School of Forestry. No student will be recommended for graduation who has not had at least six months of practical field work that is in line with his objective and that has been accepted as satisfactory by the faculty of the School of Forestry.

FIVE-YEAR CURRICULUM (B.S., M.F. DEGREES). The forester is being called upon more and more to serve as planner and coordinator in the use of

wild land. It is not enough to determine merely the kind of use for which the land is inherently best suited. An appropriate balance must be sought between farm, pasture, forest, range, recreation, wildlife, watershed, and other uses, in the light of sound national requirements for products and service. In this light the forester must be better prepared in the basic and social sciences. To meet the demand for men trained in the broader field, the five-year curriculum, including four years of undergraduate work leading to the degree of Bachelor of Science and a graduate year leading to the degree of Master of Forestry, is strongly recommended.

Advanced Degrees. The degrees of Master of Forestry and Master of Science are offered to graduates of the State College, or other colleges of equal rank, who have met the State College requirements for graduate study. The graduate program and thesis for the Master of Forestry degree are designed to fit the student for administrative or professional work in forestry, logging engineering, or wood products. The work for the Master of Science degree develops the student for research work in his particular field.

The degree of Forest Engineer is offered to graduates of the School of Forestry who have had at least five years of successful forestry practice following graduation. A satisfactory thesis must be presented and application for the degree must be made not later than January 1 preceding the commencement at which the degree is conferred.

The requirements for advanced degrees are given under GRADUATE DIVISION.

Minors. Graduates of the School of Forestry often are employed in work that combines forestry with related fields. Students desiring training for such work may take a minor in the field of their choice. Minors most commonly selected by students majoring in technical forestry are fish and game management, grazing, soil conservation, recreation, entomology, and pathology; students majoring in wood products may take a minor in pulp and paper.

Summer Employment. The principal operations of the lumber industry of the United States are in the Pacific Northwest. This fact creates conditions that make it possible for students who are physically fit to find employment in the logging camps and in sawmills. The United States Forest Service has adopted a definite policy of employing forestry students during vacation periods. Students expecting to engage in forestry work are thus enabled to obtain valuable field experience at reasonable pay without incurring the costs incident to traveling long distances.

The school, in cooperation with forest-fire fighting agencies, maintains a forest-fire suppression crew during the summer. Members of the crew are given instruction in woodsmanship and in fire suppression and related fields. The crew is subject to fire call anywhere in Oregon and hence the men involved receive valuable fire-fighting experience as well as a monetary income. Qualified students are allowed to join the crew on a volunteer basis.

Equipment. The School of Forestry is housed in the Forestry Building (described under BUILDINGS). The laboratories are well equipped with appropriate instruments and apparatus. Through the courtesy of the manufacturers of logging equipment much valuable logging machinery is available for demonstration purposes. Lumber-manufacturing concerns have generously supplied the school with wood products made from various species of Oregon trees. All publications dealing with general forestry, logging, or lumber manufacture are provided. A dry-kiln of commercial size, completely equipped for research in lumber seasoning, is used by students in wood products.

Actual field work, essential in preparing men for work in forestry and logging engineering, is made possible in the large timbered areas easily accessible from the State College. Some of the largest lumber-manufacturing and pulp-and-paper plants in the Northwest are located within two or three hours' ride from Corvallis. Located in the heart of the greatest timbered region of the United States, the School of Forestry possesses unique advantages for preparing men for service in professional forestry, logging engineering, and wood products.

Lands. A State forest of 75,000 acres, located within 75 miles of the campus, has been placed, by law, at the disposal of the School of Forestry for scientific management. An area of 160 acres of logged and second-growth fir, presented to the school by the Spaulding Logging Company, lies within ten miles of the campus. Mrs. Mary J. L. McDonald of San Francisco gave the school for demonstration purposes 640 acres of timbered land lying near Prospect in the Crater Lake region. Mrs. McDonald also made possible the acquisition of 4,800 acres of second-growth Douglas fir, lying within seven miles of the campus and known as the McDonald Forest. This area is devoted to experimental work in reforestation, and also serves as a base for laboratory work in surveying, mapping, timber estimating, and logging road location. A tract of cut-over land, 180 acres in extent, is devoted to arboretum and experimental planting purposes. A forest nursery on the arboretum tract, financed by the United States Forest Service and the State Board of Forestry, is operated in cooperation with the school. A full-time nurseryman is required for this project.

Through the generosity of John W. Blodgett, prominent timberman, a tract of 2,400 acres of cut-over land in Columbia County has been presented to the School of Forestry for research in reforestation.

Curricula in Forestry

Logging Engineering — *Technical Forestry*
Wood Products — *Forest Recreation*

LOWER-DIVISION CURRICULUM

Freshman Year	Term hours F	W	S
General Forestry (F 111)	3	----	----
Forest Protection (F 112)	----	3	----
Forest Problems (F 114)	2	----	----
Tree Identification (F 153)	----	----	4
General Botany (Bot 201, 202)	3	3	----
Forest Engineering: Forest Surveying Instruments (LE 123)	----	----	3
Intermediate Algebra (Mth 100)	4	----	----
Trigonometry (Mth 106)	----	4	----
Elements of Statistics (Mth 109)	----	----	4
Extempore Speaking (Sp 111)	----	3	----
English Composition (Eng 111, 112, 113)	3	3	3
Military Science	1	1	1
[1]Physical Education	1	1	1
	17	18	16

Sophomore Year			
Mensuration: Felled Timber and Its Products (F 221), Mensuration: Standing Timber (F 222)	4	4	----
[2]Forest Engineering (LE 224, 225, 226)	5	5	5
Qualitative Physics (Ph 211, 212)	3	3	----
Wood Utilization (WP 330)	----	----	4
Outlines of Economics (Ec 212)	3	----	----
Descriptive General Chemistry (Ch 130)	----	----	3
Modern Governments (PS 201, 202)	----	4	4
Military Science	1	1	1
Physical Education	1	1	1
	17	18	18

[1]General Hygiene (PE 150), 2 term hours, is taken in place of physical education one term of the freshman year.

[2]Students expecting to major in wood products may take approved courses in lieu of this subject.

UPPER-DIVISION CURRICULA[1]

LOGGING ENGINEERING

B.S., B.F. Degrees

Junior Year	Term hours F	W	S
Bridge Design (LE 381)	3	....	....
Logging Methods (LE 392)	3	....	....
Forest Valuation (F 321)	....	....	4
Business Law (BA 256, 257)	3	3	....
Accounting for Technical Students (BA 385, 386)	3	3	....
Logging Machine Design (LE 386)	....	3	....
Engineering Geology (G 324)	....	3	....
Silviculture (F 345)	3	....	....
Logging Equipment (LE 382)	....	3	....
Commercial Woods (WP 331)	....	....	3
Cost Accounting for Industrials (BA 494)	....	....	3
Timber Transportation (LE 374)	....	....	4
Electives	3	3	3
	18	18	17
Senior Year			
Timber Transportation (LE 474, 475, 476)	4	4	4
Logging Plans (LE 471, 472, 473)	5	5	5
Forest Policy (F 411)	4	....	....
Forest Economics (F 412)	....	4	....
Seminar (F 407)	1	1	1
Electives	3	3	7
	17	17	17

Recommended Electives: Lumber Seasoning (WP 494), Production Control (WP 412), Personnel Management (BA 414), Labor Problems (Ec 425), Transportation (Ec 435), Differential and Integral Calculus (Mth 201, 202, 203), Steam, Air, and Gas Power (ME 346), Nutrition (FN 225), Principles of Forest Entomology (Ent 321), Business English (Eng 217), Technical Report Writing (Eng 118), Community Hygiene (PE 221), First Aid (PE 358), Typing (SS 121), Camp Cookery (FN 250), Forest Management Problems (F 325).

TECHNICAL FORESTRY

B.S., B.F. Degrees

Junior Year	Term hours F	W	S
Identification of Woods (WP 334)	....	4	....
Mensuration: Timber Growth (F 223)	....	....	4
Dendrology (F 353)	4	....	....
Logging Methods (LE 392)	....	3	....
Silviculture (F 341, 342, 343)	4	4	4
Fire Protection (F 331)	3	....	....
Accounting for Technical Students (BA 385)	....	3	....
Range and Range Livestock Management (AH 220)	3	....	....
Forest Valuation (F 321)	....	....	4
Electives	3	3	5
	17	17	17
FOREST RECREATION OPTION			
Silviculture (F 341, 343)	....	4	4
Forest Valuation (F 321)	....	....	4
Forest Wildlife Management (FG 310, 311, 312)	3	3	3
Home Ground Planning (LA 279)	....	3	....
Plant Materials (LA 326)	3	....	....
Landscape Architecture (LA 379)	....	....	3
Forest Sanitation (Bac 361)	3	....	....
Fire Protection (F 331)	....	3	....
Park Forestry (F 361)	4	....	....
Electives	4	4	3
	17	17	17

[1]In any of the curricula the student may take one or more minors in liberal arts and sciences according to his needs and interests. Students in the five-year curriculum (page 323) have a broader opportunity to elect additional courses according to individual aims and aptitudes.

Senior Year	Term hours F	W	S
Forest Policy (F 411)	4	----	----
Forest Economics (F 412)	----	4	----
Wood Properties, Seasoning, and Grading (WP 397)	----	----	4
Forest Management: Recreation (F 421), Timber Management: Even-aged Stands (F 422), Timber Management: Many-aged Stands (F 423)	3	3	3
Forest Administration (F 311, 312, 313)	3	3	3
Seminar (F 407)	1	1	1
Electives	6	6	6
	17	17	17

MINORS

Entomology			
Principles of Forest Entomology (Ent 321), Forest Entomology (Ent 322, 323)	3	3	3
Advanced Forest Entomology (Ent 423)	4	*or* (4)	*or* (4)
Entomological Nomenclature and Literature (Ent 352)	----	3	----
Aquatic Entomology (Ent 341)	----	----	4
Fish and Game Management			
Forest Wildlife Management (FG 310, 311, 312)	3	3	3
Range and Pasture Botany (Bot 314)	3	----	----
Range Livestock Management (AH 419, 420)	----	3	3
Management of Game Fish (FG 454)	----	3	----
Management of Big Game (FG 457)	----	3	----
Grazing			
General Botany (Bot 203)	----	----	3
Stock Judging I (AI 111)	----	3	----
Range and Pasture Botany (Bot 314)	3	----	----
Forest Wildlife Management (FG 310, 311, 312)	3	3	3
Systematic Botany (Bot 313)	----	----	4
Principles of Plant Ecology (Bot 341)	----	4	----
Range Livestock Management (AH 419, 420)	----	3	3
Range Survey Methods (AH 333)	----	----	3
Range Improvement and Maintenance (FC 319)	----	3	----
Pathology			
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
Systematic Botany (Bot 313)	----	----	4
Principles of Plant Pathology (Bot 351)	4	----	----
Plant Pathological Technique (Bot 451)	3	----	----
Microtechnique (Bot 469)	----	3	----
Science			
Engineering Geology (G 324)	----	3	----
Principles of Forest Entomology (Ent 321)	3	----	----
Forest Pathology (Bot 315)	----	3	----
Principles of Plant Ecology (Bot 341)	----	4	----
Forest Soils (Sls 214)	----	----	3
Soil Conservation			
Range Improvement and Maintenance (FC 319)	----	3	----
Cover Crop and Soil-Erosion Prevention Plants (FC 320)	----	2	----
Soil Conservation Engineering (AE 471)	3	----	----
Soil Conservation (Sls 413)	----	3	----
Forest Soils (Sls 214)	----	----	3
Climatology (Sls 319)	----	----	2

WOOD PRODUCTS

B.S., B.F. Degrees

Junior Year			
Identification of Woods (WP 334)	----	4	----
Forest Management Problems (F 325)	----	----	3
Wood Grading (WP 333)	4	----	----
Accounting for Technical Students (BA 385, 386)	3	3	----
Cost Accounting for Industrials (BA 494)	----	----	3
Business Law (BA 256, 257, 258)	3	3	3
Money and Banking (Ec 413)	----	----	4
Timber Mechanics (WP 332)	4	----	----
Forest Valuation (F 321)	----	4	----
Electives	3	3	5
	17	17	18

Senior Year	Term hours F	W	S
Forest Policy (F 411)	----	----	4
Forest Economics (F 412)	----	4	----
Lumber Seasoning (WP 494)	4	----	----
The Lumber Plant (WP 495)	4	----	----
Lumber Merchandising (WP 496)	----	----	4
Production Control (WP 412)	----	4	----
International Trade (Ec 440)	4	----	----
Sawmill Administration (WP 411)	----	----	3
Seminar (F 407)	1	1	1
[1]Electives	4	8	4
	17	17	17
MINORS			
Business Administration			
Elements of Finance (BA 222)	----	4	----
Investments (BA 463)	----	----	3
Production Management (BA 413)	4	----	----
Business and Agricultural Statistics (BA 469)	----	----	3
Thesis (BA 403)	----	5	----
Pulp and Paper			
Principles of Chemistry (Ch 201, 202, 203)	4	4	4
Organic Chemistry (Ch 226, 227)	5	5	----
Quantitative Analysis (Ch 234)	----	----	5
Pulp and Paper Chemistry (Ch 460, 461, 462)	3	3	3

FIVE-YEAR UNDERGRADUATE AND GRADUATE CURRICULUM

B.S., M.F. Degrees

Freshman and Sophomore Years

See LOWER-DIVISION CURRICULUM, pages 319-320.

Junior Year	Term hours F	W	S
Identification of Woods (WP 334)	----	4	----
Mensuration: Timber Growth (F 223)	----	----	4
Dendrology (F 353)	4	----	----
Fire Protection (F 331)	----	3	----
Logging Methods (LE 392)	3	----	----
Forest Pathology (Bot 315)	----	3	----
Forest Soils (Sls 214)	----	----	3
Range and Pasture Botany (Bot 314)	3	----	----
Principles of Plant Ecology (Bot 341)	----	4	----
Wood Properties, Seasoning, and Grading (WP 397)	----	----	4
Electives	7	4	6
	17	18	17
Senior Year			
Silviculture (F 341, 342, 343)	4	4	4
Forest Administration (F 311, 312, 313)	3	3	3
Forest Wildlife Management (FG 310, 311, 312)	3	3	3
Home Ground Planning (LA 279)	3	----	----
Landscape Architecture (LA 379)	----	----	3
Electives	4	8	4
	17	18	17
Graduate Year			
Forest Management (F 521, 522, 523)	3	3	3
Forest Economics (F 511)	3	----	----
Forest Fire Protection (F 531)	----	----	3
Silviculture (F 541)	----	3	----
Thesis (F 503)	3	3	3
Electives	3	3	3
Seminar (F 507)	3	3	3
	15	15	15

[1]Recommended Electives: General Advertising (SS 439), Steam, Air, and Gas Power (ME 346), Materials of Engineering (ME 316), Fuels and Lubricants (ME 325), Differential and Integral Calculus (Mth 201, 202, 203), Business English (Eng 217), Merchandising and Selling (SS 436), Personnel Management (BA 414), Business and Agricultural Statistics (BA 469).

Logging Engineering

COURSES in logging engineering are designed to prepare men to deal with the woods problems peculiar to the lumber industry of the Pacific Northwest. Emphasis is placed upon the preparation of logging plans and the transportation of timber from the woods to the mills.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

LE 123. **Forest Engineering: Forest Surveying Instruments.** 3 hours any term.

Measurement of distance, direction, and elevation. Two recitations; 1 three-hour laboratory period.

LE 224. **Forest Engineering: Elements of Forest Mapping.** 5 hours fall or winter.

Theory and use of engineer's transit and level; survey of definite areas; direct and indirect leveling; computing and plotting of field data. Three recitations; 1 two-hour laboratory period; 1 four-hour field period.

LE 225. **Forest Engineering: Forest Surveys.** 5 hours any term.

Public land surveys; mapping of definite area by approved methods; drafting of field data; free-hand lettering; theory of photographic surveying. Three recitations; 1 two-hour laboratory period; 1 four-hour field period.

LE 226. **Forest Engineering: Forest Surveys and Structures.** 5 hours winter or spring.

Theory and application of triangulation; solar and polar observations; forest improvements, including roads, trails, shelters, bridges, and communication systems. Three recitations; 1 two-hour laboratory period; 1 four-hour field period.

UPPER-DIVISION COURSES

LE 370. **Field Work.** 1 to 6 hours.

Practical field work on some modern logging operation, performed by the student between the sophomore and junior years or between the junior and senior years. A satisfactory report based on approved outline must be submitted. (See Section 18, Academic Regulations.)

LE 374. **Timber Transportation.** 4 hours spring.

Survey of the problem; development of methods; small operations. Two lectures; 2 three-hour laboratory periods. Professor Patterson.

LE 381. **Bridge Design.** 3 hours fall.

Design of wood structures as applied to logging transportation systems; details, specifications, and cost estimates. One recitation; 2 two-hour laboratory periods. Professor Patterson.

LE 382. **Logging Equipment.** 3 hours winter.

Rigging; logging power-units; construction equipment; camp layouts. One lecture; 2 two-hour laboratory periods. Professor Patterson.

LE 386. **Logging Machine Design.** 3 hours winter.

Details of standard equipment, rigging, and tools constructed in camp shops. One lecture; 2 two-hour laboratory periods. Professor Patterson.

LE 392. **Logging Methods.** 3 hours fall and spring.
Relation between logging and forest production; felling and bucking; skidding, loading, hauling; relative merits of various methods. Three lectures. Professor Patterson.

LE 471. **Logging Plans.** 5 hours fall.
Control of area; instrument control; surveying timbered area; preparation of topographic and relief maps; cruising. One recitation; 1 three-hour field period; 1 nine-hour field period. Mr. Budelier.

LE 472. **Logging Plans.** (g) 5 hours winter.
Preparation of plans; complete set of working plans for the area from data obtained in LE 471; logging-area limits; transportation systems; landings and machine settings; volumes for individual shows; detailed costs per thousand and a logging report for the area. Prerequisite: LE 392, 471, and 474. Three recitations; 2 two-hour laboratory periods. Professor Patterson.

LE 473. **Logging Plans.** (g) 5 hours spring.
Management control: organization, planning, standardization of employment, wage payment, purchasing, stores, tool storage and issuing, plant layout, plant maintenance, production control. Prerequisite: LE 474. Three recitations; 2 two-hour laboratory periods. Professor Patterson.

LE 474. **Timber Transportation.** (g) 4 hours fall.
Motor truck transportation; logging railroads; miscellaneous systems. Two lectures; 2 two-hour laboratory periods. Professor Patterson.

LE 475. **Timber Transportation.** (g) 4 hours winter.
Economic theory of location and construction of transportation systems; grades; alignment, etc. Prerequisite: LE 474. One lecture; 1 nine-hour field period. Mr. Budelier.

LE 476. **Timber Transportation.** (g) 4 hours spring.
Structures and materials for use with transportation systems; costs of surveys, construction, operation, and maintenance on a per-thousand basis; preliminary and final reports. Prerequisite: LE 475. One lecture; 1 nine-hour field period. Mr. Budelier.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

LE 501. **Research.** Terms and hours to be arranged.

LE 503. **Thesis.** Terms and hours to be arranged.

LE 505. **Reading and Conference.** Terms and hours to be arranged.

LE 507. **Seminar.** Terms and hours to be arranged.
Seminars: Timber Transportation, Logging Methods, Logging Plans.

Technical Forestry

BASIC training for the practice of forestry, particularly in the Northwest, is afforded in the courses in technical forestry. Stress is laid on (a) the scientific methods involved in measuring, tending, and utilizing the forest crop, and (b) the social, political, and economic considerations that determine the character of forest policy and practice.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

F 111. **General Forestry.** 3 hours any term.
Preliminary survey of the entire field of forestry including the development of forestry in the United States and the origin and distribution of our public domain. May be elected by students in other schools. Three lectures or recitations.

F 112. **Forest Protection.** 3 hours any term.
A preliminary study of the field of forest protection with special emphasis given to the training and knowledge needed to fit the first-year forester for work in a forest protection organization. Two lectures or recitations; 1 three-hour laboratory period.

F 114. **Forest Problems.** 2 hours any term.
Practical application of classroom work to the solving of elementary field problems. One lecture; 1 three-hour laboratory period.

F 153. **Tree Identification.** 4 hours fall or spring.
Field characteristics and classification of principal timber trees of the Pacific Coast, their commercial range, local occurrence, size, growth, form; climate, soil, and moisture requirements; resistance; relative tolerance and reproduction. Two lectures; 1 two-hour laboratory period; 1 three-hour field period.

F 211. **General Forestry.** 3 hours fall.
Sustained yield; forest protection; lumbering; tree identification. (Not open to forestry students.) Two recitations; 1 three-hour laboratory period.

F 212. **Forest Administration.** 3 hours winter.
The administrative control of the National Forests; the policies of the United States Forest Service in regard to fire, trespass, timber, grazing, lands, research, public relations, and accounts. (Not open to forestry students.)

F 221. **Mensuration: Felled Timber and Its Products.** 4 hours any term.
The cubic contents; scaling and grading logs; piece and cord measurements. Three recitations; 1 three-hour field or laboratory period.

F 222. **Mensuration: Standing Timber.** 4 hours any term.
The volume of individual trees; timber cruising. Three recitations; 1 three-hour field period.

F 223. **Mensuration: Timber Growth.** 4 hours winter or spring.
Growth of even-aged stands; growth of many-aged stands; growth of individual trees. Three recitations; 1 three-hour field period.

UPPER-DIVISION COURSES

F 311. **Forest Administration: Land Use.** 3 hours any term.
Application of principles and techniques of economic planning to the problem of coordinating forest land uses with one another and with other forms of land use. Mr. Vaux.

F 312. **Forest Administration: Laws.** 3 hours any term.
Critical survey of state forest laws; Federal laws dealing with forest lands and their administrative interpretation. Assistant Professor Evenden.

F 313. **Forest Administration: Control.** 3 hours any term.
Personnel work and financial control on public and private forest property. Assistant Professor Evenden.

F 321. **Forest Valuation.** 4 hours.
Use of valuation as a tool of management in forest enterprises; methods of valuing various types of assets, including land, stumpage, capital equipment, and the going operation. Three lectures; 1 three-hour laboratory period.

F 325. **Forest Management Problems.** 3 hours spring.
Growth and yield studies for application to even and uneven aged forest stands; coordinating logging methods with sustained yield timber production. Two lectures or recitations; 1 three-hour laboratory period. Assistant Professor Nettleton.

F 331. **Fire Protection.** 3 hours any term.
Fire prevention; presuppression; suppression. Two lectures or recitations; one three-hour laboratory period. Assistant Professor Schroeder.

F 341. **Silviculture: Forest Ecology.** 4 hours any term.
Factors affecting distribution and succession of forest vegetation. Three recitations; 1 three-hour field period. Assistant Professor McCulloch.

F 342. **Silviculture: Forest Practices.** 4 hours any term.
Treatment of stands to insure perpetuation of forest resources. Three recitations; 1 three-hour field period. Assistant Professor McCulloch.

F 343. **Silviculture: Forestation.** 4 hours any term.
Nursery practice; establishment and maintenance of plantations. Three recitations; 1 three-hour field period. Assistant Professor McCulloch.

F 345. **Silviculture.** 3 hours fall.
Silvicultural practices requisite for insuring reproduction following logging; seed trees; selection cuttings; justifiable regeneration costs. For students in logging engineering. Assistant Professor McCulloch.

F 353. **Dendrology.** 4 hours fall or spring.
Classification and identification of forest trees, including taxonomy; silvical characteristics and distribution of commercial species; life history and requirements of trees. Two recitations; 2 two-hour laboratory periods. Professor Starker.

F 361. **Park Forestry.** 4 hours spring.
Trees and their treatment for park and recreational purposes. Three recitations; 1 three-hour laboratory period. Professor Starker.

F 370. **Field Work.** 1 to 6 hours.
Practical field work performed by the student between the sophomore and junior years or between the junior and senior years, in connection with some technical forestry work carried on by private interests, the state, or by the Forest Service. A report based on an approved outline must be submitted. Staff.

F 401. **Research.** Terms and hours to be arranged.

F 403. **Thesis.** Terms and hours to be arranged.

F 405. **Reading and Conference.** Terms and hours to be arranged.

F 407. **Seminar.** 1 hour each term.

F 411. **Forest Policy.** (g) 4 hours any term.
Forestry in the economic and sociological life of the country. Three lectures; 1 three-hour laboratory period. Professor Mason.

F 412. **Forest Economics.** (g) 4 hours any term.
The economic forces that control and regulate the forest enterprises. Three lectures; 1 three-hour laboratory period. Professor Mason.

F 417, 418. **Regional Forestry.** 2 hours each term fall and winter.
Survey of the field of technical forestry. Of special interest to those who plan to enter the Federal or State Forest Service. Professor Starker.

F 421. **Forest Management: Recreation.** (g) 3 hours fall or spring.
Forest recreation, its importance and nature; planning the use of the forest for recreational purposes, dovetailing the recreational use with other forest uses. Two lectures; 1 three-hour laboratory period. Assistant Professor Willison.

F 422. **Timber Management: Even-aged Stands.** (g) 3 hours fall or winter.
The conversion of natural or denuded forests to a normal even-aged condition. Two lectures; 1 three-hour laboratory period. Assistant Professor Willison.

F 423. **Timber Management: Many-aged Stands.** (g) 3 hours winter or spring.
The conversion of natural many-aged forest to a normal condition. Two lectures; 1 three-hour laboratory period. Assistant Professor Willison.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

F 501. **Research.** Terms and hours to be arranged.

F 503. **Thesis.** Terms and hours to be arranged.

F 505. **Reading and Conference.** Terms and hours to be arranged.

F 507. **Seminar.** Terms and hours to be arranged.
Seminars: Forest Mensuration, Forest Administration, Forest Protection, Dendrology, Municipal Forestry, Recreational Forestry, Forest Economics, Forest Ecology.

F 511. **Forest Economics.** 3 hours.
Taxation of forest lands, the effects of taxation on lumbering and sustained yield. Prerequisite: graduate standing and consent of instructor. Professor Mason.

F 512. **Forest Economics.** 3 hours.
Forest fire damage appraisal; insurance of timberlands. Prerequisite: graduate standing and consent of instructor. Professor Mason.

F 521, 522, 523. **Forest Management.** 3 hours each term.
The planning, development, and administration of forest lands for recreational purposes; principles of managing even-aged and many-aged stands for timber production. Prerequisite: F 221, 222, 223; F 341, 342, 343. Two recitations; 1 three-hour laboratory period. Assistant Professor Willison.

F 531. **Forest Fire Protection.** 3 hours.

Forest fire plans, their preparation and execution. Prerequisite: graduate standing and consent of instructor. Assistant Professor Schroeder.

F 541, 542, 543. **Silviculture.** 3 hours each term.

Advanced approach in silvics in the treatment of stands. Research methods used in silviculture and sample-plot work. Prerequisite: graduate standing and consent of instructor. One lecture; 1 four-hour laboratory period. Professor Starker.

Wood Products

COURSES in wood products are designed to meet the needs of men who desire to prepare themselves for service in the wood-manufacturing industry. Especial attention is given to manufacturing conditions existing in the Pacific Northwest.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

WP 330. **Wood Utilization.** 4 hours any term.

Adaptation to commercial uses; chief wood-using industries and relative amounts of principal commercial species used annually; adaptation of wood to special purposes; substitutes for wood; minor uses of wood; byproducts. Three lectures; 1 two-hour laboratory period. Assistant Professor Voorhies.

WP 331. **Commercial Woods.** 3 hours spring.

Identifying woods commonly used; seasoning, gluing, and preservation of woods. Designed primarily to meet requirements of woodworkers and engineers. Two lectures; 1 two-hour laboratory period. Assistant Professor Voorhies.

WP 332. **Timber Mechanics.** 4 hours fall.

Mechanical properties of principal commercial timber; obtaining strength data; use of strength data. Two recitations; 2 two-hour laboratory periods. Assistant Professor Voorhies.

WP 333. **Wood Grading.** 4 hours fall.

Basic grades and standard commercial grading rules. Two lectures; 2 two-hour laboratory periods. Assistant Professor Voorhies.

WP 334. **Identification of Woods.** 4 hours fall or winter.

Wood structure; identification of important commercial woods; physical and structural properties. Two lectures; 2 two-hour laboratory periods. Professor Starker.

WP 397. **Wood Properties, Seasoning, and Grading.** 4 hours fall or spring.

Mechanical and physical properties of wood; principles of lumber seasoning; lumber grading. Abbreviated course for students not majoring in wood products. Three lectures; 1 two-hour laboratory period. Assistant Professor Voorhies.

WP 411. **Sawmill Administration.** 3 hours spring.

Personnel control in lumbering operations. Two lectures; 1 three-hour laboratory period. Assistant Professor Evenden.

WP 412. **Production Control.** 4 hours winter.

Production-control systems as applied to sawmills. Three lectures; 1 two-hour laboratory period. Assistant Professor Evenden.

WP 494. **Lumber Seasoning.** (g) 4 hours fall.

Air seasoning; fundamental principles underlying seasoning and kiln-drying of woods; kiln-drying methods and their merits; effect of kiln-drying upon wood structure; types of kilns; study of recording instruments used. Field trips required. Two lectures; 2 two-hour laboratory periods. Assistant Professor Voorhies.

WP 495. **The Lumber Plant.** (g) 4 hours fall.

Various types of modern mills; electrical versus steam mills; machinery and power of small and large plant; lumber-handling devices; examination of up-to-date mills and reports on them. Three lectures; 1 two-hour laboratory period. Assistant Professor Voorhies.

WP 496. **Lumber Merchandising.** (g) 4 hours spring.

Lumber salesmanship; selling agencies; trade associations; standardization of sizes and grades; trade-marking; advantages of wood construction. Assistant Professor Evenden.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

WP 501. **Research.** Terms and hours to be arranged.

WP 503. **Thesis.** Terms and hours to be arranged.

WP 505. **Reading and Conference.** Terms and hours to be arranged.

WP 507. **Seminar.** Terms and hours to be arranged.

Seminars: Wood Utilization, Wood Properties, Sawmill Management.

WP 594. **Lumber Seasoning.** 3 hours.

Studies in research technique in seasoning; advanced studies in technical problems. Prerequisite: WP 494. Assistant Professor Voorhies.

School of Home Economics

Faculty

AVA BERTHA MILAM, M.A., Dean of the School of Home Economics.
FRANCES ALEXANDER, B.A., Secretary.

Clothing, Textiles, and Related Arts

ALMA CATHERINE FRITCHOFF, M.A., Professor of Clothing, Textiles, and Related Arts; Head of Department.
DOROTHY GATTON, M.A., Associate Professor of Clothing, Textiles, and Related Arts.
ELIZABETH WILEY KLEINSORGE, A.M., Associate Professor of Clothing, Textiles, and Related Arts.
JOAN PATTERSON, B.Arch., Associate Professor of Clothing, Textiles, and Related Arts.
GERTRUDE STRICKLAND, B.S., Assistant Professor of Clothing, Textiles, and Related Arts.
CLARA WILLIAMS EDABURN, M.A., Instructor in Clothing, Textiles, and Related Arts.
MARGARET MIDDLETON, B.S., Graduate Assistant in Clothing, Textiles, and Related Arts.

Extension Methods

AZALEA LINFIELD SAGER, M.A., Professor of Extension Methods.

Foods and Nutrition

JESSAMINE CHAPMAN WILLIAMS, M.A., Professor of Foods and Nutrition; Head of Department.
MARGARET LOUISE FINCKE, Ph.D., Associate Professor of Foods and Nutrition.
AGNES KOLSHORN, M.A., Associate Professor of Foods and Nutrition.
EVRA ALTA GARRISON, M.A., Assistant Professor of Foods and Nutrition.
VIVIAN MAE ROBERTS, M.S., Assistant Professor of Foods and Nutrition.
LILLIAN CATHERINE TAYLOR, M.A., Assistant Professor of Foods and Nutrition.
*ANDREA JOHNSEN OVERMAN, M.Sc., Instructor in Foods and Nutrition.
MILDRED MARGUERITE ARNOLD, M.S., Instructor in Foods and Nutrition.
ISABELLE ROSE THOMAS, B.S., Instructor in Foods and Nutrition.
PHYLLIS CARPENTER, B.S., Research Assistant in Foods and Nutrition.
JEANNE PERKINS, B.S., Research Assistant in Foods and Nutrition.

Home Economics Education

FLORENCE BLAZIER, Ph.D., Professor of Home Economics Education; Head of Department.

*On leave of absence.

BERTHA KOHLHAGEN, M.S., State Supervisor and Teacher Trainer in Home Economics Education.

GERTRUDE ROSKIE, M.S., Assistant State Supervisor and Teacher Trainer in Home Economics Education.

MAY DU BOIS, M.S., Assistant Professor of Home Economics Education.

*ESTHER WOOD BODNER, B.S., Supervising Teacher in Home Economics Education.

EVELYN SWAIM, M.S., Supervising Teacher in Home Economics Education.

HARRIET TURNER, M.S., Supervising Teacher in Home Economics Education.

EMMAJEAN PETERSON, M.S., Supervising Teacher in Home Economics Education.

Home Economics Research

MAUD MATHES WILSON, A.M., Professor in Charge.

Household Administration

SARA WATT PRENTISS, M.A., Professor of Child Development and Parent Education; Head of Department.

VERA HASKELL BRANDON, Ph.D., Professor of Child Development.

ELEANOR SPIKE OEHLER, M.S., Associate Professor of Household Administration; Director of Home Management Houses.

HELEN ELIZABETH WALSH, M.A., Assistant Professor of Household Administration.

KATHERINE HASKELL READ, M.S., Assistant Professor of Child Development and Director of Nursery School.

AMELIA GRACE SANSOM, B.S., Instructor in Household Administration.

CORA BELLE HAAG, B.S., Graduate Assistant in Household Administration.

GLADYS EMMA HEDLUND, B.A., Graduate Assistant in Household Administration.

Institution Economics

MELISSA HUNTER, M.A., Professor of Institution Economics; Head of Department; Director of Dormitories.

GEORGIA CHAPMAN BIBEE, B.S., Assistant Professor of Institution Economics; Supervisor of Memorial Union Dining Service.

Home Economics Extension†

AZALEA LINFIELD SAGER, M.A., Professor of Extension Methods; State Leader of Home Demonstration Agents.

LUCY ADA CASE, M.A., Associate Professor of Foods and Nutrition; Extension Nutritionist.

MABEL CLAIR MACK, M.S., Associate Professor of Foods and Nutrition; Extension Nutritionist.

ZELTA FEIKE RODENWOLD, M.S., Assistant Professor of Home Economics Extension; Director of Women's Programs, Radio Station KOAC.

* On leave of absence.

† Extension work in home economics is a part of the Federal Cooperative Extension Service. The resident-instruction and extension staffs cooperate closely in the upbuilding of Oregon home and family life.

IZOLA DOROTHY JENSEN, M.A., Assistant Professor and Extension Specialist in Community Social Organization.

LOIS AILEEN LUTZ, M.A., Assistant Professor and Extension Specialist in Home Management.

LUCY ROCENA LANE, M.A., Assistant Professor and Extension Specialist in Clothing and Textiles.

General Statement

ALL problems of home and family life fall within the field of home economics. The School of Home Economics seeks to serve, directly or indirectly, every Oregon home. Through resident teaching the school makes its direct contribution to the life of the commonwealth. Students are trained for the responsibilities of homemaking and parenthood, for education, administration and management, and for other work in home economics and allied fields. The true homemaker not only must be trained in the science, the art, and economics of the household, but also must have a well-rounded personality, with intelligent interests, trained judgment, and cultivated tastes, enabling her to solve the problems of the changing modern home with its complex social and civic relationships. Hence the home economics curriculum must be liberal as well as technical. Through research and extension, closely coordinated with the resident teaching, effort is constantly directed toward the solution of home problems.

Training in homemaking, important in the education of every young woman, is fundamental in all the work of the school. Curriculum A provides especially for those whose main object in attending college is preparation for home life. Students in this curriculum may also prepare for teaching and other earning fields related to home economics. Curriculum B, termed the professional curriculum, provides an excellent background for students who wish to enter the earning fields. In the junior and senior years the student may specialize in some field such as home-economics teaching, home-economics extension, hospital dietetics, institutional management, nutrition, nursery school teaching, farm security, or commercial fields of home economics. In both curricula courses in English, art, history, economics, science, and other departments of general training, supplement the home economics courses. Curriculum C is planned for students who enter the School of Home Economics following two years of lower-division work in liberal arts. The student's four-year program is thus divided into two distinct parts, two years devoted to general studies and two years devoted largely to home economics. Students in this curriculum must fulfill the same requirements in biological and physical sciences and social sciences as in the other curricula.

For students who do not plan to become candidates for a degree, programs of study are outlined covering one year or more of work and including those subjects of most value to the individual, rather than as preparation for advanced study.

For homemakers, special students, and students registered in other schools on the campus, the school offers service and special courses. Minors in home economics may be outlined for students in other schools.

Home-Economics Research. The School of Home Economics cooperates with the State Agricultural Experiment Station in conducting research

dealing with home problems. Studies are now carried on in two major fields, foods and nutrition and housing. Those under way in the first-named field deal with the thiamin content of frozen vegetables; losses in calcium and phosphorus in the freezing and subsequent cooking of vegetables; the ascorbic acid metabolism of college students; and the nutritional status of 4-H Club children and older rural youth as related to national defense.

Training in methods of research is included in graduate courses offered in the departments of Foods and Nutrition; Clothing, Textiles, and Related Arts; Household Administration; Institution Economics; and Home-Economics Education.

Home-Economics Extension. The School of Home Economics cooperates with the Federal Cooperative Extension Service of the State College and with the United States Department of Agriculture in the upbuilding of Oregon home and family life. Members of the home-economics faculty prepare correspondence courses in home-economics subjects which form a part of the program of the divisions of Federal Cooperative Extension and General Extension. Resident-instruction staff members also teach courses in home economics in the annual summer short course for 4-H club members.

Special courses in home-economics extension are described under the Department of Extension Methods.

Major Curricula. Undergraduate curricula leading to the bachelor's degree are offered in the School of Home Economics as follows:

CURRICULUM A, a four-year curriculum combining a general cultural education with training in the principles of homemaking. Students wishing to teach home economics, or enter home-economics journalism, may register in this curriculum.....Pages 335-336

CURRICULUM B, a four-year curriculum preparing for homemaking and for home-economics teaching, institutional management, extension work, and commercial fields, especially in foods or textiles. The first two years gives the necessary foundation for any of the professional fields. In the last two years opportunity for specialization is afforded.....Pages 336-337

CURRICULUM C, a general curriculum in home economics extending through the junior and senior years, based on a liberal-arts curriculum completed in lower division or junior college. Students must complete enough courses in home economics to meet the institutional requirements for a major in home economics.....Page 337

Requirements for Graduation. For the B.A. or B.S. degree in home economics a minimum of 192 term hours must be completed. The work should be distributed as suggested by the following curricula. At least 45 term hours in upper-division courses are required. Transfers from other institutions are required to complete at least 18 term hours in home economics at this institution. Curricula A and B as printed include the requirement of 36 hours of either science or social science for the B.S. degree. For the B.A. degree 36 term hours in arts and letters must be completed, including requirements in a foreign language. Students in Curriculum C may have completed 36 hours in science, social science, or arts and letters as part of their freshman and sophomore work; if not they must elect sufficient work in their junior and senior years to meet the specific requirements for the degree (B.A. or B.S.) desired.

Graduate Work. All departments of the School of Home Economics offer graduate work leading to the master's degree (M.A., M.S.). For the requirements for graduate work and advanced degrees see GRADUATE DIVISION.

Facilities. Modern facilities for carrying on all phases of home-economics work are provided in the Home Economics Building, the Home Management Houses, the Nursery School, and the Memorial Union Dining Service. Several

food laboratories, a nutrition laboratory, and animal laboratories are maintained, together with facilities for instruction in family cookery and table service. Seven laboratories provided with modern equipment are devoted to clothing, textiles, and related arts. The Memorial Union dining-room facilities afford opportunity for training in different types of food service, including table d'hote, tearoom, banquet, and catering service. The central kitchen and cold-storage rooms are equipped with modern labor-saving and power equipment. The halls of residence for men and for women are available for study of housing problems. The Nursery School and two of the three home-management houses, Kent and Withycombe, are located on the campus; Dolan House is near the campus.

The supervised teaching is carried on in the public schools of Corvallis, the plant and equipment of the high schools being used by the student-teacher group.

The Home Economics Extension Department, through which the School of Home Economics maintains direct relationship with the homemakers and the 4-H club girls of the state, provides guidance to undergraduate and graduate students who wish to specialize in this field. The department supervises apprenticeship training in counties located near the State College.

Curricula in Home Economics[1]

B.A., B.S. Degrees

Curriculum A

Freshman Year	Term hours F	W	S
Color and Composition (AA 160, 161)	3	3	(3)
House Planning and Architectural Drawing (AA 178)	(3)	(3)	3
Physical or Biological Science	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
Introduction to Home Economics (HAd 101)	1	....	....
History of Western Civilization (Hst 201, 202, 203)	3	3	3
Social Ethics (PE 131)	....	....	....
[2]Appreciation of Music (Mus 121)	1	(1)	(1)
General Hygiene (PE 150)	(2)	2	(2)
Physical Education	(1)	1	1
[3]Electives	....	....	3
	14	15	16

Sophomore Year			
Foods (FN 211, 212, 213)	3	3	3
Textiles (CT 250)	3	(3)	(3)
Clothing (Selection) (CT 211), Clothing (Construction) (CT 212)	(3)	3	3
Elementary Psychology (Psy 201, 202, 203)	3	3	3
Nutrition (FN 225)	(3)	(3)	3
Literature	3	3	3
Physical Education	1	1	1
Electives	3	3	....
	16	16	16

[1]See Suggested Elective Combinations, pages 337-338.
[2]Mus 122, 123 are recommended electives.
[3]Students who have not had sufficient preparation in clothing are required to take CT 111 in their freshman year as a prerequisite to CT 212. For exemption from CT 111 the student must pass the clothing placement test given at the opening of the fall term.

Junior Year	Term hours F	W	S
Outlines of Economics (Ec 211)	4	(4)	(4)
General Sociology (Soc 211)	(4)	4	(4)
Food Purchasing (FN 411)	(3)	(3)	3
House Furnishing (CT 331)	3	(3)	(3)
Household Management (HAd 340)	(4)	4	(4)
Child Development (HAd 311, 312)	3	3	(3)
Physiology (Z 306, 307)	3	3	----
Costume Design (CT 311) *or* Consumer Buying in Clothing and Textiles (CT 350)	(3)	(3)	3
Electives	4	3	11
	17	17	17

Senior Year			
Home Management House (HAd 350)	5	(5)	(5)
[1]Family Relationships (HAd 422)	2	(2)	(2)
Political Science	(3)	3	(3)
Electives	9	13	16
	16	16	16

Curriculum B

Freshman Year			
Color and Composition (AA 160, 161)	3	3	(3)
House Planning and Architectural Drawing (AA 178)	(3)	(3)	3
History of Western Civilization (Hst 201, 202, 203)	3	3	3
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
Social Ethics (PE 131)	----	----	----
[2]Appreciation of Music (Mus 121)	1	(1)	(1)
Introduction to Home Economics (HAd 101)	1	----	----
General Hygiene (PE 150)	(2)	2	(2)
Physical Education	1	(1)	1
[3]Electives	----	----	3
	15	14	16

Sophomore Year			
Foods (FN 220, 221, 222)	3	3	3
Textiles (CT 250)	(3)	(3)	3
Clothing (Selection) (CT 211)	3	(3)	(3)
Clothing (Construction) (CT 212)	(3)	(3)	3
Organic Chemistry (Ch 226)	4	----	----
Elements of Biochemistry (Ch 250)	----	4	----
Physiology (Z 306, 307)	3	3	----
Literature	3	3	3
Outlines of Psychology (Psy 221, 222)	(3)	3	3
Physical Education	1	1	1
	17	17	16

Junior Year			
Costume Design (CT 311)	3	(3)	(3)
Clothing (CT 312) *or* Applied Design (CT 335)	(3)	(3)	3
House Furnishing (CT 331)	(3)	3	(3)
General Bacteriology (Bac 204)	(3)	(3)	3
Household Management (HAd 340)	(4)	(4)	4
Nutrition (FN 320, 321)	3	3	(3)
General Sociology (Soc 211)	(4)	4	(4)
Child Development (HAd 311, 312)	3	3	(3)
Extempore Speaking (Sp 111) *or* Elementary Journalism (J 111)	3	(3)	(3)
Outlines of Economics (Ec 211)	4	(4)	(4)
Household Physics (Ph 214)	----	----	4
Electives	----	3	3
	16	16	17

[1]Child Development (HAd 413) or Nursery School (HAd 425) may be substituted.
[2]Mus 122, 123 are recommended electives.
[3]Students who have not had sufficient preparation in clothing are required to take CT 111 in their freshman year as a prerequisite to CT 212. For exemption from CT 111 the student must pass the clothing placement test given at the opening of the fall term.

Senior Year	Term hours F	W	S
Family Relationships (HAd 422)	2	(2)	(2)
Home Management House (HAd 350)	(5)	5	(5)
Political Science	(3)	(3)	3
Electives	14	11	13
	16	16	16

Curriculum C

A minimum of 45 term hours in home economics is required. Of the required 45 term hours 39 are prescribed. See statement on page 76 regarding the science, social science, or arts and letters requirement for B.S. or B.A. degree.

During the freshman and sophomore years the student must have taken an approved program in arts and sciences leading to the Junior Certificate or equivalent. Courses in home economics need not have been taken, but students who find it possible to take a year (9 term hours) of foods or of clothing and textiles, or both, will be enabled to elect a wider range of advanced courses in home economics during their junior and senior years.

Junior Year	Term hours F	W	S
Nutrition (FN 225)	3	(3)	(3)
Foods (FN 211, 212, 213) *or* (FN 220, 221, 222)	3	3	3
Textiles (CT 250), Clothing (CT 211, 212) *or* Clothing Selection (CT 217), Clothing Construction (CT 218, 219)	3	3	3
House Furnishing (CT 331 *or* 231)	(3)	3	(3)
Outlines of Economics (Ec 211)	(4)	4	(4)
Outlines of Psychology (Psy 221, 222)	3	3	(3)
Electives	4	....	10
	16	16	16

Senior Year			
Electives in Home Economics courses (upper division)	3	....	3
Household Management (HAd 340)	4	(4)	(4)
Child Development (HAd 311, 312)	3	3	(3)
Home Management House (HAd 350)	(5)	(5)	5
General Sociology (Soc 212)	(3)	3	(3)
Political Science	(3)	3	(3)
Electives	6	7	8
	16	16	16

Suggested Elective Combinations

Home Economics students wishing to prepare for certain earning phases of home economics may elect any of the following groups of courses.

COMMERCIAL WORK IN CLOTHING, TEXTILES, AND RELATED ARTS

For students interested in commercial work in the fields of clothing, textiles, and related arts the following courses are suggested:

	Term hours
French	12
General Chemistry	6
Organic Chemistry	4
Art Appreciation (AA 114, 115, 116)	6
Lower-Division Drawing	6
Consumer Buying in Clothing and Textiles (CT 350)	3
Dress Design (CT 411)	3
Commercial Clothing (CT 412)	3
Clothing for Children (CT 420)	3
House Furnishing (CT 431)	3
Applied Design (CT 435)	3
Advanced Textiles (CT 450)	3
Merchandising and Selling (SS 436)	3
Educational Psychology (Ed 312)	3
Principles of Teaching (Ed 313)	3
Elementary Journalism (J 111)	3
Extempore Speaking (Sp 111)	3
Radio Speaking (Sp 234)	3

COMMERCIAL WORK IN FOODS AND NUTRITION

For students in Curriculum B preparing for commercial positions, such as journalism, radio, or food demonstration work, the following courses are required:

	Term hours
[1]Extempore Speaking (Sp 111)	3
[1]Elementary Journalism (J 111)	3
Experimental Cookery (FN 435)	3
Food Purchasing (FN 411)	3
Food Management (FN 412)	3
Food Demonstrations (FN 413)	3
Household Equipment (HAd 330)	3
Educational Psychology (Ed 312)	3
[1]General Bacteriology (Bac 204, 205)	6
Merchandising and Selling (SS 436)	3

Suggested Electives	Term hours F	W	S
Voice and Dictation (Sp 120)	3 *or*	3 *or*	3
Radio Speaking (Sp 234)	3	....	....
Nutrition of the Infant and Child (FN 421)	....	3	....
Quantity Cookery and Catering (IEc 311)	3	....	....
Economics of the Family (HAd 441)	3	....	....
Principles of Teaching (Ed 313)	3 *or*	3 *or*	3

CHILD DEVELOPMENT AND NURSERY SCHOOL

Specialization in this field involves at least one year of graduate study leading to a master's degree. Students are advised to plan their undergraduate and graduate programs as a unit, including special courses in biology, psychology, and sociology, as well as the usual home-economics requirements. The following courses are required for students in this field:

	Term hours
Nutrition of the Infant and Child (FN 421)	3
or Feeding the Family (FN 325)	3
First Aid (PE 358)	2
Child Development (HAd 413)	3
Family Relationships (HAd 422)	2
Parent Education (HAd 423)	2
Nursery School Procedures (HAd 425)	3
Studies in Child Development and Family Relationships (HAd 490)	3
or Applied Statistics (Mth 341, 342)	6
Economics of the Family (HAd 441)	3
Clothing for Children (CT 420)	3
Statistical Methods in Education (Ed 517)	3
Adult Education (Ed 497)	3
Individual Differences (Psy 471, 472, 473)	9
Speech Defects (Sp 250)	3
The Family (Soc 312)	3

The following courses are suggested as desirable electives:

House Planning in Relation to Function (HAd 443)	2
Adult Education in Home Economics (HEd 440)	3
Adolescence: Growth and Development of the Individual (Ed 461)	3
Character Education (Ed 490)	3
Group Thinking (Ed 491)	3
Character Education Problems (Ed 492)	3
Social Problems (Soc 411, 412)	4–6
Radio Speaking (Sp 234)	3
Extension Methods (EM 411, 412)	6
Evolution and Eugenics (Z 314)	3
Leadership of Party Games (PE 240)	1
Nature, Function, and Organization of Play (PE 435)	3
Psychology of Childhood (Ed 460)	3

HOME ECONOMICS TEACHING

For students preparing to teach home economics the following sequence is suggested. Additional electives should be taken to meet the requirements for certification (see pages 256-257 for requirements).

These requirements for certification are not requirements for graduation in home economics. For those who wish to teach in reimbursed vocational departments, Curriculum A or B is required including Sp 111 and CT 312.

[1]One of these is required of all students in Curriculum B.

	Term hours F	W	S
Secondary Education (Ed 311)	3		
Educational Psychology (Ed 312)	3		
Principles of Teaching (Ed 313)		3	
Oregon School Law and Oregon System of Education (Ed 316)	2	or 2	or 2
History of Oregon (Hst 377)			3
Organization and Administration of Homemaking Education (HEd 412)	3	or 3	or 3
Special Teaching Methods (Ed 408d)	3	or 3	or 3
Supervised Teaching (Ed 415) (hours to be arranged)			

INSTITUTION ECONOMICS AND DIETETICS

For students in Curriculum B preparing for positions as dietitians in hospitals, dormitories, cafeterias, hotels, and tearooms, the following courses are required.

	Term hours F	W	S
General Bacteriology (Bac 204, 205)	3	3	
Constructive Accounting (BA 111)	4		
Educational Psychology (Ed 312)	3		
Principles of Teaching (Ed 313)		3	
Quantity Cookery and Catering (IEc 311)	3		
Physiological Chemistry (Ch 330, 331)		2	3
Nutrition in Disease (FN 420)			3
Institutional Organization and Administration (IEc 430)	2		
Institutional Equipment (IEc 420)		3	
Institutional Marketing (IEc 440)			2
Institution Experience (IEc 450)			4

Suggested electives: Food Purchasing (FN 411), Food Management (FN 412), Food Demonstrations (FN 413), Experimental Cookery (FN 435), Advanced Nutrition (FN 422), Nutrition of the Infant and Child (FN 421), Readings in Nutrition (FN 481), Personnel Management (BA 414).

HOME ECONOMICS EXTENSION

For students preparing for positions in the field of home economics extension the following courses are suggested as electives.

Junior Year	Term hours F	W	S
Educational Psychology (Ed 312)		3	
Problems of the Consumer-Buyer (HAd 442)		3	
Applied Design (CT 335)			3
Principles of Teaching (Ed 313)			3
Elementary Journalism (J 111)	3		
Public Information Methods (J 313)	3		
Community Drama (Sp 247)		3	
Speech Defects (Sp 250)			3
Home Ground Planning (LA 279)	3		
Senior Year			
Extempore Speaking (Sp 111)	3		
Family Relationships (HAd 422)			2
Extension Methods (EM 411, 412), Reading and Conference (EM 405)	3	3	3
Food Purchasing (FN 411)	3		or 3
House Planning in Relation to Function (HAd 443)			2
Nursery School Procedures (HAd 425)	3	or 3	or 3
Nutrition of the Infant and Child (FN 421)	3	or 3	or 3
Household Equipment (HAd 330)			3

SUGGESTED MINORS

Suggested outlines of minors in various fields, such as arts and sciences, physical education, journalism, speech and dramatics, languages, business administration and secretarial science are supplied on request. See also Subject Preparation for Teaching on pages 256-261.

Clothing, Textiles, and Related Arts

OFFICES, classrooms, and laboratories of the Department of Clothing, Textiles, and Related Arts are located in the Home Economics Building. All necessary furnishings and equipment are available for thorough instruction in textiles, clothing, tailoring, costume design, house decoration, and applied design.

DESCRIPTION OF COURSES

REQUIRED

Curriculum A: CT 211, 212, 250, 311, 331, or 350.
Curriculum B: CT 211, 212, 250, 311, 312 or 335, 331.
Curriculum C: CT 211, 212, 250, 331 or 217, 218, 219, 231.

ELECTIVE

Curriculum A: CT 311, 312, 335, 350, 411, 412, 420, 431, 435, 450.
Curriculum B: CT 335, 350, 411, 412, 420, 431, 435, 450.
Curriculum C: CT 311, 312, 335, 411, 412, 420, 431, 435, 450.
For students in education, secretarial science, etc.: CT 217, 218, 219, 231, 235, 250.

Students planning to register for clothing courses CT 111, 212, 312 should keep in mind, when planning their wardrobes for the college year, that these courses require a certain amount of clothing construction. Students in clothing and textiles courses who do not wish to make garments for themselves may be furnished material through orders given the department.

LOWER-DIVISION COURSES

CT 111. **Elementary Clothing.** 3 hours any term.

Fundamental processes of hand and machine sewing; selection and construction of simple garments and household articles. Required of all home-economics students who have not had sufficient high-school work in clothing, or its equivalent, to enter CT 212. Six periods laboratory work.

CT 211. **Clothing (Selection).** 3 hours any term.

The artistic and economic factors in the selection of adult clothing; wardrobe needs of the college girl. Prerequisite: AA 160, 161. Two lectures; 1 two-hour laboratory period.

CT 212. **Clothing (Construction).** 3 hours any term.

Pattern study; commercial patterns and their alterations; development of original designs from basic patterns; fundamental principles of fitting applied to a foundation blouse and of dress selection and construction applied to wool fabrics. Prerequisite: CT 111 (or its equivalent); CT 211. Three two-hour laboratory periods.

CT 217. **Clothing Selection.** 3 hours any term.

Required in Curriculum C and elective for students in other schools. Aims to develop good taste in dress and to give an appreciation in selection of clothing from standpoint of beauty, health, and economy.

CT 218, 219. **Clothing Construction.** 3 hours each term, winter and spring.

Principles of selection and construction applied in the planning and construction of garments. Elective for students, other than those majoring in home economics, who wish to cover briefly the field of dress selection and construction. Prerequisite to CT 219: CT 217. Three two-hour laboratory periods.

CT 231. **House Furnishing.** 3 hours fall.

Elective for students other than those majoring in home economics. Aims to develop appreciation of beauty and suitability in home furnishings and some knowledge of the materials and processes involved. Three two-hour laboratory periods.

CT 235. **Applied Design.** 3 hours spring.

Elective for students in other schools, and for home-economics students in Curriculum C. Decorative art involving a consideration of line, form, and color as applied to problems in weaving, block print, batik, etc. Three two-hour laboratory periods. Offered alternate years.

CT 250. **Textiles.** 3 hours any term.

Standard fabrics from the standpoint of the consumer with the aim of developing good judgment in the buying and use of clothing and house-furnishing materials; properties and uses of different textile fibers and fabrics. Prerequisite: chemistry desirable but not required. Two lectures; 1 two-hour laboratory period.

UPPER-DIVISION COURSES

CT 311. **Costume Design.** 3 hours any term.

Principles of art applied in the selection and design of appropriate costumes; historic costume and its relation to modern dress. Prerequisite: CT 212, 250. One lecture; 2 two-hour laboratory periods. Professor Fritchoff.

CT 312. **Clothing.** 3 hours any term.

Principles of tailoring and draping used as a means of developing independence, initiative, originality in designing, planning, and constructing garments. Prerequisite: CT 311. Three two-hour laboratory periods. Assistant Professor Strickland.

CT 331. **House Furnishing.** 3 hours any term.

Principles involved in furnishing a small home from the standpoint of comfort, beauty, and economy. Prerequisite: CT 212, 250. One recitation; 2 two-hour laboratory periods. Associate Professor Patterson.

CT 335. **Applied Design.** 3 hours any term.

Decorative art involving careful consideration of line, form, and color, original designs executed in various media for clothing and house-furnishing accessories; weaving, block printing, batik, and screening. Prerequisite: CT 212, 250. Three two-hour laboratory periods. Associate Professor Patterson.

CT 350. **Consumer Buying in Clothing and Textiles.** 3 hours spring.

Problems in the production and consumption of textiles and clothing, with emphasis on the economic principles involved. Prerequisite: CT 212, 250; Ec 211. Associate Professor Kleinsorge.

CT 401. **Research.** Terms and hours to be arranged.

CT 403. **Thesis.** Terms and hours to be arranged.

CT 405. **Reading and Conference.** Terms and hours to be arranged.

CT 407. **Seminar.** Terms and hours to be arranged.

CT 411. **Dress Design.** (G) 3 hours spring.

Aim is to give practical help and inspiration to students and teachers of dressmaking and design. Designing, modeling, and creative work; development of historical costume and its relation to modern fashions. Prerequisite: CT 312, 335. One lecture; 2 two-hour laboratory periods. Professor Fritchoff.

CT 412. **Commercial Clothing.** (G) 3 hours winter.

Selecting, designing, fitting, and constructing garments for different types of figures; organization of work from trade standpoint; emphasis on speed, economy, effectiveness, selling features, etc. Prerequisite: CT 312, 335. Three two-hour laboratory periods. Assistant Professor Strickland.

CT 420. **Clothing for Children.** (G) 3 hours fall.

Selection and construction of clothing for children from the standpoint of health, beauty, and cost. Prerequisite: CT 312. One lecture, 2 two-hour laboratory periods. Assistant Professor Strickland.

CT 431. **House Furnishing.** (G) 3 hours spring.
(Advanced course.) Historic periods of decoration with emphasis on their backgrounds; furniture and decorative textiles and their practical application to the home. Prerequisite: CT 331, 335. One lecture; 2 two-hour laboratory periods. Associate Professor Patterson.

CT 435. **Applied Design.** (G) 3 hours winter.
For students desiring more advanced work in applied design. Prerequisite: CT 331, 335. Three two-hour laboratory periods. Associate Professor Patterson.

CT 450. **Advanced Textiles.** (G) 3 hours fall.
Aims to give a scientific background for those interested in doing advanced work in textiles. Recent investigation and research in the textile field. Prerequisite: CT 331, 350, Ch 226. Two lectures; two hours laboratory. Associate Professor Gatton.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

CT 501. **Research.** Terms and hours to be arranged.

CT 503. **Thesis.** Terms and hours to be arranged.

CT 505. **Reading and Conference.** Terms and hours to be arranged.

CT 507. **Seminar.** Terms and hours to be arranged. Professor Fritchoff and staff.

Extension Methods

INSTRUCTION in this department is intended to supplement that of the subject-matter departments in the training of students for positions as home demonstration agents, county agents, 4-H club agents, extension specialists, and for similar types of work in which extension methods are commonly used.

The extension worker must be well trained not only in the subject matter of her field but also in the methods by which extension work is successfully carried on. She must be able to give or know how to obtain authoritative advice for her community or county on any problem that may arise related to her field of service. She must know and practice the technique of platform speaking and demonstration, radio speaking, how to conduct discussions, and how to support the extension program by effective publicity. Excellent opportunities for combining a major in agriculture or home economics with training in journalism, speech and dramatics, economics, sociology, and other departments, supplemented by work in extension methods, should materially assist in meeting the need for better training on the part of extension workers.

This department is a joint department within both the School of Agriculture and the School of Home Economics.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

EM 405. **Reading and Conference.** Terms and hours to be arranged.
Students carry on individual study in special fields of extension methods under guidance of instructor. Professor Sager and Associate Professor Mack.

EM 411, 412. **Extension Methods.** (G) 3 hours each term.

Intensive study of the history and present organization of extension work; training in the most successful methods employed by extension specialists, county agricultural agents, home demonstration agents, 4-H club leaders, and agricultural workers in commercial fields. For senior or graduate students only. Professor Sager and Associate Professor Mack.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

Foods and Nutrition

FIVE laboratories for foods instruction, accommodating eighteen students each, are provided. Two dining rooms and small kitchens are used in meal service in the department and for occasions by the school. For work in nutrition a chemical laboratory, a basal-metabolism laboratory, and laboratories for animal experimentation are provided.

DESCRIPTION OF COURSES

REQUIRED

Curriculum A: FN 211, 212, 213, 225, 411.
Curriculum B: FN 220, 221, 222, 320, 321.
Curriculum C: FN 211, 212, 213, 225 or 220, 221, 222, 225.

ELECTIVE

Curriculum A: FN 325, 412, 413.
Curriculum B: FN 411, 412, 413, 420, 421, 422, 423, 435, 481; HEd 420.
Curriculum C: FN 320, 321, 325, 411, 412, 413, 420, 421, 435, 481.

For students in education, pharmacy, etc.: FN 211, 212, 213, 218, 225, 240, 250. If FN 211, 212, 213 or FN 220, 221, 222 are elected the full three terms must be completed.

LOWER-DIVISION COURSES

FN 211, 212, 213.* **Foods.** 3 hours each term.

An introduction to the subject of foods; selection, preparation, and service. For students not electing chemistry. Prerequisite or parallel: one year of biological or physical science. FN 225 should parallel or precede FN 213. Two recitations; 2 two-hour laboratory periods.

FN 218. **Food Preparation.** 3 hours any term.

For women students who are not majoring in home economics. Basic principles of food preparation, menu making, and meal service. One recitation; 2 two-hour laboratory periods.

FN 220, 221, 222.* **Foods.** 3 hours each term.

Foods in their scientific and economic aspects; selection, preparation, and service. Prerequisite: Ch 101, 102, 103; Ch 226 prerequisite or parallel. Two recitations; 2 two-hour laboratory periods.

FN 224. **Nutrition for National Defense.** 1 hour any term.

The present national and local situation in nutrition and the present plan for dealing with it; nutritive values of foods; diet patterns; adequacy of diets of students; dietary deficiencies; relation of diet in a physical fitness program.

* Home practice in food preparation is required of students who have completed FN 213 and FN 222, the character and amount of practice being arranged with the instructors in charge.

FN 225. **Nutrition.** 3 hours any term.

An elective for men and women in other schools; required in curricula A and C in Home Economics. Nutritive value of foods from the standpoint of newer scientific investigations; selection of an optimal diet for health; present-day problems in nutrition; recent trends in American dietary habits.

FN 240. **Food Selection and Preparation (For Men).** 2 hours winter.

For men who are planning and preparing their own meals or acting as managers of living groups. Open to men in all schools. One lecture; 1 three-hour laboratory period.

FN 250. **Camp Cookery (For Men).** 2 hours spring.

Preparation of palatable and nutritious products from foods available in camps; outdoor food preparation involving the use of reflectors and improvised camping utensils. One lecture; 1 three-hour laboratory period.

UPPER-DIVISION COURSES

FN 320. **Nutrition.** 3 hours any term.

Required in Curriculum B. A scientific study of nutrition involving digestive and metabolic processes and products; investigations that have established the quantitative bases in dietetics and the standards that have been adopted. Prerequisite: FN 222, Ch 250, Z 306; Z 307 may be carried parallel. Two lectures; 1 two-hour laboratory period. Assistant Professor Garrison.

FN 321. **Nutrition.** 3 hours any term.

Continuation of FN 320. Application of scientific principles of nutrition to the individual and family group; projects in animal experimentation. Prerequisite: FN 320. Two lectures; 1 two-hour laboratory period. Assistant Professor Garrison, Associate Professor Fincke.

FN 325. **Feeding the Family.** 2 hours.

Practical applications of the knowledge of nutrition to the feeding of infants and children through the period of growth, including prenatal period; planning family meals to meet the requirements of all members. Preferably this course should follow or parallel Child Development. Prerequisite: FN 225, FN 213, Z 211 or Z 306; Z 307 prerequisite or parallel. Assistant Professor Roberts.

FN 401. **Research.** Terms and hours to be arranged.

FN 403. **Thesis.** Terms and hours to be arranged.

FN 405. **Reading and Conference.** Terms and hours to be arranged.

FN 407. **Seminar.** Terms and hours to be arranged.

FN 411. **Food Purchasing.** 3 hours any term.

Household purchasing; study of standards, grades, and qualities of food products as found on the market; factors governing cost; food laws; the ethics of food buying and selling. Prerequisite: FN 213 and 225, or 222; Ec 211. Two lectures; 2 two-hour laboratory periods. Associate Professor Kolshorn.

FN 412. **Food Management.** (g) 3 hours winter or spring.

Aims to give the upper-division student opportunity to check and improve the techniques in the phases of food study in which further help is needed. Includes complete responsibility in purchasing, menu making, meal management. Prerequisite: FN 213, 225, 411; or FN 222, 320. Six periods. Assistant Professor Roberts, Mrs. Overman.

FN 413. **Food Demonstrations.** (g) 3 hours.
Principles and techniques involved in food demonstrations with practical experience in planning and presenting such demonstrations. Planned especially to meet the needs of students interested in commercial work or in teaching. Prerequisite: FN 213, 225, 411; or FN 222, 320. Six periods. Assistant Professor Roberts.

FN 420. **Nutrition in Disease.** (G) 3 hours spring.
Dietary adjustments for abnormal conditions. A preliminary course for students who wish to become hospital dietitians or nutrition specialists and for students who desire to broaden their training in nutrition. Prerequisite: FN 321. Professor Williams.

HEd 420. **Community Problems in Nutrition.** (G) 3 hours winter.
Nutrition problems facing the high-school teacher in her contacts with the community. Field work will consist of individual and group projects worked out in cooperation with agencies interested in a nutrition-health program. Prerequisite: FN 321, Ed 313. Two recitations; 1 laboratory period. Assistant Professors Roberts and Garrison.

FN 421. **Nutrition of the Infant and Child.** (G) 3 hours.
Nutritional needs from prenatal life through adolescence; maternal dietary requirements. Prerequisite: FN 321. Professor Williams.

FN 422, 423. **Advanced Nutrition.** (G) 3 hours each term. Students may register for one or two terms.
Various problems fitted to the needs of the individual student may be selected from the following fields: energy metabolism; determination of vitamin values by both chemical and biological methods; determination of the calcium and phosphorus content of foods; surveys of dietaries of individuals or groups; balance studies. Prerequisite: FN 321. Professor Williams, Associate Professor Fincke, Assistant Professors Garrison and Roberts.

FN 435. **Experimental Cookery.** (G) 3 hours winter.
Development of experimental methods; their application to investigations in cookery and the skills involved; acquaintance with the literature in this field; preparation of the student for independent investigations in foods. Prerequisite: Ch 226, FN 222. Associate Professor Kolshorn.

FN 481. **Readings in Nutrition.** (G) 3 hours fall.
A course in which recent research studies in nutrition are reviewed and interpretations and their significance are discussed. A fundamental course for graduate work in nutrition. Prerequisite: FN 321. Professor Williams, Associate Professor Fincke.

GRADUATE COURSES

Courses numbered 400-499 and designated *(g)* or *(G)* may be taken for graduate credit.

FN 501. **Research.** Terms and hours to be arranged.

FN 503. **Thesis.** Terms and hours to be arranged.

FN 505. **Reading and Conference.** Terms and hours to be arranged.

FN 507. **Seminar.** Terms and hours to be arranged. Professor Williams and staff.

Home Economics Education

PROFESSIONAL training for prospective teachers of home economics is afforded by the Department of Home Economics Education. Any student having a scholarship record below average should confer with the Dean of the School of Home Economics before registering for teacher-training work.

This department is a joint department within both the School of Home Economics and the School of Education.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

HEd 401. **Research.** Terms and hours to be arranged.

HEd 403. **Thesis.** Terms and hours to be arranged.

HEd 405. **Reading and Conference.** Terms and hours to be arranged.

HEd 407. **Seminar.** Terms and hours to be arranged.

Ed 408d. **Special Teaching Methods.** (See Ed 408, page 267.) Professor Blazier.

HEd 412. **Organization and Administration of Homemaking Education.** (G) 3 hours any term.

Typical organizations of homemaking departments on both the vocational and the nonvocational basis; equipment and management. Prerequisite: Ed 408d. Professor Blazier.

HEd 413. **The Supervision of Home Projects.** (G) 2 hours spring.

Use of home projects in home-economics instruction; field work in supervision of home projects. Prerequisite: HEd 412. One recitation; 1 two-hour laboratory period. Professor Blazier.

HEd 420. **Community Problems in Nutrition.** (G) 3 hours winter.

Nutrition problems facing the high-school teacher in her contacts with the community. Field work will consist of individual and group projects worked out in cooperation with agencies interested in a nutrition-health program. Two recitations; one laboratory period. Prerequisites: FN 321, Ed 313. Assistant Professors Roberts and Garrison.

HEd 440. **Adult Education in Home Economics.** (G) Hours to be arranged, winter.

Problems in the adult-education program authorized under the Smith-Hughes Act; field work in promoting, organizing, observing, and teaching adult classes. Prerequisite: HEd 412. Professor Blazier.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

HEd 501. **Research.** Terms and hours to be arranged.

Problems in home economics education. Professor Blazier.

HEd 503. **Thesis.** Terms and hours to be arranged.

HEd 505. **Reading and Conference.** Terms and hours to be arranged.

HEd 507. **Seminar.** Terms and hours to be arranged. Professor Blazier.

Household Administration

UNDER this department instruction is offered in household management, economics of the family, problems of the consumer-buyer, household equipment, housing, child development, nursery school, parent education, and family life. Offices, classrooms, and equipment laboratory are located in the Home Economics Building. Three well-equipped Home Management Houses and a Nursery School are located on or near the campus.

DESCRIPTION OF COURSES

REQUIRED

Curriculum A: HAd 101, 311, 312, 340, 350, 422.
Curriculum B: HAd 101, 311, 312, 340, 350, 422.
Curriculum C: HAd 311, 312, 340, 350.

ELECTIVE

Curriculum A: HAd 330, 401, 403, 405, 407, 413, 423, 425, 441, 442, 443, 490.
Curriculum B: HAd 330, 401, 403, 405, 407, 413, 423, 425, 441, 442, 443, 490.
Curriculum C: HAd 330, 401, 403, 405, 407, 413, 422, 423, 425, 441, 442, 443, 490.
For students in secretarial science, education, pharmacy, etc.: HAd 222, HAd 225, HAd 101, HAd 239, and any other courses for which prerequisites have been taken.

LOWER-DIVISION COURSES

HAd 101. **Introduction to Home Economics.** 1 hour fall.
Aims to orient beginning students in the field of home economics and to assist them in adjusting themselves to college life.

HAd 222. **Family Relationships.** 2 or 3 hours any term.
Aims to give a better understanding of present-day family life and some of the problems existing. Open to both men and women with sophomore standing or above. No prerequisites. Two recitations.

HAd 225. **Child Care and Training.** 3 hours spring.
Growth, development, care, and training of the young child; observations in the nursery school. For students not in home economics degree curricula. Open to both men and women. No prerequisites.

HAd 239. **Home Management.** 3 hours spring.
Problems that arise in the management of the home, with emphasis on management of money, time, and energy in relation to family living. For students not in home-economics degree curricula; for both men and women. No prerequisites.

UPPER-DIVISION COURSES

HAd 311, 312. **Child Development.** 3 hours each term, fall and winter or winter and spring.
Growth and development of the normal preschool child; observations in the nursery school. Prerequisite: Psy 203 or 221, 222. Three recitations; 1 one-hour observation period. Professors Brandon and Prentiss.

HAd 330. **Household Equipment.** 3 hours spring.
Selection, operation, care, and arrangement of household equipment. Prerequisite: one term of foods. Two recitations; 1 three-hour laboratory period. Assistant Professor Walsh.

HAd 340. **Household Management.** 4 hours any term.
Problems arising in the management of a home; special consideration to the management of money, time, and energy. Prerequisite: FN 213 or 222; Ec 211 (may parallel). Assistant Professor Walsh.

HAd 350. **Home Management House.** 5 hours any term.

Principles underlying management of a home are put into practice during a six weeks' residence in a house. Prerequisite: HAd 311, 312, HAd 340. Associate Professor Oehler, Miss Sansom.

HAd 401. **Research.** Terms and hours to be arranged.

HAd 403. **Thesis.** Terms and hours to be arranged.

HAd 405. **Reading and Conference.** Terms and hours to be arranged.

HAd 407. **Seminar.** Terms and hours to be arranged.

HAd 413. **Child Development.** (G) 3 hours fall.

Growth and development in middle and late childhood and early adolescence. Prerequisite: HAd 311, 312. Professor Brandon.

HAd 422. **Family Relationships.** (G) 2 hours any term.

Factors entering into adjustments within the modern family group. Prerequisite or parallel: HAd 312, 340; or Ed 460, 461, 490 or equivalent. Open to both men and women. Professor Prentiss.

HAd 423. **Parent Education.** (G) 2 hours winter.

Methods and content in parent education. Prerequisite: HAd 312; HAd 340. It is suggested that Ed 491 precede this course. Two recitations. Assistant Professor Read.

HAd 425. **Nursery School Procedures.** (G) 3 hours any term.

Observation in the college nursery school with practice in meeting the developmental needs of preschool children. Discussion of the nursery school experience with emphasis on developing insight into child behavior, skill in guiding it, and in promoting growth for the child through enrichment of the environment. Prerequisite: HAd 311, 312. Two three-hour laboratory periods; 2 recitations. Assistant Professor Read.

HAd 441. **Economics of the Family.** (G) 3 hours fall or winter.

Economics most directly touching the welfare of the family in modern industrial society; family income, its size, sources, adequacy, distribution; the problem of income apportionment and household expenditure; household production; economic contribution of women in homemaking. Prerequisite: Ec 211, HAd 340 (latter may be taken parallel). Assistant Professor Walsh.

HAd 442. **Problems of the Consumer-Buyer.** (G) 3 hours winter.

Problems met by the household buyer in her efforts to make an intelligent selection of goods on the modern market; the different types of retail marketing agencies that serve her; methods of improving consumer-buying. Prerequisite: Ec 211, HAd 340. Assistant Professor Walsh.

HAd 443. **House Planning in Relation to Function.** (G) 2 hours.

Private dwellings from the standpoint of family needs and interests—information required in making plans; sources of information now available; characteristics of the "ideal" whole-family house; variations among households in needs and interests; evaluation of housing features as the basis for elimination when planning houses that are limited in cost. Prerequisite: HAd 312, 340. Offered in summer session.

HAd 490. **Studies in Child Development and Family Relationships.** (G) 3 hours fall or winter.

An analysis of methods and techniques used in experimental investigations of child development and family relationships. Prerequisite: HAd 311, 312, 422. Professor Brandon.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

HAd 501. **Research.** Terms and hours to be arranged.

HAd 503. **Thesis.** Terms and hours to be arranged.

HAd 505. **Reading and Conference.** Terms and hours to be arranged.

HAd 507. **Seminar.** Terms and hours to be arranged.

Institution Economics

COURSES in institution economics are planned to meet the needs of students who desire to prepare for positions in the field of institutional management. Two halls of residence for women and five for men, together with the banquet rooms and tea rooms in the Memorial Union, are used as laboratories. The facilities are adequate for thorough training in this field.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

IEc 311. **Quantity Cookery and Catering.** 3 hours fall.
Application of principles of cookery to the preparation of food in large quantity; standardization of formulas, dietetic value, cost; use of modern equipment; menu planning; experience in the preparation and service of foods for special functions. Prerequisite: FN 213 or 222. One lecture; 2 two-hour laboratory periods. Assistant Professor Bibee.

IEc 320. **Cafeteria Management.** 3 hours.
Offered to meet the needs of the student who plans to teach and manage a school cafeteria. Menu study, buying, cafeteria plans, accounting, management, and practice in quantity cookery. At present offered in summer session only. Prerequisite: FN 213 or 222. Assistant Professor Bibee.

IEc 401. **Research.** Terms and hours to be arranged. Professor Hunter.

IEc 403. **Thesis.** Terms and hours to be arranged. Professor Hunter.

IEc 405. **Reading and Conference.** Terms and hours to be arranged. Professor Hunter.

IEc 407. **Seminar.** Terms and hours to be arranged. Professor Hunter.

IEc 420. **Institutional Equipment.** (g) 3 hours winter.
Equipment for bedrooms, living rooms, dining rooms, and kitchens in different types of institutions; design, materials; construction, cost, and arrangement. Prerequisite: HAd 340. Professor Hunter.

IEc 430. **Institutional Organization and Administration.** (g) 2 hours fall.
Principles of organization and administration as applied to various types of institutions; discussion of employment problems and training, labor laws, office records. Prerequisite: HAd 340. Professor Hunter.

IEc 440. **Institutional Marketing.** (g) 2 hours spring.
Institutional marketing from the standpoint of food purchasing, including production and distribution of food commodities, marketing costs, factors

influencing prices, marketing of special foods such as meats, vegetables, fruits, eggs. Prerequisite: HAd 340. Professor Hunter.

IEc 450. **Institution Experience.** (G) 4 hours spring.
Aims to give practical experience in organization and administration of an institution; practice work in the various halls of residence, the Memorial Union Dining Service, and office of the Director of Dormitories. Prerequisite: IEc 311, 420, 430, 440. One lecture; 3 two-hour laboratory periods. Assistant Professor Bibee.

GRADUATE COURSES

Courses numbered 400-499 and designated *(g)* or *(G)* may be taken for graduate credit.

IEc 501. **Research.** Terms and hours to be arranged.

IEc 503. **Thesis.** Terms and hours to be arranged.

IEc 505. **Reading and Conference.** Terms and hours to be arranged.

IEc 507. **Seminar.** Terms and hours to be arranged.

School of Pharmacy

Faculty

ADOLPH ZIEFLE, M.S., Phar.D., Dean of the School of Pharmacy; Professor of Pharmacy.

LULA MARY STEPHENSON, Secretary to the Dean.

Practical Pharmacy

LEWIS CLEMENCE BRITT, Ph.D., Associate Professor of Pharmacy.

Pharmaceutical Analysis

JOHN ALAN ELLEGOOD, M.S., Assistant Professor of Pharmaceutical Analysis; In Charge of Department; Director of the Drug Laboratory of the Oregon State Board of Pharmacy.

Pharmacology and Pharmacognosy

ERNST THEODORE STUHR, M.S., Associate Professor of Pharmacology and Pharmacognosy; In Charge of Department.

General Statement

IN 1898, on petition of the druggists of Oregon, pharmacy was first established as a separate department of the State College. The aim was to provide for more thorough theoretical and practical instruction than could be provided in the average drug store, in which up to that time most young men and women were trained for the pharmacy profession. From its inception the department grew steadily, and in 1917 it was raised to the rank of a school. The school is an integral part of the State College organization, and as a consequence has shared in the support accorded by the State of Oregon and the national government. As a result of this support, together with the fact that it is a part of a great educational institution, the school is equipped to offer standard curricula and to maintain a high degree of excellence in its work.

The School of Pharmacy is a member of the American Association of Colleges of Pharmacy and is accredited by the American Council on Pharmaceutical Education. Institutions holding membership in these organizations must maintain certain minimum requirements for entrance and graduation. Their influence has been so great that many states either by law or by ruling of the state board of pharmacy recognize their standards. Diplomas as well as the work of students in this school are recognized by all state boards of pharmacy requiring graduation from an accredited school of pharmacy as a prerequisite for examination and registration.

Requirements of the Pharmaceutical Profession. Public sentiment demands high requirements for the practice of pharmacy through the enactment of stringent state and Federal laws. Pharmacists must now have a scientific training such as cannot be obtained by merely working in a drug store. The minimum college requirement of the Oregon State Board of Pharmacy is com-

pletion of an accredited four-year curriculum in pharmacy as a prerequisite for examination and registration.

Pharmacy as a Profession for Women. No field of work offers more desirable opportunities for women than pharmacy. The work is clean, pleasant, and agreeable, and women are peculiarly adapted to it. The technical work of manufacturing and dispensing drugs involves the traits of neatness and accuracy that, generally speaking, are more predominant in women than in men. As more than seventy-five per cent of all drugs and druggists' sundries are purchased by women, it is natural that those patrons should often prefer to deal with women.

Drug-Store Experience. The Oregon State Board of Pharmacy requires one year of drug-store experience (2,400 hours) before registration can be granted. Students are not required to have had such experience to register in or be graduated from the School of Pharmacy. Such experience is very desirable, however, and students are urged to acquire one or preferably two years of experience before taking up the courses in pharmacy. The Oregon State Board of Pharmacy does not allow credit for part-time drug-store experience while the student is in attendance at any educational institution.

Oregon Law Relating to the Practice of Pharmacy. The Oregon State Pharmacy Law is enforced by the Oregon State Board of Pharmacy. The state law outlines the scope and duties of registered pharmacists with regard to the dispensing of prescriptions, the sale of poisons, and other professional services. A registered pharmacist may operate and manage a drug store, compound medicinal substances, and sell poisons, and it is his duty to train apprentices in the professional phases of pharmacy.

A resumé of the Oregon State Pharmacy Law passed in 1921 and amended in 1935 is as follows:

To qualify as REGISTERED PHARMACIST, a candidate must meet the following requirements:

(1) He must be an American citizen and at least twenty-one years of age.

(2) He must be a graduate of a school or college of pharmacy accredited by the Oregon State Board of Pharmacy, the American Association of Colleges of Pharmacy, and the American Council on Pharmaceutical Education.

(3) He must take the registered pharmacist's examination, make a weighted average of seventy-five per cent, and not fall below sixty per cent in any one subject. His grade in the examination in compounding prescriptions and practical work must be at least seventy-five per cent.

(4) He must have completed one year of practical drug-store experience under the supervision of a registered pharmacist comprising a minimum of at least 2,400 hours of work per calendar year. In no case will more than 2,400 hours of practical experience be credited for any calendar year. In no case may drug-store experience be counted that the candidate may have had before his sixteenth birthday. No credit is allowed for drug-store experience gained while in attendance at a school or college of pharmacy. Blanks are provided by the State Board of Pharmacy for the registration of practical experience. All such experience must be certified to on an affidavit by a registered pharmacist.

Eligibility for Examination. All graduates of the School of Pharmacy who are American citizens and twenty-one years of age are eligible to take the examinations of the Oregon State Board of Pharmacy. Those graduates who

pass in all subjects and meet all other requirements receive the certificate of registered pharmacist. Graduates who have not completed at least 2,400 hours of drug-store work have no standing whatsoever as registered pharmacists until they can fulfill this requirement.

Preparation for Examinations of State Boards of Pharmacy. Before they can practice pharmacy, all graduates are required to pass the examination of a state board of pharmacy. During the third term of each academic year, the faculty organizes review classes for senior students for the purpose of giving trial state-board examinations, studying typical state-board questions, studying specimens of drugs and chemicals for examination in identification, giving oral examinations, and using all other means to aid the students in the various subjects in which they will be examined. Because of this service graduates of the School of Pharmacy have made an outstanding record in the examinations of the Oregon State Board of Pharmacy.

Reciprocity. As the Oregon State Board of Pharmacy is a member of the National Association of State Boards of Pharmacy, graduates who are registered by this Board are privileged to reciprocate without further examination with all states except California and New York.

O. S. P. A. Educational Fund. Oregon druggists assembled at the thirty-sixth annual convention of the Oregon State Pharmaceutical Association held in the Pharmacy Building, July 1925, established an Educational Fund to assist worthy students of the School of Pharmacy who have a reasonable amount of means to complete their course. The operation of the fund is under the direction of a Board of Trustees elected from membership in the state association. As a basis for granting loans students are required to submit on the application form a budget, references, the name of a guarantor, and other information regarding their assets and liabilities. The average loan per student per year is $100. Only in exceptional cases are loans granted during the first term.

Correspondence. Inquiries regarding the School of Pharmacy may be addressed to the dean. Students desiring to enter will be provided by the State College registrar with proper blanks for filing credentials.

Major Curricula

UNDERGRADUATE and graduate work is offered by the School of Pharmacy preparing students for all fields of the pharmacy profession and leading to both the bachelor's and master's degrees.

The Bachelor's Degree. Four-year curricula leading to the degree of Bachelor of Arts or Bachelor of Science are offered by the School of Pharmacy. During the freshman and sophomore years all students pursue substantially the same curriculum. In the junior and senior years the curricula are differentiated into Practical Pharmacy and Professional Pharmacy. The distinction between these two fields of study is one of emphasis, as service in the field of either curriculum is both practical and professional. A total of 192 term hours must be completed for a degree in either curriculum.

A. PRACTICAL PHARMACY CURRICULUM. This curriculum is designed to provide thorough instruction in pharmacy, chemistry, biology, accounting, business law, and related subjects, to prepare the student not only to pass the examinations of state boards of pharmacy but to serve efficiently in all branches

of practical drug-store work. As the commercial phases of pharmacy are rapidly becoming a dominant feature of the modern drug store, a series of lectures and demonstrations in the model drug store is given each year to the members of the senior class by a group of twenty nonresident lecturers representing all phases of the drug business.

The following are some of the fields open to thoroughly prepared and experienced pharmacists: preparation and dispensing of medicines; service as dispensers and clinical technicians in hospitals, managers and proprietors of drug stores, chemists and department managers for laboratories that manufacture drugs and chemicals; public-health work where the graduate is expected to advise the public in health and sanitation, and a variety of other positions demanding a knowledge of pharmacy and related subjects.

B. PROFESSIONAL PHARMACY CURRICULUM. Students wishing to enter positions demanding more intensive preparation in scientific and cultural subjects than is provided in the practical pharmacy curriculum, together with basic training in pharmacy and related subjects, may prepare through this curriculum for the following positions: research and manufacturing chemists with wholesale drug firms; traveling representatives with drug firms who call on physicians and pharmacists in the interest of newly developed drugs and other substances; inspectors for state and Federal bureaus; pharmacists and specialists with the United States government in the departments of public health, veteran's administration, the Navy, the Army, internal revenue department, Federal pure-food and drug laboratories, chemists with state boards of health and state food and drug laboratories, and a variety of other positions. Graduates of this curriculum are eligible to take the examinations of any state board of pharmacy. If they qualify as registered pharmacists, they are licensed to dispense prescriptions and to operate a drug store.

Options in the election of courses are permitted according to the student's interests and needs. Prior to registration for each term the dean outlines for each student the courses he should elect to fulfill his objective, together with delinquencies.

As the State College is listed as an approved institution by the American Medical Association, a student by completing the professional pharmacy curriculum can qualify in the period of four years for admission to a Class A medical school and for the degree of Bachelor of Arts or Bachelor of Science. For admission to the study of dentistry the preliminary educational requirements are two years (ninety term hours) of training in liberal arts and sciences, including one year of English, general chemistry, biology or zoology and physics, and one-half year of organic chemistry; the regular two-year premedical course as given by standard liberal-arts colleges is recommended. If a student is interested in any specific medical or dental school, he should study current catalogs and other requirements. Upon request the dean will furnish all information necessary to outline the student's program.

Advanced standing is granted to students transferring from other institutions of collegiate rank. Application for advanced standing is made on official transcript submitted to the Registrar. Upon receipt of the advanced-standing report, the dean makes a study of the student's case and outlines the program to be followed to be graduated in pharmacy, or to qualify for any other objective.

Beginning January 1, 1938, all transfer students who have not been registered in an accredited school or college of pharmacy, regardless of the amount of credit presented, must be registered in pharmacy for three collegiate years

to qualify for graduation and examination by a state board of pharmacy. This requirement is effective in all accredited schools and colleges of pharmacy.

Graduate Work. Graduate work leading to the degree of Master of Arts or Master of Science is offered in the School of Pharmacy. Candidates for the master's degree must hold a bachelor's degree in pharmacy from the State College or its equivalent from another accredited institution. In addition, candidates must have attained a creditable scholastic average in their undergraduate work and must have determined upon a definite objective to be attained through the advanced work. Institutional requirements for the degree of Master of Science will be found under GRADUATE DIVISION.

In all cases, a minimum of one entire academic year of three terms in residence is necessary when full time is devoted to the fulfillment of the requirements for the degree. If a candidate devotes part time to instructional work, for which compensation is received, a period longer than three terms is required. Fulfillment of the requirements of the major is based primarily on original work completed along some line of experimental investigation. A thesis must be prepared, incorporating the results of the investigation. An oral examination, given by the instructors in the department in which the candidate majored, is required.

Facilities

MODERN facilities for the work of the School of Pharmacy are afforded in the Pharmacy Building. These include special laboratories, a model drug store, State Board of Pharmacy Drug Laboratory, a complete sign-card and window-trimming department, museum, library, and study room. The laboratories and lecture rooms are equipped with all apparatus necessary for practical pharmaceutical instruction. Students have individual desks supplied with the materials necessary for the specific course.

Model Drug Store. Donations from wholesale and jobbing firms, from manufacturers of drug-store fixtures, and from other sources have made it possible for the School of Pharmacy to equip a model drug store in the Pharmacy Building. The fixtures consist of Stedman's rubberoid flooring, 32 feet of mahogany English wall cases, 18 feet of plate-glass marble-base showcases, a 10-foot wrapping counter, a 10-foot mahogany prescription case, 25 feet of cross partition, an intercommunicating telephone, and similar displays. These fixtures, together with a complete stock, are used for instruction in salesmanship, showcase and window trimming, inventory, the keeping of poison and narcotic records, taking copies of prescriptions over a telephone, systematizing a drug stock, and store management. As the stock and fixtures were donated for instructional purposes, nothing is actually sold or dispensed.

State Drug Laboratory. For the purpose of determining the purity and regulating the sale of medicinal substances in the State of Oregon, the Oregon State Board of Pharmacy, in October 1927, established in the Pharmacy Building a State Drug Laboratory, which is under the supervision of trained chemists.

The purpose of the laboratory is to enforce Section 20 of the Oregon laws as amended in 1935 fixing the responsibility for the purity of drugs upon the pharmacist. Realizing that druggists are not equipped to assay pharmaceutical preparations, the Board of Pharmacy established the laboratory primarily to assist them to dispense pure drugs. By means of the laboratory it is also the

object of the Board to prevent dishonest practice and gross adulteration of medicinal substances sold by individuals other than pharmacists, and to make it a legal necessity that all drugs sold in the state shall be true to label.

The funds required to equip and maintain the laboratory are furnished by the Oregon State Board of Pharmacy. The room, permanent laboratory furniture, and other requisites are furnished by the State College. The director of the laboratory is also a member of the faculty of the School of Pharmacy.

Four-Year Curricula in Pharmacy[1]

B.A., B.S. Degrees

Practical Pharmacy *Professional Pharmacy*

LOWER-DIVISION CURRICULUM

Freshman Year	Term hours F	W	S
English Composition (Eng 111, 112, 113)	3	3	3
General Chemistry (Ch 204, 205, 206)	5	5	5
History or elective	3	3	3
[2]Theoretical Pharmacy (Phr 111, 112)	3	3	----
[2]Pharmaceutical Processes (Phr 113)	----	----	3
[3]Physical Education	1	1	1
Military Science	1	1	1
	16	16	16
Sophomore Year			
Organic Chemistry (Ch 226, 227)	5	5	----
[4]Inorganic Pharmacy (Phr 311)	----	----	5
German or French (or elective)	4	4	4
[5]Sign Card Writing (Phr 211, 212)	2	2	----
Accounting for Technical Students (BA 385)	3	----	----
Business Law (BA 256) or elective	----	4	----
Natural Products and Drug Principles (PhA 321)	----	----	3
Physical Education	1	1	1
Military Science	1	1	1
Elective	----	----	2
	16	17	16

PRACTICAL PHARMACY

Junior Year

(See Lower-Division Curriculum above.)

General Bacteriology (Bac 204)	3	----	----
Pathogenic Bacteriology (Bac 332)	----	3	----
Immunity and Serum Therapy (Bac 333)	----	----	3
Practical Pharmacognosy (PhP 331, 332, 333)	3	3	3
Quantitative Drug Analysis (PhA 361, 362)	3	3	----
Physiology (Z 306, 307, 308)	3	3	3
Drug Assaying (PhA 327)	----	----	3
Pharmaceutical Calculations (Phr 313)	3	----	----
Microscopy of Drugs (PhP 438) or Military Science, or elective	(3)	*or* (3)	3
Galenical Pharmacy (Phr 317)	----	5	----
Military Science or approved elective	3	----	----
	18	17	15

[1]Both curricula as outlined include the necessary 36 term hours of science for a B.S. degree; the professional curriculum also includes the necessary 36 hours of arts and letters (including two years of a foreign language) necessary for a B.A. degree.

[2]Students expecting to major in the professional curriculum take German (GL 1, 2, 3, or equivalent), in place of Phr 111, 112, 113.

[3]General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education. Women take Social Ethics (PE 131) one term.

[4]Students expecting to major in the professional curriculum take Ch 232 instead of Phr 311.

[5]Students expecting to major in the professional curriculum take General Physics (Ph 201, 202, 203) in place of Phr 211, 212, and omit the spring-term elective.

Senior Year	Term hours F	W	S
Practical Pharmacology (PhP 491, 492, 493)	3	3	3
Proprietary Remedies (Phr 451)	---	3	---
Organic Pharmacy (Phr 440)	3	---	---
[1]U. S. Pharmacopoeia and National Formulary (Phar 441, 442)	---	3	3
Drug-Store Practices (Phr 447, 448, 449) or Military Science	3	3	3
Manufacturing Pharmacy (Phr 444)	3	---	---
Prescription Lectures (Phr 454)	3	---	---
Prescription Incompatibilities (Phr 455)	---	3	---
Prescription Compounding (Phr 456)	---	---	3
Approved elective	---	---	3
	15	15	15

PROFESSIONAL PHARMACY

Junior Year

(See Lower-Division Curriculum.)

Vertebrate Zoology (Z 204, 205, 206)	4	4	4
Theoretical Pharmacy (Phr 120)	4	or (4)	or (4)
Inorganic Pharmacy (Phr 311)	---	---	5
Practical Pharmacognosy (PhP 331, 332)	3	3	---
Pharmaceutical Calculations (Phr 313)	3	---	---
Galenical Pharmacy (Phr 317)	---	5	---
Essay Writing (Eng 211)	---	3	---
Elementary Physical Chemistry (Ch 340)	---	---	3
Military Science or nonscience elective	3	3	3
	17	18	15

Senior Year			
Elementary Psychology (Psy 201, 202)	---	3	3
Organic Pharmacy (Phr 440)	3	---	---
U. S. Pharmacopoeia and National Formulary (Phr 441, 442)	---	3	3
Practical Pharmacology (PhP 491, 492)	3	3	---
Prescription Lectures (Phr 454)	3	---	---
Prescription Compounding (Phr 456)	---	---	3
Literature or Public Speaking or Military Science	3	3	3
Natural Products and Drug Principles (PhA 321)	---	---	3
Approved electives	3	4	---
	15	16	15

Practical Pharmacy

IN THE Department of Practical Pharmacy are offered elementary, basic, and advanced courses in theoretical pharmacy, pharmaceutical processes, and commercial pharmacy. Most of the work is of upper-division and graduate character.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Phr 111, 112. **Theoretical Pharmacy.** 3 hours each term fall and winter. Two lectures; 1 recitation; 1 three-hour laboratory period. Professor Ziefle, Assistant Professor Ellegood.

Phr 113. **Pharmaceutical Processes.** 3 hours spring.

The fundamental manipulation used in the manufacture of simple galenical preparations. Prerequisite: Phr 112 or 120. Two lectures; 1 recitation; 1 three-hour laboratory period. Associate Professor Stuhr.

Phr 120. **Theoretical Pharmacy.** 4 hours winter or spring.

Identical with Phr 111, 112, except that no laboratory work is offered. Admission to this course is restricted to students transferring from other in-

[1]Phar 447, 448, 449 required of all students except those in R. O. T. C.

stitutions having advanced-standing credit for one year of general chemistry and other science courses. Five lectures. Professor Ziefle.

Phr 211, 212. **Sign Card Writing.** 2 hours each term fall and winter.

The printing of labels, price tags, and simple display signs; preparation of display standards and backgrounds; and other practical display work. Students are required to furnish brushes and pens. Three two-hour laboratory periods. Associate Professor Britt.

Phr 220. **Household Preparations.** 3 hours any term.

The most common medicinal remedies, technical preparations, toilet requisites, and druggists' sundries used in the home. In the laboratory students prepare representative samples of each class of preparations and study the mode of application and specific use. Elective without prerequisites. Two lectures; 1 three-hour laboratory period. Professor Ziefle.

UPPER-DIVISION COURSES

Phr 311. **Inorganic Pharmacy.** 5 hours spring.

Inorganic chemicals and their preparations used in medicine. In the laboratory students make representative samples of certain types of chemicals, as well as tests for impurities, such as arsenic, lead, and antimony. Prerequisite: Ch 205. Three lectures; 2 three-hour laboratory periods. Associate Professor Britt.

Phr 313. **Pharmaceutical Calculations.** 3 hours fall or winter.

Weights and measures used in pharmacy; percentage solution; alligation; specific gravity; thermometers; etc. Prerequisite: Ch 206, Phr 113. Associate Professor Britt.

Phr 317. **Galenical Pharmacy.** 5 hours winter.

The various types of galenical preparations as outlined in the U. S. Pharmacopoeia and National Formulary; laboratory work in the preparation of simple galenicals, such as waters, pills, emulsions, suppositories, ointments, troches. Prerequisite: PhP 331, Ch 226. Three lectures; 2 three-hour laboratory periods. Associate Professor Britt.

Phr 440. **Organic Pharmacy.** 3 hours fall.

Organic chemicals and their preparations used in medicine, with particular reference to the correlation between chemical constitution and physiological action. Prerequisite: Phr 317, PhP 333, Ch 227. Three lectures. Associate Professor Britt.

Phr 441, 442. **U. S. Pharmacopoeia and National Formulary.** 3 hours each term winter and spring.

All drugs in United States Pharmacopoeia and National Formulary, as well as all important unofficial drugs and preparations in the dispensatories, studied with emphasis on composition, uses, methods of manufacture, reasons for each step in process of manufacture, and all other important data. Prerequisite: Phr 440. Three lectures. Associate Professor Britt.

Phr 444. **Manufacturing Pharmacy.** 3 hours fall.

The manufacture of the more complex pharmaceuticals involving chemical reactions in their preparation. Prerequisite: Phr 317, Ch 227. Three three-hour laboratory periods. Associate Professor Stuhr.

Phr 447, 448, 449. **Drug-Store Practices.** 3 hours each term.

Practical drug-store work, including preliminary problems of establishing a drug store, store arrangement, salesmanship, showcase and window trim-

ming, inventory, keeping narcotic and poison records, taking copies of prescriptions over the telephone, and other phases of drug-store work. The stock and equipment of the model drug store are used for instruction, but as all stock and sundries in the model drug store were donated for instructional purposes, nothing is actually sold or dispensed. Prerequisite: Phr 313. Two lectures; 1 three-hour laboratory period. Professor Ziefle.

Phr 450. **Pharmacy Law.** 2 hours spring.

Study of the Oregon Pharmacy Law and promulgations of the Oregon State Board of Pharmacy, the Federal Food, Drugs, and Cosmetic Act, the Harrison Narcotic Act, and other laws regulating the practice of pharmacy. One lecture; 1 recitation. Professor Ziefle.

Phr 451. **Proprietary Remedies.** 3 hours winter.

A brief descriptive survey of the more important preparations of various pharmaceutical manufacturers; a consideration of their composition and therapeutic use. The text, *New and Nonofficial Remedies*, is supplemented by current literature and laboratory reports. Prerequisite: Phr 440. Three lectures. Associate Professor Britt.

Phr 454. **Prescription Lectures.** 3 hours fall.

The theory of procedures in prescription compounding and the proper management of the prescription department. Prerequisite: Phr 317, PhP 333, Ch 227. Two lectures; 1 three-hour laboratory period. Associate Professor Britt.

Phr 455. **Prescription Incompatibilities.** 3 hours winter.

Several hundred incompatibilities in prescriptions studied from the point of view of the cause of the incompatibility and the best method of overcoming it. Prerequisite: Phr 454. Two lectures; 1 three-hour laboratory period. Associate Professor Britt.

Phr 456. **Prescription Compounding.** 3 hours spring.

Students apply the principles learned in Phr 454 and 455 to the actual compounding of more than one hundred prescriptions representing the general types met with in actual practice. Prerequisite: Phr 455. One lecture; 2 three-hour laboratory periods. Associate Professor Britt.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

Phr 501. **Research.** Terms and hours to be arranged.

Phr 503. **Thesis.** Terms and hours to be arranged.

Phr 505. **Reading and Conference.** Terms and hours to be arranged.

Phr 507. **Seminar.** Terms and hours to be arranged.

Pharmaceutical Analysis

ALL courses in drug analysis, qualitative and quantitative, are offered through the department of Pharmaceutical Analysis. All the work is of upper-division or graduate character. The Department of Pharmaceutical Analysis is under the supervision of the Director of the Drug Laboratory of the Oregon State Board of Pharmacy.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

PhA 321. **Natural Products and Drug Principles.** 3 hours spring.
The composition and identification of natural products, alkaloids, synthetic drugs, and newer remedies. Prerequisite: Ch 226. One lecture; 2 three-hour laboratory periods. Assistant Professor Ellegood.

PhA 327. **Drug Assaying.** 3 hours spring.
The quantitative determination of the purity of the more common official and unofficial drugs. Prerequisite: Ch 227. One lecture; 2 three-hour laboratory periods. Assistant Professor Ellegood.

PhA 361, 362, 363. **Quantitative Drug Analysis.** 3 hours each term.
Advanced methods in drug assaying. Students showing proficiency in this course are permitted to do special work in the State Drug Laboratory. Prerequisite: Phr 311, Ch 227. One lecture; 2 three-hour laboratory periods. Assistant Professor Ellegood.

PhA 441. **Toxicology.** (G) 3 hours.
Detection of the common inorganic and organic poisons, with emphasis on alkaloids and synthetics. Prerequisite: PhP 333, PhA 321, Ch 227. One lecture; 2 three-hour laboratory periods. Assistant Professor Ellegood.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

PhA 501. **Research.** Terms and hours to be arranged.

PhA 503. **Thesis.** Terms and hours to be arranged.

PhA 505. **Reading and Conference.** Terms and hours to be arranged.

PhA 507. **Seminar.** Terms and hours to be arranged.
Conducted jointly with Phr 507 and PhP 507.

Pharmacology and Pharmacognosy

COURSES in the identification of medicinal plants, together with all courses dealing with the physiological action of drugs and their therapeutic value, are included in the Department of Pharmacology and Pharmacognosy. All the work is of upper-division or graduate character.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

PhP 331, 332, 333. **Practical Pharmacognosy.** 3 hours each term.
The official botanical, animal, and synthetic drugs, and their macroscopic identification. Prerequisite: Phr 113, Ch 227. Three lectures. Associate Professor Stuhr.

PhP 438. **Microscopy of Drugs.** 3 hours winter.
Microscopic structure and characteristics of drugs; methods of identifying powdered drugs and of detecting adulterations. Prerequisite: PhP 332.

PhP 491, 492, 493. **Practical Pharmacology.** 3 hours each term.
Physiological action and medicinal uses of drugs on the human organism, including toxicological aspects of poisonous drugs, with demonstrations and laboratory exercises. Prerequisite: Phr 317, PhP 333. Two lectures; 1 three-hour laboratory period. Associate Professor Stuhr.

PhP 494. **Pharmacological Standardization.** (G) 3 hours winter or spring.
Biological assaying, employing the methods of the U. S. P., together with certain unofficial but well-recognized procedures. Prerequisite: PhP 493, Ch 227, Bac 333, Z 308. One lecture; 2 three-hour laboratory periods. Associate Professor Stuhr.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) or (*G*) may be taken for graduate credit.

PhP 501. **Research.** Terms and hours to be arranged.

PhP 503. **Thesis.** Terms and hours to be arranged.

PhP 505. **Reading and Conference.** Terms and hours to be arranged.

PhP 507. **Seminar.** Terms and hours to be arranged.
Conducted jointly with Phr 507 and PhA 507.

Secretarial Science

Faculty

VICTOR PIERPONT MORRIS, Ph.D., Dean and Director of Business Administration, Oregon State System of Higher Education; In Charge of Secretarial Science.

CHARLES THEODORE YERIAN, Ph.D., Professor of Secretarial Science; Chairman of Department.

BERTHA WHILLOCK STUTZ, M.S., Associate Professor of Secretarial Science.

MINNIE DEMOTTE FRICK, B.S., Associate Professor of Secretarial Science.

LLOYD Q LARSE, M.Ed., Assistant Professor of Secretarial Science.

CECIL CLARENCE CALLARMAN, M.S., Assistant Professor of Secretarial Science.

LOUISE JACKMAN ORNER, M.S., Instructor in Secretarial Science.

EDWARD VIETTI, M.S., Instructor in Secretarial Science.

ELIZABETH POULTON, M.S., Instructor in Secretarial Science.

General Statement

THE Secretarial Science four-year curriculum is planned to meet the needs of students who wish to prepare themselves for responsible secretarial positions or for such positions as office manager, assistant to public officials, and research assistants. Students may major in secretarial science and minor in some other field.

A four-year degree curriculum in secretarial training was offered at the State College from 1916 to 1932, though instruction in secretarial subjects had been offered for many years before that time. In the 1932 allocations of major curricula in the State System of Higher Education, secretarial science was assigned to the State College with the provision that it should be under the control of the Dean and Director of Business Administration. In May 1933, the work in secretarial science was organized by authority of the State Board of Higher Education into a four-year curriculum leading to a bachelor's degree.

For a degree in secretarial science students must satisfy all the general requirements and in addition must follow a prescribed curriculum including the first two years of shorthand and typing, Office Procedure (SS 311, 312), one year of accounting, Business English, Elements of Finance (BA 222), Elements of Marketing (BA 223), one year of Business Law, one year of psychology, and one year of Principles of Economics. For the Bachelor of Arts degree students must complete 36 hours of arts and letters including two years of work in a foreign language; for the Bachelor of Science degree students must complete 36 hours of either science or social science. The curriculum as outlined includes all the requirements for the Bachelor of Secretarial Science degree and provides electives that may be used in meeting requirements for the B.A. or B.S. degree.

Commercial Education. In conjunction with the Department of Secretarial Science, the School of Education meets the demand for well-prepared teachers of commercial branches in secondary schools. In the selection of their courses in both secretarial science and education, students should advise with the Department of Secretarial Science and the School of Education. For the requirements for certification see SCHOOL OF EDUCATION.

Facilities. The classrooms and laboratories for the instruction in secretarial science are located in Commerce Hall. Special facilities comprise the latest office appliances and fixtures, including the standard types of typewriters, duplicators, Mimeographs, dictaphones, Mimeoscopes, filing cabinets, adding machines, bookkeeping machines, and accounting machines. All appliances and equipment are kept in constant repair. Students are taught how to keep in repair the appliances they use.

Curriculum in Secretarial Science

B.A., B.S., B.S.S. Degrees[1]

Freshman Year	Term hours F	W	S
Stenography (SS 111, 112, 113)	3	3	3
Typing (SS 121, 122, 123)	2	2	2
English Composition (Eng 111, 112, 113)	3	3	3
[2]Physical Education	1	1	1
Military Science	1	1	1
Group requirement in science	3	3	3
Electives—			
Chosen from the following: (Sp 111, 112, 113; Sp 120, 121, 122); modern language; social science (SSc 101, 102, 103); art and architecture (AA 114, 115, 116); literature (Eng 101, 102, 103; Eng 104, 105, 106)	3	3	3
	16	16	16
Sophomore Year			
Applied Stenography (SS 211, 212, 213)	3	3	3
Principles of Economics (Ec 201, 202, 203)	3	3	3
Constructive Accounting (BA 111, 112, 113)	4	4	4
Elementary Psychology (Psy 201, 202, 203)	3	3	3
Business English (Eng 217)	....	....	3
Physical Education	1	1	1
Military Science	1	1	1
Electives—			
Chosen from the following: literature (Eng 271, 272, 273; Eng 274, 276); modern language; history (Hst 224, 225, 226); sociology (Soc 211); philosophy (Phl 211, 212, 213); political science (PS 212); music (Mus 121, 122, 123)	3	3	....
	18	18	18
Junior Year			
Office Procedure (SS 311, 312)	5	5	....
Office Organization and Management (SS 313)	....	....	5
Elements of Finance (BA 222)	4	....	....
Elements of Marketing (BA 223)	....	4	....
Business Law (BA 256, 257, 258)	4	4	4
Federal and State Tax Forms (BA 214)	....	....	3
Electives—			
Chosen from the following: sociology (Soc 364); history (Hst 377); English (Eng 201, 202, 203); religion; science; advanced military science	3	3	3
	16	16	15

[1]For specific requirements for B.A., B.S., and B.S.S. degrees see page 76.

[2]General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education. Women take Social Ethics (PE 131), one term.

Senior Year	Term hours F	W	S
[1]Secretarial Science (SS 411, 412)	3	3	----
[2]Seminar in Secretarial Science (SS 407)	----	1	----
Merchandising and Selling (SS 436)	----	3	----
General Advertising (SS 439)	----	----	3
International Trade (Ec 440)	4	----	----
Money and Banking (Ec 413)	----	----	4
Latin-American Relations (PS 418)	----	3	----
Pacific Area Relations (PS 419)	----	----	3
International Relations (PS 417)	3	----	----
Electives— Chosen from the following: government (PS 415); sociology (Soc 312; Soc 411, 412); religion (R 461; R 463); science; advanced military science	5	5	5
	15	15	15

Description of Courses

COURSES IN SECRETARIAL SCIENCE

LOWER-DIVISION COURSES

SS 111, 112, 113. **Stenography.** 3 hours each term.

Theory of shorthand; practical applications of theory principles in sentence dictation. SS 121, 122, 123 must be taken concurrently with this sequence unless the student has had the equivalent. Students who have had at least one year of shorthand are not permitted to take course SS 111 for credit. Four recitations.

SS 121, 122, 123. **Typing.** 2 hours each term.

Theory and practice of touch typing; rhythm drills, dictation exercises; writing paragraphs; punctuation and mechanical arrangement of business correspondence, legal forms, tabulating, manifolding, speed practice. Students who have had at least one year of typing are not permitted to take SS 121 for credit. Five periods laboratory work; 1 hour home assignment.

SS 211, 212, 213. **Applied Stenography.** 3 hours each term.

Advanced principles and phrases of shorthand; dictation and transcripts covering vocabularies of representative businesses, such as law, banking, insurance, railway, and manufacturing; advanced dictation, legal forms, newspaper and magazine articles. Prerequisite: SS 113, 123 or equivalent. Three recitations; 3 one-hour laboratory periods; 3 hours home work.

UPPER-DIVISION COURSES

SS 311, 312. **Office Procedure.** 5 hours each term fall and winter.

Training in the most efficient stenographic methods and office practice, filing, advanced dictation, transcripts, reports, and practical use of modern office appliances. Prerequisite: SS 213 or equivalent. Three lectures; 3 two-hour laboratory periods.

SS 313. **Office Organization and Management.** 5 hours spring.

Principles and practices of scientific secretarial office management, covering organization, arrangement, and operation, with special consideration of the employment and training of secretarial office workers; office efficiency problems; business ethics. Prerequisite: SS 312.

[1]SS 412 is offered each term.
[2]Offered each term.

SS 407. **Seminar.** 1 hour any term.

SS 411. **Secretarial Science.** 3 hours fall.
Duties of the secretary in business and the professions; relation of the private secretary to the employer; office organization and management; application of actual problems in college offices. Prerequisite: SS 313 or equivalent. Professor Yerian.

SS 412. **Secretarial Science.** 3 hours any term.
Continuation of SS 411. Nine hours laboratory each week in campus offices. Professor Yerian.

SS 436. **Merchandising and Selling.** (g) 3 hours winter.
Retail organizations, practices, policies, and problems; stock-control systems; buying; methods of sales promotion such as retail display and coordination of advertising with market and merchandising processes; general sales fundamentals and techniques. Professor Yerian.

SS 439. **General Advertising.** (g) 3 hours spring.
Theory and practice; economic and social implications of advertising, the advertising agency; the "Campaign," including methods of research and coordination of advertising with market and merchandising processes; selection of media; retail and mail-order advertising; mechanics of advertising, including typography, printing, engraving, and book making; practice in production of layouts and copywriting. Professor Yerian.

GRADUATE COURSES

Courses numbered 400-499 and designated (*g*) may be taken for graduate credit. For graduate courses in commercial education, see below.

COURSES IN COMMERCIAL EDUCATION

UPPER-DIVISION COURSES

Ed 408c. **Special Teaching Methods.** (See Ed 408, page 265.) Associate Professor Stutz.

CEd 401. **Research.** Terms and hours to be arranged.

CEd 403. **Thesis.** Terms and hours to be arranged.

CEd 405. **Reading and Conference.** Terms and hours to be arranged.

CEd 407. **Seminar.** Terms and hours to be arranged.

GRADUATE COURSES

CEd 501. **Research.** Terms and hours to be arranged.

CEd 503. **Thesis.** Terms and hours to be arranged.

CEd 505. **Reading and Conference.** Terms and hours to be arranged.

CEd 507. **Seminar.** Terms and hours to be arranged.

CEd 541. **Current Practices in Typewriting.** 3 hours fall.
Principles underlying the development of typing skills; motivation, supplementary materials, and special devices. Prerequisite: Ed 408c and teaching experience in typing. Associate Professor Stutz.

CEd 542. **Current Practices in Shorthand.** 3 hours winter.

Correct writing habits; correlation of sound and symbol response and the development of supplementary material through word and sentence building and transcription technique. Prerequisite: Ed 408c and experience in teaching stenography. Associate Professor Stutz.

CEd 543. **Problems in Commercial Education.** 3 hours spring.

Recent and current trends in the commercial curriculum in high school; evaluation of debatable methods and available research studies. Prerequisite: Ed 408c and teaching experience in commercial subjects. Associate Professor Stutz.

Military Science and Tactics

Faculty

(Personnel detailed from United States Army)

COLONEL WILLIAM R. SCOTT, Infantry; Commandant; Professor of Military Science and Tactics.

LIEUTENANT COLONEL DANIEL FLOYD JONES, Field Artillery; Assistant Professor of Military Science and Tactics. (Field Artillery Unit)

MAJOR LEONARD LLEWELLYN CUTSHALL, Infantry; Associate Professor of Military Science and Tactics, Director of Infantry Unit.

MAJOR GLEN MERRILL WEBSTER, Corps of Engineers; Associate Professor of Military Science and Tactics; Director of Engineering Unit.

CAPTAIN DAVID BRUCE POWERS, Corps of Engineers; Assistant Professor of Military Science and Tactics.

CAPTAIN LEE HUSE PRAY, Infantry; Assistant Professor of Military Science and Tactics.

CAPTAIN KERMIT MILTON JOHNSON, Field Artillery; Assistant Professor of Military Science and Tactics.

CAPTAIN HENRY MERLE GARRETSON, Field Artillery; Assistant Professor of Military Science and Tactics.

CAPTAIN JOHN ROBERT ELTING, Field Artillery; Assistant Professor of Military Science and Tactics.

CAPTAIN THOMAS THEODORE MACKENZIE, Corps of Engineers; Assistant Professor of Military Science and Tactics.

FIRST LIEUTENANT RALPH MAURICE DAVIS, Corps of Engineers; Assistant Professor of Military Science and Tactics.

FIRST LIEUTENANT GERALD ST. CLAIR MUSHET, Infantry; Assistant Professor of Military Science and Tactics.

TECHNICAL SERGEANT JOHN CARSON WOODBURY; Assistant to Professor of Military Science and Tactics (Sergeant-Major).

SERGEANT JAMES LOUIS ARMOUR; Instructor in Military Science and Tactics (Field Artillery Unit).

SERGEANT JOHN EARL CRAWFORD; Instructor in Military Science and Tactics (Infantry Unit).

SERGEANT EDWARD HURSHAL COMBS; Instructor in Military Science and Tactics (Field Artillery Unit).

SERGEANT JAMES DEMITH; Instructor in Military Science and Tactics (Field Artillery Unit).

SERGEANT JOHNNIE ERNEST PARKER; Instructor in Military Science and Tactics (Field Artillery Unit).

SERGEANT ARTHUR BERRY HOLMES; Instructor in Military Science and Tactics (Engineer Unit).

SERGEANT BRUCE STEPHEN WHITEHEAD; Instructor in Military Science and Tactics (Engineer Unit).

General Statement

FOR many years the State College Cadet Corps has held a reputation for excellence. Instruction in military tactics was started about 1872 in conformity with a requirement of the Federal Land-Grant Act of 1862, under which the State College was established in 1868 as the land-grant institution of Oregon.

For the academic year 1916-17, the State College was classified by the United States War Department as a "Distinguished College," the highest rating for such an institution. Conditions and methods of rating have varied since 1917, but the Cadet Corps has maintained its position of prestige. During the World War the number of graduates who served with distinction in our armed forces gave proof of the high quality of their preparation for public service and of the value to the nation of such military instruction.

Reserve Officers' Training Corps. Oregon State College qualified under the provisions of the Act of Congress passed in 1916 which gave a greater measure of Federal aid and recognition to military training at this institution. The College agreed to meet prescribed standards of training in order that its graduates might receive commissions as reserve officers in the Army who would be available for service in event of a national emergency. The Corps of Cadets at Oregon State now comprises units of the Reserve Officers' Training Corps—Infantry, Field Artillery, Engineers, and Band.

Requirements. Military instruction is required in the freshman and sophomore years of all men students who are citizens of the United States, under twenty-six years of age, and physically qualified except as stated below. Exemptions from military training are granted for the following reasons: physical unfitness; age twenty-six or over; service of six months or more in the Army, Navy, or Marine Corps; noncitizenship; married and living with wife in Corvallis or vicinity; completion of four Citizen Civilian Military Training Camps; members of Naval or Marine Reserve; conscientious objection on account of *religious belief*, in which case the student is required to make application to the Commandant in writing accompanied by a letter from his parents or guardian and a letter from the pastor of his church showing that he is a member of the church in good standing, that the church does not believe in military training, and that the objection is based on this religious belief. Transfer students who have eighty or more hours of credit accepted at Oregon State College may be exempt, and in other exceptional cases exemption may be granted on the basis of individual handling by the Commandant.

Basic Course. The first two years of military instruction requiring three hours a week constitute what is known as the Basic Course of the Reserve Officers' Training Corps. During that period, the student does not receive any emoluments other than the use of a uniform provided by the War Department. Uniforms must be returned by the students at the end of each year or upon withdrawal from college. The prescribed textbooks, shoes, and a leather belt of the approved type must be provided by the student. Cadet corporals are selected from second-year students of this course.

Advanced Course. The Advanced Course is an elective course of five hours a week covering the third and fourth years of military instruction in the Reserve Officers' Training Corps. Students in this course are appointed cadet officers and sergeants of the Cadet Corps. Upon completion of requirements for this course, students receive commissions as second lieutenants in the

Officers' Reserve Corps, Army of the United States, for that branch in which they have specialized—Infantry, Field Artillery, or Engineer Corps. Under present War Department allotments, about three hundred and ten students are permitted to take the advanced course. The students for the course are selected by the Professor of Military Science and Tactics from those applicants whose military efficiency, academic standing, and physical condition are such as to warrant further training.

Advanced-course students enter into a contract with the government to continue the course to completion, unless excused by competent authority. In return the student receives allowances toward subsistence which average about $7.50 a month during the period from date of entrance into the course to the date of completion. He also receives an officers' uniform which he uses during the course and which becomes his property upon completion of the first year. At the end of the second year he receives $7 to cover the cost of maintenance of his uniform during the year. During the two-year course he receives from the United States a total of about $200 cash, a tailor-made uniform, and all expenses during the six-weeks summer camp.

Academic Credits. For the basic course, 1 hour of academic credit is allowed for each term, and for the advanced course the credit is 3 hours for each term, making a total of 24 hours credit.

Military Sports. Supplementary to normal instruction in marksmanship, the Military Department supervises the college rifle teams.

Description of Courses

COURSES IN INFANTRY

LOWER-DIVISION COURSES

MS 111, 112, 113. **First-Year Basic Course.** 1 hour each term.

Freshman year. Aims to instruct the student in basic Infantry subjects; to inculcate obedience, decorum, cheerfulness, esprit, and other elements of good discipline with the corresponding physical development; and to lay a sound foundation for the further pursuit of military studies. Subjects include: orientation; National Defense Act and R. O. T. C.; obligations of citizenship; military history and military policy; military discipline; courtesies and customs of the service; military organization; map reading; leadership; rifle marksmanship. Three periods.

MS 211, 212, 213. **Second-Year Basic Course.** 1 hour each term.

Sophomore year. Aims to give students further training in the basic Infantry subjects; to inculcate leadership; to build on the knowledge they have already acquired and to prepare them to take up the Advanced Course. Subjects include: leadership; automatic rifle; combat training; musketry; scouting and patrolling; combat principles; characteristics of infantry weapons. Three periods.

UPPER-DIVISION COURSES

MS 311, 312, 313. **First-Year Advanced Course.** 3 hours each term.

Junior year. Aims to give further training in basic Infantry subjects and in leadership, as the ground work for the duties of Junior officers of Infantry; to develop tactical judgment; to prepare the student for practical training while attending R. O. T. C. summer camp. Subjects include:

aerial photograph reading; instructional methods; machine guns; howitzer; pistol; rifle marksmanship; combat training; field fortification; company administration; care and operation of motor vehicles; defense against chemical warfare. Five periods. Assistant Professor Pray.

MS 411, 412, 413. **Second-Year Advanced Course.** 3 hours each term.
Senior year. Aims to complete the preparation of the student for commission as a second lieutenant of Infantry in the Officers' Reserve Corps of the United States Army. Subjects include: leadership; military law; military history and policy of the United States; Officers' Reserve Corps regulations; emergency procurement of property and funds; tanks; mechanization; combat training. Five periods. Associate Professor Cutshall.

COURSES IN FIELD ARTILLERY

LOWER-DIVISION COURSES

MS 121, 122, 123. **First-Year Basic Course.** 1 hour each term.
Freshman year. Aims to create a foundation of essential information upon which to base the military training of the student. Subjects include: military fundamentals; orientation; National Defense Act and R. O. T. C.; obligations of citizenship; military history and policy; military discipline; courtesies and customs of the service; map reading; military organization; leadership; elementary gunnery; duties of cannoneers and the firing battery; field artillery ammunition and matériel. Rifle marksmanship to students so electing. Three periods.

MS 221, 222, 223. **Second-Year Basic Course.** 1 hour each term.
Sophomore year. Aim is to further the student's knowledge of the basic field artillery subjects and to prepare them to take up the Advanced Course. Subjects include: leadership; fire control instruments; battery communications; duties of battery commander's detail; automotive vehicle construction and operation. Three periods.

UPPER-DIVISION COURSES

MS 321, 322, 323. **First-Year Advanced Course.** 3 hours each term.
Junior year. Aims to give further training in basic Field Artillery subjects and in leadership, as the ground work for the performance of the duties of junior Field Artillery officers; to prepare the student for the practical training he will receive while attending R. O. T. C. summer camp. Subjects include: leadership; aerial photograph reading; care and operation of motor vehicles; battery administration; defense against chemical warfare; reconnaissance and occupation of a position; field artillery gunnery. Five periods. Assistant Professor Jones.

MS 421, 422, 423. **Second-Year Advanced Course.** 3 hours each term.
Senior year. Aims to complete the preparation of the student for commission as a second lieutenant of Field Artillery in the Officers' Reserve Corps and the United States Army. Subjects include: leadership; military law; military history and policy of the United States; Officers' Reserve Corps regulations; emergency procurement of property and funds; field artillery subjects; combat training. Five periods. Associate Professor Sheets.

COURSES IN MILITARY ENGINEERING

LOWER-DIVISION COURSES

MS 131, 132, 133. **First-Year Basic Course.** 1 hour each term.
Freshman year. Designed to impart essential military knowledge combined with development of individual initiative and self-reliance. Subjects in-

clude: military organization; military discipline, courtesies, and customs of the service; National Defense Act and R. O. T. C.; military history and policy; obligations of citizenship; leadership; rifle marksmanship; map reading; floating bridges. Three periods.

MS 231, 232, 233. **Second-Year Basic Course.** 1 hour each term.

Sophomore year. Introduction to application of engineering science to military purposes; preparation of students to take up the Advanced Course. Subjects include: leadership; map and aerial photograph reading; military sketching; map making; rigging; weapons and musketry; scouting and patrolling; floating bridges. Three periods.

UPPER-DIVISION COURSES

MS 331, 332, 333. **First-Year Advanced Course.** 3 hours each term.

Junior year. Aims to give further training in basic military-engineering subjects and in leadership, as a ground work for the performance of the duties of a junior Engineer officer; to prepare the student for the practical training given at the R. O. T. C. summer camp. Subjects include: leadership; engineer training—military roads, bridges, explosives and demolitions, field fortifications; company administration; defense against chemical warfare; combat training. Five periods. Assistant Professor Davis.

MS 431, 432, 433. **Second-Year Advanced Course.** 3 hours each term.

Senior year. Aims to complete the preparation of the student for commission as a second lieutenant of Engineers in the Officers' Reserve Corps of the United States Army. Subjects include: leadership; military law; military history and policy of the United States; Officers' Reserve Corps regulations; emergency procurement of property and funds; engineering subjects; combat training. Five periods. Associate Professor Webster.

Division of Physical Education

Faculty

CLAIR VAN NORMAN LANGTON, Dr.P.H., Ed.D., Director of the Division of Physical Education.

ELIZABETH HEATH, B.S., Secretary to the Director.

Physical Education for Women

EVA M SEEN, Ed.D., Professor of Physical Education for Women; Head of Department.

HENRIETTA MORRIS, Sc.D., Associate Professor of Hygiene.

LAURA CORNELIA MCALLESTER, B.S., Assistant Professor of Physical Education for Women.

BETTY LYND THOMPSON, M.A., Associate Professor of Physical Education for Women.

NATALIE REICHART, M.A., Assistant Professor of Physical Education for Women.

JEANNETTE ALICE BRAUNS, M.S., Instructor in Physical Education for Women.

FLORENCE LOUISE HUPPRICH, M.A., Instructor in Physical Education for Women.

MARJORIE HAMPTON DENNIS, M.S., Instructor in Physical Education for Women.

Physical Education for Men

CLAIR VAN NORMAN LANGTON, Dr.P.H., Ed.D., Professor and Director of Physical Education; Professor of Hygiene.

PERCY PHILIP LOCEY, M.A., Director of Intercollegiate Athletics, Professor of Physical Education.

RALPH ORVAL COLEMAN, M.A., Professor of Physical Education; Director of Intramural Sports; Head Coach of Baseball.

RAYMOND GEORGE NEBELUNG, Dr.P.H., Associate Professor of Hygiene.

DELMAR ISAAC ALLMAN, Dr.P.H., Associate Professor of Hygiene.

JACK ERNEST HEWITT, M.A., Associate Professor of Physical Education; Coach of Swimming.

GRANT ALEXANDER SWAN, B.S., Assistant Professor of Physical Education; Head Coach of Track.

EDWARD ALMERON STEVENS, LL.B., Assistant Professor of Physical Education; Coach of Rowing.

WALTER MILO ADRION, M.A., Assistant Professor of Physical Education.

ALONZO L STINER, B.S., Head Coach of Football; Instructor in Physical Education.

AMORY TINGLE GILL, B.S., Head Coach of Basketball; Instructor in Physical Education.

JAMES VICTOR DIXON, M.S., Assistant Coach of Football; Assistant Professor of Physical Education.

HOWARD WILLIAM RAABE, M.S., Assistant Professor of Physical Education.

HAROLD WILLIAM MOE, B.S., Assistant Coach of Football; Instructor in Physical Education.

WILLIAM WARD MCKALIP, B.S., Freshman Coach; Instructor in Physical Education.

General Statement

ALL instruction and related activities in the fields of physical education and hygiene are administered by the Division of Physical Education. Close cooperation is maintained with the Student Health Service and other student-welfare agencies of the State College.

Lower-division and service courses in physical education are offered at the State College. By action of the State Board of Higher Education on March 7, 1932, all major work in the Oregon State System of Higher Education leading to baccalaureate and advanced degrees in physical education was confined to the School of Physical Education at the University, and lower-division work (instruction in the freshman and sophomore years) was assigned to both the University and the State College.

The lower-division work in physical education is essentially the same at both institutions. While it is recommended that students intending to major in physical education enter the institution at which major work is offered at the beginning of their freshman year, they may, if they wish, spend their freshman and sophomore years at the State College, and transfer to the University for their major work at the beginning of the junior year, without loss of credit and with fundamental requirements for upper-division standing fully met.

At both institutions, the lower-division program is intended not only to lay the foundation for specialization in physical education, but also to serve the needs of students majoring in other fields. In addition to the lower-division work, the State College offers upper-division service courses in physical education for students in other fields.

As stated on page 6, the dean of the major school at the University serves as an adviser to the end that the work in physical education at the State College shall bear a proper relation to the work of the major school.

Students who plan to minor in physical education at the State College or major at the University should confer with advisers in the office of the Department of Physical Education for Women or for Men, respectively.

Intramural Sports. Intramural sports are conducted by both Physical Education departments. The department for women has charge of all women's athletics and offers for the students a wide program of intramural sports and mixed recreation. The department for men carries on extensive organized sports programs that are separate and apart from intercollegiate athletics.

The function of the program of intramural sports is to give every student the moral, social, physical, and educational values of competitive sports. Competition is organized between living organizations, clubs, individuals, classes, and institutional departments. The program of sports provides for both individual and team endeavor. "Athletics for all" is the purpose of intramural sports promotion.

Athletic Organizations. Athletic organizations for men include the Minor "O" and Varsity "O" associations and the honor societies, Sigma Alpha

and Sigma Delta Psi. The Women's Athletic Association sponsors a program of competitive and recreational activities for women. The Orange "O" letter, the senior plaque, and election to Parthenia are honor awards.

Student Health Service. The Student Health Service provides medical examinations for all entering students and advises with the Physical Education departments in the assignment of students to activities in accord with their physical needs. The following activity classification is made, based upon the medical examinations: (a) unlimited activity, (b) unlimited activity with observation, (c) restricted activity, (d) corrective gymnastics, (e) no activity.

Fees. The regular State College registration fee entitles every student to the use of gymnasium, pool, and showers, to the use of gymnasium and swimming suits and towels, to laundry service, and to use of bandages and consumable supplies. Every student has a basket or locker in the gymnasium for his or her exclusive use and is urged to use the gymnasium facilities to the utmost.

Prerequisites for a Major. Students taking the first two years toward a major in physical education with the intention of transferring to the University should take all prerequisite subjects and the freshman and sophomore technical subjects. On transfer to the University these courses are accepted and adjustments made so that requirements for a degree in physical education can be completed in the junior and senior years. Prerequisite courses are as follows:

	Term hours
General Zoology	9
Elementary General Chemistry	12
English Composition	9
Elementary Human Physiology	6
Elements of Psychology	9
Sociology	9
Group requirements (year sequence elected from Language and Literature and Social Science groups)	12

Minor in Physical Education. Students preparing for part-time teaching positions in physical education should take as a minor a minimum of 24 term hours of professional courses. On completion of the minor (see page 261), the student may be recommended for a part-time teaching position in physical education in the high schools of the state.

Required Courses. Courses PE 114, 115, 116, PE 131, PE 214, 215, 216 for women, and PE 151, 152, 153, PE 251, 252, 253 for men, are required of all undergraduates. PE 150 (General Hygiene) is required of both men and women. For the Junior Certificate students are required to complete the following:

Freshman Year

Physical Education, 1 term hour each term for two terms. (Students in Nursing Education only, 1 hour each term for three terms.)

General Hygiene, 2 term hours for one term. (Students in Nursing Education only, 1 hour each term for three terms.)

Sophomore Year

Physical Education, 1 term hour each term for three terms.

Required activity courses are regularly scheduled classes planned as instructional hours leading to a knowledge and appreciation of the technique involved and not merely to give opportunity for recreation or exercise. Ample opportunity for exercise and recreation is provided, and all of the facilities of the department are at the student's disposal outside the regular class hours.

The physical-activity courses for students taking a minor in physical education (PE 124-126, 224-226 for women; PE 174-176, 274-276 for men) may be considered as fulfilling the physical-education requirement for that year.

Elective Courses. Courses PE 314, 315, 316, PE 414, 415, 416 for women, and PE 351, 352, 353, PE 451, 452, 453 for men, may be taken to the amount of one hour per term for juniors and seniors and a total of not more than six term hours in addition to the regular physical-education requirement.

Description of Courses

SERVICE COURSES FOR WOMEN

LOWER-DIVISION COURSES

PE 147, 148, 149. **General Hygiene.** 1 hour each term.

Required of all students in nursing education only. Principles and practices of health promotion; individual and physiological hygiene; disease prevention and control; community hygiene and public health. Lectures, recitations, and demonstrations concerning phases of health that should be understood by all college students. Associate Professors Morris and Nebelung.

PE 150. **General Hygiene.** 2 hours any term.

Principles and practices of health promotion; individual and physiological hygiene; disease prevention and control; community hygiene and public health. Lectures, recitations, and demonstrations concerning phases of health that should be understood by all college students. Required of all freshmen. Two periods.

PE 250. **Advanced Hygiene.** 3 hours any term.

Continuation of PE 150. Lectures and discussions on what the average person wants to know about personal health, exercise, weight control, prevention of infection, social hygiene, diet and dietary dangers, stimulants, injurious popular remedies and fads, sunlight, air and ventilation, the glands and health, choosing a doctor, and life-extension problems. Associate Professor Nebelung.

PE 114, 115, 116. **Freshman Physical Education.** 1 hour each term.

Two terms required of all freshman women. In fulfilling this requirement the student is permitted to elect courses offered in team sports, such as basketball, volleyball, baseball, field hockey, soccer, and field ball; and in individual sports, such as archery, badminton, tennis, swimming, fencing, golf, and riding; dancing; tumbling; and mechanics of posture. All freshman students are required to take one term of General Hygiene and two terms of Elementary Physical Education. Three periods.

PE 131. **Social Ethics.** One term, no credit.

Aim is threefold: to bring new students into early contact with their dean of women; to give the dean of women the opportunity of instructing new students in the fundamental principles of conduct both on the campus and elsewhere; to bring students a vision of woman's position and responsibility in the economic, social, and spiritual life of today. Required of all freshman women. One period.

PE 214, 215, 216. **Sophomore Physical Education.** 1 hour each term.

Same activities as in PE 114, 115, 116. Three terms required of all sophomore women. Three periods.

UPPER-DIVISION COURSES

*PE 314, 315, 316. **Junior Physical Education.** 1 hour each term.

Elective for juniors. Same activities as in PE 114, 115, 116. Three periods. Staff.

*PE 414, 415, 416. **Senior Physical Education.** 1 hour each term.
Elective for seniors. Same activities as in PE 114, 115, 116. Three periods. Staff.

SERVICE COURSES FOR MEN

LOWER-DIVISION COURSES

PE 150. **General Hygiene.** 2 hours any term.
Principles and practices of health promotion, individual and physiological hygiene; disease prevention and control, community hygiene and public health. Lectures, recitations, and demonstrations concerning phases of health that should be understood by all college students. Required of all freshmen.

PE 250. **Advanced Hygiene.** 3 hours any term.
Continuation of PE 150. Lectures and discussions on what the average person wants to know about personal health, exercise, weight control, prevention of infection, social hygiene, diet and dietary dangers, stimulants, injurious popular remedies and fads, sunlight, air and ventilation, the glands and health, choosing a doctor, and life-extension problems. Associate Professor Nebelung.

PE 151, 152, 153. **Elementary Physical Education.** 1 hour each term.
Physical activities taught not only for the acquisition of skill, but from the standpoint of their adaptation in the social life of the student. The time set aside is for instruction. It is hoped that the student will use the open hours provided and also the intramural sports for practice in these various activities. All freshman students are expected to take one term of General Hygiene and two terms of Elementary Physical Education. Two periods.

PE 251, 252, 253. **Advanced Physical Education.** 1 hour each term.
Required of sophomores. Two periods.

UPPER-DIVISION COURSES

*PE 351, 352, 353. **Physical Activities.** 1 hour each term.
A continuation of PE 251, 252, 253. Elective for juniors. Two periods. Staff.

*PE 451, 452, 453. **Physical Activities.** 1 hour each term.
A continuation of PE 351, 352, 353. Elective for seniors. Two periods. Staff.

PROFESSIONAL COURSES

LOWER-DIVISION COURSES

PE 121, 122, 123. **Introduction to Physical Education.** 2 hours each term.
Required in the freshman year for all students taking a minor. Introduces the student to the modern developments of physical education in relation to general education. General aims and objectives; history of physical education; practical considerations, program, physical plant, and personnel. Professors Coleman and Seen.

* Elective physical-education courses for juniors and seniors may be taken to the amount of one term hour per term and a total of not more than six term hours in addition to the physical-education requirement.

PE 124, 125, 126. **Physical Education Laboratory.** 2 hours each term.
Required of all women taking a minor. Intensive instruction in all the various activities that go to make up the physical-education program. Six periods.

PE 174. **Technique of Gymnastics.** 2 hours fall.
Required in the freshman year for all men taking a minor. A laboratory course in the technique and skills in gymnasium work, including practice in the various forms of marching (military, gymnastic, calisthenic), mass athletics (games, relays, contests, track, and field), tumbling, and apparatus work for school purposes. Six periods. Assistant Professor Adrion.

PE 175. **Technique of Football, Track, and Field.** 2 hours winter.
Required in the freshman year for all men taking a minor. A laboratory course in the techniques and skills of football, track, and field activities, including actual practice in the fundamentals of these sports. Six periods. Assistant Professor Swan, Mr. Stiner.

PE 176. **Technique of Minor Sports.** 2 hours spring.
Required in the freshman year for all men taking a minor. A laboratory course in the techniques and skills of speedball, six-man football, soccer, volleyball, handball, and badminton. Including actual practice in the fundamentals of these sports. Six periods.

PE 221. **Community Hygiene.** 2 hours fall.
General principles of hygiene as applied to community problems; protection of the health of the community; problems of contagious diseases and their prevention; modern organizations for the promotion of healthful living. Associate Professor Nebelung.

PE 224, 225, 226. **Physical-Education Laboratory.** 2 hours each term.
Required of all women taking a minor. A continuation of PE 124, 125, 126. Six periods.

PE 240. **Leadership of Party Games.** 2 hours fall or winter.
Study and practice of games for family recreation, parties, picnics, clubs, and community centers. Professor Seen.

PE 274. **Technique of Swimming, Tennis, and Golf.** 2 hours fall.
Required in the sophomore year for all men taking a minor. A laboratory course in the techniques and skills of swimming, life saving, diving, and water polo, including actual practice in the fundamentals of aquatics; tennis; and golf. Six periods. Professor Coleman, Associate Professor Hewitt, Mr. McKalip.

PE 275. **Technique of Boxing and Wrestling.** 2 hours winter.
Required in the sophomore year for all men taking a minor. A laboratory course in the techniques and skills of boxing and wrestling, including actual practice in the fundamentals of these two sports. Six periods. Associate Professor Allman, Assistant Professor Dixon.

PE 276. **Technique of Baseball and Basketball.** 2 hours spring.
Required in the sophomore year for all men taking a minor. A laboratory course in the techniques and skills of baseball and basketball, including actual practice in the fundamentals of these two sports. Six periods. Professor Coleman, Mr. Gill.

UPPER-DIVISION COURSES

PE 343, 344, 345. **Physical-Education Technique (Women).** 3 hours each term.
Required during the junior year for all women taking a minor. Technique of teaching dancing and sports; study of problems of directed teaching.

Prerequisite: skill and knowledge standard in activities as determined by the department. Five periods. Staff.

PE 346. **Coaching of Basketball (Men)** 2 hours fall.
The coaching and training of basketball teams beginning with fundamentals, passing, dribbling, and pivoting with emphasis on the psychology of the game; various methods of defense and offense. Mr. Gill.

PE 347. **Coaching of Football (Men).** 2 hours winter.
Fundamentals of football, theory and practice, details of each position on the team, training and managing, complete technique of developing offensive and defensive tactics, a comparison of the various systems in American intercollegiate football. Mr. Stiner.

PE 348. **Coaching of Baseball (Men).** 2 hours spring.
The technique of batting, pitching, baseball strategy, and how to play various positions; promoting the game; making schedules; points of inside baseball; care and construction of the field; baseball management. Professor Coleman.

PE 349. **Coaching of Track and Field (Men.)** 2 hours spring.
How to train for various track and field events; their form and technique; conduct of athletic meets; construction, use, and assembling of all equipment used by the participants on the field; development of certain types of individuals for certain events. Assistant Professor Swan.

PE 350. **Organization and Administration of Intramural Sports.** 2 hours winter.
Organization and administration of an intramural program for high schools and colleges; aims and objectives; steps in organizing a program; units of competition; program of sports; methods of competition; scoring plans; special administrative problems. Professor Coleman.

Ed 351. **Health Education.** 3 hours fall.
The fundamental philosophy and principles of health education, with emphasis on organization and administration of health instruction. Provision is also made for students interested in adult health education. Associate Professor Morris.

Ed 352. **Health Education.** 3 hours winter.
Continuation of Ed 351. Emphasis is placed on the subject matter of health instruction and its use in secondary schools and in adult health education. Prerequisite: Ed 351. Associate Professor Morris.

PE 358. **First Aid.** 2 hours any term.
Emergency treatment of all classes of injuries (until the doctor comes). Leads to standard Red Cross certificate. Open as a service course to all departments. Associate Professors Allman and Hewitt.

PE 359. **First Aid.** 2 hours spring.
Continuation of PE 358. Leads to Red Cross advanced and instructor's certificates. Open as a service course to all departments. Prerequisite: PE 358. Associate Professors Allman and Hewitt.

PE 361. **Athletic Training and Conditioning (Men).** 3 hours winter.
Practical and theoretical aspects of massage, bandaging, treatment of sprains, bruises, strains and wounds; diet and conditioning of athletes. Lectures, demonstrations, and practice. Prerequisite: Z 210. Associate Professor Allman.

Ed 421, 422, 423. **School Health Problems.** (g) 2 hours each term.
Factors in the maintenance of the health of school children; prevention and control of communicable diseases in relation to the school child; school sanitation; proper construction and care of school equipment; factors affecting the health of the school child; the health of the teacher; the hygiene of carrying out various phases of instruction. Professor Langton.

PE 421. **Principles of Physical Education.** (g) 3 hours fall.
General philosophy and principles of physical education and its relation to general education. Three periods. Professors Langton and Seen.

PE 422. **Tests and Measurements in Physical Education.** (g) 3 hours winter.
Survey of the field; special study of typical tests, methods of scoring, principles of test building. Should be preceded by or taken simultaneously with Ed 416 whenever possible. Associate Professor Hewitt.

PE 423. **Organization and Administration.** (g) 3 hours spring.
Administrative problems applied to high-school situations, including organization of departments, organization of instructional and recreational programs, supervision of both teaching and physical plant and routine administration. Professors Langton and Seen.

Ed 425. **School and Community Club Work.** (G) 3 hours winter.
A cooperative effort to prepare teachers and others for effective club work and community leadership. Specialists in 4-H Club work and others assist through giving lectures in their respective fields. Prerequisite: Ed 311, 312, 313. Professor Seen.

PE 435. **Nature, Function, and Organization of Play.** 3 hours spring.
Nature and function of play; adaptation of activities; program making. Playgound instruction, management, and supervision. Assistant Professor Reichart.

GRADUATE SERVICE COURSES

Courses numbered 400-499 and designated (*g*) may be taken for credit toward a graduate minor.

Graduate Division

OLOF LARSELL, Ph.D., Sc.D., Dean and Director of the Graduate Division, Oregon State System of Higher Education.

GEORGE REBEC, Ph.D., Counsellor of the Graduate Division, Oregon State System of Higher Education.

WILLIBALD WENIGER, Ph.D., Associate Dean of the Graduate Division, In Charge at the State College.

HOWARD RICE TAYLOR, Ph.D., Associate Dean of the Graduate Division, In Charge at the University.

ESTHER SIGRID LOCKREN, B.A., Secretary of the Graduate Division at the State College.

CLARA LYNN FITCH, Secretary of the Graduate Division at the University.

Graduate Council

General Graduate Council

OLOF LARSELL, Ph.D., Sc.D., Dean and Director of the Graduate Division.
WILLIBALD WENIGER, Ph.D., Associate Dean of the Graduate Division.
HOWARD RICE TAYLOR, Ph.D., Associate Dean of the Graduate Division.
VERNE VINCENT CALDWELL, Ph.D., Dean and Director of General Extension.
JAMES RALPH JEWELL, Ph.D., LL.D., Dean of Education.
EARL LEROY PACKARD, Ph.D., Dean and Director of General Research.
FLORENCE BLAZIER, Ph.D., Professor of Home Economics Education.
PHILIP MARTIN BRANDT, A.M., Professor of Dairy Husbandry.
SAMUEL HERMAN GRAF, M.E., M.S., Professor of Mechanical Engineering.
THEODORE KRATT, Mus.M., Mus.D., Professor of Music.
DON CARLOS MOTE, Ph.D., Professor of Entomology.
FRANKLIN DICKERSON WALKER, Ph.D., Professor of English.
EDWARD STAUNTON WEST, Ph.D., Professor of Biochemistry.

State College Graduate Council

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WILLIBALD WENIGER, Ph.D., Associate Dean of the Graduate Division; Vice-chairman.
FLORENCE BLAZIER, Ph.D., Professor of Home Economics Education.
PHILIP MARTIN BRANDT, A.M., Professor of Dairy Husbandry.
VERNE VINCENT CALDWELL, Ph.D., Dean and Director of General Extension.
LEWIS CLEMENCE BRITT, Ph.D., Associate Professor of Pharmaceutical Analysis.

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SAMUEL HERMAN GRAF, M.E., M.S., Professor of Mechanical Engineering.
EARL GEORGE MASON, M.F., Professor of Forestry.
DON CARLOS MOTE, Ph.D., Professor of Entomology.
CARL WALTER SALSER, Ed.M., Professor of Education.

University Graduate Council

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VERNE VINCENT CALDWELL, Ph.D., Dean and Director of General Extension.
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C. LYLE KELLY, M.A., C.P.A., Professor of Business Administration.
THEODORE KRATT, Mus.M., Mus.D., Professor of Music.
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ELON HOWARD MOORE, Ph.D., Professor of Sociology.
HAROLD JOYCE NOBLE, Ph.D., Associate Professor of History.
FRED LEA STETSON, M.A., Professor of Education.
FRANKLIN DICKERSON WALKER, Ph.D., Professor of English.
LOUIS AUBREY WOOD, Ph.D., Professor of Economics.

Medical School Graduate Council

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HANCE FRANCIS HANEY, Ph.D., M.D., Professor of Physiology.
MATTHEW CASEY RIDDLE, M.D., Associate Professor of Medicine.
EDWARD STAUNTON WEST, Ph.D., Professor of Biochemistry.
RUTH WHEELOCK, M.A., R.N., Associate Professor of Nursing Education.

State College Graduate Committees

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Agriculture: PHILIP MARTIN BRANDT, A.M., Chairman; DANIEL BARTON DELOACH, Ph.D.; HENRY HARTMAN, M.S.; ERNEST HERMAN WIEGAND, B.S.A.

Education: CARL WALTER SALSER, Ed.M., Chairman; RILEY JENKINS CLINTON, Ed.D.; GEORGE BRYAN COX, M.S.; OTHNIEL ROBERT CHAMBERS, Ph.D.; ELMO NALL STEVENSON, Ed.D.

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Pharmacy: LEWIS CLEMENCE BRITT, Ph.D., Chairman; ERNST THEODORE STUHR, M.S.; JOHN ALAN ELLEGOOD, M.S.

General Studies: WILLIAM HENRY DREESEN, Ph.D., Chairman; ROLAND EUGENE DIMICK, M.S.; KENNETH LLEWELLYN GORDON, Ph.D.; WALTER FRASER MCCULLOCH, M.S.; JAMES WILSON SHERBURNE, Ph.D.; WILLIAM DONALD WILKINSON, Ph.D.

Graduate Study

IN the disciplines of undergraduate education the primary aim is to prepare the student for cultured living and intelligent citizenship, and in techniques leading to a professional career. In graduate study the dominant aim is the development of the scholar, capable of original thinking and of creative achievement in the advancement and extension of knowledge. Hence a graduate degree indicates more than the mere completion of a prescribed amount of advanced study; it indicates that the student has shown both promise and performance in the field of independent scholarship.

Graduate study in the Oregon State System of Higher Education is defined to include all study beyond the bachelor's degree, in other than strictly professional curricula. By professional curricula are meant clearly defined and sharply specialized curricula, such as those in law and medicine, leading to professional degrees.

At the State College, the first advanced degree (A.M.) was conferred in 1876; in 1910 graduate study was placed under the supervision of a special standing committee of the faculty.

Advanced degrees were conferred occasionally at the University from the earliest days. In 1897 definite requirements of residence work were established for the master's degree. Graduate instruction was placed under the administrative control of the Graduate School in 1899-1900.

In 1933 all graduate work in the State System was coordinated under the Graduate Division.

Organization of Graduate Division

THE Graduate Division has jurisdiction over all graduate study in the State System leading to other than strictly professional degrees. The Graduate Division is administered through the graduate dean, the associate graduate deans at Oregon State College and the University of Oregon, and the graduate

councils at the State College, the University, and the University of Oregon Medical School.

A State System General Graduate Council formulates policies for the improvement and coordination of the program of graduate instruction and research of the State System as a whole, and facilitates cooperation between the institutions in the development of common procedures in the administration of graduate work and uniform standards of graduate scholarship. The membership of the General Graduate Council includes the graduate dean, the associate deans, the dean of general research, the dean of general extension, the dean of education, and representatives from the institutional graduate councils.

The institutional graduate councils have jurisdiction over the policies and procedures of graduate work within their respective institutions. The actual formulation of departmental graduate programs and the working out and direction of the programs of individual students are responsibilities of the departments; but no department has authority to waive or supersede the general rules or requirements of the Graduate Division.

Institutional Allocation of Graduate Work

ON the basis of the allocations of curricula in the Oregon State System of Higher Education, all graduate study leading to advanced degrees at the institutions of the State System has been allocated by curricula or major subjects as follows:

Oregon State College—

The biological sciences, the physical sciences (including mathematics), and the professional and technical fields of agriculture, education, engineering, forestry, home economics, and pharmacy.

University of Oregon—

Liberal arts and sciences and the professional fields of architecture and allied arts, business administration, education, journalism, law, medicine (at the Medical School in Portland), music, and physical education.

In certain fields graduate work may be carried on at the Portland Extension Center, leading to degrees, through the Graduate Division, from the State College or the University.

Students may be enrolled for major work on one campus and for minor work on another.

General Regulations

FOUR classes of graduate students are recognized: (1) those wishing to become candidates for a master's degree; (2) those wishing to become candidates for a doctor's degree; (3) those desiring an engineer degree; and (4) those wishing merely to take work beyond the requirements for the bachelor's degree. Students of the first three classes make out programs and comply with the other requirements expressed in the rules stated below. Students in the fourth class register for the courses they desire, with the understanding that the institution is under no implied obligation to accept credit earned as work toward a degree. Whether a student is adequately prepared to

enter a particular course is determined by the instructor in charge and the head of the department.

Admission. A graduate of any accredited college or university is admitted to the Graduate Division by the registrar of the institution which he wishes to enter, upon filing an application for admission and an official transcript of his college record (including undergraduate and graduate work). Such admission, however, does not of itself entitle a student to become a candidate for a degree. Admission to candidacy for an advanced degree is granted only after the student has demonstrated, by passing a qualifying examination, the thoroughness of his previous preparation and his ability to do work of a graduate character.

Graduate credit will not be granted for undergraduate work taken in excess of the requirements for the bachelor's degree.

Preparation Required for Graduate Study. Preparation for a graduate major must be an undergraduate major in the same subject, or a fair equivalent. Preparation for a graduate minor must be at least one year sequence of upper-division work in addition to foundational courses in the subject. Graduate credit may not be earned in courses for which the student does not show proper preparation by previous record or special examination.

Study Program and Load. Graduate students beginning work toward a degree will be expected to work out, in tentative form at least, a complete program of study leading toward the degree desired. This program should allow sufficient time for completion of the thesis. Work on the thesis should be begun as early as possible.

The normal load for a graduate student devoting all of his time to graduate study is 12 term hours in courses each term, plus 3 hours for thesis. The maximum load is 16 term hours (at the State College, 17 term hours on petition). For assistants, scholars, and fellows the maximum load is 10 term hours; for part-time assistants, scholars, and fellows, the maximum is 15 term hours.

The graduate program of each candidate should include a substantial amount of work with at least three faculty members offering graduate instruction.

Grade Requirement. A grade-point average of 3.00 (a B average) is required for every graduate degree. Grades below C are not accepted for graduate credit.

Graduate Courses. All courses numbered in the 500s carry graduate credit, as do those in the 400s which have been approved by the Graduate Council. Approved courses in the 400s are designated in the catalogs by (G) or (g) following the course title. Courses designated (G) may form a part of either a major or a minor; courses designated (g) may be taken toward a minor only. Graduate students taking courses in the 400s are expected to do work of a higher order and broader scope than the work of undergraduate students in the same courses.

Fees. Graduate students registered for seven term hours of work or more pay a fee of $32.50 a term. Graduate students do not pay the nonresident fee. Graduate students registered for six term hours or less pay the regular part-time fee of $4.00 a term hour but not less than $10.00 a term. Payment of the graduate fee entitles the student to all services maintained by the State College for the benefit of students.

Master of Arts and Master of Science

Credit Requirement. For the departmental Master of Arts and Master of Science degrees, the student must complete a program of study totaling not less than 45 term hours in courses approved for graduate credit. Approximately two-thirds of the work (30 term hours) must be in the major and one-third (15 term hours) in the minor.

Residence Requirement. For all master's degrees the residence requirement is one academic year of full-time study, or equivalent. (Work taken in summer sessions will count toward the satisfaction of the residence requirement.) Graduate or research assistants may satisfy the residence requirement by five terms of work. Students who have taken graduate work at another institution may lighten their load by transferring credit; but transferred credit will not shorten the residence requirement.

A maximum of 15 term hours earned in graduate courses in the Portland Extension Center or at the University of Oregon may be counted as credit earned in residence toward the departmental master's degree. If adequate course offerings are available, all of the work toward the Master of Arts (General Studies) degree may be earned at the Portland Center.

Transferred Credit. A maximum of 15 term hours of graduate work done at another accredited institution, or in extension courses approved for graduate credit, may be transferred, provided that: (1) the work fits into a logical curriculum for the degree; (2) the transfer is approved by the major department and by the Graduate Council; (3) grades of A or B have been earned. Credit granted for work done at another institution is tentative until validated by work in residence. (See also "Time Limit" below.)

Language Requirements. For the Master of Arts degree, the student must show, by examination or by adequate undergraduate courses, a reading knowledge of one foreign language, preferably French or German. By petition to the Graduate Council, a student may be permitted to substitute another language, if it is equally relevant to his program of graduate studies. For the Master of Science degree there is no foreign-language requirement, unless needed in the individual student's program.

Course Requirements. For the Master of Arts (Departmental) and Master of Science degrees at least one year sequence in the 500-599 series (normally of seminar or research nature and for approximately three hours of credit per term) is required.

Time Limit. All work counted toward the master's degree (including work for which credit is transferred from another institution, the thesis, and the final examination) must be completed within a period of five years.

Qualifying Examination. A student wishing to become a candidate for a master's degree is given a qualifying examination designed to test his basic training and his ability to pursue studies at the graduate level in his chosen field. This examination may be oral or written or both. It must be taken before the student has completed 15 term hours of graduate work. If satisfactory knowledge and ability are demonstrated, the student is formally advanced to candidacy for the degree sought, subject to the approval of the associate dean of the Graduate Division.

Qualifying examinations are scheduled jointly by the department or school and the graduate office; a list of scheduled examinations is compiled at the be-

ginning of the fall term and the beginning of the summer session, and is available at the graduate office.

Graduates of the State College who have maintained a grade-point average of at least 3.25 throughout their undergraduate work may be exempted from taking the qualifying examinations.

Thesis. Every candidate for a master's degree must file in the office of the Graduate Division three copies of an accepted thesis, and five copies of an abstract of the thesis not later than two weeks before the date of the final examination. Every thesis for a master's degree must have the approval of the major professor and the graduate committee of the school or college in which the candidate is majoring, before being filed with the Graduate Division.

The three copies of the thesis are filed unbound. Two are bound at the expense of the State College and are deposited in the Library. The third copy becomes the property of the major department. One of the Library copies is available for general circulation.

Full information concerning the prescribed style for theses may be obtained on request at the office of the Graduate Division.

Final Examination. A final oral examination of not less than two hours is required of every candidate for the master's degree; when deemed desirable a written examination may also be required. For the master's degree, the examining committee consists of at least four members of the faculty (two in the student's major field, one in the minor field, and one in a field not directly connected with the candidate's studies).

The examination committee is nominated by the student's adviser, subject to the approval of the associate dean of the Graduate Division, who is ex officio a member of all examining committees.

Master of Arts (General Studies). See page 391.

Doctor of Philosophy

General Requirements. The degree of Doctor of Philosophy is granted primarily for attainments and proved ability. There is no rigid credit requirement. It is not the policy of the Graduate Division to accept as a candidate for the Ph.D. degree any student whose academic training, both undergraduate and graduate, has been exclusively at the institution from which the degree is sought. The student working toward the Ph.D. degree chooses a major and, subject to the approval of his major professor, two minor lines of study. If the major department offers several distinct lines of study, one minor may lie in that department. With the assistance of an advisory committee nominated by the major school or department and approved by the associate dean of the Graduate Division, the student outlines a program devoting approximately sixty per cent of his time to the major, including thesis, and approximately forty per cent to the minors.

Residence. For the doctor's degree, at least two years of full-time work beyond the master's degree are required, of which at least one year (usually the last) must be spent in residence at Oregon State College.

Language Requirements. For the Doctor of Philosophy degree, a reading knowledge of French and German must be demonstrated by a formal exami-

nation in each language. These examinations should be taken as early as possible after the beginning of graduate work, and must be passed before the preliminary examinations may be taken. Another foreign language may, with the approval of the Graduate Council, be substituted for either French or German if, in the opinion of the student's advisory committee, it will be of more value in his program.

Preliminary Examinations. The student working toward the doctor's degree must pass a group of comprehensive preliminary examinations (at least partly oral) in his major and minor subjects not less than one academic year before he expects to receive the degree. Advancement to candidacy is contingent on passing these examinations.

Thesis. Every candidate for the degree of Doctor of Philosophy must submit a thesis embodying the results of research, and giving evidence of originality and ability in independent investigation. The thesis must be a real contribution to knowledge, based on the candidate's own investigations. It must show a mastery of the literature of the subject, and be written in creditable literary form. It is expected that the preparation of an acceptable thesis will require at least the greater part of an academic year.

Three copies of the thesis and five copies of an abstract must be deposited, unbound, in the graduate office not less than two weeks before the time set for the final examination.

Final Examination. The final examination for the degree of Doctor of Philosophy may be written in part, but must include an oral examination, usually of three hours' duration. The oral examination is open to any member of the faculty and to advanced graduate students. The date of the oral examination is publicly announced at least one week before it is held. The examining committee consists of the candidate's advisory committee and other members, including at least one not directly connected with the major or minor department. The committee is nominated by the major department or school, subject to the approval of the associate dean of the Graduate Division. Five members of the examining committee are designated to read the thesis and determine its acceptability. Unanimous vote is necessary for approval.

In the oral examination the candidate is expected to defend his thesis and to show a satisfactory knowledge of his major and minor fields. The written examination, if given, is expected to cover aspects of the major and minor fields with which the thesis is not directly concerned.

Other Graduate Degrees

Master of Education. Candidates for the Master of Education degree must have had teaching experience. The thesis problem should deal with some applied or professional aspect of education. In other respects the requirements for this degree are similar to the requirements for the M.S. Since this is a professional degree, both the major and the minor will ordinarily consist of education courses.

Master of Forestry. The general requirements for the professional degree of Master of Forestry are the same as those for the Master of Science. The program of study is designed, however, not primarily for the research worker, but for the administrator. The thesis for the M.F. degree must be an original study showing the application of professional knowledge to the accomplishment of a specific practical objective.

Engineer Degrees. For the degrees of Chemical Engineer, Civil Engineer, Electrical Engineer, Forest Engineer, Mechanical Engineer, and Mining Engineer, the candidate must hold the degree of B.S. or M.S. in the corresponding field of engineering from the State College, must have had at least five years of successful professional practice following graduation, and must present a satisfactory thesis. Before January 1 of the academic year in which the degree is desired, the candidate submits to the head of the department in which his major interest lies a complete statement of his professional experience since receiving the bachelor's degree. If the statement is approved, after it has been examined by the head of the department, the school graduate committee, and the Graduate Council, the candidate is instructed to prepare and submit his thesis. The thesis must be of high order and is subject to the same scrutiny and regulations as other graduate theses. Upon acceptance of the thesis the candidate is recommended for the degree in the usual manner. The candidate registers for the degree with the State College Registrar, either in person or by mail, not later than March 1, and pays the thesis examination fee of $10.00. After his thesis has been accepted he pays the usual graduation fee of $6.50.

Doctor of Education. The degree of Doctor of Education is granted primarily for attainments and proved ability. Successful teaching experience is required. There is no rigid credit requirement but since a minimum of three years of graduate study is necessary, the total number of term hours of graduate credit including thesis will approximate 135.

Along with the education major, one minor in a field of education and one minor in a field of study outside the school of education are required. Foreign languages are required if necessary in the dissertation problem.

Assistantships, Scholarships, and Fellowships

A VARYING number of graduate and research assistantships, scholarships, and fellowships are awarded annually to graduates of accredited universities and colleges who have superior records in their undergraduate work. All persons holding these positions are expected to register in the Graduate Division, and to become candidates for advanced degrees. Assistants, scholars, and fellows pay the same fees as other graduate students. Applications for these positions should be made before March 15. Application blanks are furnished on request by the Graduate Division.

Graduate Assistantships. A graduate assistant renders services amounting to not more than 18 hours a week—reading papers, handling laboratory and quiz sections, etc. He is permitted to enroll for a maximum of 10 term hours of course work. A graduate assistant commonly completes the work for a master's degree in two years. The stipend is $550 a year. Appointment is for one year; reappointment may be made for one additional year.

A part-time graduate assistant receives $275 a year. His maximum course load is 15 term hours.

Research Assistantships. A research assistant aids a faculty member in carrying on a research project. Compensation and enrollment limitations are the same as for a graduate assistant.

Graduate and Research Scholarships. Scholarships are awarded to students whose promise is considered exceptional. Ordinarily, award of a scholar-

ship is based on the student's record during a previous year of study and service at the institution. Required services and enrollment limitations are the same as for assistants. The stipend is $650 a year.

Graduate and Research Fellowships. A fellow is normally a person proceeding toward the doctorate, with at least one year of markedly superior work toward that degree completed. The graduate fellow gives instructional assistance in his department. The duties of a research fellow are similar to the duties of a research assistant; a fellow is, however, expected to assume greater responsibility in connection with the research project to which he is assigned. Fellows are allowed to enroll for a maximum of 10 term hours of course work. The stipend is $760 a year.

State Scholarships. A limited number of scholarships covering tuition and laboratory and course fees are available to graduate students in the institutions of the Oregon State System of Higher Education. All applicants, to be eligible, must be in need of financial assistance, and must show evidence of superior scholarship. Applications should be made to the Registrar of the State College, on official blanks furnished by his office, and must be filed before April 1.

Graduate Work at the State College

GRADUATE work at the State College is carried on under the auspices of the Graduate Division, and under the direction of the Graduate Council of the State College and the associate dean of the Graduate Division. Correspondence relating to graduate work in fields allocated to the State College should be addressed to the Graduate Division, Oregon State College, Corvallis, Oregon, or to the department concerned.

The State College is authorized to grant the following advanced degrees through the Graduate Division:

Doctor of Philosophy: Agriculture, Botany, Chemistry, Entomology, Geology, Mathematics, Physics, Zoology.

Doctor of Education: Education.

Master of Arts (Departmental): Bacteriology, Botany, Chemistry, Education, Engineering, Entomology, Geology, Home Economics, Mathematics, Mining Engineering, Pharmacy, Physics, Zoology.

Master of Arts (General Studies).

Master of Science: Agriculture, Bacteriology, Botany, Chemistry, Education, Engineering, Entomology, Forestry, Geology, Home Economics, Mathematics, Mining Engineering, Pharmacy, Physics, Zoology.

Master of Education: Education.

Master of Forestry: Logging Engineering, Technical Forestry, Wood Products.

Engineer: Chemical Engineering (Ch.E.); Civil Engineering (C.E.); Electrical Engineering (E.E.); Forestry, including Logging Engineering, Technical Forestry, and Wood Products (F.E.); Mechanical Engineering (M.E.); Mining Engineering (Mi.E.).

A major may be selected from among several fields within a department or may involve two or more related departments. The scope of the departments and schools is indicated in the descriptions on earlier pages.

Graduate Work at the University

GRADUATE work at the University is carried on under the auspices of the Graduate Division, and under the direction of the Graduate Council of the University and the associate dean of the Graduate Division. Correspondence relating to graduate work in the fields allocated to the University should be addressed to the Graduate Division, University of Oregon, Eugene, Oregon, or to the department concerned.

The following degrees are granted by the University through the Graduate Division:

Doctor of Philosophy: Economics, Education, English, History, Medical Sciences, Psychology, Romance Languages, Sociology.

Doctor of Education: Education.

Master of Arts (Departmental): Anthropology, Architecture, Art, Biology, Business Administration, Chemistry, Classics, Economics, Education, English, Geology and Geography, German, History, Journalism, Landscape Architecture, Mathematics, Medical Sciences, Music, Pacific Basin Studies, Philosophy, Physical Education, Physics, Political Science, Psychology, Romance Languages, Sociology.

Master of Arts (General Studies).

Master of Science: Anthropology, Architecture, Art, Biology, Business Administration, Chemistry, Economics, Education, English, Geology and Geography, History, Journalism, Landscape Architecture, Mathematics, Medical Sciences, Music, Pacific Basin Studies, Philosophy, Physical Education, Physics, Political Science, Psychology, Sociology.

Master of Fine Arts: Art and Architecture, Landscape Architecture, Music.

Master of Architecture: Architecture.

Master of Business Administration: Business Administration.

Master of Education: Education.

Master of Landscape Architecture: Landscape Architecture.

Master of Music: Music.

Graduate Work at the Medical School

THE University of Oregon Medical School offers graduate instruction leading to the Master of Arts, Master of Science, and Doctor of Philosophy degrees in the medical sciences: anatomy, bacteriology, biochemistry, pathology, pharmacology, and physiology. The Medical School admits as candidates for graduate degrees in these fields only those students who are preparing for a professional career in medicine or allied fields, such as dentistry, nursing, and work as a medical or dental technician. Work toward these degrees is offered as an integral part of the program of the Graduate Division, and is subject to the rules and regulations of the Graduate Division. Graduate degrees earned at the Medical School are conferred by the University of Oregon, upon recommendation of the faculty of the Medical School.

In addition to opportunities for graduate study and research in the preclinical departments, arrangements may be made for special study of clinical problems by experimental methods, through the cooperation of the preclinical

and clinical departments. In some cases, students doing work of this kind may qualify for graduate degrees.

Graduate Work at the Portland Center

IF adequate course offerings are available for an integrated program in the fields in which the student wishes to work, he may complete all the requirements for the Master of Arts (General Studies) degree at the Portland Center. In a number of fields, one-third of the work for the Master of Arts (Departmental) or the Master of Science degree may be earned in Portland. Graduate work beyond the master's degree is not offered at the Portland Center. Graduate degrees earned at the Portland Center are awarded by the State College or the University according to major subject, in harmony with the allocation of curricula and degrees.

Master of Arts (General Studies)

IN addition to the regular Master of Arts (Departmental) degree, the State College and the University offer the degree of Master of Arts (General Studies) in fields in which graduate work is allocated to the institution. This degree is granted for achievement in cultural scholarship, not for specialized work in one of the traditional fields of learning. The student pursues a program of study selected from the offerings of several departments. The requirements are flexible, but the work must be integrated and organic. The student's thesis provides the focus which determines the selection of courses for his program.

The credit requirement for this degree is 45 term hours, including credit for thesis. The thesis shall be the equivalent, in point of performance, of nine term hours of course work.

A committee may, on recommendation of the student's adviser, waive the foreign-language requirement.

If adequate offerings are available in the fields in which he wishes to work, a student may complete all the requirements for the M.A. (General Studies) at the Portland Center.

The general-studies program at the State College is supervised by a special committee (William Henry Dreesen, chairman).

In addition to courses chosen from the offerings of the several State College schools and departments, the following courses are available for the general-studies student:

GSt 501. **Research in General Studies.** Terms and hours to be arranged.

GSt 503. **Graduate Thesis.** Terms and hours to be arranged.

GSt 505. **Reading and Conference.** Terms and hours to be arranged.

Part IV

Research

Research

ADVANCEMENT of human knowledge and technical and technological service to the commonwealth are recognized functions of institutions of higher learning. Research in the Oregon State System of Higher Education is encouraged and assisted through the General Research Council and divisional councils and by such special institutional agencies as the Agricultural Experiment Station and the Engineering Experiment Station of Oregon State College, and the Commonwealth Service Council of the University of Oregon.

The General Research Council

General Council

EARL LEROY PACKARD, Ph.D., Dean and Director of General Research; Chairman.

OLOF LARSELL, Ph.D., Sc.D., Dean of the Graduate Division; Vice Chairman.

WILLIAM F ALLEN, Ph.D., Professor of Anatomy.

CHANDLER BAKER BEALL, Ph.D., Professor of Romance Languages.

ROBEN JOHN MAASKE, Ph.D., President of Eastern Oregon College of Education.

ORIN KAY BURRELL, M.A., C.P.A., Professor of Business Administration.

RALPH RUSKIN HUESTIS, Ph.D., Professor of Zoology.

RALPH WALDO LEIGHTON, Ph.D., Executive Secretary of Research; Dean and Director of Physical Education.

FRED ORVILLE MCMILLAN, M.S., Professor of Electrical Engineering.

WILLIAM EDMUND MILNE, Ph.D., Professor of Mathematics.

WILLIAM ALFRED SCHOENFELD, M.B.A., Dean and Director of Agriculture.

HOWARD RICE TAYLOR, Ph.D., Professor of Psychology.

WILLIBALD WENIGER, Ph.D., Professor of Physics.

Natural Science Divisional Council

WILLIAM EDMUND MILNE, Ph.D., Professor of Mathematics; Chairman.

WALTER BENO BOLLEN, Ph.D., Associate Professor of Bacteriology.

NATHAN FASTEN, Ph.D., Professor of Zoology.

JAMES WILLIAMS FERGUSON, Ph.D., Assistant Professor of Chemistry.

SAMUEL HERMAN GRAF, M.E., M.S., Professor of Mechanical Engineering.

EDWIN THOMAS HODGE, Ph.D., Professor of Economic Geology.

RALPH RUSKIN HUESTIS, Ph.D., Professor of Zoology.

ADOLF HENRY KUNZ, Ph.D., Associate Professor of Chemistry.

EARL GEORGE MASON, M.F., Professor of Forestry.

DON CARLOS MOTE, Ph.D., Professor of Entomology.

ETHEL IDA SANBORN, Ph.D., Associate Professor of Botany.

ERNST THEODORE STUHR, M.S., Associate Professor of Pharmacology.

WILLIBALD WENIGER, Ph.D., Professor of Physics.
EDWARD STAUNTON WEST, Ph.D., Professor of Biochemistry.
JESSAMINE CHAPMAN WILLIAMS, M.A., Professor of Foods and Nutrition.
HARRY BARCLAY YOCOM, Ph.D., Professor of Zoology.

Language, Literature, Art Divisional Council

CHANDLER BAKER BEALL, Ph.D., Professor of Romance Languages; Chairman.
LOUIS ARTAU, B.A., Assistant Professor of Music.
FREDERICK MALCOLM COMBELLACK, Ph.D., Instructor in Latin and Greek.
JOHN LEO FAIRBANKS, Professor of Art and Architecture.
ROBERT DEWEY HORN, Ph.D., Associate Professor of English.
JOHN M KIERZEK, Ph.D., Professor of English.
EDWARD CHRISTIAN ALAN LESCH, Ph.D., Associate Professor of English.
GEORGE FREDERIC LUSSKY, Ph.D., Professor of Germanic Languages and Literatures.

Medical Science Divisional Council

WILLIAM F ALLEN, Ph.D., Professor of Anatomy, Chairman.
NOBLE WILEY JONES, M.D., Clinical Professor of Medicine.
OLOF LARSELL, Ph.D., Sc.D., Professor of Anatomy.
FRANK R MENNE, M.D., Professor of Pathology.
FRANK R MOUNT, M.D., Assistant Clinical Professor of Medicine.
HARRY JOHNSON SEARS, Ph.D., Professor of Bacteriology.
EDWARD STAUNTON WEST, Ph.D., Professor of Biochemistry.

Social Science Divisional Council

ORIN KAY BURRELL, M.A., C.P.A., Professor of Business Administration.
GLENN ALMER BAKKUM, Ph.D., Professor of Sociology.
JAMES DUFF BARNETT, Ph.D., Professor of Political Science.
VERA HASKELL BRANDON, Ph.D., Professor of Household Administration.
JOSEPH WALDO ELLISON, Ph.D., Professor of History.
HOMER GARNER BARNETT, Ph.D., Instructor in Anthropology.
JAMES RALPH JEWELL, Ph.D., LL.D., Dean of Education; Director of High School Teacher Training.
ROBERT W LEEPER, Ph.D., Assistant Professor of Psychology.
MILTON NELS NELSON, Ph.D., Professor of Economics.
KENNETH JOHN O'CONNELL, LL.B., S.J.D., Assistant Professor of Law.
HARVEY GATES TOWNSEND, Ph.D., Professor of Philosophy.
GEORGE STANLEY TURNBULL, M.A., Professor of Journalism.
LOUIS AUBREY WOOD, Ph.D., Professor of Economics.

THE General Research Council was established as an interinstitutional organization by the State Board of Higher Education for the purpose of stimulating the development of general research among the staff members of the State System whose projects do not fall in the organized and directed program of other research agencies at the State College and the University.

By subsequent action of the State Board, four divisional councils have been designated as follows: Language, Literature, and Art; Medical Science; Science; and Social Science. The divisional councils are advisory bodies assisting in the encouragement of research in their respective fields, in the development of cooperative research, and in the examination and evaluation of all projects for which research funds are requested.

The Dean and Director of General Research is chairman of the General Research Council and the budgetary officer. The General Research Council is concerned with the general policies affecting the research interests of staff members. It prepares annually and submits a budget for the support of general research. The council is authorized to make grants-in-aid to approved research projects initiated by staff members of the major institutions of the State System. Such grants are restricted to individuals or groups of individuals of the rank of instructor or higher. The General Research Council also assigns research assistants, research scholars, and research fellows to approved research projects requiring the technical assistance of graduate students. Assistantships, scholarships, and fellowships carry stipends of $550, $650, and $760 respectively. Appointments are made jointly by the Research Council and the Graduate Division.

Agricultural Experiment Station

WILLIAM ALFRED SCHOENFELD, M.B.A., Director of the Agricultural Experiment Station.

RALPH STEPHEN BESSE, M.S., Assistant Director of the Agricultural Experiment Station.

ESTHER FLORA MCKINNEY, Accountant, Agricultural Experiment Station.

MARGARET HURST, B.S., Secretary, Agricultural Experiment Station.

DIVISION OF AGRICULTURAL ECONOMICS

ERMINE LAWRENCE POTTER, M.S., Agricultural Economist; In Charge, Division of Agricultural Economics.

Agricultural Economics

WILLIAM HENRY DREESEN, Ph.D., Agricultural Economist.

DANIEL BARTON DELOACH, Ph.D., Associate Agricultural Economist.

Farm Management

DWIGHT CURTIS MUMFORD, M.S., Economist in Charge.

GUSTAV WESLEY KUHLMAN, Ph.D., Associate Economist.

GEORGE BALFOUR DAVIS, B.S., Research Assistant (Farm Management).

HERMAN LAMOTTE THOMAS, M.S., Associate Agricultural Economist, Conservation Economic Division, Soil Conservation, United States Department of Agriculture.

JAMES CECIL MOORE, M.S., Acting State Representative, Division of State and Local Planning, Bureau of Agricultural Economics, United States Department of Agriculture.

DIVISION OF ANIMAL INDUSTRIES

PHILIP MARTIN BRANDT, A.M., Dairy Husbandman; In Charge, Division of Animal Industries.

Animal Husbandry

RAY GEORGE JOHNSON, B.S., Animal Husbandman.

ORAN MILTON NELSON, M.S., Animal Husbandman.

ALFRED WEAVER OLIVER, M.S., Associate Animal Husbandman.

BENJAMIN WILLIAM RODENWOLD, M.S., Assistant Animal Husbandman.

Dairy Husbandry

GUSTAV HANS WILSTER, Ph.D., Dairy Husbandman.

IDWAL RALPH JONES, Ph.D., Dairy Husbandman.

HAROLD PLYMPTON EWALT, B.S., Research Assistant (Dairy Husbandry).

*ROY EDGAR STOUT, M.S., Research Assistant (Dairy Husbandry).

JOHN HARKNESS BYERS, M.S., Research Assistant (Dairy Husbandry).

Fish and Game Management

ROLAND EUGENE DIMICK, M.S., Wildlife Conservationist in Charge.

FRANCIS PRIDAY GRIFFITHS, Ph.D., Assistant Conservationist.

ARTHUR SKOGMAN EINARSEN, B.S., Associate Biologist, Bureau of Biological Survey, United States Department of the Interior.

JAY B LONG, B.S., Research Assistant (Fish and Game Management).

HARVEY DUNKEL RONNE, B.S., Research Assistant (Fish and Game Management).

Poultry Husbandry

HUBERT ELMER COSBY, Poultry Husbandman in Charge.

CLAYTON ERNEST HOLMES, Ph.D., Associate Poultry Husbandman.

WILBUR TARLETON COONEY, B.S., Research Assistant (Poultry Husbandry).

Veterinary Medicine

JAMES NIVEN SHAW, B.S., D.V.M., Veterinarian in Charge.

ERNEST MILTON DICKINSON, D.V.M., M.S., Veterinarian.

OTTO HERBERT MUTH, D.V.M., M.S., Associate Veterinarian.

ROBERT WATSON DOUGHERTY, D.V.M., M.S., Assistant Veterinarian, Agricultural Experiment Station; Cooperative Agent, Bureau of Animal Industry, United States Department of Agriculture.

ARNOLD SAMUEL ROSENWALD, B.S., D.V.M., Assistant Veterinarian.

WILLIAM ROBERT JONES, D.V.M., Junior Veterinarian, Bureau of Animal Industries, United States Department of Agriculture.

MERWYN PIERCE CHAPMAN, Research Assistant (Veterinary Medicine).

KENNETH STANTON JONES, D.V.M., Research Assistant (Veterinary Medicine).

DIVISION OF PLANT INDUSTRIES

GEORGE ROBERT HYSLOP, B.S., Agronomist; In Charge, Division of Plant Industries.

* On leave of absence.

Farm Crops

HARRY AUGUST SCHOTH, M.S., Agronomist, Division of Forage Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

DONALD DAVID HILL, Ph.D., Agronomist.

ROBERT ESTES FORE, Ph.D., Associate Agronomist.

HENRY HARDY RAMPTON, M.S., Associate Agronomist, Division of Forage Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

LINDEN ELI HARRIS, M.S., Associate Agronomist.

HAROLD ETHAN FINNELL, M.S., Assistant Agronomist.

ELTON NELSON, B.S., Agent, Division of Cotton and other Fiber Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

LOUISA AMES KANIPE, B.S., Assistant Seed Technologist (Junior Botanist), Division of Seed Investigations, Bureau of Plant Industry, United States Department of Agriculture.

LEROY ROBERT HANSEN, M.S., Research Assistant (Farm Crops).

HENRY RAYMOND FORTMANN, B.S., Research Graduate Assistant (Farm Crops).

Food Industries

ERNEST HERMAN WIEGAND, B.S.A., Technologist in Charge.

THOMAS ONSDORFF, M.S., Associate Technologist.

EDWARD WINSLOW HARVEY, Ph.D., Assistant Technologist.

HERBERT STANFORD MADSEN, B.S., Assistant Technologist.

Horticulture

WALTER SHELDON BROWN, M.S., D.Sc., Horticulturist.

HENRY HARTMAN, M.S., Horticulturist (Pomology).

*WILLIS PIERRE DURUZ, Ph.D., Horticulturist (Plant Propagation).

ARTHUR GEORGE BRISTOW BOUQUET, M.S., Horticulturist (Vegetable Crops).

CARL EPHRAIM SCHUSTER, M.S., Horticulturist, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

GEORGE FORDYCE WALDO, M.S., Associate Pomologist, Division of Fruits and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

ELMER HANSEN, M.S., Assistant Horticulturist (Pomology).

ALFRED NATHAN ROBERTS, M.S., Research Assistant (Horticulture).

Soil Science

WILBUR LOUIS POWERS, Ph.D., Soil Scientist in Charge.

CHARLES VLADIS RUZEK, M.S., Soil Scientist (Fertility).

MORTIMER REED LEWIS, C.E., Irrigation and Drainage Engineer, Soil Conservation.

ROSCOE ELMO STEPHENSON, Ph.D., Soil Scientist.

EDWARD FRITCHOFF TORGERSON, B.S., Associate Soil Scientist (Soil Survey).

* On leave of absence.

JOHN MELVILLE HALEY, B.S., Assistant Irrigation Engineer, Cooperative Agent, Soil Conservation Service, United States Department of Agriculture.

ALBERT WILLIAM MARSH, M.S., Research Graduate Assistant (Soils).

HAROLD ERNEST DREGNE, M.S., Research Graduate Assistant (Soils).

HARRY EDWIN CLARK, B.S., Research Graduate Assistant (Soils).

OTHER DEPARTMENTS

Agricultural Chemistry

J SHIRLEY JONES, M.S.A., Chemist in Charge.

REGINALD HEBER ROBINSON, M.S., Chemist (Insecticides and Fungicides).

JOSEPH ROY HAAG, Ph.D., Chemist (Animal Nutrition).

DELOSS EVERETT BULLIS, M.S., Associate Chemist.

MILES BRAYTON HATCH, M.S., Assistant Chemist.

PAUL HENRY WESWIG, Ph.D., Assistant Chemist.

Agricultural Engineering

FREDERICK EARL PRICE, B.S., Agricultural Engineer in Charge.

WILLIAM MAGRUDER HURST, B.S., Agricultural Engineer, Bureau of Agricultural Chemistry and Engineering, United States Department of Agriculture.

*HERBERT REEVES SINNARD, M.S., R.A., Associate Agricultural Engineer (Farm Structures).

*CLARENCE IVAN BRANTON, B.S., Assistant Agricultural Engineer.

GEORGE RAYMOND STAFFORD, Engineering Aid, Bureau of Agricultural Chemistry and Engineering, United States Department of Agriculture.

HOWARD FRANCIS CARNES, B.S., Junior Agricultural Engineer, Bureau of Agricultural Chemistry and Engineering, United States Department of Agriculture.

LEONARD MARTIN KLEIN, B.S., Mechanical Engineer, Bureau of Agricultural Chemistry and Engineering, United States Department of Agriculture.

Bacteriology

GODFREY VERNON COPSON, M.S., Bacteriologist in Charge.

JOSEPH ELLSWORTH SIMMONS, M.S., Bacteriologist.

WALTER BENO BOLLEN, Ph.D., Associate Bacteriologist.

CARL LAMANNA, Ph.D., Research Assistant in Bacteriology.

Entomology

DON CARLOS MOTE, Ph.D., Entomologist in Charge.

BENJAMIN GARRISON THOMPSON, Ph.D., Associate Entomologist.

SIDNEY CARROLL JONES, M.S., Associate Entomologist.

KENNETH WIESNER GRAY, M.S., Associate Entomologist.

JOE SCHUH, M.S., Assistant Entomologist.

HUGH ENGLE MORRISON, M.S., Assistant in Entomology.

Home Economics

MAUD MATHES WILSON, A.M., Home Economist.

* On leave of absence.

Plant Pathology

CHARLES ELMER OWENS, Ph.D., Plant Pathologist in Charge.

SANFORD MYRON ZELLER, Ph.D., Plant Pathologist.

FRANK PADEN MCWHORTER, Ph.D., Plant Pathologist.

BLISS F DANA, M.S., Plant Pathologist, Division of Fruits and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

FLOYD DOUGLAS BAILEY, M.S., Associate Pathologist, Insecticide Control Division, Agricultural Marketing Service, United States Department of Agriculture.

PAUL WILLIAM MILLER, Ph.D., Associate Pathologist, Division of Fruits and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

GODFREY RICHARD HOERNER, M.S., Agent, Division of Drugs and Related Plants, Bureau of Plant Industry, United States Department of Agriculture.

JOHN A MILBRATH, Ph.D., Assistant Plant Pathologist.

Publications and News Service

CHARLES DAVID BYRNE, Ed.D., Director of Information.

EDWIN THOMAS REED, B.S., A.B., Editor of Publications.

FRANK LLEWELLYN BALLARD, B.S., Editor of Agricultural Publications.

DELMER MORRISON GOODE, M.A., Editor of Publications.

JOHN COLE BURTNER, B.S., In Charge of News Service.

BRANCH STATIONS

LEROY CHILDS, A.B., Superintendent, Hood River Branch Experiment Station, Hood River.

FRANK CHARLES REIMER, M.S., Superintendent, Southern Oregon Branch Experiment Station, Talent.

DALE EVERETTE RICHARDS, B.S., Superintendent, Eastern Oregon Livestock Branch Experiment Station, Union.

HAROLD KARL DEAN, B.S., Superintendent, Umatilla Branch Experiment Station, Hermiston; Division of Western Irrigation Agriculture, Bureau of Plant Industry, United States Department of Agriculture.

HERBERT BADOLLET HOWELL, B.S., Superintendent, John Jacob Astor Branch Experiment Station, Astoria.

GEORGE ADAMSON MITCHELL, B.S., Superintendent, Pendleton Branch Experiment Station, Pendleton; Assistant Agronomist, Division of Dry Land Agriculture, Bureau of Plant Industry, United States Department of Agriculture.

MERRILL MAHONRI OVESON, M.S., Superintendent, Sherman Branch Experiment Station, Moro; Division of Cereal Crops and Diseases and Division of Dry Land Agriculture, Bureau of Plant Industry, United States Department of Agriculture.

ELLIOTT STANFORD DEGMAN, Ph.D., Superintendent, Medford Branch Station, Medford; Associate Pomologist, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

OBIL SHATTUCK, M.S., Assistant Superintendent, Squaw Butte-Harney Cooperative Range and Livestock Station, Burns.

ARCH WORK, B.S., Associate Irrigation Engineer, Division of Irrigation, Soil Conservation Service, United States Department of Agriculture, Medford.

KENNETH COLE IKELER, M.S., Superintendent, Squaw Butte-Harney Cooperative Range and Livestock Station, Burns, United States Grazing Service, Department of the Interior.

LOUIS GUSTAV GENTNER, M.S., Assistant Superintendent and Associate Entomologist, Southern Oregon Branch Experiment Station, Talent.

JAMES FOSTER MARTIN, M.S., Junior Agronomist, Division of Cereal Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

J. R. KIENHOLZ, Ph.D., Assistant Pathologist, Division of Fruit and Vegetable Crops and Diseases, Hood River.

JOSEPH BELANGER, B.S., Cooperative Research Agent, Conservation Experiment Station Division, Soil Conservation Service, Moro.

SEA FOOD LABORATORY

EDWARD WINSLOW HARVEY, Ph.D., Assistant Technologist, Project Leader, Sea Food Laboratory, Astoria.

FRANK HENRY ALLHANDS, Research Assistant in Food Technology, Sea Food Laboratory, Astoria.

AGRICULTURAL EXPERIMENTAL AREAS

HERBERT BADOLLET HOWELL, B.S., Superintendent, Northrup Creek Cut-over Land Grazing Experimental Area.

ALVIN EUGENE GROSS, M.S., Superintendent, Klamath Experimental Area and Nematode Project, Klamath Falls.

THOMAS HAMILTON DEARMOND, B.S., Superintendent, Red Hill Soils Experimental Area, Oregon City.

OREGON State Agricultural Experiment Station was organized July 2, 1888, in accordance with the Act of Congress of 1887 known as the Hatch Act. The Experiment Station includes the central station at Corvallis and nine branch stations and four experimental areas advantageously located in such a way as to cover the varying agricultural conditions of Oregon.

The Central Station. At the central station about 1,177 acres of land are used by State College and Station workers engaged in the scientific investigation of problems presented by the different branches of agriculture. The Station includes the following departments: Agricultural Economics; Agricultural Engineering; Animal Husbandry; Bacteriology; Chemistry; Dairy Husbandry; Entomology; Farm Crops; Farm Management; Food Industries; Fish and Game Management; Home Economics; Horticulture; Plant Pathology; Poultry Husbandry; Soils; and Veterinary Medicine.

The scientific investigations of the station staff strongly support the instruction given in the classroom and through the Extension Service. Aside from the original investigations of economic significance to agriculture, the work affords daily object lessons in modern farm methods. To the students in the various fields of study the value of the investigative work can hardly be

overestimated. To the state, from the point of view of economic progress, its value has been greater, in the estimation of many people, than the entire cost of the State College to the commonwealth. The work of the Experiment Station is fundamental in the agricultural development of the state. Oregon's soil and climatic conditions present many problems that are unique and that must be solved before the state can develop its great potential agricultural wealth.

The Branch Stations and Experimental Areas. The nine branch stations located at Astoria, Burns, Hermiston, Hood River, Medford, Moro, Talent, Union, and Pendleton and the four experimental areas located at Birkenfeld, Klamath, Ontario, and Oregon City conduct experiments on the major agricultural problems of their respective agricultural sections of the state.

The John Jacob Astor Branch Experiment Station. The major problems under investigation at this station are dairying, improvement of forage crops, soil fertility, soil management for Coast conditions, and the drainage, improvement, and cultivation of tide-lands.

The Umatilla Branch Experiment Station at Hermiston is studying problems of agriculture under irrigation on the Umatilla Reclamation Project and similar lands of the Columbia River Basin.

The Hood River Branch Experiment Station deals with orchard pests, pollination, varietal testing, fertilizing, soil management, and other problems to reduce cost of producing fruit in this important orcharding section.

The Sherman Branch Experiment Station at Moro is conducting investigations on the major problems of cereal production under eastern Oregon dry land conditions with special reference to the development of new and improved varieties, rates and dates of seeding, summer fallow, fertility, drainage practices, and soil conservation.

The Southern Oregon Branch Experiment Station at Talent is centering attention on problems of fruit production and general farming in the Rogue River Valley.

The Eastern Oregon Branch Livestock Experiment Station at Union is conducting experiments in fattening, wintering, grazing and management of livestock in the production of home-grown livestock, feeds and cash crops and in developing proper land utilization, soil conservation and fertility maintenance in the Blue Mountain region.

The Medford Branch Experiment Station is conducted jointly by the United States Department of Agriculture, Bureau of Plant Industry and Soil Conservation, and the Oregon Agricultural Experiment Station. The major investigations deal primarily with problems of irrigation, drainage and soil fertility, and responses of pear trees to these practices.

The Pendleton Branch Experiment Station conducted cooperatively with the United States Department of Agriculture is equipped with 160 acres of land in an important wheat-growing belt for the purpose of establishing and maintaining crop rotation and soil conservation investigations.

The Squaw Butte-Harney Cooperative Range and Livestock Station consists of 16,000 acres of intermountain arid range lands used for experimental grazing work under controlled conditions with the object of rehabilitating depleted and

wornout ranges; 183 acres of irrigated land used in conducting experiments in the production of alfalfa hay, legumes, and forage for livestock feeding and in introducing, testing, and developing cash crops adapted to the high altitude areas of the Harney Basin; 520 acres of native meadow land used for experimental fall and winter pasture and for the production of native hay for feeding experimental livestock. The combination of range and meadow land makes a complete experimental unit conducted cooperatively and jointly by the Oregon Agricultural Experiment Station and the U. S. Grazing Service, Department of the Interior.

The Northrup Creek Experimental Area located near Birkenfeld, Oregon, is conducting investigations in the utilization of logged-off timber lands by experimenting with sod-forming grasses on such lands and the utilization of the forage by livestock.

The Klamath Experimental Area is conducting research in the control of nematodes and other pests and diseases of potatoes and in developing economic uses for class 5 lands, of which there are 12 to 15 thousand acres in the Klamath irrigated basin.

The Malheur Experimental Area is devoted to experiments in the economic production of vegetable and crop seeds and forage under the irrigated conditions of the Vale-Owyhee project and in the production and utilization of forage crops for livestock.

The Red Soils Experimental Area is centering attention on rebuilding wornout red hill soils, of which there are approximately 800,000 acres in the Willamette Valley.

Engineering Experiment Station

RICHARD HAROLD DEARBORN, A.B., E.E., Director of the Engineering Experiment Station.

SAMUEL HERMAN GRAF, M.E., M.S., Director of Engineering Research.

ARTHUR LEMUEL ALBERT, M.S., E.E., Communication Engineering.

*FREDERICK ALTON EVEREST, E.E., Radio Engineering.

GEORGE WALTER GLEESON, Ch.E., Chemical Engineering.

BURDETTE GLENN, M.S., Highway Engineering.

*JAMES RINALDO GRIFFITH, C.E., Structural Engineering.

FRED ORVILLE MCMILLAN, M.S., Electrical Engineering.

WALLACE HOPE MARTIN, M.E., M.S., Mechanical Engineering.

EARL GEORGE MASON, M.F., Forestry.

FRED MERRYFIELD, M.S., Sanitary Engineering.

CHARLES ARTHUR MOCKMORE, C.E., Ph.D., Civil and Hydraulic Engineering.

WILLIAM HOWARD PAUL, M.S., Automotive Engineering.

BENJAMIN FRANKLIN RUFFNER, Aero.E., M.S., Aeronautical Engineering.

EUGENE CARL STARR, B.S., E.E., Electrical Engineering.

CHARLES EDWIN THOMAS, M.M.E., Engineering Materials.

GLENN VOORHIES, M.S., F.E., Wood Products.

* On leave of absence.

Technical Counselors

R. H. BALDOCK, State Highway Engineer, Salem.

R. R. CLARK, Designing Engineer, Corps of Engineers, Portland District, Portland.

C. B. MCCULLOUGH, Assistant State Highway Engineer, Salem.

R. G. DIECK, Consulting Civil Engineer, Portland.

CLAIR VAN NORMAN LANGTON, Dr.P.H., Ed.D., Technical Counselor in Sanitary Engineering.

PAUL B. MCKEE, President, Portland Gas & Coke Company, Portland.

JAMES H. POLHEMUS, President, Portland General Electric Co., Portland.

J. C. STEVENS, Consulting Civil and Hydraulic Engineer, Portland.

CHARLES E. STRICKLIN, State Engineer, Salem.

BY ACT of the Board of Regents of the State College on May 4, 1927, the Engineering Experiment Station was established at Corvallis to serve the state in a manner broadly outlined by the following policy:

(1) To serve the industries, utilities, professional engineers, public departments, and engineering teachers by making investigations of significance and interest to them.

(2) To stimulate and elevate engineering education by developing the research spirit in faculty and students.

(3) To publish and distribute through bulletins, circulars, and technical articles in periodicals the results of such studies, surveys, tests, investigations, and researches as will be of greatest benefit to the people of Oregon, and particularly to the state's industries, utilities, and professional engineers.

The Engineering Experiment Station is an integral part of the School of Engineering. All staff members and laboratory facilities of the Engineering School are available for the investigational work of the Station to the extent of the sums allocated or contributed for their operation and support. Much of the work of the Station has been made possible by the assistance of industries and state and national associations.

The dean of engineering is director of the station, and the heads of the various major departments function as a council ex-officiis. The director of research acts as chairman of the council, technical adviser upon investigation work, and as engineering editor of publications. The active staff is composed of members of the instructional staff who may be interested in various specific research projects, and of research fellows who are pursuing graduate study and are assigned to part-time work in the Station. Experts who are especially qualified by training and experience to advise upon the investigations in certain fields have been appointed to the staff as special technical counselors. Some technical assistants have been supported by manufacturers and industrial associations interested in working out specific problems.

Part V

Extension

Extension

THROUGH extension services the benefits of all the state institutions of higher education are brought to the people of the state in their own communities. All divisions of the State System of Higher Education seek through every means possible, so far as resources and facilities permit, to serve the entire state. All extension activities of the several institutions are administered through two coordinated extension services: the General Extension Division and the Federal Cooperative Extension Service. The latter includes all extension activities carried on jointly with the Federal Government.

General Extension Division

Administration

VERNE VINCENT CALDWELL, Ph.D., Dean and Director of General Extension and Summer Sessions; Professor of Psychology.

WILLIAM GILBERT BEATTIE, B.A., Assistant Director of General Extension; Professor of Education.

MARY E KENT, B.A., Eugene, Office Manager; Assistant Professor of Extension Teaching.

Correspondence Study

MOZELLE HAIR, B.A., Head, Correspondence Study; Assistant Professor of Sociology.

HELEN K KILPATRICK, Record Clerk.

MARY E SHELDON, Mimeograph Clerk.

LEONA SPEER, Record Clerk.

State-Wide Extension Classes

WILLIAM GILBERT BEATTIE, B.A., Assistant Director of General Extension; Professor of Education.

ELSIE M ISOTOFF, Secretary.

Portland Extension Center

VERNE VINCENT CALDWELL, Ph.D., Professor of Psychology.

EDWARD M HULME, M.A., Professor of History.

MABLE HOLMES PARSONS, M.A., Professor of English.

ALFRED POWERS, B.A., Professor of Journalism.

BERNARD HINSHAW, B.A., Associate Professor of Art.

PHILIP WOOD JANNEY, B.A., C.P.A., Associate Professor of Business Administration.

LOUIS BERELSON, Ph.D., Assistant Professor of English; Adviser in General Studies.

PERCY M COLLIER, B.A., LL.B., Assistant Professor of English.
MARGARET M SHARP, Administrative Assistant.
MAURINE W CHURCHILL, Secretary.

Radio Station KOAC

VERNE VINCENT CALDWELL, Ph.D., Acting Manager.
ZELTA FEIKE RODENWOLD, M.S., Chairman, KOAC Program Staff; Director of Women's Program; Assistant Professor of Home Economics Extension.
BURTON SEYMOUR HUTTON, B.S., Director of Agricultural Programs.
*KENNETH SCOTT WOOD, M.A., Director of News and General-Interest Programs.
JAMES MADISON MORRIS, B.S., Announcer.
HELEN BREDING, B.S., Secretary.

Visual Instruction

URIEL SELLERS BURT, Head of Department; Associate Professor of Visual Instruction.
RUTH P ADAMS, Secretary.

In-Service Extension in Elementary Education

HARVEY EDGAR INLOW, M.A., LL.B., Head of Department; Professor of Elementary Teacher In-Service Extension Education.

Summer Sessions

VERNE VINCENT CALDWELL, Ph.D., Director of Summer Sessions; Director, Portland Summer Session.
LOUIS BERELSON, Ph.D., Secretary of Summer Sessions.

THE General Extension Division of the Oregon State System of Higher Education serves the people of the state through adult education by means of extension classes, correspondence study, visual instruction, and radio, and administers the summer sessions of the institutions of the State System. Its work is organized into the following departments:

At Corvallis: Visual Instruction; Radio Station KOAC.
At Eugene: Correspondence Study; State-Wide Extension Classes.
At Portland: Portland Extension Center; Summer Sessions.
At Monmouth: In-Service Extension in Elementary Education.

A State-Wide Campus. Through the General Extension Division the curricula, personnel, and facilities of all the state institutions of higher education are made available in some degree to every citizen, group, and community in Oregon. The activities of the General Extension Division are closely coordinated with those of the Federal Cooperative Extension Service and all other organized service agencies in the state.

Portland Extension Center. General extension in Portland is carried on through the Portland Extension Center, 814 Oregon Building. One hundred

* On leave of absence 1941-42.

and forty-four evening, late afternoon, and Saturday morning courses in thirty-two different departments and professional schools were offered during the academic year 1941-42. The work of these classes is of standard college or university grade. Resident credit at the University, the State College, or the colleges of education may be earned through these courses. Courses may be taken at the Portland Extension Center for graduate credit toward a master's degree at the University or the State College. Detailed information is published in the Portland Extension Center Announcements.

Correspondence Study. Study at home under competent supervision is possible for any resident of Oregon through carefully organized courses of instruction prepared by members of the faculties of the Oregon State System of Higher Education. These lesson outlines take the place of lectures and class exercises given to students in residence. More than two hundred courses in a wide variety of subjects are offered. Courses may be taken without credit by persons who enjoy the intellectual stimulus of organized, directed study, or they may be taken for credit toward a college degree. There are no special entrance requirements to correspondence courses; any adult who has sufficient preparation to profit from them may enroll. Complete information is published in a special Correspondence Study Catalog.

Visual Instruction. The Department of Visual Instruction provides glass and film slides, microscopic slides, and motion picture films suitable for educational use by schools, community clubs, and other organizations. A special catalog is published listing the material available. This department is maintained jointly by the General Extension Division and the Federal Cooperative Extension Service.

Radio Station KOAC. Radio Station KOAC is Oregon's public-owned station of which the State Board of Higher Education is the managing agency. The station is located at Corvallis, Oregon, on the campus of Oregon State College, the licensee and operator of the physical plant. The General Extension Division of the State System of Higher Education directs the program service. Program talent is drawn from Oregon State College, the University of Oregon, the Oregon colleges of education, and from various departments of the state government. In addition, various other public agencies, organizations, and individuals contribute frequently to broadcasts from the station. The station, established in 1925, is operated entirely in the interest of the Oregon public. The programs are absolutely free from commercialism. The radio service is used as a means of extending throughout the state the benefits of the varied activities of all the state institutions of higher education. KOAC operates with 5,000 watts power on a frequency of 550 kilocycles by authority of the Federal Radio Commission. Announcements of radio programs are issued periodically, and will be furnished on request.

The Summer Sessions. The summer sessions of the several institutions, although a phase of resident instruction, are administered under the General Extension Division. The 1942 summer sessions include two five-week sessions at the University in Eugene, at the State College in Corvallis, at each of the three colleges of education (in Monmouth, Ashland, and LaGrande), and at the Portland Extension Center. The Portland summer session offers work for the University, the State College, and the colleges of education. At the University, State College, and Portland sessions, both undergraduate and graduate courses are offered. Information concerning the summer sessions is issued in separate bulletins.

Federal Cooperative Extension Service

Extension Staff at Corvallis

Administration

WILLIAM ALFRED SCHOENFELD, M.B.A., Director, Extension Service.
WILLIAM LEROY TEUTSCH, B.S., Assistant Director, Extension Service.
CHARLES WESLEY SMITH, B.S., County Agent Leader.
AZALEA LINFIELD SAGER, M.A., State Home Demonstration Leader.
HARRY CASE SEYMOUR, State Leader of 4-H Club Work.
CLIFFORD LOVEJOY SMITH, M.S., Assistant County Agent Leader.
JOHN MYERS CLIFFORD, Extension Secretary.

Professors

*FRANK LLEWELLYN BALLARD, B.S., Editor of Agricultural Publications.
LE ROY BREITHAUPT, B.S., Extension Agricultural Economist (Statistics, News, and Outlook).
OVID TULLIUS MCWHORTER, B.S., Extension Horticulturist.
EDWIN RUSSELL JACKMAN, B.S., Specialist in Farm Crops.
HARRY GRANT AVERY, B.S., Assistant Extension Economist, Marketing.
PAUL CARPENTER, B.S., Extension Agricultural Economist (Marketing).
ROGER WILLIAM MORSE, B.S., Extension Dairyman.
JAMES RALPH BECK, B.S., Specialist in Land Use Planning.
*RAY GEORGE JOHNSON, B.S., Specialist in Range Management.
HARRY ARTHUR LINDGREN, B.S., Extension Animal Husbandman.

Associate Professors

HELEN JULIA COWGILL, M.A., Assistant State 4-H Club Leader.
LEONARD JOHN ALLEN, M.S., Assistant State 4-H Club Leader.
*URIEL SELLERS BURT, Specialist in Visual Instruction.
LUCY ADA CASE, M.A., Extension Nutritionist.
MABEL CLAIR MACK, M.S., Extension Nutritionist.
*JOHN COLE BURTNER, B.S., Extension Editor.

Assistant Professors

HAROLD H WHITE, M.S., Associate Extension Economist.
ARTHUR SOLOMON KING, M.S., Specialist in Soils.
IZOLA DOROTHY JENSEN, M.A. Specialist in Community Social Organization.
NOEL LINDSAY BENNION, M.S., Extension Poultryman.
LOIS AILEEN LUTZ, M.A., Specialist in Home Management.
LUCY ROCENA LANE, M.A., Specialist in Clothing and Textiles.
LAWRENCE COATS JENKINS, B.S., Assistant Specialist in Farm Crops.
MARION DAWS THOMAS, B.S., Assistant Extension Economist.

* Part time, Federal Cooperative Extension.

Instructors

GERALD TITUS NEWCOMB, M.S., Assistant Soils Specialist.
ROBERT H STERLING, B.S., Assistant Specialist in Land Use Planning.

County Extension Agents

Professors

WALTER ARMAND HOLT, B.S., County Agent, Umatilla County.
CHARLES ALBERT HENDERSON, B.S., County Agent, Klamath County.
OTTIS SCHULER FLETCHER, M.S., County Agent, Lane County.
ROBERT GREY FOWLER, B.S., County Agent, Jackson County.
WILLIAM FLETCHER CYRUS, B.S., County Agent, Washington County.
SYLVESTER BENJAMIN HALL, B.S., County Agent, Multnomah County.
JOHN JERRY INSKEEP, B.S., County Agent, Clackamas County.
GEORGE HERRICK JENKINS, B.S., County Agent, Coos County.
WILLIAM SAMUEL AVERILL, B.S., County Agent, Benton County.

Associate Professors

GEORGE ALLEN NELSON, B.S., County Agent, Columbia County.
PHILIP TUTHILL FORTNER, B.S., County Agent, Baker County.
DAVID HONORE KENNEDY, B.S., Club Agent, Tillamook County.
RICHARD CARL KUEHNER, B.S., Club Agent, Lane County.
ARCHIE LEE MARBLE, B.S.A., County Agent, Hood River County.
CHESTER HAROLD BERGSTROM, B.S., County Agent, Tillamook County.
WILBUR WRAY LAWRENCE, B.S., County Agent, Wasco County.
VICTOR WALDEMAR JOHNSON, B.S., County Agent, Lake County.
FRANCES ANN CLINTON, M.S., Home Agent, Marion County.
RALPH EDWARD BROOKE, M.S., County Agent, Malheur County.
GUSTAVE YNGVE HAGGLUND, B.S., County Agent, Deschutes County.
JAMES ROLAND PARKER, M.S., County Agent, Douglas County.
REX WARREN, M.S., County Agent, Yamhill County.
WALTER CHRISTIAN LETH, B.S., County Agent, Polk County.

Assistant Professors

LEROY CLINTON WRIGHT, B.S., County Agent, Sherman County.
CLAY CARL MILLER, B.S., Club Agent, Multnomah County.
ROBERT MYRON KNOX, B.S., County Agent, Curry County.
GARNET DOUGLAS BEST, B.S., County Agent, Wallowa County.
*CHARLES JOSEPH WEBER, B.S., Urban Club Agent, Portland.
FLOYD CHARLES MULLEN, B.S., County Agent, Linn County.
†HARRY LABARE RICHES, B.S., County Agent, Marion County.
AFTON ZUNDEL, B.S., County Agent, Clatsop County.

* Part time, Federal Cooperative Extension.
† On leave of absence.

OLIVER KENNETH BEALS, B.S., County Agent, Josephine County.
EARL A BRITTON, A.B., Club Agent, Douglas County.
MAUD CONWAY CASSWELL, B.S., Home Agent, Columbia County.
HAZEL PACKER, B.S., Home Agent, Yamhill County.
KENNETH WHITE SAWYER, B.S., County Agent, Jefferson County.
OSCAR EDWIN MIKESELL, B.S., Club Agent, Linn County.
WILLIAM ARTHUR SAWYER, B.S., County Agent, Harney County.
WINNIFRED KEIL GILLEN, M.S., Home Agent, Klamath County.
CLIFFORD CHARLES JENKINS, B.S., Club Agent, Klamath County.
ETHAN LINDEN WOODS, B.S., County Agent, Crook County.
NELLIE CATHERINE LYLE, M.S., Home Agent, Lane County.
MARJORIE ELLSWORTH, B.S., Home Agent, Union County.
RUTH ESTHER CRAWFORD, B.S., Home Agent, Josephine County.
HOWARD GEORGE SMITH, B.S., County Agent, Lincoln County.
CLIFFORD BERNARD CORDY, M.S., Assistant County Agent, Jackson County.
DOROTHY LAMB BISHOP, B.S., Home Agent, Coos County.
ROLAND WILLIAM SCHAAD, B.S., County Agent, Union County.
ROBERT EDWARD RIEDER, B.S., Acting County Agent, Marion County.
MELVIN EMMETT KNICKERBOCKER, B.S., County Agent, Grant County.
HELEN NORINE ALLEN, B.S., Home Agent, Clackamas County.

Instructors

ERNEST MILLARD HAUSER, B.S., Club Agent, Malheur County.
WAYNE D HARDING, Club Agent, Marion County.
LAWRENCE EDWARD FRANCIS, B.S., Club Agent, Jackson County.
EDWIN GUSTAVE KELTNER, B.S., Club Agent, Clackamas County.
ARNOLD CHRISTIAN EBERT, B.S., County Agent, Wheeler County.
HARRY FRANKLIN CLINE, B.S.A., Assistant County Agent, Umatilla County.
GRANT WELLINGTON PERRY, B.S., Assistant County Agent, Baker County.
CLIFFORD DE VERE CONRAD, B.S., County Agent, Morrow County.
*WALTER JOHN JENDRZEJEWSKI, B.S., Assistant County Agent, Klamath County.
WILLIAM FREDRICK MARSHALL, B.S., County Agent, Gilliam County.
PALMER STANLEY TORVEND, B.S., Assistant County Agent, Washington County.
*HARRY JAMES ENDICOTT, B.S., Assistant County Agent, Malheur County.
STONEWALL ANDREW JACKSON, B.S., Club Agent, Benton County.
GENE MAURICE LEAR, B.S., Assistant County Agent, Umatilla County.
DONALD WAYNE JOSSY, B.S., Club Agent, Clatsop County.
WILLIAM GERALD NIBLER, B.S., Assistant County Agent, Marion County.
ANN ELIZABETH EPPERSON, A.B., Home Agent, Multnomah County.
MARY ELLEN HECKATHORN, B.S., Home Agent, Deschutes County.
CHESTER E OTIS, B.S., Club Agent, Lake County.
AMOS WILBUR BIERLY, B.S., Assistant County Agent, Coos County.

* On leave of absence.

MARJORIE ILEE TYE, B.S., Home Agent, Wasco County.

JOHN ROBERT MCCAMBRIDGE, B.S., Assistant County Agent, Klamath County.

MARIAN JANE FARRELL, B.S., Home Agent, Jackson County.

LEEDS CRIM BAILEY, B.S., Assistant County Agent, Malheur County.

KENNETH ALEXANDER MCKENZIE, B.S., Assistant County Agent, Wasco County.

OLA FAYE NICHOLS, B.S., Home Agent, Washington County.

MYRTLE MAE CARTER, M.S., Home Agent, Umatilla County.

CAL GRAHAM MONROE, B.S., Assistant County Agent, Union County.

ELBERT NEIL HOFFMAN, B.S., Assistant County Agent, Malheur County.

ELIZABETH HEDWIG BOECKLI, B.S., Assistant Club Agent, City of Portland.

FEDERAL Cooperative Extension performs one of the three great functions of Oregon State College, which include: resident instruction, research and experimentation, and college extension. The Extension Service is and experimentation, and college extension. The Extension Service is charged charged with the duty of extending the benefits, advantages, and available information of the State Colege and of the United States Department of Agriculture to every portion of the state and to all those persons who for any reason are unable to come to the campus.

The Farm and Home Interests of Oregon. The Extension Service includes all forms of cooperative off-campus instruction and assistance in those phases of agriculture, home economics, and related subjects which lend themselves to extension methods or which can be practically adapted to the direct needs of the people of the state. The various extension activities are the means through which information, instruction, assistance, and methods of self-help are carried to all persons who desire them at any point within the state. In brief, the Extension Service represents the medium, both independently and in hearty cooperation with all other organized forces of betterment, for enlarging and enriching the agricultural and home interests of Oregon. No county, town, hamlet, farm, or home need be without some benefit of this service.

Extension Projects. In order to assure the maximum of efficiency, extension work is conducted on the basis of definitely planned projects. These require approval by the proper State College authority and the Secretary of the United States Department of Agriculture before Federal and State funds appropriated for the work may be expended.

The several distinct lines of work now covered by written projects, from which citizens of the state are receiving benefit, include:

General—

General Administration and Organization of the Extension Service
County Agent Work
Home Demonstration Work
4-H Club Work
Preparation, Printing, and Distribution of Bulletins
News Service and Publicity
Visual Instruction*

* Supported jointly with General Extension Division.

Agriculture—
- Soils, Irrigation, and Drainage
- Horticulture
- Animal Husbandry
- Dairying
- Poultry Husbandry
- Farm Crops
- Agricultural Economics, including Marketing and the Collection and Dissemination of Statistical and Outlook Information
- Rodent Eradication
- Land Use Planning

Home Economics—
- Nutrition
- Home Management
- Clothing and Textiles
- Community Social Organization

These projects are not assumed to cover all problems of importance within the state. It is the purpose to put into operation and to emphasize those lines of extension service that are fundamental to large and important interests of farm or home welfare, or to material agricultural development.

Part VI
Miscellaneous

Summary of Enrollment and Degrees Granted 1940-41

ENROLLMENT BY CURRICULUM AND CLASS, REGULAR SESSION 1940-41

Curriculum	Freshman year	Sophomore year	Junior year	Senior year	Graduate	Special	Subtotal	Total
Liberal Arts and Sciences								
Lower Division								
Arts and Letters	91	34	.....	.....	.....	1		
Science	186	185	.....	.....	.....	1		
Social Science	80	62	.....	.....	.....	.....		
Total, Lower Division	357	281	.....	.....	.....	2	640	
School of Science								
General Science	.....	.....	15	25	.....	.....		
Bacteriology	.....	.....	3	6	3	.....		
Botany	.....	.....	.....	1	13	.....		
Chemistry	.....	.....	12	14	44	.....		
Entomology	.....	.....	1	5	10	.....		
Geology	.....	.....	10	10	11	.....		
Mathematics	.....	.....	5	1	7	.....		
Physics	.....	.....	1	2	7	.....		
Zoology	.....	.....	6	5	2	.....		
Total, School of Science	186	185	53	69	97	1	591	
Total, Liberal Arts and Sciences, excluding duplicates	357	281	53	69	97	2	.....	859
Professional Curricula								
School of Agriculture	245	255	125	130	67	4	.....	826
School of Education	63	90	58	32	64	1	.....	308
School of Engineering	362	377	206	158	12	5	.....	1,120
School of Forestry	61	127	75	77	17	.....	.....	357
School of Home Economics	253	214	123	111	50	3	.....	754
School of Pharmacy	26	43	22	21	1	.....	.....	113
Secretarial Science	214	214	73	99	.....	.....	.....	600
Lower-Division Architecture and Allied Arts	8	10	.....	.....	.....	1	.....	19
Lower-Division Business Administration	47	36	.....	.....	.....	.....	.....	83
Lower-Division Journalism	12	1	.....	.....	.....	.....	.....	13
Lower-Division Music	4	.....	.....	.....	.....	.....	.....	4
Unclassified	.....	.....	.....	.....	33	.....	.....	33
Totals (excluding duplicates)	1,652	1,648	735	697	341	16	.....	5,089
Auditors	.....	.....	.....	.....	.....	.....	.....	28
Total Students, Regular Session								5,117

DISTRIBUTION OF ENROLLMENT AS TO SEX AND RANK 1940-41

	Men	Women	Total
Total Graduate Students	241	100	341
Total Undergraduate Students	3,117	1,631	4,748
Total Auditors	9	19	28
Totals	3,367	1,750	5,117

ENROLLMENT IN SUMMER SESSIONS, 1940

	Men	Women	Total
First Session	402	503	905
Second Session	108	98	206
Auditors	5	24	29
4-H Club Short Course	690	1,169	1,859
Totals	1,205	1,794	2,999
Net Total, excluding duplicates	1,125	1,731	2,856

ENROLLMENT IN GENERAL EXTENSION DIVISION

July 1, 1940-June 30, 1941 (excluding duplicates)

	Undergraduate			Graduate			Total		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
Extension Classes:									
Portland Center	1,120	1,447	2,567	62	78	140	1,182	1,525	2,707
Albany	2	25	27	.....	.....	.....	2	25	27
Ashland	10	16	26	8	2	10	18	18	36
Baker	4	28	32	.....	.....	.....	4	28	32
Corvallis	5	79	84	2	3	5	7	82	89
Dallas	10	17	27	.....	.....	.....	10	17	27
Eugene	109	187	296	8	5	13	117	192	309
Hillsboro	20	20	40	.....	.....	.....	20	20	40
Klamath Falls	8	45	53	.....	.....	.....	8	45	53
La Grande	12	31	43	.....	.....	.....	12	31	43
Lakeview	7	39	46	.....	.....	.....	7	39	46
Medford	21	57	78	.....	.....	.....	21	57	78
Roseburg	4	20	24	.....	.....	.....	4	20	24
Salem	50	93	143	2	15	17	52	108	160
The Dalles	3	12	15	.....	.....	.....	3	12	15
Total, All Classes	1,385	2,116	3,501	82	103	185	1,467	2,219	3,686
Correspondence-Study:									
New Registrants	528	554	1,082	.....	.....	.....	528	554	1,082
Students registered before July 1, 1940, who are still enrolled	383	349	732	.....	.....	.....	383	349	732
Total Correspondence-Study	911	903	1,814	.....	.....	.....	911	903	1,814
GRAND TOTAL, Extension Classes and Correspondence-Study	2,296	3,019	5,315	82	103	185	2,378	3,122	5,500

SUMMARY OF DEGREES GRANTED 1940-41

Advanced Degrees		
Doctors of Philosophy	8	
Masters of Arts	5	
Masters of Science	78	
Masters of Education	7	
Masters of Forestry	6	
Total Advanced Degrees		104
Bachelors' Degrees		
Bachelors of Arts		
Science	12	
Education	3	
Home Economics	8	
Nursing Education	5	
Secretarial Science	7	
Bachelors of Science		
Science	60	
Agriculture	128	
Education	37	
Chemical Engineering	21	
Civil Engineering	30	
Electrical Engineering	27	
Mechanical Engineering	43	
Industrial Arts	24	
Forestry	56	
Home Economics	111	
Nursing Education	4	
Pharmacy	21	
Secretarial Science	67	
Bachelors of Secretarial Science	5	
Total Bachelors' Degrees	.....	669
Total Degrees Granted 1940-41	.....	773

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