



OREGON STATE SYSTEM
OF HIGHER EDUCATION

Oregon State College Bulletin

CORVALLIS • OREGON

CATALOG
ISSUE
1951-52

Oregon State College B U L L E T I N

Number 16

May 1951

Published monthly by the Oregon State Board of Higher Education at Oregon State College, Corvallis, Oregon. Entered as second-class matter at the post office at Corvallis, Oregon, under authority of the act of August 24, 1912, as amended by the act of August 4, 1947 (Sec. 34.21 PL & R). Authorized March 28, 1950. Point of additional entry at Eugene, Oregon, authorized September 13, 1950.

Oregon State College

CATALOG

1951-52



Corvallis, Oregon

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	Term expires
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LEIF S. FINSETH, Dallas	1952
FRANK VAN DYKE, Medford	1953
HENRY F. CABELL, Portland	1954
EDGAR W. SMITH, Portland	1955
A. L. GRANT, Baker	1956
CHERYL S. MACNAUGHTON, Portland	1957
HERMAN OLIVER, John Day	1958
R. E. KLEINSORGE, Silverton	1959

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R. E. KLEINSORGE

LEIF S. FINSETH

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Secretary of the Board

Office of the State Board of Higher Education
Eugene, Oregon

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 and the University of Oregon Dental School are located in Portland.

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; students who do not plan to become elementary-school teachers may devote their time exclusively to lower-division studies in the liberal arts and science or (at Southern Oregon and Eastern Oregon Colleges of Education) to approved lower-division programs in semiprofessional fields.

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.

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President, University of Oregon

ROBEN JOHN MAASKE, Ph.D.
President, Oregon College of Edu-
cation

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Dean, University of Oregon Medi-
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of Education

ELMO NALL STEVENSON, Ed.D.
President, Southern Oregon College
of Education

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TRAVIS CROSS, B.A. Director of Information

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WILLIAM RALPH STOVALL Assistant Chief Accountant
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VIRON A. MOORE, M.S. Assistant Director of General Extension

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ELZIE VANCE HERBERT Head of Orders Department
IMOGENE CUSAC, B.A., B.A. in L.S. Cataloger for Union Catalog

HIGH SCHOOL RELATIONS

ERIC DEAN ANDERSON, M.A. Executive Secretary

1951

June 1951

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ACADEMIC CALENDAR

Summer Session, 1951

- June 18, *Monday* Registration
- June 19, *Tuesday* Classes begin
- June 20, *Wednesday* Last day for payment of registration fee without penalty
- June 30, *Saturday* Last day for adding a course
- July 4, *Wednesday* Independence day, holiday
- July 11, *Wednesday* Last day for withdrawal from a course
- July 28, *Saturday* Last day for filing graduate theses
- August 10, *Friday* Final examinations
- August 10-24 Post session in Education

Fall Term, 1951-52

- September 13, *Thursday* Faculty meeting
- September 16-22, *Sunday-Saturday*
..... New Student Week and Registration
- September 24, *Monday* Classes begin
- October 6, *Saturday* Latest day for registering or for addition of new courses
- October 6, *Saturday* Latest day for dropping a course without responsibility for grade
- November 1, *Thursday* Close of midterm examinations
- November 22-24, *Thursday to Saturday*
..... Thanksgiving vacation
- November 24, *Saturday* Latest day for withdrawing from college without responsibility for grade
- December 12, *Wednesday* Classes end
- December 13-19, *Thursday-Wednesday*
..... Final examinations
- December 19, *Wednesday* Fall term ends

EIGHTY-FOURTH YEAR

Winter Term, 1951-52

- January 2, *Wednesday* Registration
- January 3, *Thursday* Classes begin
- January 16, *Wednesday* Latest day for registering or for addition of new courses
- January 16, *Wednesday* Latest day for dropping a course without responsibility for grade
- February 6, *Wednesday* Close of midterm examinations
- February 26, *Tuesday* Latest day for withdrawing from college without responsibility for grade
- March 15, *Saturday* Classes end
- March 17-22, *Monday-Saturday*
..... Final examinations
- March 22, *Saturday* Winter term ends

Spring Term, 1951-52

- March 31, *Monday* Registration
- April 1, *Tuesday* Classes begin
- April 14, *Monday*.....Latest day for registering or for addition of new courses
- April 14, *Monday* Latest day for dropping a course without responsibility for grade
- May 7, *Wednesday* Close of midterm examinations
- May 17, *Saturday* Latest day for withdrawing from college without responsibility for grade
- May 30, *Friday* Memorial Day, holiday
- June 7, *Saturday* Classes end
- June 8, *Sunday* Baccalaureate Service
- June 9, *Monday* Eighty-third Commencement
- June 9-14, *Monday-Saturday*
..... Final examinations
- June 14, *Saturday* Spring term ends

1952

January 1952

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July 1952

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Charter of Oregon State College

FEDERAL LAND-GRANT ACT (FIRST MORRILL ACT), JULY 2, 1862

. . . Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there be granted to the several States, for the purposes hereinafter mentioned, an amount of public land, to be apportioned to each State . . . And be it further enacted, That all moneys derived from the sale of lands afore said, by the States . . . shall constitute a perpetual fund . . . the interest of which shall be inviolably appropriated by each State . . . to the endowment, support and maintenance of at least one college, where the leading object 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 such manner as the Legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life. . . . No State shall be entitled to the benefit of this act unless it shall express its acceptance thereof by its Legislature, within two years from the date of its approval by the President. . . .

IRREVOCABLY ACCEPTED BY OREGON LEGISLATURE, OCTOBER 9, 1862

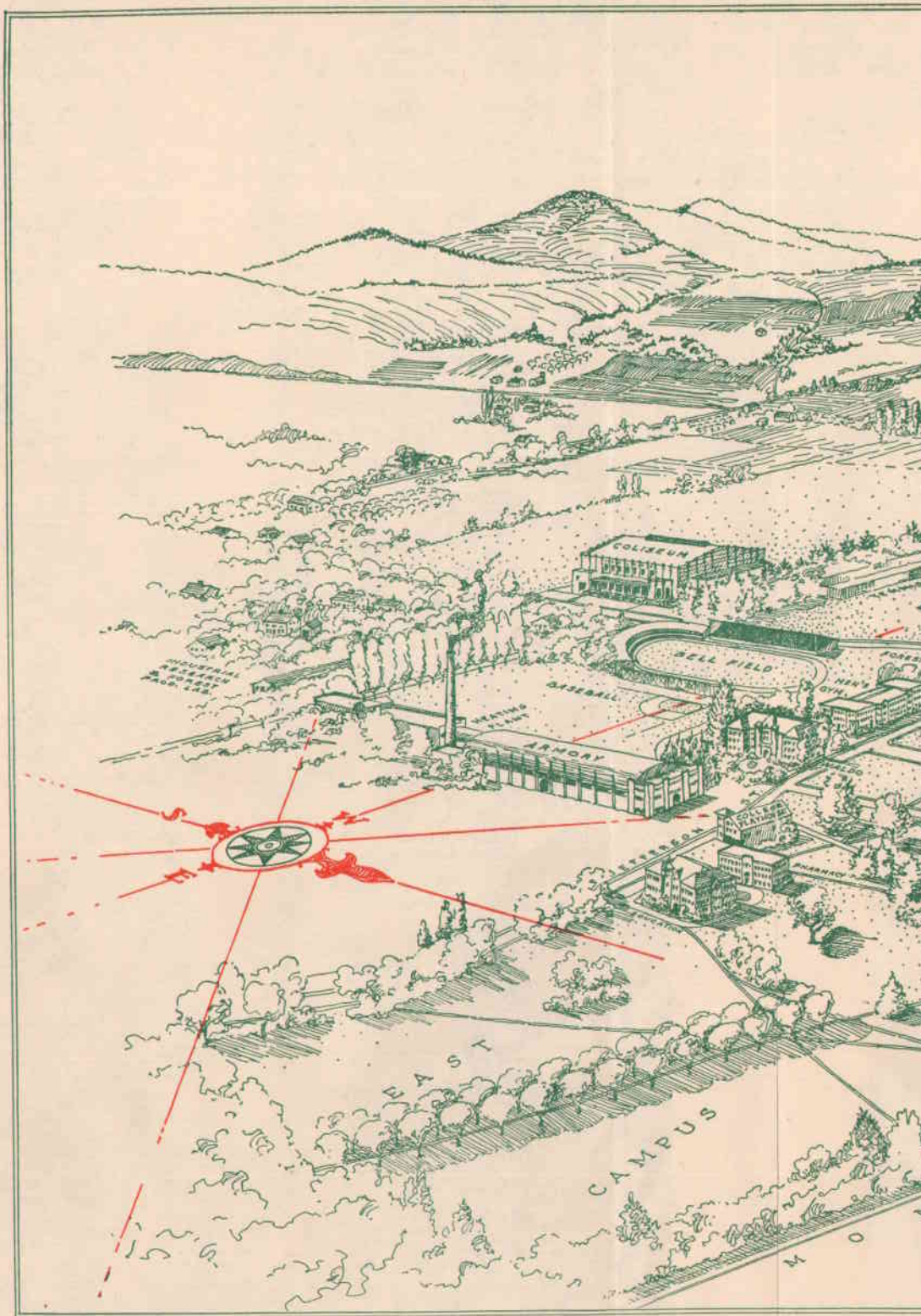
. . . each and all of the propositions in said act of Congress offered to the State of Oregon are hereby irrevocably adopted, with all the conditions and obligations therein contained. . . .

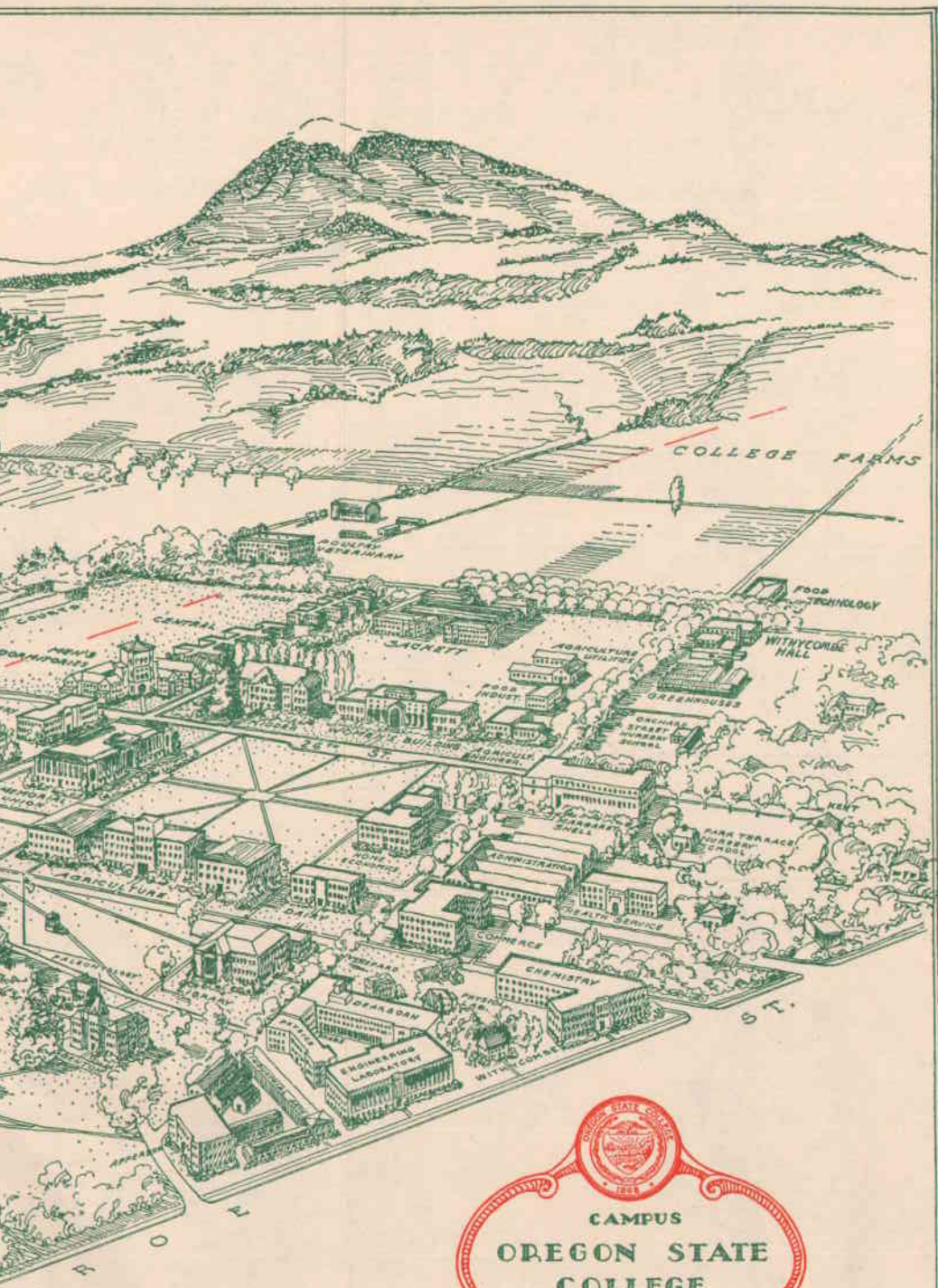
CORVALLIS COLLEGE (OREGON STATE COLLEGE) DESIGNATED AND ADOPTED AS THE LAND-GRANT INSTITUTION OF OREGON, OCTOBER 27, 1868

Be it enacted by the Legislative Assembly of the State of Oregon: That J. F. Miller, J. H. Douthit and Joseph C. Avery are hereby constituted a board of commissioners with power . . . To locate all the lands to which the state is entitled by act of congress for the purpose of establishing an agricultural college . . . That, until other provision can be made, the Corvallis college is hereby designated and adopted as the agricultural college, in which all students sent under the provisions of this title shall be instructed in all the arts, sciences, and other studies, in accordance with the requirements of the acts of congress making such donation. . . .

THE OCTOBER 27, 1868 ACTION MADE PERMANENT, OCTOBER 21, 1870

Be it enacted by the Legislative Assembly of the State of Oregon, That Corvallis College, in Benton County, is hereby designated and permanently adopted as the Agricultural College of the State of Oregon, in which all students sent under the provisions of law shall be instructed in accordance with the requirements of the Act of Congress, approved on the second day of July, 1862, granting public lands to the several States and Territories, which might provide colleges for the benefit of Agriculture and the Mechanic Arts, and the acts amendatory thereof. . . .





CAMPUS
OREGON STATE
COLLEGE

Oregon State College

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 GUY CHESTER STOVER Chief, Campus Patrol
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 HARRY RUTHERFORD Supervisor of Building Repairs
 HENRY BRANDT Superintendent of Light and Power
 DONALD WHITE Supervisor Janitorial
 DONALD E. HOUT Office Manager
 RUTH SCHERMERHORN Head of Telephone Exchange
 LYDIA WITTE Secretary to General Superintendent of Physical Plant

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 GRACE M. CRONENBERGER Accountant

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 LA VERNE SENSIBA Secretary

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CRYSTAL FOSTER, R.N.	Nurse
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MARGARET ELLEN HOPE, R.N.	Nurse
JOYCE MOZEJKO, R.N.	Nurse
LAURA MACKENZIE	Nurse
JOAN ULLMAN	Nurse

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MARY IOLA BASH, A.B.	Dean of Women
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IRWIN CECIL HARRIS, M.S.J.	Manager, Student Educational Activities
LAURENCE E. DARLINGTON, M.S.	Assistant Dean of Men
MARTHA RUTH MORTON, M.A.	Assistant Dean of Women
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MILTON GORDON, Ph.M.	Counselor, Counseling and Testing Bureau
J. DAVID O'DEA, M.S.	Instructor, Counseling and Testing Bureau
LORIS ROY BAKER, B.S.	Assistant to Director of Intercollegiate Athletics
PAUL JOHN BOCK, B.D.	Executive Secretary of Round Table
CLYTIE MAY WORKINGER	Placement Secretary, School of Education
EMMA SEVERSON COE, B.A.	Secretary, Employment and Housing for Men
EDITH MAE WILKINSON, B.S.	Secretary to the Dean of Men
VIDA L. BOWER	Secretary to the Dean of Women
IRIS MAUDENE SCHEIDE	Secretary to the Personnel Coordinator

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BILLIE REGER	Office Secretary

State College Staff*

CHARLES D. BYRNE, Ed.D., Chancellor, Oregon State System of Higher Education.

B.S. (1921), M.S. (1922), Wisconsin; Ed.D. (1938), Stanford. Chancellor, State System, since 1950.

AUGUST LEROY STRAND, Ph.D., President.

B.S. (1917), Montana State; M.S. (1925), Ph.D. (1928), Minnesota. At Oregon State since 1942.

GEORGE WILCOX PEAVY, M.S.F., Sc.D., LL.D., President Emeritus.

B.L. (1895), M.S.F. (1905), Sc.D. (1936), Michigan; LL.D. (1937), Willamette. At Oregon State since 1910. Dean of Forestry 1913-41.

RICHARD ALTON ADAMS, General Superintendent of Physical Plant.

At Oregon State since 1947.

THOMAS FRANCIS ADAMS, B.S., Acting Director of Dormitories.

B.S. (1930), Oregon State. At Oregon State since 1950.

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

B.S. (1924), Michigan State Normal; M.A. (1939), Michigan. At Oregon State since 1939.

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

B.S. (1923), M.S. (1926), E.E. (1939), Oregon State. At Oregon State since 1923.

ROBERT M ALEXANDER, M.A., Assistant to the Director, Agricultural Experiment Station.

B.S. (1942), Oregon State; M.A. (1949), Harvard. At Oregon State since 1946.

CHARLES EDWIN ALLEN, B.S., Research Assistant, Agricultural Experiment Station.

B.S. (1942), Iowa State. At Oregon State since 1949.

ETHEL E ALLEN, B.S., Assistant Editor of Publications (Retired).

B.S. (1916), Oregon State. At Oregon State 1917-48.

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

B.S. (1914), M.S. (1915), Oregon State. At Oregon State since 1915.

IRA SHIMMIN ALLISON, Ph.D., Professor of Geology; Chairman of Department.

A.B. (1917), Hanover College; Ph.D. (1924), Minnesota. At Oregon State since 1928.

DELMAR ISAAC ALLMAN, Dr.P.H., Professor of Physical Education.

B.S. (1928), Michigan State Normal College; M.S. (1931), Dr.P.H. (1936), Michigan. At Oregon State since 1937.

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

B.S. (1916), LL.D. (1929), Oregon State. At Oregon State since 1925.

ARTHUR W ANDERSON, M.S., Instructor in Bacteriology.

B.S. (1943), North Dakota State; M.S. (1947), Wisconsin. At Oregon State since 1949.

* State College officers of administration, instruction, research and extension at Corvallis having the rank of instructor or above, and United States Department of Agriculture scientists at the State College.

- CARL LEONARD ANDERSON, Dr.P.H., Professor of Hygiene and Health Education.
B.S. (1928), M.S. (1932), Dr.P.H. (1934), Michigan. At Oregon State since 1949.
- WILLIAM BALLANTYNE ANDERSON, Ph.D., Professor Emeritus of Physics.
B.S. (1901), M.S. (1903), Ph.D. (1906), Wisconsin. At Oregon State since 1914.
- SPENCER BUTHER APPLE, JR., M.S., Associate Professor of Horticulture.
B.S. (1933), M.S. (1936), Texas Agricultural and Mechanical College. At Oregon State since 1950.
- BRADFORD HENRY ARNOLD, Ph.D., Assistant Professor of Mathematics.
B.S. (1938), M.S. (1940), Washington; Ph.D. (1942), Princeton. At Oregon State since 1947.
- GEORGE H. ATHERTON, B.S., Mechanical Engineer, Oregon Forest Products Laboratory (Instructor).
B.S. (1950), Oregon State. At Oregon State since 1950.
- WINFRED MCKENZIE ATWOOD, Ph.D., Professor Emeritus of Plant Physiology.
A.B. (1907), A.M. (1910), Cornell College; M.S. (1911), Ph.D. (1913), Chicago. At Oregon State since 1913.
- WILLIAM E. BABCOCK, D.V.M., Research Assistant, Agricultural Experiment Station.
B.S. (1944), D.V.M. (1945), Washington State. At Oregon State since 1949.
- CHARLES OGDEN BAILEY, M.S., Instructor in Aeronautical Engineering.
B.S. (M.E.) (1945), M.S. (1948), Oregon State. At Oregon State since 1945.
- FLOYD D. BAILEY, M.S., Associate Plant Pathologist, U. S. Department of Agriculture (Retired).
M.S. (1912), Wisconsin. At Oregon State since 1925.
- *SAMUEL HALL BAILEY, M.S., Agricultural Experiment Station Editor.
B.S. (1942), Utah State; M.S. (1947), Wisconsin. At Oregon State since 1947.
- WILLIAM MURRAY BAILEY, Master Sergeant, Assistant to the Professor of Military Science and Tactics.
At Oregon State since 1949.
- LORIS ROY BAKER, B.S., Assistant Director of Athletics.
B.S. (1926), Oregon State. At Oregon State since 1947.
- †WALTER CLIFFORD BAKER, B.S., Associate Professor of Mechanical Engineering.
B.S. (1945), Oregon State. At Oregon State since 1945.
- WILLIAM JENNINGS BAKER, M.S., Chief of Research, Oregon Forest Products Laboratory (Professor).
B.S.F. (1927), M.S. (1928), Oregon State. At Oregon State 1930-35 and since 1947.
- FLORENCE S. BAKKUM, M.A., Instructor in Mathematics.
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- ‡GLENN ALMER BAKKUM, Ph.D., Professor of Sociology; Head of Department.
B.S. (1920), Iowa State; M.A. (1925), Columbia; Ph.D. (1928), Cornell. At Oregon State since 1935.
- BENJAMIN J. BALLARD, B.S., Instructor in Electrical Engineering; Assistant Engineer of KOAC.
B.S. (1945), Oregon State. At Oregon State since 1945.

* On military leave.

† Fall and winter terms, 1950-51.

‡ On sabbatical leave, 1950-51.

- FRANK LLEWELLYN BALLARD, B.S., Associate Director, Federal Cooperative Extension.
B.S. (1916), Oregon State. At Oregon State since 1917.
- WILLIAM JOHN BARCLAY, Ph.D., Assistant Professor of Electrical Engineering.
B.S. (1939), Oregon State; Engineer (1941), Ph.D. (1949), Stanford. At Oregon State since 1949.
- ERVIN EARL BARKLOW, B.S., Superintendent of Campus Engineering and Blue Print Service.
B.S. (1927), Oregon State. At Oregon State since 1939.
- GEORGE HECTOR BARNES, Ph.D., Professor of Forest Management.
B.S. (1924), Washington; M.S. (1929), California; Ph.D. (1946), Duke. At Oregon State since 1943.
- MARY IOLA BASH, A.B., Dean of Women.
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- VIOLET OULBEGIAN BASKAM, M.M., Instructor in Music.
B.M. (1943), M.M. (1944), Michigan. At Oregon State since 1948.
- REX WARD BEACH, B.A., Colonel, Professor of Air Science and Tactics.
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- EDWARD BENJAMIN BEATY, M.A., Professor Emeritus of Mathematics.
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- JAMES RALPH BECK, B.S., Acting Assistant Director, Federal Cooperative Extension Service.
B.S. (1920), Oregon State. At Oregon State since 1922.
- MANNING HENRY BECKER, M.S., Assistant Professor of Agricultural Economics; Assistant Agricultural Economist, Agricultural Experiment Station.
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- BETATRICE BUTLER BEEBE, M.A., Assistant Professor of English.
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- FRANK M BEER, M.S., Assistant Professor of Science Surveys.
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- RICHARD OLIVER BELKENGREN, Ph.D., Associate Professor of Botany.
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- ELMA MARSHALL BEMIS, M.A., B.S. in L.S., Binding Librarian (Instructor).
A.B. (1915), B.S. (1917), M.A. (1918), Phillips; M.A. (1942), Colorado State College of Education; B.S. in L.S. (1944), Denver. At Oregon State since 1944.
- HELEN R BENDIXEN, B.A., Assistant Program Consultant (Instructor), Memorial Union.
B.A. (1949), Washington State. At Oregon State since 1949.
- NOEL LINDSAY BENNION, M.S., Extension Poultry Specialist.
B.S. (1928), Utah State; M.S. (1932), Kansas State. At Oregon State since 1937.
- ROBERT WILLIAM BERGSTROM, Ed.D., Professor of Physical Education.
B.S. (1937), Oregon State; M.A. (1942), Ed.D. (1947), Columbia. At Oregon State 1941-42, 1946-47, and since 1950.
- NORBORNE BERKELEY, M.A., Assistant Professor of History.
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- HAROLD WRIGHT BERNARD, Ph.D.**, Assistant Professor of Education.
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- PAUL EMILE BERNIER, Ph.D.**, Associate Professor of Poultry Husbandry; Associate Poultry Husbandman, Agricultural Experiment Station.
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- RAMONA ELIZABETH BERRY, M.A.**, Assistant Professor of History.
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- RALPH STEPHEN BESSE, M.S.**, Associate Director, Agricultural Experiment Station.
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- VIRGIL MARION BETT, M.S.**, Assistant Professor of Economics.
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- ***LOUIS E BIGELOW**, Master Sergeant, Instructor in Military Science and Tactics.
At Oregon State since 1950.
- EDWARD H BISSEL, A.B.**, Major, Assistant Professor of Military Science and Tactics, Adjutant.
A.B. (1935), California, Los Angeles. At Oregon State since 1949.
- EVA BLACKWELL, B.S.**, Assistant Registrar.
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- ***MAURINE KIMEL BLACKWELL, M.S.**, Research Assistant in Home Economics, Agricultural Experiment Station.
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- GRANT E BLANCH, Ph.D.**, Associate Professor of Agricultural Economics; Acting Head of Department; Associate Agricultural Economist, Agricultural Experiment Station.
B.S. (1940), Utah State; M.S. (1941), Illinois; Ph.D. (1944), Cornell. At Oregon State since 1945.
- LAWRENCE THOMAS BLANEY, M.S.**, Instructor in Horticulture; Research Assistant, Agricultural Experiment Station.
B.S. (1941), M.S. (1948), Penn State. At Oregon State since 1948.
- JOHN H BLODGETT, Ph.B.**, Captain, Air Force, Associate Professor of Air Science and Tactics.
Ph.B. (1940), Toledo. At Oregon State since 1947.
- PAUL JOHN BOCK, B.D.**, Instructor in Philosophy and Religion.
B.A. (1944), Heidelberg College, Tiffin, Ohio; B.D. (1950), Yale (Divinity School). At Oregon State since 1950.
- RALPH BOGART, Ph.D.**, Professor of Animal Husbandry; Animal Husbandman, Agricultural Experiment Station.
B.S. (1934), Missouri; M.S. (1936), Kansas State; Ph.D. (1940), Cornell. At Oregon State since 1947.
- JOBBE KYER BOGGS**, Master Sergeant, Instructor in Military Science and Tactics; Rifle Team Coach.
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- DUIS DONALD BOLINGER, Ph.D.**, Assistant Professor of Physics.
B.S. (1930), Missouri; M.S. (1938), Oregon State; Ph.D. (1951), Stanford. At Oregon State since 1948.
- WALTER BENO BOLLEN, Ph.D.**, Professor of Bacteriology; Bacteriologist, Agricultural Experiment Station.
B.S. (1921), M.S. (1922), Oregon State; Ph.D. (1924), Iowa State. At Oregon State since 1929.
- CARL ARTHUR BOLLER, JR., M.S.**, Assistant Professor of Horticulture; Assistant Horticulturist, Agricultural Experiment Station.
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- CARL ELDON BOND, M.S.**, Assistant Professor of Fish and Game Management; Assistant Biologist, Agricultural Experiment Station.
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- JESSE FRANKLIN BONE, D.V.M.**, Instructor in Veterinary Medicine; Research Assistant, Agricultural Experiment Station.
B.A. (1937), B.S. (1949), D.V.M. (1950), Washington State. At Oregon State since 1950.
- JOHN MORTON BORGERSON, M.Ed.**, Associate Professor of Air Science and Tactics.
B.Sc. (1937), North Dakota; M.Ed. (1950), Montana. At Oregon State since 1951.
- ARTHUR GEORGE BRISTOW BOUQUET, M.S.**, Professor Emeritus of Horticulture.
B.S. (1906), Oregon State; M.S. (1930), Cornell. At Oregon State since 1909.
- *EDOUARD JOANY BOURBOUSSON, Docteur en Droit International**, Associate Professor of French.
Licence és Lettres (1916), Licence en Droit (1916), Licence és Sciences (1917), Lyons; Docteur en Droit International (1919), Paris. At Oregon State since 1943.
- CHARLES HENRY BOWEN, M.A.**, Associate Professor of Economics.
B.A. (1930), Washington; M.A. (1935), California. At Oregon State since 1947.
- CAROL A BOWMAN, B.S.**, Research Assistant, Agricultural Experiment Station.
B.S. (1948), Oregon State. At Oregon State since 1948.
- HAROLD ALFRED BOYD, JR., M.A.**, Instructor in Geology.
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- RALPH LESTER BOYD, Ph.D., C.P.A.**, Associate Professor of Business Administration.
B.Ed. (1930), Illinois State Normal; M.S. (1932), Ph.D. (1942), Illinois; C.P.A. (1933) Illinois, (1945) Ohio. At Oregon State since 1948.
- 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. At Oregon State since 1932.
- JAMES JOSEPH BRADY, Ph.D.**, Professor of Physics.
B.A. (1927), Reed College; M.A. (1928), Indiana; Ph.D. (1931), California. At Oregon State since 1937.
- KATHERINE PATRICIA BRALY, Technical Adviser**, Braly Ornithological Collection.
At Oregon State since 1944.
- NORMAN ROBERT BRANDENBURG, B.S.**, Assistant Professor of Agricultural Engineering; Assistant Agricultural Engineer, U. S. Department of Agriculture.
B.S. (1944), Colorado. At Oregon State since 1950.

* On sabbatical leave 1950-51.

- VERA HASKELL BRANDON, Ph.D.**, Acting Dean, School of Home Economics; Professor of Child Development.
B.S. (1911), B.S. (1927), M.S. (1929), Oregon State; Ph.D. (1936), Iowa. At Oregon State since 1928.
- PHILIP MARTIN BRANDT, A.M.**, Professor of Dairy Husbandry; Head of Department; Dairy Husbandman, Agricultural Experiment Station.
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- VIVIAN BRASHEAR, M.S.**, Assistant Professor of Home Administration.
B.S. (1917), M.S. (1927), Iowa State. At Oregon State since 1947.
- LE ROY BREITHAUP, B.S.**, Extension Agricultural Economist.
B.S. (1910), Oregon State. At Oregon State 1911-18 and since 1920.
- BURNS W BREWER, Ph.D.**, Assistant Professor of Mathematics.
A.B. (1935), A.M. (1936), Ph.D. (1938), Missouri. At Oregon State since 1947.
- CHESTER O BRODERS, M.S.**, Assistant Professor of Business Administration.
B.S. (1923), Oregon State; M.S. (1932), California. At Oregon State since 1947.
- HUGH CAMPBELL BROOKS, M.A.**, Instructor in Geography.
B.A. (1947), Certificate (1948), M.A. (1950), Columbia. At Oregon State since 1950.
- JESSE FRANKLIN BRUMBAUGH, A.M.**, Professor Emeritus of Psychology.
A.B. (1894), DePauw; LL.B. (1911), South Dakota; A.M. (1902), Chicago. At Oregon State since 1915.
- ROBERT J BRUSH, B.S.**, Instructor in Education.
B.S. (1940), Minnesota. At Oregon State since 1949.
- JOSEPH CHESTER BRYE, M.M.**, Assistant Professor of Music.
B.M. (1940), M.M. (1941), Northwestern. At Oregon State since 1947.
- EDWARD CHARLES BUBL, Ph.D.**, Assistant Chemist and Assistant Food Technologist, Agricultural Experiment Station.
B.S. (1942), Illinois; M.S. (1945), Wisconsin; Ph.D. (1948), Oregon State. At Oregon State since 1948.
- DELOSS EVERETT BULLIS, M.S.**, Chemist, Agricultural Experiment Station.
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- WILLIAM SAMSON BURDIC, B.S.**, Instructor in Electrical Engineering.
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- EILEEN BARBARA BURKE, M.S.**, Research Assistant, Agricultural Experiment Station.
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- HENRY BUTHERUS, B.S.**, Major, Assistant Professor of Military Science and Tactics.
B.S. (1936), B.S. (Psych.) (1940), Washington State. At Oregon State since 1949.
- IRENE BUTTS, B.A.**, Instructor in English.
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- JOSEPH SHIREY BUTTS, Ph.D.**, Professor of Biochemistry; Head of Department of Agricultural Chemistry.
B.S. (1926), Florida; M.S. (1928), Fordham; Ph.D. (1933), Southern California. At Oregon State since 1939.
- CLEO CLIFFORD BYERS, M.S.**, Instructor in Physics.
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- JOHN HARKNESS BYERS, M.S.**, Research Assistant, Agricultural Experiment Station.
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- WILLIAM ELMER CALDWELL, Ph.D.**, Professor of Chemistry.
Met.E. (1924), Montana School of Mines; B.S. (1928), Ph.D. (1930), Wisconsin. At Oregon State since 1930.
- WHEELER CALHOUN, JR., B.S.**, Research Assistant, Agricultural Experiment Station.
B.S. (1946), Oregon State. At Oregon State since 1948.
- 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. At Oregon State since 1941.
- JOHN CARL CAMPBELL, M.S.**, Extension Rural Housing Specialist.
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- RONALD KENNETH CAMPBELL, Ph.D.**, Associate Professor of Business Administration.
A.B. (1925), Illinois; M.B.A. (1928), Harvard; Ph.D. (1940), Stanford. At Oregon State since 1945.
- THOMAS J CAMPBELL, B.S.**, Major, Associate Professor of Military Science and Tactics; Director of Engineer Unit.
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- NORMAN WOODROW CAMPION, A.B.**, Major, Associate Professor of Air Science and Tactics.
A.B. (1937), California. At Oregon State since 1949.
- DONALD THOMAS CARLSON, B.A.**, Executive Secretary of College Relations, President's Office.
B.A. (1947), Stanford. At Oregon State since 1947.
- EDWIN FAY CARLSON, Sergeant First Class, Instructor in Military Science and Tactics.**
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- WILLIAM HUGH CARLSON, M.A. in L.S.**, Librarian (Professor).
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- PAUL CARPENTER, B.S.**, Extension Agricultural Economist (Marketing).
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- WILLARD JOSEPH CHAMBERLIN, Ph.D.**, Associate Professor of Entomology.
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- STUART HUTCHINGS CHAPMAN, B.S.**, Associate Professor of Mechanical Engineering; Superintendent of Heating Plant.
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- HELEN GENEVA CHARLEY, M.S.**, Assistant Professor of Foods and Nutrition.
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- VERNON HENDRUM CHELDELIN, Ph.D.**, Professor of Chemistry.
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- WILLIAM G CHELF**, Sergeant, Instructor in Military Science and Tactics.
At Oregon State since 1948.
- WEN-LAN CHEN**, Ph.D., Assistant Professor of Chemical Engineering.
B.S. (1940), Northwestern Engineering College, China; M.S. (1947), Ph.D. (1950),
Pennsylvania State. At Oregon State since 1950.
- WILLIAM WESLEY CHILCOTE**, Ph.D., Assistant Professor of Botany and Plant
Pathology.
B.S. (1943), Ph.D. (1950), Iowa State. At Oregon State since 1950.
- HERBERT ELLSWORTH CHILDS**, Ph.D., Professor of English.
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- BERT EINAR CHRISTENSEN**, Ph.D., Professor of Chemistry.
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- HARVEY DEVON CHRISTENSEN**, M.S., Instructor in Mechanical Engineering.
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State since 1947.
- CLARENCE LEWIS CHURCH**, M.A., Instructor in Physics.
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44 and since 1945.
- JOHN TERRELL CLAPP**, Ph.D., Assistant Professor of Chemical and Metallurgical
Engineering.
B.S. (1933), Purdue; M.S. (1940), Ph.D. (1942), Illinois. At Oregon State since
1947.
- CHARLES LESTER CLARK**, Ph.D., Professor of Mathematics.
B.A. (1939), M.A. (1940), Stanford; Ph.D. (1944), Virginia. At Oregon State since
1944.
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- ROBERT RALPH CLARK**, M.S., Extension Horticulture Specialist.
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- STANLEY ARNOLD CLAYES**, Ph.D., Instructor in English.
A.B. (1946), Ursinus College; M.A. (1950), Ph.D. (1951), Pennsylvania. At Oregon
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- LESLIE ALLISON CLAYTON**, M.S., Assistant Professor of Civil Engineering.
B.S. (1941), M.S. (1949), Colorado. At Oregon State since 1947.
- LAURA M CLEAVELAND**, M.S., Assistant Professor of Institution Management;
Manager Memorial Union Dining Service.
B.S. (1930), Iowa State; M.S. (1942), Oregon State. At Oregon State since 1946.
- JOHN MYERS CLIFFORD**, Acting Extension Administrative Assistant.
At Oregon State 1918-20 and since 1933.
- ***FRANCES ANN CLINTON**, M.S., State Extension Agent (Home Economics).
B.S. (1925), College of Puget Sound; M.S. (1930), Oregon State. At Oregon State
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- RILEY JENKINS CLINTON**, Ed.D., Professor of Education.
A.B. (1922), B.S. (in Ed.) (1922), M.A. (1925), Missouri; Ed.D. (1933), Stanford.
At Oregon State since 1928.
- RAYLENE COAD**, Ph.D., Research Associate in Chemistry (Instructor).
B.S. (1947), M.S. (1947), California; M.A. (1949), Radcliffe College; Ph.D. (1950),
California. At Oregon State since 1950.

* On leave of absence spring-summer 1951.

- HAROLD COCKERLINE, B.S., Professor of Electrical Engineering.
B.S. (in E.E.) (1912), Oregon. At Oregon State since 1921.
- RALPH COLBY, Ph.D., Dean of Lower Division; Professor of English.
B.A. (1916), M.A. (1917), Minnesota; Ph.D. (1928), Illinois. At Oregon State since 1928.
- RALPH ORVAL COLEMAN, M.A., Professor of Physical Education; Head Coach of Baseball.
B.S. (1918), Oregon State; M.A. (1929), Columbia. At Oregon State since 1919.
- EDWARD FRANKLIN COLES, B.S., Extension Agricultural Economist.
B.S. (1950), Oregon State. At Oregon State since 1950.
- CLARA ROSE COMBELLACK, Ph.D., Instructor in English.
A.B. (1928), M.A. (1930), Stanford; Ph.D. (1937), California. At Oregon State since 1946.
- OLIVER CECIL COMPTON, Ph.D., Associate Professor, Associate Horticulturist, Agricultural Experiment Station.
B.S. (1931), M.S. (1932), California; Ph.D. (1947), Cornell. At Oregon State since 1948.
- MELVIN J CONKLIN, B.S., Assistant Professor of Agricultural Economics; Assistant Economist, Agricultural Experiment Station.
B.S. (1922), Montana State. At Oregon State since 1950.
- LAWRENCE DAVID COOLIDGE, Ph.D., Assistant Professor of Business Administration.
A.B. (1936), M.A. (1938), Ph.D. (1950), Columbia. At Oregon State since 1948.
- WILBUR TARLTON COONEY, M.S., Associate Professor of Poultry Husbandry; Associate Poultry Husbandman, Agricultural Experiment Station.
B.S. (1937), M.S. (1942), Oregon State. At Oregon State since 1937.
- MARTIN PORTMAN COOPEY, B.S., Associate Professor of Civil Engineering.
B.S. (1936), Oregon State. At Oregon State since 1941.
- GODFREY VERNON COPSON, M.S., Professor Emeritus of Bacteriology; Student Counselor in General Science.
B.S. (1911), M.S. (1913), Oregon State. At Oregon State since 1915.
- EVERETT STEWART CORTRIGHT, M.A., Associate Professor of Speech.
B.A. (1927), Iowa State Teachers; M.A. (1941), Michigan. At Oregon State since 1944.
- EDGAR W COULSON, JR., B.S., Research Engineer, Engineering Experiment Station.
B.S. (1950), Oregon State. At Oregon State since 1951.
- JUNIUS LORING COVINGTON, B.S., Research Assistant, Agricultural Experiment Station.
B.S. (1947), Oregon State. At Oregon State since 1948.
- JOHN RITCHIE COWAN, M.Sc., Assistant Professor of Farm Crops; Assistant Agronomist, Agricultural Experiment Station.
B.S.A. (1939), Toronto; M.Sc. (1942), Minnesota. At Oregon State since 1948.
- HELEN JULIA COWGILL, M.A., Assistant State 4-H Club Leader Emeritus.
B.S. (1913), B.S. (1916), Oregon State; M.A. (1931), Washington. At Oregon State since 1914.
- GEORGE BRYAN COX, M.S., Professor of Industrial Engineering and Industrial Arts; Professor of Industrial Education; Head of Department.
B.S. (1919), Missouri; M.S. (1940), Oregon State. At Oregon State since 1927.

- JOSEPH ALFRED COX, M.S.**, Assistant Professor of Physical Education.
B.A. (1926), Colorado College; M.S. (1938), Oregon State. At Oregon State since 1946.
- BOB WALLACE COYLE**, Extension Agricultural Economist.
At Oregon State since 1946.
- DAVID EUGENE CRABTREE, B.S.**, Instructor in Industrial Arts.
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- IRENE LOUISE CRAFT, M.S.**, Assistant Serials Librarian (Assistant Professor), Library.
B.S. (1930), Fort Hays Kansas State; M.A. (1931), Nebraska; B.S. in L.S. (1941), M.S. in L.S. (1943), Illinois. At Oregon State since 1944.
- WILLARD MAXSON CRAIG, M.B.A., LL.B.**, Associate Professor of Business Administration.
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- JOHN FRANCIS CRAMER, D.Ed.**, Dean and Director of General Extension; Professor of Education.
A.B. (1920), A.M. (1921), Willamette; M.Ed. (1932), D.Ed. (1937), Oregon.
- GRAYDON T CREWS, M.S.**, Science Student Personnel Adviser.
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- LOIS CRISWELL, B.A.**, Catalog Assistant (Assistant Professor), Library.
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- WILLIAM RAMSDEN CROOKS, M.A.**, Assistant Professor of Psychology.
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- MYRON GEORGE CROPSEY, M.S.**, Associate Professor of Agricultural Engineering; Associate Agricultural Engineer, Agricultural Experiment Station.
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- GEORGE EDWARD CROSSEN, Ph.D.**, Dean of Pharmacy; Professor of Pharmacy; Director of the Drugs Laboratory of the Oregon Board of Pharmacy.
B.S. (1933), M.S. (1937), Ph.D. (1940), Minnesota. At Oregon State since 1945.
- HAMBLIN HOWES CROWELL, Ph.D.**, Assistant Entomologist, Agricultural Experiment Station.
B.S. (1935), M.S. (1937), Oregon State; Ph.D. (1940), Ohio. At Oregon State since 1946.
- ANDREW JACKSON CULVER, JR., M.S.**, Associate Plant Pathologist, U. S. Department of Agriculture.
B.A. (Delaware), 1943; M.S. (1948), Vermont. At Oregon State since 1950.
- FREDERICK HENRY DAHL, B.S.**, Extension Agricultural Economist.
B.S. (1940), Oregon State. At Oregon State since 1947.
- CHARLES HENRY DALEY, JR., M.A.**, Instructor in Physical Education.
B.S. (1943), North Central College (Illinois); M.A. (1947), Michigan. At Oregon State since 1947.
- EVA ANN DALTON, M.S.**, Research Assistant, Agricultural Experiment Station.
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- BLISS F DANA, M.S.**, Pathologist, U. S. Department of Agriculture.
B.S. (1916), M.S. (1917), Washington State. At Oregon State since 1931.
- LOUISE LIEURANCE DANIELS, A.B.**, Instructor in English.
A.B. (1946), Miami (Ohio). At Oregon State since 1947.

- ROBERT HORNIMANN DANN, M.A.**, Professor of Sociology.
B.A. (1917), Pacific College; M.A. (1918), Haverford College. At Oregon State since 1927.
- EUGENE VERLE DANNEN, B.S.**, Assistant Professor of Soils.
B.S. (1939), Oregon State. At Oregon State 1938-39 and since 1946.
- MABEL DARELIUS, R.N.**, Nurse, Student Health Service (Retired).
R.N. (1912), Eugene Hospital School of Nursing; graduate work (1917), Los Angeles County Hospital. At Oregon State since 1921.
- LAURENCE EDWIN DARLINGTON, M.S.**, Assistant Dean of Men.
B.S. (1932), M.S. (1934), Oregon State. At Oregon State 1921-40 and since 1948.
- WILLIAM ALBERT DAVIES, M.F.**, Associate Professor of Forest Engineering.
B.S.F. (1938), M.F. (1946), Washington. At Oregon State since 1946.
- GEORGE BALFOUR DAVIS, M.S.**, Assistant Professor of Agricultural Economics;
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- JOHN ARTHUR DAY, B.A.**, Instructor in Physics.
B.A. (1936), Colorado College; Certificate in Meteorology (1937), Boeing School of Aeronautics. At Oregon State since 1946.
- JOHN COURTNEY DECIUS, Ph.D.**, Assistant Professor of Chemistry.
A.B. (1941), Stanford; M.A. (1943), Ph.D. (1947), Harvard. At Oregon State since 1949.
- FRED WILLIAM DECKER, M.S.**, Instructor in Physics.
B.S. (1940), Oregon State; M.S. (1943), New York. At Oregon State since 1946.
- MAX WALKER DE LAUBENFELS, Ph.D.**, Professor of Zoology.
A.B. (1916), Oberlin; A.M. (1926), Ph.D. (1929), Stanford. At Oregon State since 1950.
- JOHN RICHARD DELLENBACK, J.D.**, Assistant Professor of Business Administration.
B.S. (1940), Yale; J.D. (1949), Michigan. At Oregon State since 1949.
- ***RICHARD ROY DEMPSTER, Ph.D.**, Associate Professor of Physics.
A.B. (1930), M.A. (1931), Ph.D. (1942), California. At Oregon State since 1944.
- HENRY CORNELIUS DEMUTH, B.S.**, Colonel, Professor of Military Science and Tactics.
B.S. (1917), U.S. Military Academy. At Oregon State since 1948.
- GEORGE WILLIAM DEWEY, B.S.**, Extension Specialist in Certification; Research Assistant, Agricultural Experiment Station.
B.S. (1911), Michigan State. At Oregon State since 1944.
- ELVIS ARNIE DICKASON, M.S.**, Research Assistant, Agricultural Experiment Station.
B.S. (1947), M.S. (1949), Oregon State. At Oregon State since 1949.
- ERNEST MILTON DICKINSON, D.V.M., M.S.**, Professor of Veterinary Medicine; Veterinarian, Agricultural Experiment Station.
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- MARIE DIEDESCH, M.S.**, Associate Professor of Clothing, Textiles, and Related Arts.
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- SHERL MELVIN DIETZ**, Ph.D., Professor of Botany and Plant Pathology;
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- JOHN RICHARD DILWORTH**, M.S., Assistant Professor of Forest Management.
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- THURSTON ERMON DOLER**, M.S., Instructor in Speech.
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- JOSEPH WALDO ELLISON, Ph.D., Professor of History; Head of Department.
A.B. (1917), M.A. (1919), Ph.D. (1923), California. At Oregon State since 1924.
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B.S. (1934), Virginia; M.A. (1935), Harvard; Ph.D. (1948), Oregon State. At Ore-
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B.S. (1932), Oregon State. At Oregon State since 1937.
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- MARIAN FIELD, B.A., Associate Professor of Art.
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B.S. (1947), M.S. (1949), Oregon State. At Oregon State since 1947.
- MARGARET LOUISE FINCKE, Ph.D., Professor of Foods and Nutrition; Head of Department.
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- DONALD WILLIAM FISHLER, B.S., Agent, U. S. Department of Agriculture; Assistant Agronomist, Agricultural Experiment Station.
B.S. (1942), Oregon State. At Oregon State since 1948.
- GERHARD RAGNVALD FLOOD, M.S., Assistant Professor of Physical Education; Head Coach of Swimming.
B.S. (1929), M.S. (1941), Oregon State. At Oregon State 1940-41 and since 1943.
- WILSON HOOVER FOOTE, Ph.D., Associate Professor of Farm Crops; Associate Agronomist, Agricultural Experiment Station.
B.S. (1942), Utah State; M.S. (1946), Ph.D. (1948), Minnesota. At Oregon State since 1948.
- JAMES ARTHUR FORCE, Master Sergeant, Instructor in Military Science and Tactics.
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- WALTER CYRIL FOREMAN, Ph.D., Assistant Professor of English.
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- HERMAN CARL FORSLUND, M.S., Associate Professor of Pharmaceutical Chemistry.
B.S. (1938), M.S. (1940), Washington State. At Oregon State since 1945.
- WILLIAM STUART FORTH, M.A., Assistant Reference Librarian (Instructor).
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- FRANCIS ARTHUR FOSTER, Instructor in Art.
Certificate of Graduation (1948), Black Mountain College. At Oregon State since 1950.
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- DOROTHY BOURKE FOX, B.A.**, Associate Professor of Art.
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B.S. (1949), Oregon State. At Oregon State since 1947.
- WILLIAM ALLEN FRAZIER, Ph.D.**, Professor of Horticulture.
B.S. (1930), Texas A and M; M.S. (1931), Ph.D. (1933), Maryland. At Oregon State since 1949.
- VIRGIL HAVEN FREED, M.S.**, Associate Professor of Farm Crops; Associate Agronomist, Associate Chemist, Agricultural Experiment Station.
B.S. (1943), M.S. (1948), Oregon State. At Oregon State since 1943.
- EDITH JEFFERS FREEMAN, Ph.D.**, Extension Sociology Specialist.
B.S. (1932), Washington; M.S. (1939), Ph.D. (1943), Cornell. At Oregon State since 1946.
- HARRY FREUND, Ph.D.**, Assistant Professor of Chemistry.
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- MINNIE DEMOTTE FRICK, B.S.**, Associate Professor Emeritus of Secretarial Science.
B.S. (1929), Oregon State. At Oregon State since 1920.
- CHARLES BOSTWICK FRIDAY, Ph.D.**, Assistant Professor of Economics.
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- LEO FRIEDMAN, Ph.D.**, Professor of Chemistry.
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- ALMA CATHERINE FRITCHOFF, M.A.**, Professor Emeritus of Clothing, Textiles, and Related Arts.
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- JOHN FULTON, M.S.**, Professor Emeritus of Chemistry.
B.S.A. (1891), B.S. (1892), M.S. (1900), Oregon State. At Oregon State since 1893.
- JOHN CLIFTON GARMAN, Ph.M.**, Associate Professor of Physics.
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- EVRA ALTA GARRISON, M.A.**, Assistant Professor of Foods and Nutrition.
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- PHILIPP GERHARDT, Ph.D.**, Assistant Professor of Bacteriology.
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- EVAN KEITH GIBSON, Ph.D.**, Assistant Professor of English.
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- HEBER HOWARD GIBSON, A.M.**, Professor Emeritus of Agricultural Education.
A.B. (1909), Denison University (Ohio); A.M. (1912), Columbia. At Oregon State since 1921.
- ROBERT CAREY GIBSON, B.S.**, Lieutenant, United States Navy, Assistant Professor of Naval Science.
B.S. (1943), U. S. Naval Academy. At Oregon State since 1950.
- JOHN S GIFFIN, B.S., M.D.**, Assistant Physician, Student Health Service.
B.S. (1934), Wisconsin; M.D. (1936), Chicago. At Oregon State since 1948.

- EARL C GILBERT, Ph.D.**, Professor of Physical Chemistry; Chairman of Department.
B.S. (1916), M.S. (1917), Hiram College; Ph.D. (1922), Chicago. At Oregon State since 1917.
- F ARCHIBALD GILFILLAN, Ph.D.**, 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. At Oregon State 1918, 1922-23, and since 1927.
- GORDON WAVERLY GILKEY, M.F.A.**, Professor of Art; Head of Department.
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- HELEN MARGARET GILKEY, Ph.D.**, Professor of Botany; Curator of Herbarium.
B.S. (1907), M.S. (1911), Oregon State; Ph.D. (1915), California. At Oregon State 1908-11 and since 1918.
- AMORY TINGLE GILL, B.S.**, Head Coach of Basketball; Instructor in Physical Education.
B.S. (1925), Oregon State. At Oregon State since 1926.
- PERCY MARGARET GILL, M.S.**, Assistant Professor of Physical Education for Women.
B.A. (1931), California; M.S. (1948), Oregon State. At Oregon State since 1945.
- WINNIFRED KEIL GILEN, M.S.**, State Extension Agent (4-H Clubs).
B.S. (1930), M.S. (1938), Iowa State. At Oregon State since 1938.
- WILLIAM JAMES GILMORE, B.C.E., B.S.**, Professor Emeritus of Agricultural Engineering.
B.C.E. (1909), B.S. (in A.E.) (1911), Iowa State. At Oregon State since 1915.
- NORVILLE RAY GISH, B.S.**, Instructor in Journalism; Assistant Experiment Station Editor.
B.S. (1949), Kansas State. At Oregon State since 1949.
- GEORGE WALTER GLEESON, Ch.E.**, Dean of Engineering and Industrial Arts; Professor of Chemical Engineering.
B.S. (in Ch.E.) (1928), M.S. (in M.E.) (1934), Ch.E. (1936), Oregon State. At Oregon State since 1928.
- RUSSELL HOLCOMB GODARD, M.A.**, Instructor in Mathematics.
B.S. (1938), Oregon State; M.A. (1939), Iowa. At Oregon State since 1950.
- EARL GODDARD, M.B.A.**, Assistant Professor of Business Administration.
B.S. (1943), Southern Illinois; M.B.A. (1945), Northwestern. At Oregon State since 1946.
- JOHNATHAN PAUL GOLDSMITH, M.S.**, Instructor in Psychology.
B.S. (1948), M.S. (1949), Oregon. At Oregon State since 1949.
- JORGE GÓMEZ-HOOVER, B.A.**, Acting Instructor in Spanish.
B.A. (1948), Amherst. At Oregon State since 1949.
- DELMER MORRISON GOODE, M.A.**, Director of Publications; Curriculum Consultant (Professor).
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- PAUL NELSON GOODMONSON, B.S.**, Extension Farm Woodlot Products Marketing Specialist.
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- SAMUEL EDLEFSSEN GRAF, B.S., Research Engineer, Engineering Experiment Station.
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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. At Oregon State since 1908.
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- HAROLD E GREEN, Master Sergeant, Instructor in Military Science and Tactics.
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- ELMER HANSEN, Ph.D.**, Horticulturist (Pomology), Agricultural Experiment Station.
B.S. (1934), M.S. (1935), Oregon State; Ph.D. (1946), Chicago. At Oregon State since 1935.
- HENRY PAUL HANSEN, Ph.D.**, Dean of Graduate School; Professor (chairman) of General Science.
Ph.B. (1930), Ph.M. (1931), Wisconsin; Ph.D. (1937), Washington. At Oregon State since 1939.
- JOHN ROBERT HARDISON, Ph.D.**, Associate Pathologist, U. S. Department of Agriculture.
B.S. (1939), Washington State; M.S. (1940), Ph.D. (1942), Michigan. At Oregon State since 1944.
- ORLANDO BUEL HARDY, B.S.**, Extension Livestock Marketing Specialist.
B.S. (1911), Oregon State. At Oregon State 1915-16, and since 1949.
- JESSE E HARMOND, B.S.**, Professor of Agricultural Engineering; Senior Agricultural Engineer, U. S. Department of Agriculture.
B.S. (1932), Mississippi State. At Oregon State since 1945.
- JAMES ARTHUR HARPER, M.S.**, Assistant Professor of Poultry Husbandry; Assistant Poultry Husbandman, Agricultural Experiment Station.
B.S. (1940), Oregon State; M.S. (1942), Pennsylvania State. At Oregon State since 1942.
- CHARLES NEWTON HARRIS, M.A.**, Assistant Professor of Speech.
B.S. (1940), Idaho; M.A. (1945), Colorado State. At Oregon State since 1946.

- IRWIN CECIL HARRIS, M.S.J., Manager of Educational Activities and Athletic News Director (Instructor).
B.S. (1941), Oregon State; M.S.J. (1943), Northwestern. At Oregon State 1942-44 and since 1945.
- ROBERT DALTON HARRIS, M.A., Assistant Professor of Psychology.
B.A. (1941), M.A. (1945), Utah; M.A. (1950), Yale. At Oregon State since 1947.
- VIRGINIA F HARRISON, M.A., Assistant Professor of Physical Education for Women.
B.S. (1940), Wisconsin; M.A. (1944), Columbia. At Oregon State since 1948.
- HENRY HARTMAN, M.S., Professor of Horticulture; Head of Department; Horticulturist in Charge, Agricultural Experiment Station.
B.S. (1917), Washington State; M.S. (1922), Iowa State. At Oregon State 1919-31 and since 1932.
- BETTY EILEEN HAWTHORNE, M.S., Assistant Professor of Foods and Nutrition.
B.S. (1941), M.S. (1944), Washington. At Oregon State since 1946.
- EUGENE PETER HAYDU, M.S., Research Assistant, Agricultural Experiment Station.
B.S. (1948), M.S. (1949), Oregon State. At Oregon State since 1949.
- CHARLES OSWALD HEATH, JR., M.S., Associate Professor of Engineering Materials.
B.S. (in M.E.) (1936), California Institute of Technology; M.S. (1944), Rutgers. At Oregon State since 1946.
- *OLIVER HARRY HEINTZELMAN, M.A., Assistant Professor of Geography.
B.A. (1940), Central Washington; M.A. (1948), Washington. At Oregon State since 1949.
- ROBERT WESLEY HENDERSON, Ph.D., Assistant to the Director, Agricultural Experiment Station; Geneticist, Division of Rubber Plant Investigations, Bureau of Plant Industry, Soils and Agricultural Engineering.
B.S. (1938), Oregon State; Ph.D. (1950), Minnesota. At Oregon State 1938-41 and since 1946.
- ELZIE VANCE HERBERT, Orders Librarian (Assistant Professor).
At Oregon State since 1920.
- HENRY HERDT, Master Sergeant, Instructor in Air Science and Tactics.
At Oregon State since 1948.
- ROBERT JOHN HERRINGTON, B.S., Instructor in Civil Engineering.
B.S. (1949), Oregon State College. At Oregon State since 1949.
- BERTHA EMMA HERSE, B.S., B.L.S., Reference Librarian, (Associate Professor).
B.S. (1910), B.S. (1928), Oregon State; B.L.S. (1924), New York State Library School. At Oregon State 1910-12, 1916-22, and since 1924.
- RICHARD MORGAN HIGHSMITH, JR., Ph.D., Associate Professor of Geography.
B.A. (1941), Central Washington; M.A. (1946), Ph.D. (1950), Washington. At Oregon State since 1947.
- IDA CATHERINE HILBERS, M.A. (in L.S.), Continuations Cataloger (Instructor), Library.
B.A. (1922), Arizona; Certificate of Librarianship (1928), M.A. (in L.S.) (1931), California. At Oregon State since 1940.
- DONALD DAVID HILL, Ph.D., Professor of Farm Crops; Head of Department; Agronomist in Charge, Agricultural Experiment Station.
B.S. (1925), Oregon State; M.S. (1927), Kansas State; Ph.D. (1936), Cornell. At Oregon State since 1927.

* On leave of absence 1950-51.

- ROBERT JOHN HILL, B.S., Major, Associate Professor of Air Science and Tactics.
B.S. (1938), U. S. Military Academy. At Oregon State since 1950.
- HOWARD H HILLEMANN, Ph.D., Assistant Professor of Zoology.
B.S. (1933), Marquette; M.A. (1939), Ph.D. (1942), Wisconsin. At Oregon State since 1946.
- LEHI F HINTZE, M.A., Instructor in Geology.
A.B. (1941), Utah; M.A. (1948), Columbia. At Oregon State since 1949.
- EDWIN THOMAS HODGE, Ph.D., Professor of Economic Geology.
B.A. (1913), M.A. (1914), Minnesota; Ph.D. (1916), Columbia. At Oregon State since 1932.
- GODFREY RICHARD HOERNER, M.S., Extension Hop Specialist; Plant Pathologist, U. S. Department of Agriculture.
B.S. (1916), Oregon State; M.S. (1918), Minnesota. At Oregon State 1918-21 and since 1931.
- JULIAN HOGAN, B.A., Lieutenant Colonel, Artillery, Associate Professor of Military Science and Tactics; Director of Basic Unit.
B.A. (1941), Creighton. At Oregon State since 1950.
- GLENN WILLIS HOLCOMB, M.S., Professor of Structural Engineering.
B.S. (in C.E.) (1919), Michigan; M.S. (1931), Oregon State. At Oregon State since 1920.
- HELEN LUCILE HOLTGATE, B.S., Clerical Exchange (Retired).
B.S. (1895), Oregon State. At Oregon State 1900-47.
- HAROLD FULLER HOLLANDS, Ph.D., Professor of Agricultural Economics; Agricultural Economist, Agricultural Experiment Station.
B.S. (1923), Ph.D. (1939), Minnesota. At Oregon State since 1948.
- HELEN LORENA HOLLANDSWORTH, M.S., Instructor in Home Economics Education.
B.S. (1937), Montana State; M.S. (1950), Oregon State. At Oregon State since 1948.
- WILLIAM HENRY EGLE HOLMES, JR., M.S., Instructor in Psychology.
B.S. (1948), M.S. (1949), Purdue. At Oregon State since 1949.
- ELVERA CHARLOTTE HORRELL, Extension Agricultural Economist (Statistics).
At Oregon State since 1942.
- INGOMAR M HOSTETTER, Ph.D., Professor of Mathematics.
B.S. (1918), Ph.D. (1935), Washington. At Oregon State since 1941.
- ELMER WILLARD HOUSE, Instructor in Air Science and Tactics.
At Oregon State since 1951.
- CLARENCE WARREN HOVLAND, Ph.D., Assistant Professor of Philosophy and Religion.
B.A. (1940), Lawrence College; B.D. (1943), Ph.D. (1950), Yale. At Oregon State since 1949.
- MILON GEORGE HUBER, B.S., Extension Agricultural Engineering Specialist.
B.S. Agric. (1929), B.S. (in M.E.) (1932), Wisconsin. At Oregon State since 1945.
- ARTHUR DOUGLAS HUGHES, M.S., Professor of Mechanical Engineering.
B.S. (in M.E.) (1932), M.S. (1932), Washington State. At Oregon State since 1938.
- KATHERINE WHIPPLE HUGHES, M.A., Science Librarian (Associate Professor).
B.S. (in L.S.) (1928), Washington; M.A. (1939), Oregon State. At Oregon State since 1929.

- MARY BOWMAN HULL, Curator Emeritus, Horner Museum of the Oregon Country.
At Oregon State since 1910.
- JOHN IRELAND HUNDERUP, M.B.A., C.P.A., Assistant Business Manager.
B.A. (1944), Linfield; M.B.A. (1946), Northwestern; C.P.A. (1946), Illinois. At Oregon State since 1946.
- ALBERT SINCLAIR HUNTER, Ph.D., Associate Soil Scientist, Agricultural Experiment Station; U. S. Department of Agriculture.
B.S. (1938), Utah State; M.S. (1940), Washington State; Ph.D. (1943), Rutgers. At Oregon State since 1949.
- MILDRED BOWERS HUNTER, Ph.D., Assistant Professor of Foods and Nutrition.
B.S. (1938), Utah State; M.S. (1939), Columbia; Ph.D. (1949), Cornell. At Oregon State since 1950.
- FLORENCE LOUISE HUPPRICH, Ed.D., Assistant Professor of Physical Education for Women.
B.S. (1923), M.A. (1926), Wisconsin; Ed.D. (1949), Oregon. At Oregon State since 1937.
- JOHN LEWIS HUSTON, Ph.D., Assistant Professor of Chemistry.
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- BURTON SEYMOUR HUTTON, B.S., State Extension Agent (4-H Clubs).
B.S. (1927), Oregon State. At Oregon State 1935-43 and since 1948.
- EDGAR ANDREW HYER, Ph.D., Assistant Professor of Agricultural Economics; Assistant Agricultural Economist, Agricultural Experiment Station.
B.S. (1939), M.S. (1942), Utah State; Ph.D. (1948), Cornell. At Oregon State since 1948.
- LORA FRANCES IVES, B.A., Reference and Serials Assistant (Assistant Professor), Library.
B.A. (1940), Certificate of Librarianship (1942), California. At Oregon State since 1944.
- EDWIN RUSSELL JACKMAN, B.S., Extension Farm Crops Specialist.
B.S. (1920), Oregon State. At Oregon State since 1920.
- HARRY JAMES JACKSON, B.S., Instructor in Mechanical Engineering.
B.S. (1947), Washington. At Oregon State since 1948.
- MARIE HULL JACKSON, B.A., B.S. (in L.S.), Catalog Librarian (Associate Professor).
B.A. (1925), Oregon; B.S. in L.S. (1926), Washington. At Oregon State 1926-35 and since 1944.
- JEAN B JAMES, B.S., Instructor in Clothing, Textiles, and Related Arts.
B.S. (1949), Oregon State. At Oregon State since 1950.
- JAMES GEORGE JAMESON, M.F.A., Instructor in Art.
B.F.A. (1949), Washington University (St. Louis); M.F.A. (1950), Illinois. At Oregon State since 1950.
- KATE WETZEL JAMESON, Ph.D., Dean of Women Emeritus.
A.B. (1905), A.M. (1910), Ohio Wesleyan; A.M. (1914), Ph.D. (1916), Wisconsin. At Oregon State since 1923.
- CLARENCE VIRGIL JEAN, B.S., Instructor in Agricultural Education.
B.S. (1942), Washington State. At Oregon State since 1950.
- HAROLD DAVID JENKINS, Ph.D., Associate Professor of English.
B.A. (1929), M.A. (1931), Kansas; Ph.D. (1943), Yale. At Oregon State since 1944.

- CLYDE MARCUS JENSEN, B.S., Captain, United States Navy, Professor of Naval Science.
B.S. (1925), U.S. Naval Academy. At Oregon State since 1948.
- HAROLD JAMES JENSEN, Ph.D., Instructor and Research Assistant in Botany and Plant Pathology.
B.S. (1947), Ph.D. (1950), California. At Oregon State since 1950.
- JANE W JENSEN, M.S., Documents Cataloger (Instructor), Library.
B.A. (1947), Pittsburgh; M.S. (1949), Illinois. At Oregon State since 1949.
- JOHN GRANVILLE JENSEN, Ph.D., Professor of Geography.
A.B. (1939), Western Washington; M.A. (1942), Ph.D. (1946), Clark. At Oregon State since 1946.
- THORKEL H JENSEN, A.M. (in L.S.), Assistant Circulation Librarian.
B.S. (1942), Pennsylvania State Teachers (Kutztown); B.S. (in L.S.) (1947), Syracuse; A.M. (in L.S.) (1949), Michigan. At Oregon State since 1949.
- VERNEI EUGENE JEPSEN, B.S., Assistant Professor of Architecture.
B.S. (1941), Iowa State. At Oregon State since 1948.
- DONALD EDWARD JEWELL, B.S., Assistant Professor of Agricultural Engineering; In Charge of Farm Service Department, Agricultural Experiment Station.
B.S. (1947), Wisconsin. At Oregon State since 1949.
- JAMES RALPH JEWELL, Ph.D., LL.D., Professor Emeritus of Education.
A.B. (1903), Coe; M.A. (1904), Ph.D. (1906), Clark; LL.D. (1927), Arkansas. At Oregon State since 1927. Dean of the School of Education 1927-47.
- ELMER CARL JOHNSON, B.S., Extension Certification Specialist.
B.S. (1947), Oregon State. At Oregon State since 1947.
- JOE BONNER JOHNSON, M.S., Assistant Professor of Animal Husbandry; Assistant Animal Husbandman, Agricultural Experiment Station.
B.S. (1939), M.S. (1947), Oregon State. At Oregon State since 1947.
- LEONE SANDS JOHNSON, M.S., Program Consultant (Assistant Professor), Memorial Union.
B.S. (1926), North Dakota State; M.S. (1948), Oregon State. At Oregon State since 1948.
- MARTIN FRED JOHNSON, Assistant Professor of Industrial Arts.
At Oregon State since 1943.
- ELVET GLYN JONES, M.A., Instructor in Psychology.
B.A. (1946), M.A. (1949), British Columbia. At Oregon State since 1948.
- HILDA MEIUS JONES, M.A., Assistant Professor of Secretarial Science.
B.S.S. (1939), M.A. (1940), New York. At Oregon State since 1947.
- 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. At Oregon State since 1925.
- J SHIRLEY JONES, M.S.A., Professor Emeritus of Agricultural Chemistry; Chemist Emeritus, Agricultural Experiment Station.
B.S. (1903), California; M.S.A. (1914), Cornell. At Oregon State since 1919.
- LEO EDWARD JONES, Ph.D., Assistant Professor of Botany and Plant Pathology; Assistant Plant Pathologist.
A.B. (1940), Chico State College (California); Ph.D. (1950), Oregon State. At Oregon State since 1950.

- SIDNEY CARROLL JONES, M.S., Associate Entomologist, Agricultural Experiment Station.
B.S. (1926), Oregon State; M.S. (1928), Iowa State. At Oregon State since 1930.
- ETTA WESTENHOUSE JUDD, B.S. in L.S., Assistant Reference Librarian (Assistant Professor).
A.B. (1932), Willamette; B.S. (in L.S.) (1935), Illinois. At Oregon State since 1951.
- ANAITA SHELKOVNIKOVA JURGENSON, A.B., Assistant Professor of Russian.
A.B. (1915), French College, Alexandre Institute, Petrograd. At Oregon State since 1946.
- *LOUIS HOWARD KAISER, M.A., Instructor in Speech.
B.S. (1948), Arkansas; M.A. (1950), Wyoming. At Oregon State since 1950.
- LOUISA AMES KANIPE, B.S., Associate Botanist; Associate Seed Technologist; Associate Professor of Farm Crops.
B.S. (1933), Colorado State. At Oregon State since 1941.
- ROY SERVAIS KEENE, B.S., Director of Intercollegiate Athletics.
B.S. (1921), Oregon State. At Oregon State since 1947.
- KENNETH R KELLER, Ph.D., Agronomist, U. S. Department of Agriculture.
B.S. (1939), South Dakota State; M.S. (1941), Ph.D. (1948), Iowa State. At Oregon State since 1948.
- RICHARD STEPHEN KELLEY, LL.B., Assistant Professor of Business Administration.
A.B. (1942), LL.B. (1948), Michigan. At Oregon State since 1948.
- ROBERT FERNALD KENISTON, M.S., Assistant Professor of Forest Management.
B.A. (1929), Nebraska; B.S. (1937), M.S. (1941), California. At Oregon State since 1946.
- ARTHUR SOLOMON KING, M.S., Extension Soil Conservation Specialist.
B.S. (1928), M.S. (1930), Oregon State. At Oregon State since 1929.
- TSOO E KING, Ph.D., Research Associate in Chemistry.
B.S. (1935), National Central University, China; M.S. (1948), Ph.D. (1949), Oregon State. At Oregon State since 1949.
- DALE EARL KIRK, B.S., Assistant Professor of Agricultural Engineering; Assistant Agricultural Engineer, Agricultural Experiment Station.
B.S. (1942), Oregon State. At Oregon State since 1942.
- LESTER A KIRKENDALL, Ph.D., Associate Professor of Family Life.
B.S. (1928), Kansas State; M.A. (1931), Ph.D. (1937), Columbia. At Oregon State since 1949.
- WILLIAM JOHN KIRKHAM, Ph.D., Associate Professor of Mathematics.
A.B. (1927), A.M. (1928), Ph.D. (1935), Indiana. At Oregon State since 1929.
- LEONARD M KLEIN, B.S., Associate Professor of Agricultural Engineering; Associate Agricultural Engineer, U. S. Department of Agriculture.
B.S. (1938), Oregon State. At Oregon State since 1939.
- PAUL XENOPHON KNOLL, M.S., Professor of Speech.
B.S. (1923), M.S. (1930), Oregon State. At Oregon State since 1928.
- ROBERT PAUL KNOLL, B.S., Director of Alumni Relations.
B.S. (1948), Oregon State. At Oregon State since 1948.
- PHILIP NOEL KNORR, M.F., Assistant Professor of Forest Management.
B.S. (1938), California; M.F. (1940), Duke. At Oregon State since 1948.

* On military leave.

- KATHERINE COLLINS KNOX, M.S., Serials Assistant (Instructor), Library.
B.A. (1947), Maryville College; M.S. (1950), Columbia. At Oregon State since 1950.
- JAMES GEORGE KNUDSEN, Ph.D., Assistant Professor of Chemical and Metallurgical Engineering.
B.Sc. (1943), M.Sc. (1944), Alberta; Ph.D. (1949), Michigan. At Oregon State since 1949.
- DONALD JOHN KOEBRICK, Master Sergeant, Instructor in Military Science and Tactics.
At Oregon State since 1947.
- *ROBERT CHARLES KOEHLER, B.S., Director of Dormitories.
B.S. (1948), Cornell. At Oregon State since 1948.
- ORVILLE KOFOID, M.S., Associate Professor of Civil Engineering.
B.S. (1932), Oregon State; M.S. (1940), Iowa. At Oregon State since 1947.
- BERTHA KOHLHAGEN, M.S., State Supervisor and Teacher Trainer in Home Economics Education.
B.S. (1929), M.S. (1941), Oregon State. At Oregon State since 1935.
- AGNES KOLSHORN, M.A., Professor of Foods and Nutrition; Extension Nutrition Specialist.
B.S. (1913), Oklahoma State; B.S. (1918), Columbia; M.A. (1919), Denver. At Oregon State since 1929.
- GERALD E KORZAN, Ph.D., Assistant Professor of Agricultural Economics; Assistant Agricultural Economist, Agricultural Experiment Station.
B.S. (1940), South Dakota State; M.A. (1948), Ph.D. (1950), Minnesota. At Oregon State since 1949.
- GEORGE KOSANOVIC, M.F.A., Instructor in Art.
B.S. (1947), Pennsylvania State Teachers (Edinboro); M.F.A. (1948), California College of Arts and Crafts. At Oregon State since 1950.
- WILLIAM ARTHUR KOSKI, M.S., Instructor in Physical Education.
B.S. (1949), Oregon State; M.S. (1950), Michigan. At Oregon State since 1950.
- WILLIAM ANTHONY KOZUMPLIK, Ph.D., Assistant Librarian (Associate Professor).
A.B. (1935), Manhattan College; A.M. (1936), Catholic University of America; Ph.D. (1942), Chicago; B.S. (in L.S.) (1947), Columbia. At Oregon State since 1949.
- WALTER CARL KRAFT, Ph.D., Assistant Professor of Modern Languages.
B.A. (1938), M.A. (1941), Oregon; Ph.D. (1950), California. At Oregon State since 1950.
- DOROTHY ELIZABETH KREBS, M.S., Research Assistant, Agricultural Experiment Station.
B.A. (1947), M.S. (1949), Oregon State. At Oregon State since 1948.
- EVERETTE SANFORD KRONE, Master Sergeant, Instructor in Military Science and Tactics.
At Oregon State since 1950.
- DAVID H KRUEGER, M.A., Instructor in Speech.
A.B. (1949), M.A. (1950), Whittier College. At Oregon State since 1950.
- HUGO MARTIN KRUEGER, Ph.D., Professor of Physiology.
A.B. (1924), M.A. (1926), Denver; Ph.D. (1930), Michigan. At Oregon State since 1948.

* On military leave.

- GUSTAV WESLEY KUHLMAN, Ph.D., Professor of Agricultural Economics; Agricultural Economist, Agricultural Experiment Station.
B.S. (1925), South Dakota State; M.S. (1926), Ph.D. (1938), Illinois. At Oregon State since 1927.
- LEE WALLACE KUHN, M.S., Assistant Professor of Fish and Game Management; Assistant Biologist, Agricultural Experiment Station.
B.S. (1940), Iowa State; M.S. (1942), Oregon State. At Oregon State since 1946.
- EDITH CARTER KUNEY, A.M., Associate Professor of Modern Languages.
A.B. (1909), Willamette; A.M. (1925), Stanford. At Oregon State 1910-15 and since 1925.
- ROBERT MANTON KUNHARDT, B.S., Lieutenant Commander, United States Navy, Assistant Professor of Naval Science.
B.S. (1942), U. S. Naval Academy. At Oregon State since 1949.
- ERVIN FREDERICK KURTH, Ph.D., Professor of Wood Chemistry.
B.S. (1927), M.S. (1929), Ph.D. (1933), Wisconsin. At Oregon State since 1945.
- PAULA YVONNE KURTZ, B.S., Instructor in Home Administration.
B.S. (1948), Oregon State. At Oregon State since 1950.
- ADELAIDE VALETA LAKE, M.A., Assistant Professor of Journalism.
B.A. (1920), Oregon; M.A. (1942), Oregon State. At Oregon State since 1939.
- LUCY ROCENA LANE, M.A., Extension Clothing and Textiles Specialist.
A.B. (1921), Baker (Kansas); M.A. (1938), Iowa. At Oregon State since 1938.
- WILLIAM MARTIN LANGAN, B.S., Agricultural Student Personnel Adviser.
B.S. (1945), Oregon State. At Oregon State since 1935.
- REUBEN DONALD LANGMO, B.S., Assistant Professor of Industrial Engineering.
B.S. (1943), Oregon State. At Oregon State since 1948.
- 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. At Oregon State since 1928.
- *JOSEPH GUIDO LAPALOMBARA, M.A., Assistant Professor of Political Science.
A.B. (1947), M.A. (1950), Illinois. At Oregon State since 1947.
- LOYD Q LARSE, Ed.M., Associate Professor of Secretarial Science.
B.S. (1928), Oklahoma A. and M.; Ed.M. (1935), Oklahoma. At Oregon State since 1940.
- HERBERT REYNOLDS LASLETT, Ph.D., Professor of Educational Psychology.
A.B. (1918), Kansas; A.M. (1923), Ph.D. (1926), Stanford; Certificat (1919), Université Montpellier. At Oregon State since 1928.
- DOROTHY C LAUDERDALE, B.S., Instructor in Architecture.
B.S. (1946), Oregon State. At Oregon State since 1948.
- ALICE M LAWRENCE, B.A., Research Assistant, Agricultural Experiment Station.
B.A. (1948), Coe. At Oregon State since 1948.
- MARGARET LUCILLE LAWRENCE, B.A., Instructor in English.
B.A. (1933), Iowa. At Oregon State since 1945.
- NANCY LEA LAWRENCE, M.S., Research Assistant, Agricultural Experiment Station.
B.S. (1943), Seton Hill; M.S. (1945), Cornell. At Oregon State since 1949.

* On leave of absence 1950-51.

- OLIVER CLARE LAWRENCE, M.A., Instructor in English.
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- WILBUR WRAY LAWRENCE, B.S., Extension Agricultural Economist.
B.S. (1926), Oregon State. At Oregon State since 1926.
- MARIE LEDBETTER, M.S., Assistant Professor of Clothing, Textiles, and Related Arts.
B.A. (1934), Willamette; M.S. (1950), Oregon State. At Oregon State since 1946.
- JEROME LLOYD LEMASTER, LL.B., M.A., Professor of Business Administration.
LL.B. (1923), Illinois; Cert.d'A. en Droit Civile (1924), Bordeaux; M.A. (1925), Colorado. At Oregon State since 1928.
- ERWIN BERTRAN LEMON, B.S., Dean of Administration.
B.S. (1911), Oregon State. At Oregon State since 1911.
- LUCY MAY LEWIS, D.L.S., Librarian Emeritus (Professor).
A.B. (1905), B.L.S. (1906), Illinois; D.L.S. (1945), Oregon State. At Oregon State since 1911. Director of Libraries Emeritus, State System, since 1945.
- MARY EUNICE LEWIS, Ph.D., Associate Professor of Modern Languages.
B.S. (1906), Pacific College; A.B. (1907), Penn College (Iowa); M.A. (1918), California; Ph.D. (1939), Washington. At Oregon State since 1928.
- JEROME CHING REN LI, Ph.D., Associate Professor of Mathematics.
B.S. (1938), Nanking; Ph.D. (1943), Iowa State. At Oregon State since 1946.
- JOHN FRANK LIGON, JR., M.A., Instructor in English.
A.B. (1938), Vanderbilt; M.A. (1940), Peabody. At Oregon State since 1946.
- RUSSELL LAVERNE LINCOLN, B.S., Instructor in Physics.
B.S. (1938), Iowa State; B.S. (in Meteorology) (1944), New York. At Oregon State since 1946.
- *ARTHUR FREDERICK LINDBERG, M.A., Instructor in English.
B.A. (1948), Oberlin College; M.A. (1950), Washington State. At Oregon State since 1950.
- HARRY ARTHUR LINDGREN, B.S., Animal Husbandry Specialist.
B.S. (in Agric.) (1911), Oregon State. At Oregon State 1913-15 and since 1920.
- EARL MILO LITWILLER, Ph.D., Professor of Food Technology; Food Technologist, Agricultural Experiment Station.
B.S. (1924), M.S. (1926), Kansas State; Ph.D. (1944), Oregon State. At Oregon State since 1942.
- HAROLD MAURICE LIVINGSTON, M.A., Assistant Professor of Speech.
A.B. (1936), Illinois Wesleyan; M.A. (1941), Colorado. At Oregon State since 1946.
- RAYMOND MARSHALL LOCKWOOD, M.S., Instructor in General Engineering.
B.S. (1944), M.S. (1950), Oregon State. At Oregon State since 1946.
- ALBERT VICTOR LOGAN, Ph.D., Associate Professor of Chemistry.
B.A. (1924), Willamette; M.S. (1928), Ph.D. (1938), Massachusetts Institute of Technology. At Oregon State since 1946.
- DAVID ROBERT LONG, B.S., Instructor in Agricultural Engineering; Research Assistant, Agricultural Experiment Station.
B.S. (1947), Oregon State. At Oregon State since 1947.
- JAY B LONG, M.S., Associate Professor of Fish and Game Management.
B.S. (1939), M.S. (1948), Oregon State. At Oregon State since 1940.
- ARVID TURNER LONSETH, Ph.D., Professor of Mathematics.
A.B. (1935), Stanford; Ph.D. (1939), California. At Oregon State since 1948.

* Fall term 1950-51.

- ALBERT THOMAS LONSKI, B.S., Instructor in Civil Engineering.
B.S. (C.E.), B.S. (Math.) (1949), Oregon State. At Oregon State since 1949.
- MARTIN JAMES LUDWIG, M.A., Instructor in English.
B.A. (1947), Northeastern (Massachusetts); M.A. (1949), Boston. At Oregon State since 1949.
- MIRIAM DANIELS LUDWIG, B.A., Instructor in Family Life.
B.A. (1946), Oberlin; Graduate, Bank Street School, New York (1948). At Oregon State since 1949.
- MARGARET C LUMPKIN, M.S., Instructor in Physical Education for Women.
B.S. (1944), Woman's College, North Carolina; M.S. (1945), Wellesley. At Oregon State since 1948.
- WALTER THOMAS LUND, M.S., Instructor-Technician in Botany.
B.S. (1930), M.S. (1932), Oregon State. At Oregon State since 1937.
- RALPH NICHOLAS LUNDE, B.S., Associate Professor of Agricultural Engineering; Associate Agricultural Engineer, Agricultural Experiment Station.
B.S. (1926), Oregon State. At Oregon State since 1930.
- EDWARD HIRAM MCALISTER, Sc.D., Professor Emeritus of Mathematics.
A.B. (1890), A.M. (1893), Sc.D. (1937), Oregon. At Oregon State since 1932.
- LAURA MCALLISTER, B.S., Assistant Professor of Physical Education for Women (Retired).
Diploma (1906), Boston Normal School of Gymnastics; B.S. (1932), Oregon State. At Oregon State 1926-48.
- THOMAS JOHN MCCLELLAN, M. Engr., Assistant Professor of Civil Engineering.
B.S. (in C.E.) (1945), Oregon State; M. Engr. (1948), Yale. At Oregon State since 1945.
- WILLIAM ANDREW MCCLENAGHAN, M.A., Instructor in Political Science.
B.A. (1948), M.A. (1950), Washington. At Oregon State since 1949.
- WALTER FRASER MCCULLOCH, Ed.D., Professor of Forest Management; Head of Department.
B.A. (1925), British Columbia; M.S. (1936), Syracuse (New York State College of Forestry); Ed.D. (1947), Oregon. At Oregon State since 1937.
- ROB STEWART MCCUTCHEON, Ph.D., Associate Professor of Pharmacy.
B.S. (1933), Idaho; M.S. (1946), Ph.D. (1948), Washington. At Oregon State since 1948.
- GERTRUDE ELIZABETH McELFRESH, A.M., Assistant Professor Emeritus of English.
B.S. (1902), Oregon State; A.B. (1909), Cornell; A.M. (1924), Columbia. At Oregon State since 1909.
- 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. At Oregon State since 1913.
- FREDERICK FRANCIS MCKENZIE, Ph.D., D.Agr., D.V.S., Professor of Animal Husbandry; Chairman of Department; Animal Husbandman, Agricultural Experiment Station.
B.S.A. (1921), British Columbia; A.M. (1923), Ph.D. (1925), Missouri; D.Agr. (1941), Catholic University of Chile; D.V.S. (1945), University of Chile. At Oregon State since 1944.
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B.S. (in E.E.) (1912), Oregon State; M.S. (in E.E.) (1919), Union College. At Oregon State since 1920.

- ISABELLA F McQUESTEN, M.S., Associate Professor of Home Economics Education.
B.S. (1932), Arizona; M.S. (1940), Oregon State. At Oregon State since 1948.
- RONALD McREARY, B.S., Instructor in Civil Engineering.
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- FRANK PADEN McWHORTER, Ph.D., Plant Pathologist, Agricultural Experiment Station.
B.S. (1917), Vanderbilt; M.S. (1920), Chicago; Ph.D. (1928), Cornell. At Oregon State since 1930.
- MORTIMER DEFOREST MACDONALD, M.S., Wood Technologist, Oregon Forest Products Laboratory (Associate Professor).
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- ROBERT ALLEN MAGEE, M.S., Assistant Chemist, U. S. Department of Agriculture.
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- PHILIP COOPER MAGNUSON, Sc.D., E.E., Assistant Professor of Electrical Engineering.
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- WILLIAM CHARLES MAILLARD, M.S., Instructor in Physics.
A.B. (1946), California; M.S. (1950), Oregon State. At Oregon State since 1950.
- BERNARD MALAMUD, M.A., Instructor in English.
B.A. (1936), College of the City of New York; M.A. (1942), Columbia. At Oregon State since 1949.
- JESSALEE AHRENS MALLALIEU, M.S., Extension Recreation Specialist.
B.S. (1933), Missouri; M.S. (1948), Wisconsin. At Oregon State since 1948.
- RHODA MANNING, Ph.D., Assistant Professor of Mathematics.
A.B. (1935), A.M. (1937), Ph.D. (1941), Stanford. At Oregon State since 1941.
- MARILYN M MANTAY, M.A., Instructor in Psychology.
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- ALBERT WILLIAM MARSH, Ph.D., Associate Professor of Soils; Associate Soil Scientist, Agricultural Experiment Station.
B.S. (in Ch.E.) (1935), M.S. (1938), Minnesota; Ph.D. (1942), Oregon State. At Oregon State since 1940.
- WILLIAM HECTOR MARSH, B.S., Lieutenant Colonel, United States Marine Corps, Assistant Professor of Naval Science.
B.S. (1941), California (Los Angeles). At Oregon State since 1950.
- THOMAS GEORGE MARSHALL, M.S., Personnel and Placement Officer, School of Engineering.
B.S. (1947), M.S. (1948), Oregon State. At Oregon State since 1948.
- DONALD JOSEPH MARTEL, B.S., Associate Professor of Landscape Architecture; Head of Department.
B.S. (1942), Oregon. At Oregon State since 1947.

- CHARLES HERBERT MARTIN, Ph.D., Associate Professor of Entomology.
B.A., M.A., (1927), Kansas; Ph.D. (1939), Cornell. At Oregon State since 1946.
- GEORGE YOULLE MARTIN, B.S., Superintendent of College Press and Clerical Exchange.
B.S. (1935), South Dakota State. At Oregon State since 1936.
- MELISSA MARGARET MARTIN, A.M., Professor of Modern Languages; Head of Department.
A.B. (1912), Oregon; B.S. (1915), Oregon State; A.M. (1920), Columbia. At Oregon State since 1915.
- RICHARD WILLIAM MARTIN, B.S., Instructor in Botany.
B.S. (1948), Oregon State. At Oregon State since 1948.
- WALLACE HOPE MARTIN, M.E., M.S., Professor of Mechanical Engineering.
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- ELLIOT NELSON MARVELL, Ph.D., Assistant Professor of Chemistry.
B.S. (1943), Brown; Ph.D. (1948), Illinois. At Oregon State since 1948.
- CLIFFORD ELGES MASER, Ph.D., Dean, School of Business and Technology; Professor of Business Administration.
A.B. (1934), Swarthmore; D.K. (1935), Ph.D. (1936), Cologne. At Oregon State since 1942.
- JOSEPH PARKE MEHLIG, Ph.D., Professor Emeritus of Analytical Chemistry.
B.S. (1908), M.S. (1910), Ph.D. (1931), Purdue. At Oregon State since 1920.
- FRED MERRYFIELD, M.S., Professor of Sanitary Engineering.
B.S. (1923), Oregon State; M.S. (1930), North Carolina. At Oregon State since 1927.
- THEODORE LAWRENCE MESANG, M.Ed., Assistant Professor of Music.
B.M. (1945), Wisconsin; M.Ed. (1949), Minnesota. At Oregon State since 1949.
- EDWIN DAVID MEYER, M.S., Associate Professor of Industrial Arts and Industrial Education.
B.S. (1927), Stout Institute; M.S. (1940), Oregon State. At Oregon State since 1925.
- OTTO HERMAN MEYER, C.E., Assistant Superintendent of Physical Plant.
A.B. (1929), B.S. in Engr. (1931), C.E. (1931), Missouri; B.S. in Arch. (1947), Oregon. At Oregon State since 1950.
- ROBERT RAY MICHAEL, M.S., Assistant Professor of Electrical Engineering.
B.S. (1940), M.S. (1947), Oregon State. At Oregon State since 1947.
- AVA BERTHA MILAM, M.A., Professor Emeritus of Home Economics.
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- JOHN A MILBRATH, Ph.D., Plant Pathologist, Agricultural Experiment Station.
B.S. (1934), Washington State; Ph.D. (1938), Oregon State. At Oregon State since 1937.
- ATLEE MILES, Master Sergeant, U. S. Marine Corps, Instructor in Naval Science.
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- LEE FRANCIS MILLER, B.S., Assistant Professor of Mechanical Engineering.
B.S. (1947), Idaho. At Oregon State since 1947.
- PAUL WILLIAM MILLER, Ph.D., Plant Pathologist, U. S. Department of Agriculture.
B.S. (1923), M.S. (1924), Kentucky; Ph.D. (1929), Wisconsin. At Oregon State since 1930.

- RUTH CATHERINE MILLER, B.S., Research Assistant, Agricultural Experiment Station.
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- LOUISE MARGUERITE MILLIGAN, A.B., B.L.S., Assistant Reference Librarian (Assistant Professor).
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- MARGARET MILLIKEN, M.S., Assistant Professor of Physical Education for Women.
B.S. (1942), M.S. (1947), Oregon State. At Oregon State since 1947.
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- *WILLIAM EDMUND MILNE, Ph.D., D.Sc., Professor of Mathematics; Head of Department.
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- MARY BETH MINDEN, M.A., Associate Professor of Home Economics Extension; Home Management Specialist.
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B.E. (1920), C.E. (1926), M.S. (1932), Ph.D. (1935), Iowa. At Oregon State since 1921.
- HAROLD WILLIAM MOE, B.S., Instructor in Physical Education; Freshman Football Coach.
B.S. (1935), Oregon State. At Oregon State 1935-42 and since 1949.
- CAL GRAHAM MONROE, B.S., State Extension Agent (4-H Clubs).
B.S. (1939), Oregon State. At Oregon State since 1942.
- JAMES CECIL MOORE, M.S., Extension Conservation Specialist.
B.S. (1926), Oregon State; M.S. (1927), Iowa State. At Oregon State 1932-35 and since 1945.
- BENJAMIN EDWARD MORGAN, Master Sergeant, Instructor in Air Science and Tactics.
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- ETHEL POPE MORGAN, B.S., Instructor in Foods and Nutrition.
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- FRED BUCKNER MORGAN, M.S., Associate Professor of Physics.
B. Ped. (1910), Kirksville State Normal (Missouri); A.B. (1915), B.S. (1915), Missouri; M.S. (1930), Pittsburgh. At Oregon State 1920-32 and since 1934.
- RALPH L MORGAN, B.S., State Supervisor of Agricultural Education.
B.S. (1920), Oregon State. At Oregon State since 1946.
- HENRIETTA MORRIS, Sc.D., Associate Professor of Hygiene.
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- HUGH ENGLE MORRISON, M.S., Assistant Entomologist, Agricultural Experiment Station.
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- ROGER WILLIAM MORSE, B.S., Extension Dairy Specialist.
B.S. (1916), Washington State. At Oregon State since 1923.
- MARTHA RUTH MORTON, M.A., Assistant Dean of Women.
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- RUTH ANNETTA MOSER, M.S., Assistant Professor of Clothing, Textiles, and Related Arts.
B.S. (1931), North Dakota Agricultural; M.S. (1950), Oregon State. At Oregon State since 1946.
- MARTIN MOSHBERGER, Colonel, Artillery; Associate Professor of Military Science and Tactics; Director, Artillery Unit.
At Oregon State since 1948.
- DON CARLOS MOTE, Ph.D., Professor of Entomology; Head of Department; Entomologist in Charge, Agricultural Experiment Station.
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- CLIFFORD HAROLD MOULTON, M.S., Instructor in Electrical Engineering.
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- RAYMOND INSLEE MOUNT, JR., M.A., Instructor in English.
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- HELEN MULHERN, M.S., Assistant Professor of Institution Management; Acting Head of Department; Assistant Director of Dormitories.
B.S. (1925), M.S. (1931), Washington. At Oregon State since 1943.
- DWIGHT CURTIS MUMFORD, M.S., Professor of Agricultural Economics; Agricultural Economist, Agricultural Experiment Station.
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- JAMES KENNETH MUNFORD, Ed.D., Associate Editor of Publications; Associate Professor of English.
B.S. (1934), Oregon State; Ed.D. (1948), Stanford. At Oregon State 1939-46 and since 1948.
- OTTO HERBERT MUTH, D.V.M., M.S., Veterinarian, Agricultural Experiment Station.
D.V.M. (1929), M.S. (1935), Michigan State. At Oregon State since 1929.
- WILFRED GERVAIS MYATT, M.A., Associate Professor of Geography.
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- KIMO NATHANIEL, Master Sergeant, Instructor in Air Science and Tactics.
At Oregon State since 1949.
- GLEN T NELSON, Ph.D., Assistant Professor of Agricultural Economics; Assistant Agricultural Economist, Agricultural Experiment Station.
B.S. (1942), M.S. (1948), Utah State; Ph.D. (1950), Illinois. At Oregon State since 1950.
- HERBERT BENJAMIN NELSON, Ph.D., Professor of English.
A.B. (1926), M.A. (1927), Colorado; Ph.D. (1944), Washington. At Oregon State since 1927.

- KERMIT EARL NELSON**, Chief Fire Controlman, U. S. Navy; Instructor in Naval Science.
At Oregon State since 1949.
- MILTON NELS NELSON**, Ph.D., Professor of Economics; Head of Department.
A.B. (1915), M.A. (1917), Ph.D. (1921), Illinois. At Oregon State since 1926.
- ORAN MILTON NELSON**, M.S., Professor of Animal Husbandry; Animal Husbandman, Agricultural Experiment Station.
B.S. (1913), M.S. (1930), Wisconsin. At Oregon State since 1913.
- HARRY IRA NETTLETON**, M.S.F., Associate Professor of Forest Management.
B.S. (1921), Oregon State; M.S.F. (1928), Idaho. At Oregon State 1936-42 and since 1947.
- BYRON LOUIS NEWTON**, Ed.D., Associate Professor of Business Administration.
B.S. (1935), Northwestern (Oklahoma); M.S. (1939), Ed.D. (1946), Oklahoma A. and M. At Oregon State 1947-48 and since 1949.
- IVAN LEON NEWTON**, B.S., Extension Certification Specialist.
B.S. (1948), Oregon State. At Oregon State since 1948.
- BEN HODGE NICHOLS**, M.S., Associate Professor of Electrical Engineering.
B.S. (in M.E.) (1919), M.S. (in E.E.) (1932), Oregon State. At Oregon State since 1919.
- DAVID BOWMAN NICODEMUS**, Ph.D., Assistant Professor of Physics.
A.B. (1937), DePauw; Ph.D. (1946), Stanford. At Oregon State since 1950.
- FRANK DUEY NICOL**, M.S., Instructor in Botany.
B.S. (1943), M.S. (1948), Northwestern. At Oregon State since 1948.
- VICTOR DAMGAARD NIELSEN**, B.S., Instructor in Horticulture; Research Assistant, Agricultural Experiment Station.
B.S. (1948), Washington State. At Oregon State since 1949.
- THOMAS BLANEY NIVEN**, Ph.D., Assistant Professor of Food Technology; Assistant Food Technologist, Agricultural Experiment Station.
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- FAITH GRIGSBY NORRIS**, Ph.D., Assistant Professor of English.
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- THOMAS HUGHES NORRIS**, Ph.D., Assistant Professor of Chemistry.
A.B. (1938), Princeton; Ph.D. (1942), California. At Oregon State since 1947.
- DALLAS W NORTON**, M.Ed., Personnel Coordinator; Assistant Registrar.
B.S. (1936), M.Ed. (1941), Oregon. At Oregon State since 1947.
- JOHN ALAN O'CONNOR**, M.S., Instructor in Music.
B.S. (1939), M.S. (1948), Idaho. At Oregon State since 1949.
- J DAVID O'DEA**, M.S., Counselor and Instructor, School of Education.
B.S. (1948), M.S. (1949), Kansas State Teachers (Emporia). At Oregon State since 1950.
- JOHN ELMER O'LEARY**, M.F., Instructor in Forest Engineering.
B.S.F. (1942), Michigan; M.F. (1947), Oregon State. At Oregon State since 1949.
- CASIMIR OLISZEWSKI**, B.C.E., Master Sergeant, Instructor in Military Science and Tactics.
B.C.E. (1932), Marquette. At Oregon State since 1950.
- ALFRED WEAVER OLIVER**, M.S., Associate Professor of Animal Husbandry; Associate Animal Husbandman, Agricultural Experiment Station.
B.S. (1918), Oregon State; M.S. (1928), Wisconsin. At Oregon State since 1919.

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- DANIEL THOMAS ORDEMAN, Ph.D., Registrar.
A.B. (1920), M.A. (1922), Washington and Lee; Ph.D. (1927), Maryland. At Oregon State since 1927.
- LOUISE JACKMAN ORNER, M.S., Assistant Professor of Secretarial Science.
B.S. (1922), M.S. (1940), Oregon State. At Oregon State since 1936.
- JOHN LYNN OSBORN, Ph.D., Associate Professor Emeritus of Zoology.
Ph.C. (1915), Michigan; A.B. (1922), Kansas; A.M. (1923), Nebraska; Ph.D. (1939), Washington. At Oregon State since 1923.
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- CHARLES ELMER OWENS, Ph.D., Professor Emeritus of Botany and Plant Pathology.
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- OLAF GUSTAV PAASCHE, B.S., Associate Professor of Mechanical Engineering.
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- EARL LEROY PACKARD, Ph.D., Professor Emeritus of Paleontology.
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- JAMES LOUIS PACKMAN, B.A., Major, Infantry, Associate Professor of Military Science and Tactics; Director of Infantry Unit.
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- FRANK LOVERN PARKS, Ph.D., Associate Professor of Sociology; Head Counselor of Lower Division.
B.A., B.E. (1929), M.A. (1932), Colorado; Ph.D. (1949), Washington. At Oregon State since 1949.
- HENRY RICHARD PATTERSON, B.S., Professor of Forest Engineering; Head of Department.
B.S. (in C.E.) (1909), Oregon. At Oregon State since 1920.

- JOAN PATTERSON, M.F.A.**, Associate Professor of Clothing, Textiles, and Related Arts.
B.Arch. (1931), Oregon; M.F.A. (1950), Cranbrook Academy of Art. At Oregon State since 1936.
- WILLIAM HOWARD PAUL, M.S.**, Professor of Automotive Engineering.
B.S. (1924), M.S. (1935), Oregon State. At Oregon State since 1926.
- OSCAR INGAL PAULSON, B.S.**, Associate Professor of Vocational Education.
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- ARTHUR LEE PECK, B.S., B.A.**, Professor Emeritus of Landscape Architecture.
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- RAY ARTHUR PENDLETON, Ph.D.**, Professor of Soils; Agronomist, U. S. Department of Agriculture.
B.S. (1928), Oregon State; M.S. (1928), Ph.D. (1930), Iowa State. At Oregon State since 1941.
- SAM RAY PEOPLES, M.S.**, Instructor in Physics.
B.S. (1947), M.S. (1950), Oregon State. At Oregon State since 1948.
- *ELNA CHRISTINE PETERSEN, M.S.**, Assistant Professor of Foods and Nutrition.
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- SIGURD HARLAN PETERSON, Ph.D.**, Professor of English; Head of Department.
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- TED WILLIAM PETERSON, B.S.**, Lieutenant Colonel, Signal Corps, Associate Professor of Military Science and Tactics; Director of Signal Unit.
B.S. (1935), North Dakota State. At Oregon State since 1950.
- LILLIAN JEFFREYS PETRI, Professor Emeritus of Music.**
At Oregon State since 1924.
- PAUL PETRI, Professor Emeritus of Music.**
At Oregon State since 1924.
- JOHN ADAMS PFANNER, JR., Ph.D.**, Associate Professor of Business Administration.
A.B. (1927), Dartmouth; M.A. (1931), Ph.D. (1939), Chicago. At Oregon State since 1946.
- JACK RUSSELL PFEIFFER, M.F.**, Acting Editor, Oregon Forest Products Laboratory (Instructor).
B.S. (1947), Colorado Agricultural and Mechanical College; M.F. (1950), Duke. At Oregon State since 1950.

* On military leave.

- MARK CLYDE PHILLIPS, B.M.E., Professor Emeritus of Mechanical Engineering.
B.M.E. (1896), Oregon State. At Oregon State since 1897.
- WAYNE E PHILLIPS, M.S., Instructor in Mechanical Engineering.
B.S. (1949), M.S. (1950), Oregon State. At Oregon State since 1949.
- HARRY KENYON PHINNEY, Ph.D., Associate Professor of Botany.
B.A. (1941), Cincinnati; M.A. (1943), Albion; Ph.D. (1945), Northwestern. At Oregon State since 1947.
- *JULIANNE WISE PHINNEY, M.S., Assistant Professor of Home Administration.
B.S. (1941), M.S. (1943), Oregon State. At Oregon State since 1945.
- ERNA PLAGEMAN, R.N., Assistant Director, Student Health Service.
R.N. (1926), Michigan. At Oregon State since 1929.
- HANS HEINRICH PLAMBECK, Ph.D., Associate Professor of Sociology.
B.A. (1935), M.A. (1938), Oregon; Ph.D. (1941), Cornell. At Oregon State since 1946.
- C VINTON PLATH, Ph.D., Associate Professor of Agricultural Economics; Associate Agricultural Economist, Agricultural Experiment Station.
B.S. (1937), North Dakota Agricultural College; M.S. (1939), Vermont; Ph.D. (1947), Cornell. At Oregon State since 1948.
- DAN WILLIAMS POLING, M.S., Dean of Men; Professor of Political Science.
B.S. (1928), M.S. (1938), Oregon State. At Oregon State since 1937.
- HELEN VIRGINIA POLING, Instructor in Physical Education for Women.
At Oregon State since 1949.
- ALBERT ROBERTS POOLE, Ph.D., Associate Professor of Mathematics.
B.A. (1929), M.A. (1931), British Columbia; Ph.D. (1935), California Institute of Technology. At Oregon State since 1946.
- MILOSH POPOVICH, M.S., Associate Professor of Mechanical Engineering; Chairman of Department.
B.S. (in C.E.) (1939), M.S. (in M.E.) (1941), Oregon State. At Oregon State in 1945 and since 1947.
- ERMINE LAWRENCE POTTER, M.S., Professor Emeritus of Agricultural Economics.
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- CHARLES EDGAR POULTON, M.S., Associate Professor of Range Management; Associate in Range Management, Agricultural Experiment Station.
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- WILBUR LOUIS POWERS, Ph.D., Professor of Soils; Head of Department; Soil Scientist in Charge, Agricultural Experiment Station.
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- IVAN PRATT, Ph.D., Associate Professor of Zoology.
B.A. (1932), College of Emporia; M.S. (1935), Kansas State; Ph.D. (1938), Wisconsin. At Oregon State since 1946.
- SARA WATT PRENTISS, M.A., Professor of Child Development; Head of Department of Family Life and Home Administration.
B.S. (1917), Oregon State; M.A. (1929), California. At Oregon State since 1917.

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- FREDERICK EARL PRICE, B.S., Dean, School of Agriculture; Director, Agricultural Experiment Station; Director, Federal Cooperative Extension.
B.S. (1922), Oregon State. At Oregon State since 1922.
- JAMES FERRIS PRICE, Ph.D., Assistant Professor of Mathematics.
A.B. (1938), Pacific; M.A. (1940), Ph.D. (1949), Oregon State. At Oregon State since 1947.
- PHIMISTER BAYARD PROCTOR, Ph.D., Managing Director, Oregon Forest Products Laboratory (Professor).
B.S.F. (1937), M.S.F. (1938), Washington; Ph.D. (1940), Yale. At Oregon State since 1945.
- HAZEL GUSTINE QUASDORF, B.A., B.S. in L.S., Assistant Science Librarian (Assistant Professor), Library.
B.A. (1920), Cornell College; B.S. in L.S. (1928), Illinois. At Oregon State since 1944.
- JOHN QUINN, Chief Quartermaster, United States Navy, Instructor in Naval Science.
At Oregon State since 1950.
- HOWARD WILLIAM RAABE, M.S., Associate Professor of Physical Education; Director of Intramural Sports.
B.S. (1935), M.S. (1939), Oregon State. At Oregon State since 1935.
- HENRY HARDY RAMPTON, M.S., Associate Agronomist, U. S. Department of Agriculture.
B.S. (1928), Utah State; M.S. (1933), Oregon State. At Oregon State since 1931.
- WARREN ROBERT RANDALL, M.S., Assistant Professor of Forest Management.
B.S. (1943), M.S. (1947), Idaho. At Oregon State since 1947.
- CECIL OTIS RAWLINGS, M.S., Extension Horticulture Specialist.
B.S. (1925), Illinois; M.S. (1946), New Hampshire. At Oregon State since 1946.
- KATHERINE HASKELL READ, M.S., Professor of Family Life; Director of Nursery Schools.
A.B. (1925), Mills College; M.S. (1938), Purdue. At Oregon State since 1941.
- HAMIT DARWIN REESE, Ph.D., Assistant Professor of Chemistry.
B.A. (1940), Brigham Young; Ph.D. (1947), Iowa State. At Oregon State since 1947.
- DOROTHY MAE REEVES, M.A., Assistant Professor of Secretarial Science.
B.A. (1934), Iowa State Teachers; M.A. (1946), New York. At Oregon State since 1950.
- ROBERT RAY REICHART, D.Ed., Associate Professor of Educational Psychology.
B.S. (1917), M.S. (1937), Oregon State; D.Ed. (1941), Oregon. At Oregon State 1926-32 and since 1934.
- WILLIAM CURTIS REID, Ph.D., Associate Professor of Visual Instruction; Head of Department; Extension Specialist in Visual Instruction.
B.A. (1929), Willamette; M.S. (1932), New York; Ph.D. (1941), Oregon State. At Oregon State since 1937.
- ORVILLE KENNETH REILLEY, Captain, Associate Professor of Air Science and Tactics.
At Oregon State since 1951.
- LEMAR FRED REMMERT, Ph.D., Assistant Chemist, Agricultural Experiment Station.
B.S. (1939), Iowa State; M.S. (1942), Oregon State; Ph.D. (1949), Wisconsin. At Oregon State since 1948.

- DANIEL CLYDE REYNOLDS, B.S., M.D., Director of Student Health Service; Professor of Hygiene.
B.S. (1916), M.D. (1918), Michigan. At Oregon State since 1929.
- ELBERT FLOYD RICE, M.S., Instructor in General Engineering.
B.S. (C.E.) (1948), Idaho; M.S. (1950), Oregon State. At Oregon State 1947-48 and since 1949.
- HILDRED ATKINSON RICE, B.S., Instructor in English.
B.S. (1931), Oregon State. At Oregon State since 1946.
- GEORGE ARTHUR RICHARDSON, Ph.D., Professor of Dairy Husbandry; Dairy Husbandman, Agricultural Experiment Station.
B.Sc. (Agr.) (1920), Toronto; M.S. (1925), Ph.D. (1927), Minnesota. At Oregon State since 1947.
- RICHARD LEVOYLE RICHARDSON, B.S., Assistant Professor of General Engineering.
B.S. (1940), Oregon State. At Oregon State since 1946.
- CHARLES ALFRED RIGAUD, B.S., Lieutenant Colonel, U. S. Marine Corps, Associate Professor of Naval Science.
B.S. (1939), Syracuse. At Oregon State since 1949.
- ELIZABETH PROPHET RITCHIE, A.B., B.L.S., Catalog Librarian Emeritus (Assistant Professor).
A.B. (1900), Cotner College; B.L.S. (1909), Illinois. At Oregon State since 1920.
- ALFRED NATHAN ROBERTS, M.S., Associate Professor of Horticulture; Associate Horticulturist, Agricultural Experiment Station.
B.S. (1939), M.S. (1941), Oregon State. At Oregon State since 1940.
- ARTHUR LOREN ROBERTS, B.S., Assistant Professor of Industrial Engineering and Industrial Arts.
B.S. (1944), Oregon State. At Oregon State since 1946.
- THOMAS EDWARD ROBERTS, M.M., Instructor in Music.
B.A. (1942), Iowa Wesleyan; M.M. (1948), Chicago Musical College. At Oregon State since 1948.
- GEORGE MORRIS ROBERTSON, M.S., Business Manager.
B.S. (1941), Oregon State; M.S. (1942), New York. At Oregon State since 1946.
- WILLIAM BARR ROBERTSON, B.S., Athletic Trainer (Instructor), Intercollegiate Athletics.
B.S. (1948), Oregon State. At Oregon State since 1946.
- DAN D ROBINSON, M.F., Associate Professor of Forest Management.
B.S.F. (1940), Oregon State; M.F. (1942), Syracuse. At Oregon State since 1944.
- REGINALD HEBER ROBINSON, M.S., Chemist (Insecticides and Fungicides), Agricultural Experiment Station.
A.B. (1909), Pacific; M.S. (1912), California. At Oregon State since 1911.
- ASA AUSTIN ROBLEY, B.S., Assistant Professor of Industrial Arts.
B.S. (1939), Oregon State. At Oregon State 1938-42 and since 1947.
- JEFFERSON BELTON RODGERS, A.E., Professor of Agricultural Engineering; Head of Department; Agricultural Engineer in Charge, Agricultural Experiment Station.
B.S. (M.E.) (1929), M.S. (A.E.) (1935), A.E. (1939), Idaho. At Oregon State since 1946.
- SHIRLEY FRANCES ROEDER, M.S., Instructor in Pharmacy.
B.S. (1947), M.S. (1949), Washington State. At Oregon State since 1949.

- HERBERT HARRISON ROOK, B.S., Assistant Professor of General Engineering.
B.S. (1940), Colorado. At Oregon State since 1947.
- ROBERT G ROSENSTIEL, Ph.D., Assistant Entomologist, Agricultural Experiment Station.
B.S. (1937), M.S. (1939), Oregon State; Ph.D. (1950), California. At Oregon State since 1946.
- CHARLES ROBERT ROSS, M.S.F., Extension Specialist in Farm Forestry.
B.S.F. (1931), Georgia; M.S.F. (1932), Washington. At Oregon State since 1946.
- JOHN DARYL ROSS, M.S., Chemical Engineer, Oregon Forest Products Laboratory (Assistant Professor).
B.S. (1943), M.S. (1948), Oregon State. At Oregon State since 1947.
- *RICHARD CHARLES ROSS, M.S., Assistant Professor of Chemical Engineering.
B.S. (1944), Oklahoma; M.S. (1948), Oregon State. At Oregon State since 1946.
- LEWIS FRANKLIN ROTH, Ph.D., Associate Professor of Botany.
B.A. (1936), Miami; Ph.D. (1940), Wisconsin. At Oregon State since 1940.
- SIDNEY RUBIN, Ph.D., Associate Professor of Economics.
B.A. (1937), M.A. (1938), Washington; Ph.D. (1950), California. At Oregon State since 1946.
- BENJAMIN FRANKLIN RUFFNER, Aero.E., M.S., Professor of Aeronautical Engineering.
B.S. (in M.E.) (1929), Aero.E. (1930), M.S. (1935), New York. At Oregon State since 1936.
- CHARLES VLADIS RUZEK, M.S., Professor of Soil Fertility; Soil Scientist (Fertility), Agricultural Experiment Station.
B.S.A. (1909), M.S. (1929), Wisconsin. At Oregon State since 1914.
- FRANK L RYAN, Major, Associate Professor of Air Science and Tactics.
At Oregon State since 1950.
- JEAN RYDER, M.S., Instructor in Physical Education for Women.
B.S. (1945), Sargent; M.S. (1949), Smith. At Oregon State since 1949.
- AZALEA LINFIELD SAGER, M.A., State Leader, Home Economics Extension; Professor of Extension Methods.
B.S. (1919), Montana State; M.A. (1921), Columbia. At Oregon State since 1932.
- RALPH WILLIAM SALISBURY, B.S., Assistant to the Director of Publications.
B.S. (1949), Kansas State. At Oregon State since 1949.
- CARL WALTER SALSER, Ed.M., Professor Emeritus of Education.
A.B. (in Ed.) (1911), Kansas State Teachers (Emporia); Ed.M. (1926), Harvard. At Oregon State since 1929. Assistant Dean of the School of Education, 1929-47.
- CLIFFORD ELROY SAMUELS, B.S., Assistant Professor of Food Technology; Assistant Food Technologist, Agricultural Experiment Station.
B.S. (1941), California. At Oregon State since 1947.
- ETHEL IDA SANBORN, Ph.D., Professor Emeritus of Botany and Paleobotany.
B.S. (1903), South Dakota State; B.A. (1904), M.A. (1907), South Dakota; Ph.D. (1928), Stanford. At Oregon State since 1932.
- HAZEL ARLINE SAREMAL, B.S., Assistant Reference Librarian (Instructor).
B.S. (1939), Oregon State; Certificate in Librarianship (1946), California. At Oregon State since 1948.
- MERRILL DREXILL SATHER, B.S., Extension Certification Specialist.
B.S. (1949), Oregon State. At Oregon State since 1949.

* On leave of absence 1950-51.

- ROY BLY SAUNDERS, Ph.D., Associate Professor of Mathematics.
A.B. (1933), Whitman; M.A. (1940), Ph.D. (1946), Minnesota. At Oregon State since 1946.
- HUBERT EUGENE SAUTER, B.L.S., Engineering Librarian (Instructor), Library.
B.E.E. (1949), Marquette; B.L.S. (1950), Wisconsin. At Oregon State since 1950.
- MURLE SCALES, M.S., Extension Clothing Specialist.
B.S. (1932), Trinity (Texas); M.S. (1947), Iowa State. At Oregon State since 1947.
- JEAN WILLARD SCHEEL, B.S., Assistant to the Director, Federal Cooperative Extension Service.
B.S. (1934), Kansas State. At Oregon State since 1946.
- BENTON F SCHEIDE, M.A., Library Circulation Assistant.
B.A. (1948), M.A. (1949), Denver. At Oregon State since 1949.
- JOHN OTTO SCHNAUTZ, D.V.M., M.S., Associate Professor of Veterinary Medicine; Associate Veterinarian, Agricultural Experiment Station.
A.B. (1937), George Washington; D.V.M. (1941), Pennsylvania; M.S. (1945), Oregon State. At Oregon State since 1942.
- WILLIAM ALFRED SCHOENFELD, M.B.A., Professor Emeritus of Agriculture.
B.S. (1914), Wisconsin; M.B.A. (1922), Harvard. At Oregon State since 1931. Dean and Director of Agriculture, 1931-50.
- HARRY AUGUST SCHOTH, M.S., Senior Agronomist, U. S. Department of Agriculture.
B.S. (1914), M.S. (1917), Oregon State. At Oregon State since 1914.
- ELVER AUGUST SCHROEDER, Ph.D., Assistant Professor of English.
A.B. (1934), Elmhurst College; M.A. (1937), Illinois; Ph.D. (1950), Michigan. At Oregon State since 1946.
- HAROLD L SCHUDEL, M.S., Instructor in Farm Crops; Research Assistant, Agricultural Experiment Station.
B.S. (1940), M.S. (1941), Nebraska. At Oregon State since 1946.
- JOSEPH SCHULEIN, B.S., Associate Professor of Chemical Engineering and Chemistry.
B.S. (in Ch.E.) (1940), Wisconsin. At Oregon State since 1942.
- MARGARET JO SCHWAB, Ed.M., Research Assistant, Agricultural Experiment Station.
B.S. (1941), Ed.M. (1948), Oregon State. At Oregon State since 1946.
- LEO ANTON SCIUCHETTI, M.S., Associate Professor of Pharmacy.
B.S. (1940), Idaho; M.S. (1942), Washington State. At Oregon State since 1946.
- ALLEN BREWSTER SCOTT, Ph.D., Associate Professor of Chemistry.
B.S. (1937), Oregon State; Ph.D. (1941), Washington. At Oregon State since 1941.
- HERMAN AUSTIN SCULLEN, Ph.D., Professor of Entomology; Apiculturist, Agricultural Experiment Station.
B.A. (1910), M.A. (1927), Oregon; Ph.D. (1934), Iowa State. At Oregon State since 1920.
- GRACE MARY SCULLY, M.S., Assistant Professor of Physical Education for Women.
B.S. (1942), M.S. (1946), Oregon. At Oregon State since 1945.
- STUART BRUCE SEATON, M.S., Associate Professor of Business Administration.
B.S. (1933), Central State (Oklahoma); M.S. (1941), Oklahoma Agricultural and Mechanical College. At Oregon State since 1950.

- 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. At Oregon State since 1935.
- RUTH SEID, B.S.**, Instructor in Pharmacy.
B.S. (1950), Washington. At Oregon State since 1951.
- HARRY CASE SEYMOUR**, State 4-H Club Leader Emeritus.
At Oregon State since 1916.
- CAROLYN LOIS SHAVER, B.S.**, Extension Information Specialist.
B.S. (1947), Cornell. At Oregon State since 1950.
- CLAYTON ALBERT SHAW, B.S.**, Major, Artillery, Assistant Professor of Military Science and Tactics.
B.S. (1942), Oregon State. At Oregon State since 1950.
- 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. At Oregon State 1919-21 and since 1926.
- MILTON CONWELL SHEELY, B.S.**, Professor of Industrial Engineering and Industrial Arts.
B.S. (in M.E.) (1939), Oregon State. At Oregon State since 1939.
- JAMES WILSON SHERBURNE, Ph.D.**, Professor (Acting Head) of Psychology.
A.B. (1927), Greenville College; M.A. (1928), Michigan; Ph.D. (1938), Ohio State. At Oregon State since 1938.
- FRED MERLE SHIDELER, M.S.**, Professor of Journalism; Head of Department; Director of News Bureau.
B.S. (1927), Kansas State; M.S. (1941), Oregon State. At Oregon State since 1929.
- DELBERT WALLACE SHIRLEY, JR., B.S.**, Assistant Professor of Electrical Engineering.
B.S. (1929), Oregon State. At Oregon State since 1947.
- CLARA LOUISE SIMERVILLE, M.A.**, Instructor in Sociology.
B.A. (1928), Willamette; M.A. (1930), Oregon. At Oregon State since 1950.
- JAMES L SIMKINS, JR., B.S.**, Master Sergeant, Instructor in Air Science and Tactics.
B.S. (1940), Washington. At Oregon State since 1950.
- JOSEPH ELLSWORTH SIMMONS, M.S.**, Professor of Bacteriology; Chairman of Department.
B.S. (1916), M.S. (1918), Wisconsin. At Oregon State since 1919.
- HERBERT REEVES SINNARD, M.S., R.A.**, Professor of Architecture and Agricultural Engineering; Head of Department of Architecture; Agricultural Engineer (Farm Structures), Agricultural Experiment Station.
B.S. (1927), M.S. (1929), Iowa State. At Oregon State 1929-32 and since 1934.
- HARRIET ELEANOR SISSON, M.S.**, Instructor in Pharmacy.
B.S. (1937), M.S. (1939), Minnesota. At Oregon State since 1946.
- DONALD PAUL SITES, M.S.**, Assistant Professor of Music.
B.A. (1939), Gustavus Adolphus; M.S. (Mus.Ed.) (1948), Idaho. At Oregon State since 1947.
- CHARLES EDWARD SKINNER, M.D.**, Assistant Physician, Student Health Service.
B.A. (1939), Oberlin; M.D. (1943), Columbia. At Oregon State since 1947.

- LOUIS SLEGEL, Ph.D., Professor of Mechanical Engineering.
B.S. (in M.E.) (1931), M.S. (in M.E.) (1932), Ph.D. (1945), Purdue. At Oregon State since 1945.
- OLIVE A SLOCUM, R.N., M.A., Assistant Professor of Nursing Education.
B.A. (1919), M.A. (1934), Southern California; R.N. (1924), State of California. At Oregon State since 1945.
- CAIRNS KING SMITH, Ph.D., Professor of History.
B.A. (1921), Saskatchewan; M.A. (1930), Minnesota; Ph.D. (1936), Chicago. At Oregon State since 1945.
- CHARLES WESLEY SMITH, B.S., Assistant Director, Federal Cooperative Extension Service.
B.S. (1921), Washington State. At Oregon State since 1927.
- CLIFFORD LOVEJOY SMITH, M.S., State Extension Agent.
B.S. (1929), Oregon State; M.S. (1930), Kansas State. At Oregon State 1931-34 and since 1941.
- EDWARD DOYLE SMITH, M.A., Instructor in English.
B.S.S. (1940), Oregon State; M.A. (1951), Oregon. At Oregon State 1946 and since 1947.
- FRANK HERSHEL SMITH, Ph.D., Associate Professor of Botany.
B.S. (1929), Arkansas; M.S. (1930), Washington State; Ph.D. (1932), Wisconsin. At Oregon State since 1936.
- JAMES WILLIAM SMITH, B.S., Assistant Professor of Industrial Arts.
B.S. (1947), Oregon State. At Oregon State since 1947.
- LAURA BELLE SMITH, M.A., Assistant Professor of Clothing, Textiles, and Related Arts.
B.A. (1933), M.A. (1934), Ohio State. At Oregon State since 1946.
- MAHLOW ELLWOOD SMITH, Ph.D., Professor of English.
A.B. (1906), Syracuse; M.A. (1909), Ph.D. (1912), Harvard. At Oregon State since 1919. Dean of Lower Division and Service Departments 1932-49.
- MARLOWE FRANCIS SMITH, Master Sergeant, Instructor in Military Science and Tactics.
At Oregon State since 1950.
- NATALIE ANN SMITH, B.A., Instructor in Family Life.
B.A. (1941), Oregon State. At Oregon State since 1949.
- ROBERT WAYNE SMITH, Ph.D., Associate Professor of History.
B.A. (1924), Kansas; M.A. (1932), Idaho; Ph.D. (1937), California. At Oregon State since 1943.
- HELEN ROBINSON SNIPPER, M.Ed., Instructor in English.
A.B. (1943), California (Los Angeles); M.Ed. (1950), Oregon. At Oregon State since 1947.
- JAMES RODNEY SNITZLER, M.B.A., Instructor in Business Administration.
B.A. (1943), Washington; M.B.A. (1949), Columbia. At Oregon State since 1949.
- JAMES DODD SNODGRASS, B.S., Assistant Professor of Forest Products.
B.S. (W.T.) (1943), Michigan. At Oregon State since 1946.
- KEITH NEWMAN SODERLUND, B.S., Instructor in Industrial Engineering and Industrial Arts.
B.S. (1948), Oregon State. At Oregon State since 1948.
- INGVALD BEN SOLBERG, B.L.A., Associate Professor of Landscape Architecture.
B.L.A. (1924), Cornell. At Oregon State since 1947.
- EUGENE CARL STARR, B.S., E.E., Professor of Electrical Engineering.
B.S. (1923), E.E. (1938), Oregon State. At Oregon State since 1927.

- MARYANNE KENNEDY STATON, M.S., Instructor in Home Administration.
B.A., B.S. (1949), M.S. (1950), Oregon State. At Oregon State since 1949.
- DONALD GRANT STAVE, B.S. in L.S., Catalog Assistant (Instructor), Library.
B.S. (1949), B.S. in L.S. (1950), North Carolina. At Oregon State since 1950.
- BARBARA D STEARMAN, B.S., Research Assistant, Agricultural Experiment Station.
B.S. (1947), Oregon State. At Oregon State since 1947.
- ADIN PETER STEENLAND, B.S., Assistant Plant Pathologist, Agricultural Experiment Station; Extension Plant Pathology Specialist.
B.S. (1942), Georgia. At Oregon State since 1947.
- ROBERT FRANCIS STEIDEL, JR., M.S., Instructor in Mechanical Engineering.
B.S. (1948), M.S. (M.E.) (1949), Columbia. At Oregon State since 1949.
- LULA MARY STEPHENSON, Curator, Horner Museum of the Oregon Country.
At Oregon State since 1941.
- 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. At Oregon State since 1923.
- EDWARD ALMERON STEVENS, LL.B., Associate Professor Emeritus of Physical Education.
LL.B. (1909), Cornell. At Oregon State since 1931.
- HARRY E STEVENS, D.Ed., Associate Professor of Education.
B.S. (1936), D.Ed. (1940), Oregon. At Oregon State since 1950.
- JOHN ROBERT STILLINGER, M.S., Chief, Industrial Service Section, Oregon Forest Products Laboratory (Assistant Professor).
B.S.F. (1944), Idaho; M.S. (1947), Syracuse. At Oregon State since 1948.
- LOUIS NELSON STONE, B.S., Assistant Professor of Electrical Engineering.
B.S. (1939), Oregon State. At Oregon State since 1947.
- WILLIAM MATTHESON STONE, Ph.D., Assistant Professor of Mathematics.
B.A. (1938), Willamette; M.A. (1940), Oregon State; Ph.D. (1947), Iowa State. At Oregon State since 1947.
- ROBERT MACLEOD STORM, Ph.D., Assistant Professor of Zoology.
B.E. (1939), Illinois State Teachers (Northern); M.S. (1941), Ph.D. (1948), Oregon State. At Oregon State since 1948.
- CLARA A STORVICK, Ph.D., Professor of Foods and Nutrition.
A.B. (1929), St. Olaf College; M.S. (1933), Iowa State; Ph.D. (1941), Cornell. At Oregon State since 1945.
- GERTRUDE STRICKLAND, B.S., Professor of Clothing, Textiles, and Related Arts; Head of Department.
B.S. (1935), Texas State College for Women. At Oregon State since 1920.
- DONALD BRUCE STUART, Superintendent of Light and Power (Retired).
At Oregon State 1916-47.
- BERTHA WHILLOCK STUTZ, M.S., Associate Professor of Secretarial Science.
B.Ped. (1910), Missouri State Teachers; B.S. (1918), M.S. (1927), Oregon State. At Oregon State since 1918.
- JAMES FREDERICK SULLIVAN, D.V.M., Instructor in Veterinary Medicine; Research Assistant, Agricultural Experiment Station.
D.V.M. (1946), Michigan State. At Oregon State since 1948.

- GRANT ALEXANDER SWAN, B.S., Assistant Professor of Physical Education; Head Coach of Track.
B.S. (1922), Oregon State. At Oregon State since 1926.
- JOHN MAX SWARTHOUT, Ph.D., Professor of Political Science; Chairman of Department.
A.B. (1934), M.A. (1937), Ph.D. (1942), Southern California. At Oregon State since 1946.
- KLINE RUTHVEN SWYGARD, Ph.D., Professor of Political Science.
B.A. (1935), Ph.D. (1950), Washington. At Oregon State since 1947.
- DAVID SWAIN TAKALO, M.S., Instructor in Bacteriology.
B.S. (1941), M.S. (1942), Oregon State. At Oregon State since 1946.
- ESTHER ADELIA TASKERUD, M.A., State Extension Agent (4-H Clubs).
B.S. (1933), South Dakota State; M.A. (1947), Columbia. At Oregon State since 1947.
- LEVERNE H TAYLOR, M.A., Head Coach of Football (Professor).
B.S. (1931), Michigan; M.A. (1940), Columbia. At Oregon State since 1949.
- HENRY ARNOLD TEN PAS, M.S., Assistant Professor of Agricultural Education.
B.S. (1940), Wisconsin; M.S. (1949), Oregon State. At Oregon State since 1948.
- LEON C TERRIERE, Ph.D., Assistant Chemist, Agricultural Experiment Station.
B.S. (1943), Idaho; Ph.D. (1949), Oregon State. At Oregon State since 1949.
- MABEL THORPE THALER, M.S., Assistant to the Director of Dormitories (Retired).
B.S. (1907), Montana State; M.S. (1908), Wooster. At Oregon State 1948-49.
- CHARLES EDWIN THOMAS, M.M.E., Professor of Engineering Materials.
M.E. (1913), M.M.E. (1931), Cornell. At Oregon State since 1918.
- MARION DAWS THOMAS, B.S., Extension Agricultural Economist.
B.S. (1937), Oregon State. At Oregon State 1937-45 and since 1947.
- BENJAMIN GARRISON THOMPSON, Ph.D., Entomologist, Agricultural Experiment Station.
B.S. (1918), M.S. (1924), Oregon State; Ph.D. (1939), Washington. At Oregon State since 1924.
- BETTY LYND THOMPSON, M.A., Associate Professor of Physical Education for Women.
A.B. (1923), Illinois Wesleyan; M.A. (1926), Wisconsin. At Oregon State since 1927.
- FRED MARION TILESTON, B.S., Assistant Irrigation Engineer, Agricultural Experiment Station.
B.S. (1939), Idaho. At Oregon State since 1949.
- EUGENE DAVIS TIMMONS, B.S., Master Sergeant, Instructor in Air Science and Tactics.
B.S. (1923), Clemson College. At Oregon State since 1950.
- LOUIS NAPOLEON TRAVER, General Superintendent of Physical Plant (Retired).
At Oregon State 1918-22 and 1940-49.
- BESSIE GWYNETH TRESSLER, B.S. in L.S., Assistant Order Librarian (Assistant Professor), Library.
A.B. (1926), College of Emporia; B.S. in L.S. (1930), Illinois. At Oregon State since 1946.
- ELEANOR TRINDLE, B.S., State Extension Agent (Home Economics).
B.S. (1937), Oregon State. At Oregon State since 1945.

- DWIGHT ORLAN TUCKWOOD, B.L.S., Order Assistant (Instructor), Library.
B.A. (1949), B.L.S. (1950), Wisconsin. At Oregon State since 1950.
- MARGARET HUSTON TULLER, B.A., Associate Professor of Home Economics Extension; Extension Rural Housing Specialist.
B.A. (1923), Missouri. At Oregon State since 1947.
- GEORGE ULNIC, B.S., Instructor in Speech.
B.S. (1939), Ohio State. At Oregon State since 1948.
- WILLIAM MURRAY ULRICH, M.B.A., Assistant Professor of Business Administration.
B.S. (1947), Oklahoma Agricultural and Mechanical College; M.B.A. (1949), California (Berkeley). At Oregon State 1947-48 and since 1949.
- PAUL B VALENTI, B.S., Coach of Freshman Basketball and Baseball (Instructor).
B.S. (1947), Oregon State. At Oregon State since 1949.
- EDNA MARJORIE VAN HORN, M.A., Associate Professor of Home Administration.
B.A. (1923), Colorado College; M.A. (1932), Columbia. At Oregon State 1939-40, 1942, and since 1944.
- LILLIAN S VAN LOAN, B.S., Instructor in Education.
B.S. (1949), Oregon College of Education. At Oregon State since 1949.
- WILLIAM ROY VARNER, E.E., Ph.D., Associate Professor of Physics.
B.S. (1912), M.S. (1932), Ph.D. (1939), Oregon State; E.E. (1914), Westinghouse. At Oregon State 1929-32 and since 1934.
- HAROLD GOODHUE VATTER, Ph.D., Associate Professor of Economics.
B.A. (1936), Wisconsin; M.A. (1938), Columbia; Ph.D. (1950), California. At Oregon State since 1947.
- EDWARD KEMP VAUGHAN, Ph.D., Plant Pathologist, Agricultural Experiment Station.
B.S. (1929), New Mexico State; M.S. (1932), Oregon State; Ph.D. (1942), Minnesota. At Oregon State since 1947.
- ERNEST VANCOURT VAUGHN, Ph.D., Professor Emeritus of History.
B.L. (1900), M.A. (1904), Missouri; Ph.D. (1910), Pennsylvania. At Oregon State since 1924.
- RUBÉN DARIO VILLEGAS, B.A., Acting Instructor in Spanish.
B.A. (1945), Escuela Normal del Estado, Durango, Dgo. At Oregon State since 1949.
- HAROLD ROTH VINYARD, Ph.D., Associate Professor of Physics.
B.S. (in E.E.) (1924), M.S. (1928), Oregon State; Ph.D. (1938), Pennsylvania State. At Oregon State since 1938.
- CHARLES WILLIAM VROOMAN, Ph.D., Assistant Professor of Agricultural Economics; Assistant Agricultural Economist, Agricultural Experiment Station.
B.S.A. (1934), M.S.A. (1936), British Columbia; Ph.D. (1949), Oregon State. At Oregon State since 1947.
- STANLEY ELLIOTT WADSWORTH, B.S., Associate Professor of Floriculture; Associate Floriculturist, Agricultural Experiment Station.
B.S. (1935), Cornell. At Oregon State since 1946.
- GEORGE FORDYCE WALDO, M.S., Horticulturist, U. S. Department of Agriculture.
B.S. (1922), Oregon State; M.S. (1926), Michigan State. At Oregon State since 1932.
- BAYARD FENTON WALKER, B.S., Instructor in Physics.
B.S. (1950), Oregon State. At Oregon State since 1950.

- SHIRLEY AILEEN WALKER, M.A., Instructor in Clothing, Textiles, and Related Arts.
B.S. (1939), Washington; M.A. (1947), Columbia. At Oregon State since 1949.
- LEW E WALLACE, B.S., Instructor in Entomology.
B.S. (1947), Oregon State. At Oregon State since 1949.
- ROBERT BOEN WALLS, M.S., Professor of Music; Director of Music; Head of Department.
B.E. (1932), Minnesota State Teachers; M.S. (1936), North Dakota. At Oregon State since 1947.
- AUSTIN FREDERICK WALTER, M.A., Instructor in Political Science; Foreign Student Counselor.
B.A. (1940), Carleton College; M.A. (1942), Fletcher School of Law and Diplomacy. At Oregon State since 1950.
- JESSE SEBURN WALTON, B.S., Professor of Chemical Engineering; Head of Department.
B.S. (1928), Iowa. At Oregon State since 1945.
- CHIH HSING WANG, Ph.D., Instructor in Chemistry.
B.S. (1937), University of Shangtung, China; M.S. (1947), Ph.D. (1950), Oregon State. At Oregon State since 1950.
- RUPERT ALRED WANLESS, B.S., Professor (chairman) of General Engineering.
B.S. (in C.E.) (1923), Oregon State. At Oregon State 1929-32 and since 1935.
- DONNA FULLERTON WARD, B.S., Research Assistant (Agricultural Chemistry), Agricultural Experiment Station.
B.S. in Police Science (1948), Washington State. At Oregon State since 1950.
- EWAN EDWIN WARD, B.S., Instructor in Electrical Engineering.
B.S. (1948), Washington State. At Oregon State since 1949.
- JOHN GORHAM WARD, B.S., Lieutenant, United States Navy, Assistant Professor of Naval Science.
B.S. (1943), United States Naval Academy. At Oregon State since 1950.
- MARGARET CHRISTIAN WARE, M.S., Instructor in Foods and Nutrition.
B.S. (1941), M.S. (1944), Oregon State. At Oregon State since 1945.
- HARRIET JANET WARNER, A.B., Assistant Reference Librarian (Assistant Professor).
A.B. (1919), Certificate of Librarianship (1930), California. At Oregon State since 1930.
- LEROY ELDON WARNER, B.S., Extension Soil Conservation Specialist.
B.S. (1942), Oregon State. At Oregon State since 1946.
- ALVIN CROPPER WARNICK, Ph.D., Assistant Professor of Animal Husbandry; Assistant Animal Husbandman, Agricultural Experiment Station.
B.S. (1942), Utah State; M.S. (1947), Ph.D. (1950), Wisconsin. At Oregon State since 1950.
- EVELYN LEE WARREN, M.S., Instructor in Foods and Nutrition.
B.S. (1944), M.S. (1947), Georgia. At Oregon State since 1949.
- REX WARREN, M.S., Extension Farm Crops Specialist.
B.S. (1931), Utah State; M.S. (1933), Oregon State. At Oregon State 1934-45 and since 1947.
- ERNEST WILLIAM WARRINGTON, M.A., D.D., Professor of Philosophy; Professor of Religion; Head of Department.
A.B. (1905), Delaware; M.A. (1907), Princeton; D.D. (1944), Lewis and Clark. At Oregon State 1921-26 and since 1928.

- *JOSEPHINE WASSON, M.A.**, Assistant Professor of Art.
B.A. (1925), Washington State; M.A. (1933), Columbia. At Oregon State since 1943.
- IVAN FREDERIC WATERMAN, C.E.**, Associate Professor of Civil Engineering.
B.S. (1910), John B. Stetson University; C.E. (1912), Wisconsin. At Oregon State since 1919.
- EDMUND JOSEPH WATSON, B.S.**, Instructor in Civil Engineering.
B.S. (1948), Oregon State. At Oregon State since 1949.
- JOHN LAWRENCE WEIBEL, D.V.M.**, Research Assistant in Poultry Pathology, Agricultural Experiment Station.
B.S. (1949), D.V.M. (1950), Washington State. At Oregon State since 1950.
- ERMA MARION WEIR, M.S.**, Assistant Professor of Physical Education for Women.
B.E. (1936), Minnesota State Teachers (Bemidji); M.S. (1941), Washington. At Oregon State since 1945.
- VIRGINIA RUTH WEISER, M.S.**, Instructor in Foods and Nutrition.
B.A. (1947), Hunter; M.S. (1949), Michigan State. At Oregon State since 1949.
- EARL WILLIAM WELLS, M.A., J.D.**, Professor of Speech.
A.B. (1921), Iowa; M.A. (1927), Wisconsin; J.D. (1928), Iowa. At Oregon State since 1921.
- VERA LUCILE WELLS, B.S.**, Instructor in Clothing, Textiles, and Related Arts.
B.S. (1948), Oregon State. At Oregon State since 1948.
- WILLIBALD WENIGER, Ph.D.**, Professor of Physics.
B.A. (1905), M.A. (1906), Ph.D. (1908), Wisconsin. At Oregon State 1908-14 and since 1920. Dean of the Graduate School 1946-49.
- WILLIAM IRVIN WEST, M.F.**, Assistant Professor of Forest Products.
B.S.F. (1939), M.F. (1941), Washington. At Oregon State since 1946.
- HAZEL KELSEY WESTCOTT, B.S.**, Administrative Assistant, President's Office.
B.S. (1920), Oregon State. At Oregon State 1919-21 and since 1926.
- WARREN C WESTGARTH, B.S.**, Instructor in Civil Engineering.
B.S. (1949), Oregon State. At Oregon State since 1949.
- PAUL HENRY WESWIG, Ph.D.**, Associate Biochemist (Agricultural Chemistry), Agricultural Experiment Station.
B.A. (1935), St. Olaf College; M.S. (1939), Ph.D. (1941), Minnesota. At Oregon State since 1941.
- WILLIAM PERRY WHEELER, M.F.**, Instructor in Forest Management.
B.S. (1948), M.F. (1949), Minnesota. At Oregon State since 1949.
- ERNEST HERMAN WIEGAND, B.S.A.**, Professor of Food Technology; Head of Department; Food Technologist in Charge, Agricultural Experiment Station.
B.S.A. (1914), Missouri. At Oregon State since 1919.
- MIRIAM AUGUSTA WIGGENHORN, M.A.**, Associate Professor of Family Life.
B.A. (1931), Nebraska; M.A. (1936), Columbia. At Oregon State since 1946.
- HUGH EDWARD WILCOX, Ph.D.**, Wood Technologist, Oregon Forest Products Laboratory (Associate Professor).
B.S. (1938), California; M.S. (1940), Syracuse; Ph.D. (1950), California. At Oregon State since 1946.
- CURTIS WILDER, M.S.**, Assistant Food Technologist, Agricultural Experiment Station.
B.S. (1940), M.S. (1941), Montana State. At Oregon State since 1944.

* On leave of absence 1950-51.

- JAMES JUNIOR WILKINSON, Re.Dir., Instructor in Physical Education; Wrestling Coach.
B.S. (1947), M.S. (1948), Re.Dir. (1949), Indiana. At Oregon State since 1950.
- WILLIAM DONALD WILKINSON, Ph.D., Professor of Geology.
B.A. (1923), Ph.D. (1932), Oregon. At Oregon State since 1932.
- EARL CLARK WILLEY, M.S., Professor of General Engineering.
B.S. (1921), M.S. (1941), Oregon State. At Oregon State since 1921.
- CHARLES HERBERT WILLIAMS, Instructor in Air Science and Tactics.
At Oregon State since 1951.
- GEORGE ALFRED WILLIAMS, A.M., Professor of Mathematics.
A.B. (1918), Illinois; A.M. (1926), California. At Oregon State since 1920.
- JESSAMINE CHAPMAN WILLIAMS, M.A., Professor Emeritus of Foods and Nutrition.
B.S. (1906), M.A. (1921), Columbia. At Oregon State since 1923.
- MAX BULLOCK WILLIAMS, Ph.D., Associate Professor of Chemistry.
B.S. (1936), M.S. (1938), Utah; Ph.D. (1941), Cornell. At Oregon State since 1941.
- SCOTT WILLIAMS, M.Ed., Instructor in Business Administration.
B.S. (1929), Oregon State; M.Ed. (1936), Oregon. At Oregon State since 1950.
- RUSSELL WILLARD WILLIAMSON, M.A., Assistant Professor of Industrial Arts.
B.S. (1935), Oregon State; M.A. (1948), Minnesota. At Oregon State since 1946.
- STANLEY E WILLIAMSON, M.A., Associate Professor of Science Education; Head of Department.
B.A. (1931), Nebraska Wesleyan; M.A. (1936), Columbia. At Oregon State since 1946.
- MAUD MATHES WILSON, A.M., Professor Emeritus of Home Economics Research.
B.S. (1913), Nebraska; A.M. (1931), Chicago. At Oregon State since 1925.
- NORMAN WILLIAM WILSON, M.A., Instructor in English.
A.B. (1930), Linfield; M.A. (1940), Oregon. At Oregon State since 1947.
- ROBERT CLAUDE WILSON, B.S., Instructor in Industrial Arts.
B.S. (1949), Oregon State. At Oregon State since 1949.
- 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. At Oregon State since 1929.
- CARLYN REO WINGER, M.A., Associate Professor of Speech.
B.A. (1928), Washington State; M.A. (1932), Wisconsin. At Oregon State since 1938.
- FRED EVERETT WINGER, D.Ed., Assistant Professor of Secretarial Science.
B.S. (1934), Nebraska; M.A. (1938), Iowa; D.Ed. (1951), Oregon. At Oregon State since 1947.
- JOHN JOSEPH WITTKOPF, B.S., Associate Professor of Electrical Engineering.
B.S. (1943), Oregon State. At Oregon State 1943-44, and since 1945.
- WILLIAM W WOJCIECHOWSKIE, Sergeant, Military Science and Tactics.
At Oregon State since 1949.
- FLOYD BYRON WOLBERG, M.S., Associate Professor of Dairy Husbandry; Associate Dairy Husbandman, Agricultural Experiment Station.
B.S. (1928), M.S. (1932), Wisconsin. At Oregon State since 1945.

- JOHN WILLIAM WOLFE, M.S., Assistant Professor of Agricultural Engineering; Assistant Agricultural Engineer, Agricultural Experiment Station. B.S. (1939), South Dakota State; M.S. (1940), Idaho. At Oregon State since 1947.
- CLYTIE MAY WORKINGER, Placement Secretary, School of Education. At Oregon State since 1910.
- OLIVER JACKSON WORTHINGTON, Ph.D., Associate Professor of Food Technology; Associate Food Technologist, Agricultural Experiment Station. B.S. (1924), Rhode Island State; M.S. (1926), Ph.D. (1936), Wisconsin. At Oregon State since 1946.
- ROSALIND WULZEN, Ph.D., Sc.D., Professor Emeritus of Zoology. B.S. (1904), M.S. (1910), Ph.D. (1914), California; Sc.D. (1943), Oregon. At Oregon State since 1933.
- RAYMOND LEROY WYNNE, Master Sergeant, Infantry, Assistant to the Professor of Military Science and Tactics. At Oregon State since 1948.
- YO-YA YANG, Ph.D., Associate Food Technologist, Agricultural Experiment Station; Acting Instructor in Chinese. B.S. (1936), Nanking; M.S. (1940), Ph.D. (1944), Oregon State. At Oregon State since 1942.
- CHARLES THEODORE YERIAN, Ph.D., Professor; Head of Departments of Secretarial Science and Business Education. B.S. (1932), Oregon State; M.S. (1936), Ph.D. (1938), Iowa. At Oregon State since 1937.
- MIRIAM A YODER, B.A., Circulation Librarian (Assistant Professor), Library. Certificate of Librarianship (1936), California; B.A. (1937), Oregon. At Oregon State since 1948.
- RAY ARNOLD YODER, M.F., Assistant Professor of Forest Management. B.S. (1941), Oregon State; M.F. (1942), Harvard. At Oregon State since 1949.
- LEONARD A YOUNCE, B.A., Assistant Coach of Football (Instructor). B.A. (1949), Portland. At Oregon State since 1949.
- DELOSS PALMER YOUNG, B.S., Professor of Speech. B.S. (1926), Oregon State. At Oregon State since 1927.
- JAMES ORVILLE YOUNG, B.S., Research Assistant (Dairy Husbandry), Agricultural Experiment Station. B.S. (1949), Oregon State. At Oregon State since 1950.
- ROY ALTON YOUNG, Ph.D., Associate Professor of Botany and Plant Pathology; Associate Plant Pathologist, Agricultural Experiment Station. B.S. (1941), New Mexico State; M.S. (1942), Ph.D. (1948), Iowa State. At Oregon State since 1948.
- EDWIN ARTHUR YUNKER, Ph.D., Professor of Physics; Chairman of Department. A.B. (1924), California; Ph.M. (1930), Wisconsin; Ph.D. (1940), Stanford. At Oregon State since 1925.
- FRANKLIN ROYALTON ZERAN, Ph.D., Professor of Education; Head of Department; Head of Placement; Associate Dean of the School of Education; Director of Summer Session. A.B. (1930), M.A. (1932), Ph.D. (1937), Wisconsin. At Oregon State since 1947.
- ADOLPH ZIEFLE, M.S., Ph.D., Professor Emeritus of Pharmacy. Ph.C. (1904), B.S. (1907), M.S. (1919), Michigan; Ph.D. (1928), Pittsburgh. At Oregon State since 1914. Dean of the School of Pharmacy 1914-45.

- QUENTIN BLISS ZIELINSKI, Ph.D., Associate Professor of Horticulture; Associate Horticulturist, Agricultural Experiment Station.
B.S. (1941), Oregon State; M.S. (1942), Ohio State; Ph.D. (1947), Virginia. At Oregon State since 1947.
- FRED CASPER ZWAHLEN, JR., B.A., Instructor in Journalism; News Bureau Assistant.
B.A. (1949), Oregon State. At Oregon State since 1950.

Fellows and Assistants

- FRANK W ADAMS, B.S., Graduate Assistant in Zoology.
- FRANKLIN DALTON ALDRICH, B.S., Graduate Assistant in Botany.
- WALTER E ALLMAN, B.A., Graduate Assistant in Industrial Engineering and Industrial Arts.
- PHILIP MARSHALL ANSELONE, M.S., Graduate Assistant in Mathematics.
- *KENNETH DALE BABER, B.S., Graduate Assistant in Chemistry.
- STEPHEN SYDNEY BAIRD, B.S., Graduate Assistant in Chemistry.
- DALLAS ODELL BANKS, B.S., Graduate Assistant in Mathematics.
- GEORGE LEWIS BARNES, M.S., Graduate Research Fellow in Botany, Agricultural Experiment Station.
- GEORGE STANLEY BEAUDREAU, B.S., Teaching Fellow in Chemistry.
- DAYTON BENJAMIN, B.A., Graduate Assistant in Family Life.
- CLIFTON FRANCIS BENNETT, B.S., Graduate Assistant in Chemistry.
- ELWIN E BENNINGTON, M.A., Graduate Assistant in Zoology.
- PAUL C BERGER, B.S., Graduate Research Assistant in Dairy Husbandry, Agricultural Experiment Station.
- JAMES R BROCK, B.S., Graduate Assistant in Food Technology.
- JOHN PHILIP BROGAN, B.S., Graduate Assistant in Science Surveys.
- ROBERT WALLACE BROWN, B.S., Graduate Assistant in Mathematics.
- RICHARD BUCKOVIC, B.S., Graduate Assistant in Farm Crops.
- WILLIAM C BURNS, B.S., Graduate Assistant in Zoology.
- DAVID CLAIR BUSH, M.S., Teaching Fellow in Chemistry.
- EARL MCKENZIE BUTTERWORTH, M.S., Graduate Teaching Assistant in Bacteriology.
- MRS. YUN-HWA CHANG, B.S., Graduate Assistant in Entomology.
- GLEN ALBERT CHRISTENSEN, B.S., Graduate Research Assistant, Engineering Experiment Station.
- PETER COAD, M.S., Teaching Fellow in Chemistry.
- RICHARD KARL COBURN, B.S., Graduate Assistant in Mathematics.
- ARTHUR L COLDWELL, B.S., Graduate Teaching Assistant in Bacteriology.
- HARRY MADISON CULBERTSON, B.S., Research Fellow in Chemistry.

* Spring term 1950.

- JEROME J DAHMEN, B.S., Graduate Research Assistant in Animal Husbandry, Agricultural Experiment Station.
- SAM H DALAL, B.S., Graduate Research Assistant in Dairy Husbandry, Agricultural Experiment Station.
- DARRELL L DAVIS, B.S., Graduate Assistant in Zoology.
- JAMES WENDELL DAVIS, B.Chem., Teaching Fellow in Chemistry.
- JOHN WILLIAM DAWSON, B.S., Graduate Assistant in Geology.
- KENNY LEROY DILLE, B.A., Graduate Assistant in Chemistry.
- NORMAN DALE DOBIE, B.S., Graduate Research Assistant in Botany, Agricultural Experiment Station.
- ROBERT EDWARD DOUGHTY, B.S., Graduate Research Assistant in Agricultural Engineering, Agricultural Experiment Station.
- RACHEL BERUBE DUBÉ, M.S., Graduate Research Fellow in Nutrition, Agricultural Experiment Station.
- DONALD G DUNLAP, B.S., Graduate Assistant in Zoology.
- GLENN D EDWARDS, M.S., Graduate Assistant in Zoology.
- MARGARET ANNA EDWARDS, B.S., Graduate Assistant in Nutrition.
- ERSEL ARTHUR EVANS, B.A., DuPont Fellow in Chemistry.
- MARGERY ANN EVENSON, B.S., Graduate Teaching Assistant in Bacteriology.
- THAD EUGENE FURLONG, B.A., Teaching Fellow in Chemistry.
- WILLIAM FURTICK, B.S., Graduate Assistant in Farm Crops.
- RALPH GARREN, JR., Graduate Research Assistant in Horticulture, Agricultural Experiment Station.
- *ADOLPH OSCAR GEISZLER, M.S., Fellow in Chemistry.
- ARNOLD RICHARD GRAY, B.S., Graduate Assistant in Physical Education.
- ALEXANDER HABURCHAK, M.S., Graduate Assistant in Farm Crops.
- OTHO MARION HALE, M.S., Research Fellow in Biochemistry.
- KENNETH HOWARD HAMMILL, B.S., Graduate Assistant in Chemistry.
- RAE LAWRENCE HARRIS, B.S., Graduate Assistant in Geology.
- AUDUS WINZLE HELTON, M.S., Graduate Research Fellow in Botany, Agricultural Experiment Station.
- EDWARD NATHAN HENNEY, B.S., Graduate Research Assistant in Food Technology, Agricultural Experiment Station.
- ROLFE H HERBER, B.S., Research Fellow in Chemistry.
- HERBERT LAWRENCE HERGERT, B.A., Research Fellow in Wood Chemistry.
- CALVIN JOHN HEUSSER, M.S., Fellow in Botany.
- MARVIN F HILL, B.S., Graduate Assistant in Zoology.
- FREDRICK WAYNE HILLER, B.S., Graduate Assistant in Chemistry.

* Fall term 1950-51.

- DOUGLAS K HILLIARD, B.S., Graduate Research Assistant in Fish and Game Management, Agricultural Experiment Station.
- VERNER EMIL HOGGATT, JR., B.S., Teaching Fellow in Mathematics.
- ARTHUR HOLLOMAN, JR., B.S., Graduate Research Fellow in Botany, Agricultural Experiment Station.
- HARRY HARKENRIDER HONEGGER, B.S., Graduate Assistant in Mechanical Engineering.
- CHESTER HORNER, B.S., Graduate Assistant in Botany.
- MING-KUEI HU, M.S., Graduate Assistant in Electrical Engineering.
- ROGER WILLIAM JAMES, B.A., Graduate Assistant in Chemistry.
- ERNEST GEORGE JAWORSKI, M.S., Research Fellow in Biochemistry.
- SAMUEL K KAMAKA, B.S., Graduate Research Assistant in Entomology, Agricultural Experiment Station.
- LEONARD M KAMM, B.S.A., Graduate Research Assistant in Dairy Husbandry, Agricultural Experiment Station.
- JAMES HERBERT KANZELMEYER, A.B., Graduate Assistant in Chemistry.
- FRANCIS WARREN KARASEK, B.S., Fellow in Chemistry.
- RUDOLPH KODRAS, M.S., Graduate Research Fellow in Agricultural Chemistry, Agricultural Experiment Station.
- WILLY H KOSEAN, B.S., Graduate Research Assistant in Farm Crops, Agricultural Experiment Station.
- ROBERT F LABBE, M.S., Fellow in Chemistry.
- RICHARD FRANCIS LAPORE, B.S., Research Assistant in Chemistry.
- ROBERT WAGNER LEDEEN, B.S., Teaching Fellow in Chemistry.
- OCTAVE LEVENSPIEL, M.S., Graduate Research Assistant in Chemical Engineering, Engineering Experiment Station.
- CELDON R LEWIS, B.S., Graduate Assistant in Geology.
- ELMO F LITTLE, M.Ed., Graduate Assistant in Science Surveys.
- HELLIN ANNA-MAIJA LOUHI, Diploma, Heinolan Seminaari (Finland), Graduate Assistant in Nutrition.
- KUO CHIN LU, B.S., Graduate Research Assistant in Bacteriology, Agricultural Experiment Station.
- JOHN A MCGOWAN, B.S., Graduate Assistant in Zoology.
- DALE LLOYD MCLEOD, B.S., Graduate Assistant in Electrical Engineering.
- GEORGE B MCLEROY, M.S., Graduate Research Fellow in Animal Husbandry, Agricultural Experiment Station.
- DUGAL R MACGREGOR, B.S., Graduate Assistant in Bacteriology.
- EUGENE FRANKLIN MAGOON, B.S., Graduate Assistant in Chemistry.
- BURTON JOSEPH MASTERS, B.S., Graduate Assistant in Chemistry.
- WALTER M MELLENTHIN, B.S., Graduate Research Assistant in Horticulture, Agricultural Experiment Station.

- JOHN RAYMOND MICKELSON, B.A., Graduate Assistant in Chemistry.
BONITA JUNE MILLER, B.S., Graduate Assistant in Botany.
DONALD D MILLER, M.S., Graduate Research Fellow in Bacteriology, Agricultural Experiment Station.
KENNETH LERON MILLER, B.A., Teaching Fellow in Chemistry.
FREND JOHN MINER, B.A., Graduate Assistant in Chemistry.
JOSEPH E MOORE, B.S., Teaching Fellow in Chemistry.
JAMES HOWARD MOSER, B.S., Graduate Research Assistant in Food Technology, Agricultural Experiment Station.
HARRY MARTIN NELSON, B.S., Graduate Assistant in Chemistry.
ROBERT ALLEN NESBIT, B.S., Graduate Assistant in Geology.
*CHARLES O NEWELL, B.S., Graduate Assistant in Science Surveys.
JAMES A NICKEL, B.S., Teaching Fellow in Mathematics.
AGNAR P B NYGAARD, M.S., Research Fellow in Biochemistry.
DAVID E OAS, B.S., Graduate Assistant in Physical Education.
NORMAN R ODELL, B.A., Graduate Assistant in Chemistry.
JAMES E OLDFIELD, B.S.A., Graduate Research Fellow in Animal Husbandry, Agricultural Experiment Station.
GLORIA OLIVE, M.A., Graduate Assistant in Mathematics.
HOWARD A OSBORN, B.S., Graduate Research Assistant in Agricultural Economics, Agricultural Experiment Station.
HERBERT E OWEN, B.S., Graduate Assistant in Botany.
PATRICIA PACKARD, B.A., Graduate Assistant in Herbarium.
RICHARD B PARKER, B.S., Graduate Research Assistant in Bacteriology, Agricultural Experiment Station.
HUSAIN A B PARPIA, M.S., Graduate Research Fellow in Food Technology, Agricultural Experiment Station.
LYSLE HARRAH PARSONS, B.S., Graduate Research Assistant in Horticulture, Agricultural Experiment Station.
PATRICIA MARGARET PEARSON, B.A., Teaching Fellow in Mathematics.
HAROLD RAY PEYTON, B.S., Graduate Research Assistant, Engineering Experiment Station.
RICHARD A PIMENTEL, B.S., Fellow in Zoology.
ALEXANDER POPE, B.S., Graduate Research Fellow in Soils, Agricultural Experiment Station.
CLARK ALFRED PORTER, B.A., Graduate Research Assistant in Botany, Agricultural Experiment Station.
LOUIS BAKER RALL, B.S., Graduate Assistant in Mathematics.
EMERSON FRANCIS REIBER, B.S., Graduate Assistant in Mechanical Engineering.

* Resigned December 1950.

- MARY LOUISE REIBER, B.S., Graduate Assistant in General Research.
- *MILTON RICHARDSON, B.S., Graduate Assistant in Agricultural Engineering.
- PHILIP CARL ROBERTI, M.S., Teaching Fellow in Chemistry.
- DEAN MOORE ROBERTSON, B.A., Graduate Assistant in Chemistry.
- ROLAND K ROBINS, M.S., Research Fellow in Chemistry.
- ARYAN INGOMAR ROEST, M.S., Teaching Fellow in Science Surveys.
- CHARLES ROGERS, M.S., Teaching Fellow in Chemistry.
- CHARLES G ROSA, M.A., Research Fellow, American Cancer Society.
- MORTON TULLY ROSENBLUM, B.A., Graduate Research Assistant in Agricultural Economics, Agricultural Experiment Station.
- JOHN D ROSLANSKY, M.S., Teaching Fellow in Zoology.
- WILLIAM DONALD SCHAEFFER, B.S., Graduate Assistant in Chemistry.
- JOSEPH HARTVIG SELLIKEN, B.S., Graduate Assistant in Mechanical Engineering.
- JAYANTILAL N SHAH, M.S., Graduate Research Assistant in Food Technology, Agricultural Experiment Station.
- BERT JACK SHELTON V, A.A., P.E., Graduate Assistant in Geology.
- SHUI HO SHIH, M.S., Graduate Research Assistant in Soils, Agricultural Experiment Station.
- ROBERT SIDNEY SHOEMAKER, B.S., Graduate Assistant in Chemistry.
- ROY HOPKINS SHOEMAKER, JR., B.S., Graduate Research Assistant in Civil Engineering, Engineering Experiment Station.
- JOHN CARL SIEGLE, B.A., Teaching Fellow in Chemistry.
- *ANDREW VAUGHN SMITH, B.S., Graduate Assistant in Electrical Engineering.
- VICTOR HERBERT SMITH, B.S., Graduate Assistant in Chemistry.
- WILLIAM ALTON SMITH, B.S., Graduate Assistant in Chemistry.
- LAURENCE PAUL SNIPPER, B.A., Teaching Fellow in Chemistry.
- KENNETH F SOIKE, B.S., Graduate Teaching Assistant in Bacteriology.
- ROBERT LYLE STEARMAN, M.S., Graduate Assistant in Mathematics.
- CHARLES JACK STEWART, B.A., Graduate Assistant in Biochemistry.
- C E STOTTS, B.S., Graduate Research Assistant in Poultry Husbandry, Agricultural Experiment Station.
- ROBERT PETER STREIFF, B.S., Graduate Research Assistant in Dairy Husbandry, Agricultural Experiment Station.
- ROBERT E STRUNK, B.S., Graduate Assistant in Farm Crops.
- CARL ROBERT TANNER, B.S., Graduate Assistant in Entomology.
- ROY TERANISHI, B.S., Graduate Assistant in Chemistry.
- FLOYD EARL THEISEN, B.S., Graduate Assistant in Chemistry.

* Fall term 1950.

- *RICHARD CLARENCE THOMAS, B.S., Graduate Assistant in Chemistry.
GENE THOMAS THOMPSON, M.A., Graduate Assistant in Mathematics.
DEWAYNE C TORGESON, B.S., Graduate Research Assistant in Botany, Agricultural Experiment Station.
GEORGE CHARLES TURRELL, B.A., Graduate Assistant in Chemistry.
WAYNE PAUL VANMETER, B.S., Graduate Assistant in Chemistry.
GEORGE WALLACE VARSEVELD, B.Sc.A., Graduate Research Assistant in Food Technology, Agricultural Experiment Station.
KENNETH M WALKER, M.S., Fellow in Zoology.
CHARLES E WARREN, B.S., Graduate Assistant in Fish and Game Management.
GERALD H WATSON, B.S., Graduate Research Assistant in Fish and Game Management, Agricultural Experiment Station.
PHYLLIS R WATT, B.S., Graduate Research Assistant in Fish and Game Management, Agricultural Experiment Station.
FRANCIS OLIVER WHIPPLE, B.A., Graduate Assistant in Chemistry.
WALTER FRANKLIN WHITBECK, B.S., Teaching Fellow in Mathematics.
GRANT M WHITE, B.S., Graduate Assistant in Pharmacy.
JACK DELMER WILLIAMSON, B.S., Graduate Assistant in Mechanical Engineering.
†FRANK M WILSON, B.S., Graduate Assistant in Zoology.
ARTHUR D WIRSHUP, M.A., Teaching Fellow in Mathematics.
SANG WAN WOO, M.S., Graduate Assistant in Nutrition.
WILLIAM K WOODWARD, B.S., Graduate Assistant in Industrial Engineering and Industrial Arts.
PAUL H WOOLEY, B.S., Graduate Research Assistant in Botany and Plant Pathology, Agricultural Experiment Station.
MEI-LING WU, M.S., Graduate Research Fellow in Nutrition, Agricultural Experiment Station.
SZU-HSIAS WU, B.S., Graduate Research Fellow in Animal Husbandry, Agricultural Experiment Station.
ROBERT M YANCEY, M.S., Fellow in Zoology.
*LLOYD R YONCE, B.S., Graduate Assistant in Zoology.

* Resigned December 1950.

† Fall term 1950.

Organization and Facilities

History

OREGON STATE COLLEGE was Oregon's first venture into state-supported higher education. On October 27, 1868, the state legislature designated Corvallis College as "the agricultural college of the State of Oregon" and began making appropriations for the support of the institution. In taking this action the legislature accepted the provisions of the First Morrill Act, which President Lincoln had signed on July 2, 1862. This Act provided grants of land to be used by the states for the sole purpose of establishing publicly controlled colleges. The Congress defined the purpose of the land-grant institutions in these words: "The leading object 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."

Subsequent federal legislation—notably the Hatch Act of 1887, the Second Morrill Act of 1890, and the Smith-Lever Act of 1914—provided further for the teaching function of the institutions and also for programs of research and extension.

With the enactment of the Smith-Lever law, the land-grant college had been developed into a distinctive institution that defined its character and function in terms different from those of the ordinary college or university. It afforded resident instruction in the practical sciences, industrial arts, business, engineering, agriculture, teacher training, and liberal arts. It conducted research into every phase of agriculture through its experiment station. It provided demonstration and instruction in agriculture and home economics to citizens residing in every corner of the state. The land-grant college became increasingly an active agency in the economic, industrial, and social advancement of the nation. It became a great educational force in the utilization of the physical resources of the country.

The Oregon legislature directed that "all students sent under the provisions of this Act shall be instructed in all the arts, sciences, and other studies in accordance with the Act of Congress."

Oregon had made an earlier attempt, even before the First Morrill Act, to establish a state university. In 1851, before statehood, the legislature of Oregon Territory, comprising the vast area from California to Canada and from the Rocky Mountains to the Pacific Ocean, designated Corvallis (then called Marysville) as the site of the territorial university. Building materials were assembled on the selected site (where Margaret Snell Hall now stands), but before construction began the legislature of 1855 changed the location of the university to Jacksonville and ordered the materials sold. The next year Corvallis established a community academy that in 1858 was incorporated as Corvallis College. This institution, maintained by the Methodist Episcopal Church, South, was partly state supported from 1868 to 1885 when the state assumed complete control.

Corvallis College originally occupied a corner at Fifth and Madison Streets. A farm of thirty-five acres, part of the present campus, was purchased in 1870. The College moved to the present campus, occupying Benton Hall, a gift of the citizens of Benton County, in 1889.

The curriculum of Corvallis College, typical of the liberal-arts college of the period, provided a classical course leading to the bachelor of arts degree and a scientific course leading to the bachelor of science degree. The curriculum began to expand under the impetus of the land-grant act. Agriculture, largely conducted in the Department of Chemistry, was added in 1869. Four professor-

ships (commerce, 1880, agriculture, 1883, household economy, 1889, and engineering, 1889) grew into departments and resulted in the establishment in 1908 of four professional schools: Agriculture, Commerce, Engineering, and Home Economics. Schools added later included Forestry, 1913; Mines, 1913; Pharmacy, 1917; and Education, 1918. The first summer school was held in 1918. Extension work had its beginnings in 1889 when farmers' institutes were held at four places in the state.

In the organization of the State System of Higher Education in 1932 the State Board of Higher Education established freshman and sophomore work in liberal arts and sciences on a parallel basis at Oregon State College and the University of Oregon. Beyond the lower-division years and in professional fields, the two institutions were differentiated. Oregon State College became the designated center of science and technology. Work in mines was incorporated in the School of Engineering. The School of Commerce was discontinued; the School of Business and Technology was established (first as a "Division") in 1943.

The first advanced degree (A.M.) was awarded in 1876. The first Ph.D. degrees were conferred in 1935. A committee on advanced degrees appointed in 1910 was the precursor of the Graduate School. From 1932 to 1946 graduate work was part of the Graduate Division of the State System of Higher Education.

General research is centered in the Graduate School. Other research divisions have been established as follows: Agricultural Experiment Station, 1888; Engineering Experiment Station, 1927; Forest Products Laboratory, 1945.

Oregon State College is a member of the Northwest Association of Secondary and Higher Schools. It was accredited by the Association of American Universities in 1926. It was accredited by the American Association of University Women in 1924. Its schools and departments are professionally accredited by the Engineers' Council for Professional Development, the Society of American Foresters, and the American Council on Pharmaceutical Education.

Presidents of Oregon State College since its founding are: W. A. Finley, 1865-71; B. L. Arnold, 1871-92; John M. Bloss, 1892-96; H. B. Miller, 1896-97; Thomas M. Gatch, 1897-1907; William Jasper Kerr, 1907-32; George Wilcox Peavy, 1934-40; Frank Llewellyn Ballard, 1940-41; Francois Archibald Gilfillan (acting), 1941-42; August Leroy Strand, from 1942.

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, etc.

Campus

CORVALLIS (population 16,173), is situated in the heart of the Willamette Valley between the Cascade Mountains and the Coast Range, 85 miles south of Portland and 60 miles from the Pacific Ocean. The climate is equable, the average annual temperature being about 52 degrees Fahrenheit. Rainfall, mostly during the winter months, averages about 39 inches annually. Corvallis has pure mountain water, modern sanitation, good schools, numerous churches, and strong civic and social organizations.

Development of the Oregon State College campus during the past forty years has been in accordance with a permanent plan prepared for the institution by consulting landscape architects of national recognition (John C. Olmsted in 1908, A. D. Taylor in 1925 and 1945).

The buildings are arranged first as colleges or schools, and further are grouped in quadrangles, so planned that expansion can take place without injury to established buildings and campus areas. Pending erection of new buildings, many of which have already been authorized in the permanent building program, immediate postwar needs have been supplied by temporary structures, moved to the campus from military posts of the Northwest.

The area from near Ninth Street to Fourteenth Street, known as the East Campus, provides a recreation park and parade ground and serves also as an outdoor surveying laboratory for engineering students. Directly west are the East Quadrangle and the Engineering Quadrangle, then the West Quadrangle, center of the present campus, the men's and women's quadrangles, and the Mall (Thirtieth Street), with the farms beyond.

Each quadrangle is provided with walks convenient to general student circulation and is planted with ornamental trees and shrubs. The plantings serve as living laboratory material for students engaged in landscape and horticultural studies.

The present buildings, with dates of original erection and later additions or remodeling are given below. For temporary buildings the dates indicate either date of erection or date acquired by Oregon State College. For location of buildings see insert following page 10.

Administration (1947)	Forestry (1917)
Administration Annex (1948)	Forest Products Laboratory (1928, 1943)
Agricultural Engineering (1912, 1939)	Food Industries (1919, 1924)
Agricultural Utilities (1909)	Food Technology (1950)
Agriculture Hall (1909, 1913)	Foundry (1899)
Apperson Hall (1898, 1920)	Greenhouses (1928)
Armory (1910, 1911)	Heating Plant (1923, 1949)
Beatrice Walton Sackett Hall (1948)	Home Economics (1914, 1920)
Benton Hall (1889)	Hudson Hall (1946, 1947)
Central Hall (1946-1947)	Industrial Arts (1908, 1949)
Chemistry Hall (1939)	Industrial Research (1947)
Coliseum (1950)	Jameson House (1942)
College Playhouse (1899, 1950)	Kent House (1924)
Commerce Hall (1922)	Kidder Hall (1892)
Dairy (1912)	Library (1918, 1941)
Dearborn Hall (1949)	Margaret Snell Hall (1921)
Dormitory Cafeteria (1946, 1947)	Mines (1913)
Engineering Laboratory (1920)	Men's Dormitory (1928)
Education Hall (1902, 1940)	Men's Gymnasium (1915, 1921)
Engineering Service (1947)	

Memorial Union (1928)	Shepard Hall (1908)
Natural History (1948)	Stadium—Bell Field (1924)
Orchard Street Nursery School (1939)	Student Health Service (1926)
Paleontology Laboratory (1899)	Veterans Administration (1947)
Park Terrace Nursery School (1918)	Veterinary Clinic (1918)
Pharmacy (1924)	Withycombe Hall (1950)
Physical Plant Warehouse (1948)	Withycombe House (1918)
Physics (1928)	Women's Building (1926)
Physiology Laboratory (1912)	Waldo Hall (1907)
Poultry-Veterinary (1927)	Winston House (1942)

Farm and Forest Lands

FOR research and instruction in agriculture the State owns and leases lands including the main campus and adjoining areas consisting of approximately 3,700 acres. The Agricultural Experiment Station, including the eight branch stations and the eight experimental areas, utilizes 23,431 acres, most of which is owned by the counties or the federal government.

The School of Forestry owns and administers a total of about 13,300 acres of forest land included in the Peavy Arboretum, the McDonald Forest, and the Blodgett and Spaulding tracts. The Peavy Arboretum and the McDonald Forest are located seven miles north of the campus and provide easily accessible areas for instruction and research. Laboratory classes in many of the forest management and forest engineering courses are held on these adjacent forest lands. Field research studies have been in progress on these areas since 1928.

Library

THE Library of Oregon State College contains approximately 256,891 volumes. These books are housed in a central stack unit, the Main Reference Room, and three divisional Reading Rooms. Books in the pure and applied sciences, numbering 42,000 volumes, are easily available in an attractive open-shelf arrangement in the Science Room in the new wing of the building. The Engineering and Applied Technology collection of 26,000 volumes, located in the old wing, is similarly arranged on open shelves and with a separate reading room. The Beaver Book Room, also in an open-shelf arrangement, houses all the books in the various literatures, as well as a representative browsing collection. Books in which required readings are assigned are housed and serviced in the Reserve Reading Room in the new wing. The seating capacity of these several reading rooms is over 900.

The Library also has in the Mary J. L. McDonald Room a collection of fine and rare editions, numbering 3,138 volumes. This collection, and the attractively decorated and furnished room which houses it, came to the Library by gift of Mrs. McDonald.

Collections. The books in the Library, and the 12,000 or more volumes added annually, are closely coordinated with the teaching and research conducted by the College. The collections are therefore primarily technical and scientific, but sufficient books in the humanities and the social sciences are owned to give the Library a good cultural and literary balance. Subjects in which special strength has been developed are textiles, costume design, nutrition, and the history of horticulture. Collections of some distinction are also being built up

in biology, food technology, chemistry, plant pathology, mycology, and entomology. Over twenty-two hundred periodicals are received currently and a large portion of the Library's holdings are consequently bound journal volumes.

The Library is a designated depository for the publications of the United States Government, of the Carnegie Institution of Washington and the State of Oregon. It is also a depository for U. S. Army Maps and has a total map collection of well over 32,000 items. Also important in the resources of the Library is a picture collection of 51,000 pieces. Newspapers received currently, a few of which are on microfilm, total 114.

In addition to the volumes in the Library all the books, numbering 832,000 volumes, in the libraries of the several state institutions of higher education are available, through unified administration, to the students and faculty of Oregon State College.

Service. The Library is open Monday through Friday from 7:45 a.m. to 10:00 p.m. on Saturdays from 7:45 a.m. to 5:00 p.m., and on Sundays from 2:00 to 5:00 p.m. It is usually closed on legal holidays.

Books may be taken for home use by anyone connected with Oregon State College and by others on permission. Students may keep books for two weeks, with privilege of renewal. Faculty members 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.

Books are freely borrowed from and lent to all the libraries in the Oregon State System of Higher Education. In addition, chiefly through the facilities of the Pacific Northwest Bibliographic Center, books are borrowed from and lent to other libraries in the Pacific Northwest and throughout the nation.

Library Fines and Charges. The following regulations govern Library fines and charges:

(1) A fine of 5¢ per day is charged for all overdue books other than Reserve books.

(2) The following fines will be charged for violation of Reserve book rules: (a) For overdue books, a regular fine of 25¢ for the first hour and 5¢ for each succeeding hour, or fraction thereof, until the book is returned or reported lost. A maximum charge of one dollar per hour may be made in cases of flagrant violation of the rules. (b) For failure to recheck books at the required times, a fine of 25¢. (c) For failure to return books to proper department desk, a fine of 25¢.

(3) Books needed for use in the Library are subject to recall at any time. A maximum fine of \$1.00 per day may be imposed for failure to return promptly.

(4) A service charge of 10¢ is added to all fines reported to the Business Office for collection.

(5) Persons losing books are charged the list price of the book plus the amount of the fine up to the time the book is reported missing. An additional 50¢ is charged as a service fee.

(6) When a book which has been billed is returned before a replacement has been ordered a refund equal to the list price is made. In cases where a replacement has been ordered, a refund is made at the discretion of 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 Oregon 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 Oregon State College Library is maintained at the University of Oregon Library.

Museums and Collections

MUSEUMS and collections maintained by Oregon State College include scientific, industrial, historical, and art materials classified and arranged for effective study and enjoyment. Special exhibitions, including occasional loan collections, are shown from time to time in the Horner Museum, the Home Economics Building, the Memorial Union, the Kidder Hall galleries, and elsewhere on the campus.

The Horner Museum of the Oregon Country

LULA MARY STEPHENSON.....Curator

The Horner Museum of the Oregon Country, in its new home on the ground floor of the Coliseum, contains notable collections of historic, scientific, industrial, and artistic interest. The Museum, formally opened February 20, 1925, was named in 1934 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. The Museum is administered by the Curator. A Museum Committee composed of five faculty members serves in an advisory capacity.

Among the largest 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 I trophies; trophies from the South Pacific war district, World War II; war implements of savage tribes of South America, Africa, 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 china, old brasses and bronzes, etc., including the valuable collection in the name of Mr. and Mrs. Louis J. Clarke; three old square pianos, one of which came around Cape Horn in a sailing vessel and up the Valley by ox team, another made in the eighteenth century; old-style organs; the famous Hank Monk stagecoach; and a great many other types of exhibits, all representing approximately twelve thousand articles from more than four hundred donors.

Valuable material is added from time to time through loans and gifts of particular interest to the College and to the public. Information concerning desirable collections that might be available as gifts or loans is solicited.

The William Henry Price Memorial Collection of Paintings

The William Henry Price Memorial Collection of Paintings, formally opened in the Memorial Union on Charter Day, October 27, 1943, includes fifty-three pictures, chiefly western landscapes and marines, by the late William Henry Price of Pasadena, California. The collection came to the campus through the generosity of the artist's widow, Sarah B. Price, and his son, Mark B. Price, who presented forty-nine of the paintings as a permanent gift to Oregon State College, one to the Horner Museum. The donors authorized

the placing of one of the paintings in the President's Office. The Memorial Union, to round out the collection, purchased four additional paintings. All of the paintings are characterized by individuality, vigor, and distinctive technique; several have won prizes at exhibitions in Los Angeles, Pasadena, and San Francisco. Custody of the collection on behalf of Oregon State College has been entrusted to a committee composed of E. C. Allworth, J. M. Clifford, and Dorothy Bourke Fox.

The Herbarium

HELEN MARGARET GILKEY, Ph.D.....Curator

PATRICIA PACKARD.....Graduate Assistant

THE Herbarium, housed in a small fireproof building west of Home Economics, contains more than 130,000 named specimens of flowering plants, ferns, mosses, algae, and fungi. The mycological section houses 40,000 packets of fungi of pathological importance; also the Henry Gilbert gift collection of 2,318 specimens of myxomycetes. Two hundred and forty-two photographs of types of northwestern plants and a seed collection of 2,800 numbers adds to the usefulness of the Herbarium. Oregon leads in number of specimens, but other parts of the United States, and foreign countries, also are represented. The largest foreign collection is from Australia.

The Braly Ornithological Collection

KATHERINE PATRICIA BRALY.....Technical Adviser

The Braly Ornithological Collection, housed in the Natural History Building, 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 Oregon 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 find the collection indispensable.

The 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 above.

The Entomological Collection

The entomological collection contains nearly 160,000 specimens of insects; of these 100,500 are named. About 80 per cent are from Oregon, the remainder being from various regions of the United States and a few thousand from various parts of the world. Most of the Orders are represented but the larger groups represented are: Coleoptera 34,500, Hymenoptera 60,900, Diptera 19,500, and Lepidoptera 8,500. This count does not include the Herr Collection of insects housed in Education Hall. This collection of several thousand exotic insects, mostly the Lepidoptera, was donated by Mrs. C. W. Herr as a memorial to her husband. The majority of the insects are on pins but a microscope collection of 4,100 slides is also maintained. A fairly large collection of aquatic insects is maintained in 3,000 vials. The entomological collection also contains 300 vials of named Arachnida.

A student reference collection containing 8,000 forms has been prepared. Approximately 1,000 other 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 trays. Life histories of the most important insects are contained in 480 glass-topped Riker mounts. A collection of plastic mounts numbering 130 specimens has been started.

The Geological Collections

The geological collections include minerals, ores, rocks, invertebrate fossils, some vertebrate fossils, and a large collection of fossil plants. The mineral collection includes 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

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." Official publications of Oregon State College are:

Monographs. Oregon State Monographs are published by Oregon State College in the various fields of research and creative scholarship. They are sold at cost.

Oregon State College Bulletin. The Bulletin of Oregon State college is a monthly publication including the Catalog, summer session announcements, occasional newsletters, and other announcements pertaining to the institution and its services.

Biology Colloquium Proceedings. The proceedings of the annual Biology Colloquium are published by the Oregon State Chapter of Phi Kappa Phi in collaboration with the honor society of Sigma Xi and the School of Science. Copies are sold at cost.

Agricultural Experiment Station Publications. The Agricultural Experiment Station issues STATION BULLETINS, TECHNICAL BULLETINS, CIRCULARS OF INFORMATION, and occasional pamphlets and reports. Single copies of experiment station publications are supplied free to residents of Oregon who request them.

Extension Publications. The Federal Cooperative Extension Service publishes series of BULLETINS and CIRCULARS. It issues a series of OUTLOOK CIRCULARS and 22 different series of 4-H CLUB BULLETINS. It also publishes miscellaneous circulars, posters, and reports. Single copies of extension bulletins are supplied free to residents of Oregon who request them.

Engineering Experiment Station Publications. The Engineering Experiment Station issues series of BULLETINS, CIRCULARS, and REPRINTS, reporting progress in engineering research. The engineering publications are distributed at cost on request.

Oregon Forest Products Laboratory Publications. The Oregon Forest Products Laboratory issues series of BULLETINS, INFORMATION CIRCULARS, and PROGRESS REPORTS. Single copies are available on request.

School of Forestry Publications. To make special reports the School of Forestry has initiated a CIRCULAR SERIES, available on request.

Academic Regulations

Admission

TO BE admitted to Oregon State College a student must be of good moral character and must provide evidence of acceptable preparation for work at the college level.

Every person applying for admission to the regular sessions (fall, winter, spring terms) of Oregon State College must submit to the Office of the Registrar complete records of all his high-school and his college work, if any. These records become the property of Oregon State College. For failure to have submitted complete records the State College may cancel the student's registration. Every applicant must also submit a formal application on an official application form. All materials should be filed at least two weeks before the applicant expects to enter the institution. If materials are filed later, the student's registration may be unavoidably delayed. The Registrar will examine the records submitted and will notify the applicant of his entrance standing. When the institution is unable to accommodate all qualified students who apply, preference will be given to Oregon residents.

Admission to Freshman Standing

A person applying for admission to freshman standing must submit a record of his high-school work on an official application form. Graduates of Oregon high schools who have had no previous college work should use the standard application form obtainable from high-school principals. It contains space for courses, grades, recommendations, date of graduation, etc. The record must be certified by the principal (or his representative) of the applicant's school. Out-of-state students who have had no previous college work should request Form A of the Office of the Registrar.

The requirements for admission of Oregon residents to first-year or freshman standing conform to the following uniform entrance requirements adopted by 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 are 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 or equivalent courses, 1 unit in health and physical education, 1 unit of mathematics, and 1 unit in the natural sciences. Individual schools within the State College may strongly recommend additional subject matter and better than average scholarship. In order to be admitted to any of the four-year curricula in engineering, except industrial arts, a student must present 1 unit in elementary algebra, $\frac{1}{2}$ unit in higher algebra, and 1 unit in plane geometry. A student deficient in mathematics and hence not qualified for admission to engineering may be classified as preengineering.

Graduates from standard out-of-state high schools are required to present substantially the same distribution of subject-matter units and must present evidence of superior scholastic achievement.

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 Oregon State College.

A person applying for admission with advanced standing must submit a certified transcript of previous college work (and a record of high-school work if this is not included on the college transcript) including honorable dismissal. A resident student must have a full C (2.00) average; nonresidents will be held to higher scholastic achievement. He must also complete application for admission Form A, obtainable from the Office of the Registrar.

Admission as Special Student

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; (2) those qualified for admission as regular students who are not working toward a degree.

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. A special student may become a degree candidate only after qualifying as a regular student.

Admission with Graduate Standing

Graduates of accredited colleges and universities applying for admission to graduate classification must present official transcripts of their undergraduate work and their graduate work, if any (2.50 grade-point average required). Admission to candidacy for 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.

Placement Examinations

TO PROVIDE the faculty with a basis for reliable advice and assistance to students planning their college programs, Oregon State College requires entering students to take placement and medical examinations.

The psychological examination is considered to some extent a measure of ability to do college work, and the results are used as a basis for planning the student's educational and vocational program. 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 obtained.

The examination in English covers the fundamental principles of grammar and tests the student's ability to apply these principles in writing. Students who make the best scores in this examination may be exempt from the first term of English Composition (Eng 111). Students failing to obtain a satisfactory rating in this examination are required to take and pass English K before registering for work in English Composition.

The medical 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.

All entering students are required to take a placement examination in mathematics.

Degrees and Certificates

○ REGON State College offers curricula leading to junior standing on the completion of two years' work, and to the following baccalaureate and graduate degrees:

Science, *B.A., B.S., M.A., M.S., Ph.D.*

Agriculture, *B.S., B.Agr., M.S., Ph.D.*

Business and Technology, *B.A., B.S., B.S.S.*

Education, *B.A., B.S., Ed.B., M.A., M.S., Ed.M., Ed.D.*

Engineering and Industrial Arts, *B.A., B.S., M.A., M.S., Ch.E., C.E., E.E., M.E., Min.E., Ph.D.*

Forestry, *B.S., B.F., M.S., M.F., F.E.*

Home Economics, *B.A., B.S., M.A., M.S., M.H.Ec., Ph.D.*

Naval Science, *B.A., B.S.*

*Nursing Education, *B.A., B.S.*

Pharmacy, *B.A., B.S., M.A., M.S.*

Physical Education (through School of Education), *B.A., B.S., Ed.B.*

Air Science, Military Science, or Naval Science may be taken by men as a comajor in any school.

Work leading to the degree of *Master of Arts (General Studies)* is offered under the direction of the Graduate School.

Lower-division work leading to certificates (*Junior Certificate, Junior Certificate with Honors Privileges, Lower-Division Certificate*) is offered in liberal arts and sciences, in the professional and technical fields listed above, and in architecture and allied arts, journalism, and music. Approved preparation is offered also for the degree curricula in medicine, dentistry, and nursing education at the University of Oregon Medical and Dental schools in Portland.

Requirements for Bachelor's Degree

Requirements for a bachelor's degree include (a) requirements for junior standing (which the student should satisfy during his freshman and sophomore years) and (b) general requirements which must be satisfied before the degree is conferred.

Requirements for Junior Standing. Fulfilling the requirements for junior standing gives a student the opportunity to pursue a major curriculum leading to a degree.† Normally, the following requirements should be completed in the student's first two years at Oregon State College:

(1) Term hours: Minimum, 93.‡

(2) Grade-Point Average: Minimum, 2.00.

* Conferred on students who take the Preparatory Nursing Curriculum at Oregon State College and complete their curriculum at the University of Oregon Medical School.

† A student who transfers to Oregon State College after completing the equivalent of the requirements for junior standing 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.

(3) English:

(a) Freshmen who received an unsatisfactory rating in the English placement examination must take and pass English K.

(b) English Composition: 9 term hours unless excused. A student whose work meets the standards aimed at may, at the end of any term, with the consent of the head of the Department of English, be excused from further required written English.

(4) Physical Education: 5 terms in activity courses unless excused.

(5) Military Science: 6 terms for men unless excused. See MILITARY SCIENCE AND TACTICS.

(6) General Hygiene.

(7) Group requirements: A prescribed amount of work selected from three "groups" representing comprehensive fields of knowledge. The three groups are: literature, science, social science. (For a classified list of courses satisfying the group requirements, see pages 148-150.) 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.

(b) For students in the professional and technical schools—At least 9 term hours in each of two of the following groups: (1) English literature or upper-division foreign language; (2) science; (3) social science. If a student 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.

General Requirements. When a student has satisfied all the requirements for junior standing, 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 (in Engineering and Forestry, 204), 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 standing: Minimum, 45.

(2) Required 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 or 45 hours in science and social science.

* Students majoring in Business and Technology are required to take not less than 36 term hours in a technical minor to be chosen from the following fields: Agriculture, Engineering, Forestry, Home Economics, Industrial Chemistry, Mining or Petroleum Geology, and Applied Physics. No more than 9 of the 36 hours may be taken in basic prerequisite or necessary related courses. The technical minors are printed on pages 269-273.

† English, Modern Languages, Speech.

- (c) Professional bachelor's degree (Ed.B., B.S.S., etc.): Fulfillment of all major requirements.
- (3) Grade-Point Average:
 - (a) Minimum 2.00 on all college work, and on all work taken in residence at this institution.
 - (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: Maximum, 48 term hours.
 - (c) Medicine: Maximum, 48 term hours.
 - (d) Applied Music: Maximum, 12 term hours.

A student may receive two or more baccalaureate degrees (for example, B.A. or B.S. with same or different majors) at the same or subsequent graduation exercises provided that (1) he meets the requirements of the curricula represented by the degrees; (2) he completes for each additional degree a minimum of 32 term hours more than the 192 term hours or 204 term hours required by the first degree (the additional term hours may be taken concurrently with the 192 or 204 term hours); (3) he is registered during the last three terms before his graduation at least one term in each appropriate school or department.

Requirements for Certificates

Junior Certificate. A student who has fulfilled requirements for junior standing and submits an application approved by his dean may be awarded a Junior Certificate.

Junior Certificate with Honors Privileges. A student who has fulfilled all requirements for a Junior Certificate and has a grade-point average of at least 2.75 may receive a Junior Certificate with Honors Privileges on submitting an application approved by his dean. Such certificate may admit him to upper-division standing and to work for a bachelor's degree with honors in colleges providing an honors program.

Lower-Division Certificate. The Lower-Division Certificate recognizes the completion of two years of lower-division work by students whose desire has been only to round out their general education. The certificate is granted on request to the dean.

Certificate in Agriculture. The Certificate in Agriculture recognizes the completion of the Two-Year Curriculum offered by the School of Agriculture and is awarded on application of the student and approval of his dean.

Requirements for Advanced Degrees

The requirements for advanced degrees are listed under GRADUATE SCHOOL. Students who, before they have received a baccalaureate degree, take courses which they wish to apply toward an advanced degree may have credits reserved as provided under "Reserving Credits" under GRADUATE SCHOOL.

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 session supplements the work of the regular year. (See summer session 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 New Student Week (see pages 90-91). A detailed calendar for the current year will be found on pages 8-9.

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 included in the SCHEDULE OF CLASSES, a copy of which is available to each student at 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 education.

A TERM HOUR is the unit of credit, representing 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 published 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, elementary algebra, or other courses of similar grade.
- 100-110, 200-210. Survey or foundation courses that satisfy 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, courses numbered 400-499 if 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.

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*, and of others listed below. *A* denotes exceptional work accomplished; *B*, superior; *C*, average; *D*, inferior.

A student who has done acceptable work to the time of the final examination, but does not take it will receive an *E*. The *E* may be removed upon presentation to a faculty committee of an acceptable reason for not taking the final examination. An *E* not removed within the first term after the student's return to the institution will be changed to an *F*. For failure in a course, the grade of *F* is given. When the quality of the work is satisfactory, but some minor but essential requirement of the course has not been completed, for reasons acceptable to the instructor, a report of *I* 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; in such cases a report of *W* is made. 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 *I*, *W*, and *E* 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 of 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.

Scholarship Regulations

The faculty Committee on Academic Deficiencies has discretionary authority to suspend or place on probation any student not achieving profitable and creditable progress toward graduation (a minimum grade-point average of 2.00 or *C* for both the term and cumulative record). Application of this rule results in the following practices:

PROBATION. Any student achieving a grade-point average below 2.00 or *C* either for a term or cumulative will be placed or continued on probation (unless subject to suspension).

SUSPENSION. A student is subject to suspension any time it is apparent that he is not satisfactorily meeting graduation requirements. Most suspensions occur when a student is 12 or more grade points deficient. (Hours taken times 2 subtracted from grade points earned.) If other factors so indicate, a student may be suspended with fewer than 12 points deficiency. Also, a student 12 or more points deficient for his last two or more terms may be suspended even though he may have a cumulative average above 2.00, if other factors so indicate. (This applies to resident and/or transfer students of sophomore, junior, or senior standing.)

RELEASE FROM PROBATION. Any student on probation may achieve good standing by earning both term and cumulative 2.00. This statement applies to resident credit alone and to resident plus transferred credit.

The scholarship requirements for participation in student extracurricular activities are printed on pages 108-109.

Fees and Deposits

STUDENTS at Oregon State College and at the University of Oregon 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.

Increases in costs of materials, supplies, and equipment may necessitate upward adjustments in the laboratory and course fees and in other incidental fees. The Board of Higher Education reserves the right to make changes in the schedule 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 athletic events; admission to concert and lecture series sponsored by the State College. No reduction in 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, \$20.00; incidental fee, \$17.00; building fee, \$8.00. The total in regular fees, which includes all laboratory and other charges in connection with instruction, is \$55.00 per term.*

Undergraduate students who are not residents of Oregon pay the same fees as Oregon residents, and, in addition, a nonresident fee of \$60.00 per term, making a total of \$115.00 per term.*

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	20.00	60.00
Incidental fee	17.00	51.00
Building fee	8.00	24.00
*Total for Oregon residents	\$ 55.00	\$165.00
*Total for nonresidents (who pay an additional nonresident fee of \$60.00 per term)	\$115.00	\$345.00

Graduate Students. Graduate students registered for seven term hours of work or more pay tuition and fees of \$40.00 a term. Graduate students do not pay the nonresident fee. Students holding graduate or research assistantships or fellowships pay fees totaling \$17.50 per term. Graduate students

* Except special fees for instruction in applied music.

registered for 6 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 reestablish the original amount.

Special Fees

The following special fees are paid by students under the conditions indicated:

Part-Time Fee	per term hour, \$5.00
Applies to both undergraduate and graduate students taking from 1 to 6 term hours of credit. Minimum charge \$10. Nonresident fee does not apply. Entitles students to all the usual services and use of the facilities of Oregon State College.	
Staff Fee	per term hour, \$3.00
On approval of the President's Office, full-time staff members registering for College courses pay a special staff fee of \$3.00 per term hour. Payment of this fee entitles staff members to instructional and library privileges only. Maximum of 5 hours per term.	
Auditor's Fee	per term hour, \$3.00
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. Students regularly enrolled in the State College may be granted the privileges of an auditor without paying the auditor's fee.	
Late-Registration Fee	\$1.00 a day
Students registering after the scheduled registration dates of any term pay a late-registration fee of \$1.00 a day, assessable after last day to add courses. Part-time students (see above) and auditors are not required to pay the late-registration fee.	
Change-of-Program Fee	\$1.00
The student pays this fee for each change in his official program after the scheduled last day for adding courses.	
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 examinations. 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.	
Registration-in-Absentia Fee	\$5 per term hour
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.	
Counseling and Testing Service Fee	\$5.00
Graduate Qualifying Examination Fee	\$1.00 to \$15.00
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 Oregon 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 are 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 Fee

The Oregon State Board of Higher Education has ruled that any person who comes into the state of Oregon for the purpose of attending one of the institutions under the control of the Board, and who for any reason is not qualified for classification as a resident of the state of Oregon, shall pay the nonresident fee, except: (a) a student who holds a degree from an accredited college or university and is registered in a curriculum other than professional dentistry, law, or medicine, (b) a student attending summer session, (c) a student paying part-time fees, (d) a student whose parent is a regular employee of the federal government stationed in Oregon, or (e) a student whose father is domiciled in the state of Oregon as defined under (1) below.

The residence or domicile of a student is normally that of his father; if his father is not living, it is normally that of his mother. In case of parents' divorce, the domicile of a student is generally determined by the residence of the parent to whom custody is granted by the court. The domicile of a wife is normally that of her husband; if both are students, the wife's residence status is determined by that of the husband. The domicile of a student who is independent of the relations mentioned above is determined by rule (1) below. An alien cannot begin to establish residence until he has obtained his first citizenship papers.

The Board has established the following rules to be observed in determining the residence status of students:

(1) Residence and domicile are synonymous and domicile shall be considered to be a fixed permanent residence to which the student has the intention of returning. The fixed permanent residence must normally have been maintained for at least twelve months prior to the school term for which resident classification is sought, and must be a bona fide residence which the student has no intention of changing when the school period has expired. Proved actual residence and intention to remain must exist simultaneously. Factors used in determining intent include age and family status of the student, residence of near relatives, place of voting, ownership of property, sources of financial support, length of time within the state, record of employment and schooling (intent cannot be demonstrated by school attendance alone).

(2) A student whose official records show his own or his parent's domicile to be outside of Oregon is prima facie a nonresident, and the burden is

upon the student to prove the contrary. If his official transcripts of academic record show attendance at a school outside of Oregon, he may be required to furnish further proof of Oregon domicile.

(3) A nonresident at the time of enrollment is held to that classification throughout his attendance as a student, except where he can prove that his or his parent's previous domicile has been abandoned and a new one established in Oregon in accordance with these regulations. A resident student will be reclassified as nonresident at any time his Oregon domicile is lost.

Student Life and Welfare

Coordination of Student Interests

THE total experience of a student while attending Oregon State College should result in satisfactory growth socially, emotionally, and educationally.

Primary responsibility for student welfare is shared by the offices of the Dean of Women, the Dean of Men, and the Personnel Coordinator. Student welfare includes personnel services, student living, social and activity programs, loan funds, scholarships and fellowships, and honors and awards. The three offices cooperate with the Office of the Registrar in maintaining complete permanent personnel records for each student attending Oregon State College, and the offices are vitally concerned with student orientation, employment, loans, placement, and follow-up.

Deans of Students. The Dean of Men and the Dean of Women have specific responsibilities for standards of student life, for coordinating the social and activity programs of the campus, and for assisting students with housing and employment. They work closely with student organizations and councils in developing sound student leadership and participation. They counsel with students on matters pertaining to general student welfare and are available for consultation on personal problems.

Personnel Coordinator. The Personnel Coordinator is primarily responsible for campus-wide academic guidance, for coordination of the various student personnel agencies of the institution, and for assisting in the promotion of an efficient student personnel service in each school or division of registration. The following personnel groups work in cooperation with the Personnel Coordinator: Head Counselors, Testing and Counseling Bureau, Clinical Services, and Academic Deficiencies Committee.

Guidance. The department of student personnel makes available to all students the campus advisory and guidance services through the various Head Counselors, advisers, Counseling and Testing Bureau, and Clinical Services. Individual students are invited to use the services anytime they may desire.

Head Counselors. Head Counselors are appointees of the deans of the respective schools and are responsible jointly to the deans and to the Personnel Coordinator for the personnel program in their several school organizations. The Head Counselors are: Frank H. Parks, Lower Division; G. T. Crews, Science; W. M. Langan, Agriculture; Earl Goddard, Business and Technology; R. R. Reichart, Education; Thomas Marshall, Engineering; W. F. McCulloch, Forestry; Betty Hawthorne, Home Economics; Rob S. McCutcheon, Pharmacy.

Counseling and Testing Bureau. Oregon State College maintains a counseling and testing service that is available to assist the student in determining his aptitude and ability to do college work, his interest and aptitude for work in a particular academic or vocational field, and the causes of difficulties.

Clinical Services. Personnel workers are expected to make full use of departments qualified to render clinical services. The clinical services are able to provide advice concerning student welfare and academic programs. Services available are: psychological, Psychology Department; health, Student Health

Service; religious education, Department of Religion; speech, Department of Speech; remedial reading, English Department; methods of study, School of Education.

Academic Deficiencies Committee. The Academic Deficiencies Committee is responsible for the administration of the regulations of the State College governing student scholarship. The committee is in close cooperation with the head counselors, attempts to learn causes for poor student accomplishment, and promotes policies and procedures deemed advisable for improvement of scholastic status of students in general.

Faculty-Student Committees. Other committees concerned with student personnel and welfare are: the Committee on Student Life, including students as well as faculty members, which assists students with social and living problems; the Committee on Student Housing, which assists students in making proper adjustments relative to housing and boarding; the Committee on Religious Education, which 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, which 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.

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 96-97). The Teacher Placement Service is described under **SCHOOL OF EDUCATION**.

New Student 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 discussions, individual conferences, and examinations and tests (see pages 79-80), an effort is made to assist every new student in getting the best possible start in his new work. During New Student Week students become acquainted 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. Directions concerning New Student Week and registration are sent three weeks before the opening of the term to each new student who is accepted for admission.

The tests given entering students are not *entrance* examinations but *placement tests*. They provide the State College faculty with reliable information as a basis for advising and assisting students in planning their college programs.

Every new student even though a transfer from another college is required to be present for the tests and events of the week. Students do not register until all test results are available for counseling purposes. Hence, any student not present at opening of New Student Week will be delayed in registration. New transfers majoring in engineering will be given placement tests.

The 1951-52 session of Oregon State College officially opens for new undergraduate students on Sunday, September 16, 1951. The first assembly, as the first event of New Student Week, is scheduled for 8:00 p.m. that day. Rooms in the dormitories will be available Sunday, September 16. Meals will be served beginning Sunday evening.

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 provide opportunity for students to do their best in their studies but through the experiences of group life, contribute to the student's total education as a person. Participation in democratic, self-governing living facilities and activities is a valid part of the educational experience of a college student.

All students have opportunity to belong to some social organization. Each living group on the campus, including college residence halls, cooperative houses, sororities, and fraternities, is organized for self-government and social activities. Students of all these living groups take an active part in campus life.

All living arrangements must be approved by the Dean of Men or the Dean of Women, who supervise students living in fraternities, sororities, cooperative houses, and private homes. Although much of the correspondence between a student or prospective student and Oregon State College will be directed by the Registrar's Office, he may expect to hear regarding housing from the Dean of Men, the Dean of Women, or the Director of Dormitories.

College Dormitories

The Director of Dormitories operates all residence halls and their facilities. Living conditions are comfortable and democratic, favorable to successful student work and to participation in wholesome activities of campus life.

Men's Residence Halls. The permanent Main Dormitory for men houses 340 students in five halls: Buxton, Cauthorn, Poling, Hawley, and Weatherford. Comfortable study rooms are provided for each two students. Each hall has its own club room. Bathroom with showers and sleeping porches with double deck bunks are provided on each floor. Dining facilities are provided in the Memorial Union. Laundry and drying facilities are provided for each hall.

The temporary dormitories, Hudson and Central halls, provide housing for about 750 men in single or double rooms. Each of the dormitories is divided into five units which are organized into clubs. Lounge and recreation rooms are provided in each dormitory. Dining facilities are provided in a separate Cafeteria Building. Laundry and drying facilities are provided in each hall.

Women's Residence Halls. Oregon State College provides three residence halls for women: Beatrice Walton Sackett, Margaret Snell, and Waldo.

Beatrice Walton Sackett Hall is composed of four separate living groups. Each unit houses about 78 girls and has its own living, dining, and lounge rooms, its own beau rooms, separate kitchenettes, laundry rooms, recreation rooms, and sun decks. Most of the rooms consist of a three-in-one combination for two girls: a large study room; a bunk room, and a closet and dressing room. Some rooms have study and sleeping facilities combined. A three-room connected bathroom with tubs and showers is available for each sixteen girls.

Waldo Hall houses 230 and Margaret Snell Hall houses 140 in large comfortable rooms accommodating two or three girls. Each hall has living, dining, and lounge rooms. Bathrooms with tub and shower are provided on each floor. Complete laundry and clothes drying facilities are provided in each hall.

Dormitories provide a single bed (some are double decked), mattress, mattress cover, study table, chair, dresser or wardrobe, two sheets, two single blankets for each bed, and pillowcase. Bed linen and three towels which are furnished are laundered weekly. Dormitory employees clean the student rooms semimonthly. Student residents are responsible for care of their rooms at other times. Students should bring an extra blanket; other extras should be delayed until after the student arrives on the campus.

Dormitory Living Expenses. The rates for board and room in Oregon State College dormitories are as follows:

	Board per month	Room per term	
		Multiple units	Single
Waldo, Snell, and Main Dormitory	\$47.00	\$53.00	\$ 79.50
Hudson and Central	47.00	45 00	57.00
Sackett	47.00	68.00	102.00

Room rent is payable in two equal installments each term. The first payment is paid at the beginning of the term when the student arrives at the dormitory. The second payment is due at the beginning of the second half of the term. Board bills must be paid in advance.

Students who do not pay board and room charges within five days after payment is due are assessed a late penalty fee of \$1.00 for each day (after 5) until a maximum charge of \$5.00 is reached. If dormitory charges are not paid within ten days after they are due, the student's registration may be cancelled.

The foregoing rates are subject to change by the State Board of Higher Education as circumstances demand.

Reserving a Room. To reserve a room in a college dormitory the student (a) completes a room application blank, obtained from the Registrar; (b) sends a check or money order for \$15.00 (payable to Oregon State College) for a room reservation; and (c) forwards the application and check or money order to the Business Office, Oregon State College, Corvallis, Oregon. Reservation should be made early, even though official admission to Oregon State College may be delayed.

A student who has requested a dormitory reservation will be assured of a room unless the deposit is returned. If a student is found ineligible for admission after he has made the deposit, the \$15.00 will be returned to him. Normally, the deposit is retained until the termination of the student's residence in the hall, at which time it will be refunded less any charges due.

Cancellation. Cancellation or transfer of deposit to any later term of any room reservation must be made not later than fourteen days before the

opening date of the term for which the deposit was made. If the cancellation is made as provided above, the deposit will be refunded. If the depositor registers in school and has not cancelled his reservation two weeks prior to opening date, he will be required to live in the dormitory. If the depositor does not register in school, and has not complied with the two-week cancellation notice, then the deposit will be forfeited in total. Requests for cancellation or transfer should be made to the Business Office.

Assignment. Assignment to a particular hall will not be made until the student has been officially admitted to Oregon State College. Room assignment is made after he arrives on the campus. Dormitories will open for students and for receiving baggage the day before the opening of College. Closing times for vacation periods will be set by the Director of Dormitories.

Responsibility in Reserving a Room. When a student reserves a room in a dormitory and makes his \$15 deposit, he is holding a room for a term and is responsible for the cost of the room unless he has cancelled his reservation before the opening of the term.

Meals. A student living in a dormitory takes his meals at the dining room to which assigned.

Board and Room Refunds. For absences of less than a week (21 consecutive meals) during a term, there will be full charge for board. If the absences are for a week (21 consecutive meals) or longer, the board refund will be 50 per cent of the scheduled rate. No refunds will be made for the examination period. There will be no refund on room charges regardless of the length of absence.

Sororities and Fraternities

Membership in fraternities and sororities is by invitation, but eligibility to initiation is based on satisfactory scholarship. The high standards of scholarship maintained by these groups require study conditions that will promote achievement in academic as well as social growth.

Board and room charges in fraternities approximate \$70.00 per month. In some cases this figure includes building and social fees while in other instances these charges are in addition to board and room costs.

Sororities. Sororities provide supervised living accommodations for women in chapter houses. Freshman women are expected to complete a full year's residence in the college dormitories even though pledged to sororities. Pledged students living outside the sorority houses should plan on financial obligations to the social group in addition to obligations incurred where they live. The selection, or "rushing," of new members takes place for limited periods twice each year. Board and room costs in the sororities approximate those of the dormitories. Cost of membership is additional.

Further information (or the pamphlet on sororities) may be obtained by writing to the Panhellenic Council, Memorial Union, Oregon State College.

Sororities at Oregon State College are: Alpha Chi Omega, Alpha Delta Pi, Alpha Gamma Delta, Alpha Omicron Pi, Alpha Phi, Alpha Xi Delta, Chi Omega, Delta Delta Delta, Delta Gamma, Delta Zeta, Gamma Phi Beta, Kappa Alpha Theta, Kappa Delta, Kappa Kappa Gamma, Pi Beta Phi, Sigma Kappa.

Phrateres is a national social society for college women.

Fraternities. Fraternities provide for men comfortable living accommodations under college supervision. In the fall, prospective members are selected following a rushing period which is held the latter part of New Student Week. Each summer a pamphlet, *Is It Greek to You?* is published by the Interfraternity Council. A copy is mailed to all men students entering Oregon State College for the first time. The booklet aims at acquainting incoming students with fraternities in general.

For New Student Week fraternities invite students to stay in their houses through "rushing." Usually about three out of four are pledged. In addition, interested students living elsewhere are rushed with about one in four being pledged. A student pledged and not having other housing arrangements will live in the fraternity. If other housing commitments have been made (the fraternity should be informed prior to rushing) the student will remain in the housing accommodations arranged for even though pledged. (See Housing Regulation Number 5, page 95.) A student not pledged and not having housing arrangements will be housed in dormitory or private home facilities. Oregon State College will give every assistance to men needing housing facilities following rushing.

Further information concerning fraternities may be obtained by addressing the Office of the Dean of Men.

Fraternities at Oregon State College are: Acacia, Alpha Gamma Rho, Alpha Sigma Phi, Alpha Tau Omega, 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, Phi Kappa Psi, Phi Kappa Sigma, Phi Kappa Tau, Phi Sigma Kappa, Pi Kappa Alpha, Pi Kappa Phi, Sigma Alpha Epsilon, Sigma Chi, Sigma Nu, Sigma Phi Epsilon, Sigma Pi, Tau Kappa Epsilon, Theta Chi, Theta Xi.

Cooperative Houses

In cooperative houses students are able to achieve desirable group and social life at a cost about \$15.00 a month less than in other types of group life. Students share all the housework responsibilities except meal preparation.

Rules and regulations on the keeping of reservations, making cancellations, or moving apply to students living in cooperatives as well as to students in other types of living groups.

For Women. Four cooperative houses for women have been developed. The interests of cooperative living are fostered by a council of Co-Resident Women. There is a resident hostess and a cook in each house. The cooperative values in this type of group living are of great satisfaction to the girls themselves and to Oregon State College. A descriptive booklet and application blank may be obtained by writing to the Office of the Dean of Women.

For Men. There are four men's cooperatives at Oregon State College. Any man interested in cooperative housing should write the Office of the Dean of Men.

Rooms in Private Homes

Official listings of approved private homes are maintained by the Dean of Men or the Dean of Women. The Housing Committee urges that a written agreement be made between the student and householder. Blank contract forms may be obtained from the Dean of Men or the Dean of Women. Such agree-

ments will be binding upon both householder and student for one term and will be enforced by the Housing Committee, if properly filed by the householder. Housing agreements whether oral or written will be enforced when satisfactory facilities are provided.

Agreements may be terminated: (1) If the student properly withdraws from college. (2) Upon mutual agreement and satisfaction to the student and householder with written notice to the Dean of Men or the Dean of Women by the householder. (3) By action of the Housing Committee. Since it is mutually beneficial if both householder and student meet each other before commitments are made, reservations in private homes are not made by the College. Housing in a private home for fall term should be arranged for soon after June 15. Costs in private homes are comparable to those in the dormitories.

Housing for Married Students

Mall Apartments. Oregon State College maintains for married students the Mall Apartments located on the campus. The apartments consist of 40 double and 10 single units. The apartments are furnished, and water and disposal of garbage are provided within the rental costs of \$26.00 per month for the single and \$32.00 per month for the double units. A married student wishing accommodations in the Mall Apartments should contact the Office of the Dean of Men.

Off-campus Apartments. A married student wishing to find living accommodations off campus should consult the Housing and Employment Secretary, Shepard Hall.

Housing Regulations

The Committee on Student Housing is responsible for the administration of the following regulations governing student housing:

1. It is the responsibility of each student to arrange, individually, for acceptable housing accommodations. Admission must be granted by the Registrar's Office before housing arrangements become official.
2. All single undergraduate students must live in approved housing. Housing in private homes will not be approved for unmarried undergraduate women except for those living with immediate relatives or those working for board and room. In either case, prior approval must be obtained from the Dean of Women.
Unmarried undergraduate students will not live in apartments, hotels, or motels.
3. A graduate or married student (or anyone not a regular full-time student) normally lives in private housing. Official approval is required if such students are to live in any type of college housing. The College is not, in general, responsible for the housing of married students.
4. All housing arrangements are for one full college term. If requested permission to move is granted by the Housing Committee the student must expect to pay a term's room rent for a room reserved but not occupied. Prior written approval must be obtained from the Dean of Men or Dean of Women if a student is to change residence or address.
5. The College cannot approve duplicate housing arrangements. Students making such arrangements and not making proper cancellations are financially responsible for all such agreements. (See "Cancellation," pages 92-93.)
6. Each student is expected to conduct himself according to established college rules regarding student conduct.

Student Automobiles Restricted

Because of the large number of cars brought to the community annually by students, traffic on the College campus is seriously congested. In the interests of safety, the adoption of rather drastic and rigid regulations has become necessary. The administration of these regulations is in the hands of a joint student-faculty committee which has authority to deal with traffic violations. All

parking of motor vehicles is limited to defined areas, and restricted parking has been established in certain of these areas.

All cars operated by students must be registered and are supplied with campus registration stickers. Students are not permitted to operate cars on the campus during certain hours. For students living in the dormitories, some parking areas are available, but these are not sufficient to accommodate all of the cars controlled by dormitory students. Students expecting to live in the dormitories are advised that the reservation of a dormitory room does not necessarily guarantee the student parking privileges. Corvallis is a relatively small city, and most all of the living accommodations are in close proximity to the campus and within walking distance.

For these reasons, students are urged to leave their cars at home.

Student Expenses

Statements of expenses are confusing. Though the average per month may vary from \$80.00 to \$100.00, the student meets large financial demands during his first two weeks of college. Registration fees are paid for the full term, room rent is paid in two installments during the term, board is paid a month in advance, and books are purchased. For this reason an Oregon student should be prepared for an initial expense of \$150.00 or more.

It is suggested that the most convenient and safest method of payment will be by check made at the correct time for the exact amount.

Fees	Fall term	Per year
Institutional fees	\$ 55.00	\$165.00
Books, supplies, etc.	20.00	45.00
Board and room	193.00	550.00
Incidentals	25.00	75.00
Totals	\$293.00	\$835.00

Note: This table does not include the \$5.00 breakage deposit, which must be maintained during the year and is refunded at the end of the year. Room deposit of \$15.00 must be paid at time of application for dormitory room. Books and supplies run higher for engineering students who must obtain equipment during their freshman year which they use throughout their undergraduate years. Out-of-state students pay \$60.00 a term additional tuition.

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.

A veteran must pay his own fees unless he has received his certificate of eligibility by registration date.

Self Support

Organized effort is made to assist students 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.

Some men and women students who live in the dormitories are employed in the cafeteria or dining rooms where it is possible for them to earn most of the cost of their board and room. Information concerning work in the dormitories can be obtained from the Office of the Director of Dormitories.

Some women students earn a large part of their expenses while attending college by working for their board and room in private homes. This plan requires that the student give approximately three hours work per day to the employer. Arrangements for working for board and room are made through the Office of the Dean of Women. In general, a girl who plans to earn such a large part of her expenses while attending college should register for less than a full academic schedule.

Some men students on campus find employment working as house boys or furnace boys in private homes, in sororities or boarding groups. Arrangements for such jobs are made through the Employment Bureau for Men in Shepard 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 full 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 stating the kind of work desired, experience, and the amount of work actually needed. Positions for part-time employment are not listed, as a rule, until about the time the term opens.

(3) 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.

(4) 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.

(5) 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.

Student Health Service

THROUGH the Student Health Service Oregon 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.

Students registered for credit may receive general medical attention and advice at the Student Health Service during dispensary hours. The Health Service does not provide house call service at any time or medical service outside of dispensary hours. Students who desire such attention should employ private physicians at their own expense. This does not apply to those who are already under care of the Health Service as infirmary in-patients. Limited hospital facilities are maintained for emergency cases which require hospitalization for general medical care. Such patients are admitted only upon the advice of the Health Service physicians. Fifteen days is the maximum period of hospitalization available to a student during any one academic year.

All expenses of or connected with surgical operations, fractures, specialized medical care, and special nursing must be met by the student who requires such attention. In no case will the Health Service pay or be responsible for bills from private physicians or private hospitals.

Health Service privileges are not available to members of the faculty.

A medical examination is required of all entering students. This includes the tuberculin test, vaccination against smallpox, and other tests that are deemed necessary to protect the health of the student body.

All activities pertaining to the medical care of students are centered in the Student Health Service building. On the ground floor are the dining room, kitchen, heating plant, and refrigeration unit. The clinic occupies the entire second floor and includes physicians' offices, examining rooms, X-ray and clinical laboratories, pharmacy, and minor surgery. On the third floor 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 health service staff includes physicians, registered nurses, a laboratory technician and an X-ray technician.

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 evidence of having had the disease or 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

A FACULTY committee, with offices in Room 102 Memorial Union, administers the Student Loan Fund and cooperates in the administration of other loan funds available for students at Oregon State College. The committee follows these fundamental principles:

- (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 in collections.

Applications for loans should be made at the Student Loan office in the Memorial Union, where the information is given on the different loan funds available and the procedure for obtaining a loan.

The Student Loan Fund

The Student Loan Fund, a perpetual, revolving trust fund established for the purpose of lending money to worthy students attending or who wish to attend Oregon State College, is administered by the Student Loan Fund, a membership organization, incorporated under the laws of the State of Oregon. Trustees are appointed by the President of the College. This fund has arisen through the generosity 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 obtained easily, but rather to aid those who are 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 College *at least one term*.

Many donors have contributed to the building of the Student Loan Fund. The names of the persons for whom these sums are memorials are on record, and through the years they have appeared in college catalogs and commencement programs.

Other Loan Funds

Concerning which information is available at the Loan Office.

- THE J. T. APPERSON EDUCATIONAL FUND:** Available to men and women who are residents of the State of Oregon.
- THE CIVIL ENGINEERING LOAN FUND:** Available to students in the Department of Civil Engineering.
- THE CRAWFORD LOAN FUND:** Available to young men who are native-born citizens of the United States.
- HARDING MCKINNEY FUND:** Available to junior and senior electrical engineering students.

Administered by other agencies

- A. W. S. EMERGENCY LOAN FUND FOR WOMEN STUDENTS:** Administered by the Dean of Women.
- OREGON STATE PHARMACEUTICAL ASSOCIATION EDUCATIONAL FUND:** Administered by the School of Pharmacy.
- THE BEN SELLING SCHOLARSHIP LOAN FUND:** Available to men and women.

Scholarships and Fellowships

STUDENTS of ability and promise may have part of their college expenses paid through one of the scholarship or fellowship funds. Most of these funds have been established through the generosity of private donors and industrial concerns. Some are limited to students in special fields of study. Others are open to students in any school.

Graduate Fellowships. In addition to the assistantships and teaching fellowships described under GRADUATE SCHOOL, the following fellowships are open to Oregon State College graduate students:

- A. E. ENGBRETSON MEMORIAL FELLOWSHIPS:** Two \$750 fellowships for graduate students in dairy manufacturing or dairy-products manufacturing.
- ATOMIC ENERGY COMMISSION PREDOCTORAL FELLOWSHIPS:** Two \$1,500 fellowships in biochemistry and organic chemistry for research on amino acids.
- DOW FELLOWSHIP:** \$1,000 from Dow Chemical Company for research in the preservation of wood by pentachlorophenol solutions.
- DUPONT FELLOWSHIP:** \$1,400 grant for an unmarried student or \$2,100 for a married student and \$1,200 for necessary expenses for research in chemistry.
- ELI LILLY RESEARCH FELLOWSHIP:** \$1,500 for research on new forms of B vitamins, with \$1,500 additional to the Department of Chemistry.
- HYSLOP AGRICULTURAL RESEARCH FELLOWSHIP:** For research in farm crops; a memorial to George R. Hyslop, for many years head of the Department of Farm Crops.
- INTERNATIONAL BABY CHICK ASSOCIATION FELLOWSHIP:** \$1,500 to a graduate student in poultry husbandry for research on factors affecting fertility and hatchability of chicken and turkey eggs.
- INTERNATIONAL NICKEL COMPANY FELLOWSHIP:** \$1,500 plus tuition for two years to a graduate student for research on nickel, copper, or platinum.
- MCDONALD FELLOWSHIPS:** Three or four annual grants of \$400 to \$600 each to assist graduate students in forestry, provided through bequest by Mrs. Mary J. L. McDonald.

- ORVILLE R. MILLER FELLOWSHIPS:** Scholarships of \$1,000 each for research in forest products, provided through the Orville R. Miller Memorial Research Fund.
- NUTRITION FOUNDATION RESEARCH FELLOWSHIP:** \$1,500 for research in biochemistry on B vitamins.
- RALSTON PURINA RESEARCH FELLOWSHIPS:** Seven awards of \$1,400 annually in universities of the United States and Canada for graduate study in nutrition and physiology applied to dairy, poultry, or animal husbandry, or in transmissible diseases of livestock and poultry.
- STANDARD OIL COMPANY OF CALIFORNIA GRADUATE FELLOWSHIP:** \$1,250 fellowship for a graduate student in mechanical engineering.
- STATE SANITARY AUTHORITY FELLOWSHIP:** \$1,000 fellowship for research in disposal of domestic or industrial wastes for a graduate student in sanitary engineering.
- SWIFT AND COMPANY RESEARCH FELLOWSHIP:** \$1,500 for studies of nucleotide and nucleic acid synthesis, with \$500 additional to the Department of Chemistry.
- U. S. PUBLIC HEALTH SERVICE PREDOCTORAL FELLOWSHIP:** \$1,500 for research in biochemistry on B vitamins.
- WEYERHAEUSER FELLOWSHIP:** For graduate study and research in forest management, a \$1,000 fellowship provided by the Weyerhaeuser Timber Foundation.

Scholarships for Undergraduates. The Registrar or the dean of the school concerned can provide information regarding the method of applying for these scholarships:

- STATE SCHOLARSHIPS:** Tuition and course fees provided by the Oregon State System of Higher Education. At least 50 per cent of these scholarships go to entering freshmen who rank in the upper third of their high-school graduating classes. Other applicants must have at least a 2.5 grade point average.
- LEONORA H. KERR-FOLK CLUB SCHOLARSHIP:** \$150 annually to outstanding freshman woman from an Oregon high school; fund established as a tribute to Mrs. William Jasper Kerr and supplemented by the College Folk Club.
- MARGARET SNELL HALL SCHOLARSHIP:** \$50 to a sophomore resident of Snell Hall with a grade-point average of at least 2.75 provided by residents of Snell Hall.
- OREGON STATE DADS CLUB SCHOLARSHIPS:** Four \$150 scholarships, two for men, two for women, awarded by the Scholarships Committee from nominations of the Dean of Men and Dean of Women. Recipients must have shown scholastic attainment for at least two terms and must be in need of financial aid.
- OREGON STATE MOTHERS CLUB SCHOLARSHIPS:** Four \$132 scholarships, two for men and two for women, awarded by the Scholarships Committee from nominations of the Dean of Men and Dean of Women. Recipients must have high character and a grade-point average of at least 3.00.
- MORTAR BOARD SCHOLARSHIP:** \$100 to an outstanding woman student worthy of financial assistance.

- BERNARD DALY SCHOLARSHIPS:** College expenses for at least 15 students from Lake County provided from the income of a fund left by the late Dr. Bernard Daly of Lakeview. The board of trustees which administers the fund receives nominations from the county judge and the school superintendent of Lake County.
- BUCHANAN-CELLERS GRAIN COMPANY SCHOLARSHIP:** \$500 a year provided by a McMinnville company for a student from Yamhill County entering the School of Agriculture to prepare to become a farm operator.
- COURTEMANCHE SCHOLARSHIP:** \$500 a year provided by L. A. Courtemanche, Inc., of McMinnville for a student from Yamhill County entering the School of Agriculture to prepare to become a farm operator.
- DANFORTH SUMMER FELLOWSHIP FOR AGRICULTURE STUDENTS:** Expenses for two weeks in St. Louis, Missouri, and two weeks in a Michigan summer camp provided by the Danforth Foundation and Ralston-Purina Mills of St. Louis for outstanding agricultural students.
- McKENZIE SCHOLARSHIP:** For a freshman from Lane County, a member of the Future Farmers of America, \$150 annually; a memorial to Gary McKenzie established by his parents.
- MULTNOMAH HUNTERS AND ANGLERS CLUB SCHOLARSHIP:** \$150 to a male student, junior or senior, majoring in fish and game management to assist him in continuing his studies in wildlife conservation and management.
- SEARS ROEBUCK AGRICULTURAL SCHOLARSHIPS:** \$2,000 for scholarships for men majoring in agriculture. Recipients must have been farm reared in Oregon, must show a good character and scholastic attainment, and must have demonstrated leadership ability through participation in 4-H Club, Future Farmers, or agricultural or community activities.
- AERO CLUB SCHOLARSHIP:** Six annual scholarships of \$400 each, at least three for freshmen, at least one of whom has done outstanding work in an aviation activity such as model building or Civil Air Patrol, and others to sophomores or juniors. Applicants must show engineering aptitude and ability in physical science and mathematics and must need financial assistance.
- LEEDY AERONAUTICAL SCHOLARSHIP:** \$200 a year for tuition and other expenses for a student in aeronautical engineering; a memorial to Lt. William Clark Leedy established by his parents, Jay Clark Leedy, '12, and Mildred W. Leedy, '14, of Brooks, Oregon, and his wife Meredith Ann Leedy.
- WEYERHAEUSER FELLOWSHIP:** \$1,000 fellowship provided by the Weyerhaeuser Timber Foundation for graduate study and research in forest management.
- AMALGAMATED SUGAR COMPANY HOME ECONOMICS SCHOLARSHIPS:** \$400 provided annually for awards in varying amounts to worthy students in need of financial assistance in pursuing their education.
- BORDEN HOME ECONOMICS SCHOLARSHIP:** \$300 for a senior in home economics who has completed two or more courses in foods and nutrition and who, among all similarly eligible students, has the highest grade-point average.
- DANFORTH FELLOWSHIPS IN HOME ECONOMICS:** Expenses for a freshman in home economics at a two-week summer camp in Michigan; for a junior in home economics for four-weeks experience and study in problems of manufacturing, commercial research, distribution, advertising, personnel, and leadership at St. Louis, Missouri, and at a Michigan summer camp; and

for a graduate student interested in religious education for five weeks at a Michigan summer camp and a year of study at certain colleges and universities—sponsored jointly by the Danforth Foundation and Ralston-Purina Mills of St. Louis.

JOHNSON SCHOLARSHIP: \$25 or less to worthy, needy, upper-division home economics students whose grade-point average is equal to or above that of the student body; a memorial to Miss A. Grace Johnson, professor of household administration from 1915 to 1933.

LEE SCHOLARSHIP: Income from a \$1,000 fund awarded each year to a junior in home economics who has shown improvement in her college work, stability and meritorious record in all her activities, and general all-around worthiness; a memorial to Mrs. Minnie E. Lee and Mr. J. B. Lee.

OREGON ASSOCIATION OF FUTURE HOMEMAKERS OF AMERICA SCHOLARSHIP: Tuition for three terms provided for a Future Homemaker of America who is a graduate of an Oregon high school and who has a major interest in home economics.

SEARS ROEBUCK HOME ECONOMICS FRESHMAN SCHOLARSHIPS: Four \$200 scholarships for freshmen in home economics awarded on merit to Oregon farm-reared girls of high promise who evince a sincere desire for a broad and thorough education in home economics and who would otherwise not be able to attend college.

DIETRICH PHARMACY SCHOLARSHIP: From a fund established by Mrs. H. D. Dietrich of San Francisco, \$100 awarded to an outstanding student in pharmacy.

HAACK LABORATORIES PHARMACY SCHOLARSHIP: \$100 awarded annually to the junior in pharmacy who has displayed outstanding ability in his sophomore year and who needs financial support to continue his education.

FRANK NAU SCHOLARSHIPS: \$100 each awarded to four deserving students in pharmacy.

OREGON STATE PHARMACEUTICAL ASSOCIATION SCHOLARSHIP: \$100 to apply toward tuition and fees of a senior in pharmacy who has demonstrated outstanding scholastic ability in all academic work, who is a resident of Oregon, and who, in the opinion of the pharmacy faculty, will benefit most from the financial support thus given.

Scholarships for Foreign Students. Many of the scholarships described above are open to foreign students. In addition, a number of scholarships are maintained especially for undergraduate or graduate students from foreign countries.

STATE SCHOLARSHIPS FOR FOREIGN STUDENTS: Tuition and fees for a limited number of students from foreign countries attending institutions of the Oregon State System of Higher Education. Application for scholarships by foreign students wishing to attend Oregon State College should be submitted to the Registrar not later than April 1.

INTERNATIONAL FRIENDSHIP SCHOLARSHIP: \$600 annually to a graduate student from a foreign country to study home economics at Oregon State College, provided by the Home Economics Club.

AVA B. MILAM FELLOWSHIP: A fellowship for a woman foreign student interested in furthering her education in home economics, established in tribute to Ava B. Milam, dean of the School of Home Economics 1917-1950.

PHI KAPPA PHI EXCHANGE SCHOLARSHIP: Tuition, board, and room for a foreign student attending Oregon State College provided by the local chapter of Phi Kappa Phi. 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.

Honors and Awards

DISTINCTION in scholarship is recognized at Oregon State College in several ways: by the presentation of Junior Honors following a student's sophomore year and of Senior Honors at the time of graduation, through election to the various honor societies, and through personal awards. General Awards may be won by students in any school or curriculum. Other awards are open only to students in particular schools or departments. A list of honor societies will be found elsewhere in this Catalog. Oregon State College students compete for awards provided by national and regional sponsors in many fields as well as for essay and oratorical prizes, awards for proficiency in special fields, and awards for all-around distinction in college life.

JUNIOR HONORS: Conferred by the Oregon State Chapter of Phi Kappa Phi on students who have completed at least 45 term hours of sophomore work at Oregon State College with a grade-point average of at least 3.50. For purposes of these awards, sophomore work is defined as the last three terms of the student's first six terms in university or college.

SENIOR HONORS: Conferred each year by the Faculty Council upon those members of the graduating class, candidates for a bachelor's degree, who through their entire college course have maintained the highest scholastic standing in their respective schools.

CUMMINGS AWARDS: Presented each spring in the proportions of \$50, \$30, \$20, and \$10 respectively to the man of highest standing in the senior, junior, sophomore, and freshman year; based on (a) scholarship, (b) success in student activities, (c) qualities of manhood, and (d) qualities of leadership; a memorial to Edward A. Cummings.

WALDO AWARDS: Presented each spring in the proportions of \$50, \$30, \$20, and \$10 respectively to the woman student of highest standing in the senior, junior, sophomore, and freshman year; based on (a) scholarship, (b) success in student activities, (c) qualities of womanhood, and (d) qualities of leadership; a memorial to Clara H. Waldo.

LIPMAN WOLFE AWARDS: Presented in the proportions of \$50, \$30, and \$20 respectively to the man or woman of highest standing in the senior, junior, and sophomore classes based on: (a) scholarship, (b) qualities of manhood or womanhood with special emphasis on unselfishness and kindness, (c) qualities of leadership, and (d) contribution to campus welfare.

ALPHA LAMBDA DELTA AWARD: Presented to the senior woman in Alpha Lambda Delta with highest scholastic standing. The society gives certificates to senior members who have a grade-point average of 3.33 or above for eleven terms.

ALPHA PHI AWARD: An annual prize of \$50 to the freshman woman who ranks first in the placement examination on English usage.

ALTRUSA AWARD: 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.

- ASSOCIATED WOMEN STUDENTS:** Awards not exceeding \$100 to the senior woman or women who, through campus-wide and house service and maintenance of high scholarship have proved themselves worthy of recognition.
- CHI OMEGA AWARD:** 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.
- CO-OP BOOK AWARDS:** Purchase orders of \$25, \$15, and \$10 donated annually by the Oregon State College Cooperative Association, to upperclassmen judged to possess the most outstanding personal libraries.
- CORVALLIS ELKS SENIOR AWARD:** Provided by Corvallis Lodge, Benevolent and Protective Order of Elks, includes registration fees for one year and \$10 a month for eight months and is given annually to the junior man who during his three years in college has contributed most to the welfare of Oregon State College.
- DELTA DELTA DELTA AWARDS:** Yearly awards of \$75 made to two women students judged to have exerted, through personal resourcefulness and unselfish effort, the most constructive influence on their associates during the academic year.
- PANHHELLENIC CUP:** Awarded to the sorority making the highest scholastic average for the year.
- PHRATERES SCHOLARSHIP CUP:** Awarded to the member of Phrateres who has attained the highest standing in scholarship for the year.
- SMITH AWARD:** Income from \$500 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 another award during the same academic year; a memorial to Drucilla Shepard Smith, formerly of McCoy, Polk County, Oregon, established by her son, Mr. John E. Smith, '02.

Awards Open to Students in Particular Schools

- ALPHA CHI OMEGA CUP:** Awarded to the student of music who has rendered the greatest service to the campus.
- SIGMA DELTA PI SPANISH AWARD:** A Spanish masterpiece and the medal of the American Association of Teachers of Spanish given annually to the advanced student of Spanish who has made the greatest progress during the academic year.
- PHI LAMBDA UPSILON AWARD:** A certificate of merit presented to an outstanding junior in chemistry and chemical engineering. The recipient's name is engraved on a plaque displayed in Chemistry Hall.
- PHI SIGMA AWARDS:** Two certificates awarded annually by the national organization of Phi Sigma, honor society in biological science, to the outstanding undergraduate and graduate students at Oregon State College who have shown creative interest in biology.
- ALPHA GAMMA RHO FRESHMAN AWARD:** A rotating trophy awarded each year to a student in agriculture who has completed a minimum of 45 term hours of college work with a grade-point average of at least 2.75 and who

is enrolled for his fourth term in college. The purpose of the award is to promote and recognize scholarship, leadership, development, and character.

ALPHA ZETA SCHOLARSHIP CUP: Awarded during the first term of the sophomore year to the student in agriculture receiving the highest grade average in the freshman class.

HANSON AWARD: An annual award of \$75 to the outstanding junior majoring in poultry husbandry, made by Mr. J. A. Hanson.

OREGON FEED AND SEED DEALERS ASSOCIATION AWARDS: Three awards of \$100 each made to outstanding junior students in agriculture.

RODENWOLD AWARDS: Medals awarded each year to the members of the five-man team that represents Oregon State College in the intercollegiate livestock judging contest at the Pacific International Livestock Show in Portland; a memorial to Ben W. Rodenwold, for many years Professor of Animal Husbandry.

SWIFT & COMPANY ESSAY AWARD: An award of \$130 to the student 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 to Chicago to attend the International Livestock Exposition and to participate while there in a market study program under the direction of Swift & Company.

PHI CHI THETA AWARDS: For women in business and technology: (a) a prize of \$5 to the freshman having the highest scholastic standing, (b) a senior key.

WALL STREET JOURNAL AWARD: Medallion and subscription to the best all-round man or woman graduate in business and technology as determined by the business administration faculty based on scholarship and leadership abilities.

KAPPA DELTA PI AWARDS: Awards of \$25 made annually to sophomore man and woman enrolled in the School of Education who as freshmen in that school made the highest scholastic average.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS CERTIFICATE OF MERIT: A certificate of merit and a pin awarded each year to the junior student member of the chapter who is judged to have been the outstanding student during the preceding academic year.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS AWARD: 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.

AMERICAN SOCIETY OF CIVIL ENGINEERS AWARDS: A first prize of \$10 and junior membership in the society (\$10), a second prize of junior membership, and a third prize of \$5 awarded by the Portland section of the society for the three best papers prepared and delivered in the student branch of the society.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS AWARDS: Awards of \$20, \$15, \$10, and \$5 are given annually for the best papers prepared and delivered in the student branch of the society.

AMERICAN SOCIETY OF METALS: Cash awards of \$25, \$15, and \$10 for the best papers prepared by student members of the society.

ETA KAPPA NU AWARD: A certificate of merit 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 Dearborn Hall.

- INSTITUTE OF AERONAUTICAL SCIENCES AWARDS:** 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.
- PI TAU SIGMA AWARD:** Three mechanical engineering handbooks presented to the outstanding student in the sophomore mechanical engineering class.
- SIGMA TAU AWARD:** A medal awarded each year to the sophomore student in engineering who as a freshman was the most outstanding student.
- SOCIETY OF AUTOMOTIVE ENGINEERS AWARDS:** Three prizes of \$10 each for the best papers prepared by student members of the society.
- TAU BETA PI LOCAL AWARDS:** Award of \$5 for the best essay submitted in the student chapter of the society. Certificates of merit are also awarded to freshmen in engineering having the highest scholastic standing during the first two terms of the year.
- KELLY AXE AWARD:** An annual award provided by the Kelly Axe Company and presented to the senior in forestry who has contributed most to the success of the School of Forestry.
- PACK FORESTRY AWARD:** Income from a gift of \$2,000 made by Mr. Charles Lathrop Pack of New Jersey awarded annually to the student in forestry who produces the most interesting, logical, and technically significant paper for publication.
- SNELLSTROM FORESTRY AWARD:** Approximately \$25 awarded annually to a junior in forestry on the basis of character, ability, sincere interest in forestry as a career, and need for financial assistance in completing his college course; a memorial to the late John R. Snellstrom, prominent Oregon lumberman and legislator.
- XI SIGMA PI PLAQUE:** Awarded each year to the student in forestry who has maintained the highest grade average during the sophomore year.
- HOME ECONOMICS FRESHMAN AWARD:** An award of \$10 to promote scholarship and leadership in home economics, the recipient being selected by a committee representing Omicron Nu and the faculty in home economics.
- OMICRON NU PLAQUE:** Awarded each year to the senior woman who has best lived the teachings of home economics throughout her college career.
- OREGON HOME ECONOMICS ASSOCIATION AWARD:** An award of \$25 made annually to an Oregon girl majoring in home economics who is a sophomore and who needs financial aid to continue her education.
- OREGON HOME ECONOMICS EXTENSION COUNCIL AWARD:** An award of \$50 annually to a junior or senior in home economics who shows sincere interest and promise of leadership in extension work, who stands high in scholarship, and who is active in campus life.
- ROTANA CLUB AWARD:** An annual award of \$25 provided by the Rotana Club of Portland for a sophomore in home economics.
- LAMBDA KAPPA SIGMA SCHOLARSHIP KEY:** Awarded annually to the senior member of Lambda Kappa Sigma, women's honorary in pharmacy, who has maintained a high scholastic average.
- LEHN AND FINK MEDAL:** An appropriately engraved gold medal awarded each year to the senior in pharmacy who has attained the highest scholarship rank or who in the judgment of the faculty has made the most distinctive contribution to science in pharmacy.

- McKESSON AND ROBBINS AWARD:** An award of \$50 annually provided for a senior in pharmacy who makes the highest average in a competitive examination.
- MERCK AND COMPANY AWARDS:** Pharmaceutical books valued at \$15 awarded to the senior who attains the highest standing in pharmacology and pharmacognosy.
- NORTH PACIFIC BRANCH OF THE AMERICAN PHARMACEUTICAL ASSOCIATION AWARD:** A year's membership in the Association and a scholarship certificate presented annually to an outstanding senior in pharmacy.
- RHO CHI AWARD:** To a junior in pharmacy who has maintained a high scholastic average in pharmacy subjects.
- WOMEN'S AUXILIARY TO OREGON STATE PHARMACEUTICAL ASSOCIATION PRIZES:** \$25 and \$15 awarded annually to outstanding women students in pharmacy.

Honor Societies

HONOR societies on the Oregon State College campus are listed below. Most of these are national organizations with chapters at leading universities.

- ALPHA DELTA SIGMA**—national professional advertising honorary fraternity for men.
- ALPHA LAMBDA DELTA**—national honorary scholastic fraternity for freshman women.
- ALPHA ZETA**—national honor society in agriculture.
- AQUABATS**—local honor society for women with outstanding aquatic ability.
- BLUE KEY**—national recognition society for senior men.
- DELTA SIGMA RHO**—national forensic honor society open to both men and women.
- EPSILON PI TAU**—national professional honor society for men in industrial arts.
- ETA KAPPA NU**—national men's professional honor society in electrical engineering.
- EUTERPE**—local women's music association.
- GAMMA SIGMA DELTA**—national honor society in agriculture.
- KAPPA DELTA PI**—national honor society in education.
- KAPPA KAPPA PSI**—honorary music society.
- KAPPA PI**—national honorary fraternity for outstanding students of art.
- KAPPA PSI**—national honor and professional fraternity for pharmacists.
- LAMBDA KAPPA SIGMA**—national professional fraternity for women in pharmacy.
- MORTAR BOARD**—national honorary organization for senior women.
- MU BETA BETA**—Four-H club honorary fraternity.
- NATIONAL COLLEGIATE PLAYERS**—national dramatic honorary fraternity.
- OMICRON NU**—national honorary fraternity for professional home economists.
- ORCHESIS**—national honor society for modern dance.
- PARTHENIA**—honorary for women in physical education.
- PHI CHI THETA**—national honor society for women in commerce.
- PHI ETA SIGMA**—national honorary scholastic fraternity for freshman men.
- PHI KAPPA PHI**—national honor society composed of faculty, graduate and undergraduate members of all departments of American universities and colleges.

- PHI LAMBDA UPSILON—national honorary chemical society.
 PHI SIGMA—honorary biology fraternity.
 PHI TAU SIGMA—national honorary fraternity for mechanical engineers.
 PI MU EPSILON—national honorary fraternity in mathematics.
 RHO CHI—national pharmaceutical honor society.
 SCABBARD AND BLADE—national military honorary of the ROTC and NROTC.
 SIGMA DELTA CHI—professional journalistic fraternity.
 SIGMA DELTA PSI—national honorary fraternity in athletics.
 SIGMA GAMMA EPSILON—national honorary fraternity for professional biologists and geology students.
 SIGMA PI SIGMA—honorary physics society.
 SIGMA TAU—national honorary fraternity for student and professional engineers.
 SIGMA XI—honorary graduate research organization.
 TAU BETA PI—national honor society for professional engineers.
 THETA SIGMA PHI—national professional fraternity for women in journalism.
 XI SIGMA PI—national professional honorary in forestry.

Memorial Union

DEDICATED "to the service and inspiration of the living and to the memory of our immortal dead," the Memorial Union is the campus center for democratic fellowship among all students, faculty, alumni, and friends of Oregon State College. The building was financed from funds provided by students, alumni, faculty members, and other friends as a memorial to the men and women who gave their lives in the service of their country in the Spanish-American and World wars.

Beautiful in design and furnishings, the building has many practical uses. Every day hundreds of students flow through its social rooms, bookstore, and post office. They read and converse in the comfortable lounges; they hold committee meetings and social hours in the club and game rooms; they pause between classes at the counter or in the booths of the coffee shop. The building contains offices for student organizations and activities. It provides a tea room open to the public, a telegraph office, a barber shop, and a spacious ballroom. The president of the Memorial Union is a student, and students share actively in its management.

Extracurricular Activities

OREGON 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; cultural development through participation in the intellectual and esthetic life of the campus. Many of these activities, because of their close relation to the educational program, are cocurricular rather than extracurricular. (See also ASSOCIATED STUDENTS, pages 111-112.)

Regulations Governing Activities Participation. Regulations governing student participation in extracurricular activities are as follows:

(1) A certificate of eligibility must be obtained from the Dean of Men or the Dean of Women before a student can qualify for an elective or appointive office in any student,

extracurricular, or organization activity. Any student is eligible to hold an elective office or to accept an appointment in a student activity provided he is registered for at least 12 term hours, has an accumulative grade-point average of at least 2.00, and a 2.00 for the preceding term, during which term he must have completed at least 12 hours of academic work.

(2) A grade-point average of less than 2.00 automatically removes a student from any such office, and prevents him from participating in any such activity.

(3) Any student shall be disqualified to continue in office in any term in which he drops below a 12-term-hour load.

Before a student may represent Oregon State College in intercollegiate athletics he must comply with the Pacific Coast Conference Rules, which are as follows:

No student shall represent his institution in any athletic contest—

(1) Unless he shall have presented fifteen Carnegie units for entrance requirements;

(2) Unless he is a bona fide student carrying at least 12 hours of work in a regular or special course as defined in the curriculum of the institution he represents;

(3) Unless he shall have passed in at least 10 hours of work in the last semester or quarter of residence previous to participation;

(4) If he has total failures on his previous record exceeding one-fifth of the total hours passed by him. Failures must remain failures on the record. Incomplete grades shall not be counted either as failed or passed, until adjusted. A condition shall count as a failure until removed. "Previous record" means the student's entire record, in all collegiate institutions.

(5) If he has completed the requirements for the bachelor's degree.

Lectures. Frequent public lectures by faculty members and visiting scholars and persons prominent in national affairs supplement the regular curriculum. Campus sponsors of lectures include the Committee on Concerts and Lectures, Faculty Men's Club, American Association of University Women, Faculty Women's Club, College Folk Club, Lower Division Faculty, Committee on Religious Education, Round Table, Associated Students, Associated Women Students, Phi Kappa Phi, Sigma Xi, and others.

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 community. Under the patronage of the Memorial Union Student Activities Committee and the Art Department, exhibitions in the Memorial Union stimulate interest in architecture, painting, sculpture, and related arts. They give the student acquaintance with the best of his historical inheritance and knowledge of contemporary art movements throughout the world. Student exhibits of art work are shown in the Kidder Hall galleries throughout the school year.

Membership in the student musical organizations is open to all students of the college after consultation with the directors concerned. Honor societies also promote art and music interests on the campus.

The Symphony Orchestra and Concert Band each play one major concert on the campus annually and make a number of such appearances in other communities; they perform frequently for other major campus events.

The Men's Glee Club and the Women's Madrigal Club present seasonal concerts both as separate choruses and as one large choir, the College Chorus. The A Cappella Choir, selected from the membership of the College Chorus, is the traveling group, making several off-campus appearances annually.

In cooperation with the Corvallis Civic Music Association, the Educational Activities Board brings artists of international fame to the campus each year for concerts and recitals. Advanced music students and faculty also give public recitals during the year. Several dance recitals are given each year under the auspices of the Division of Physical Education, Orchesis, and other organizations.

Forensics and Dramatics. Forensics and dramatics are fostered at Oregon State College for their intellectual and cultural value both to those participating and to the whole campus community. Oregon 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 stagecraft are provided by the Speech Department. Each season groups of short plays are given in connection with the instruction in community drama. Six major plays are presented each year by the National Collegiate Players and Mask and Dagger, the campus dramatic groups, or the Speech Department. Special student organizations also provide outlets for dramatic talent. Radio programs are written and produced over KOAC, KEX, KWIL, and KRUL. 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 other state, national, and Pacific Coast extempore-speaking, oratorical, and debate contests.

Sports and Athletics. Oregon State College is a member of the Pacific Coast Intercollegiate Athletic Conference composed of the leading universities and colleges of the coast region. In addition to intercollegiate athletics a comprehensive program of intramural sports is closely correlated with instruction in physical education. Stimulation and recognition of achievement in athletics and sports are provided through the Division of Physical Education, honor societies in physical education, and such organizations as the following:

For men:

ROWING CLUB
 VARSITY "O" ASSOCIATION
 PHYSICAL EDUCATION CLUB

For women:

ORANGE "O" ASSOCIATION
 PHYSICAL EDUCATION CLUB
 SEAHORSES
 WOMEN'S RECREATION ASSOCIATION

Student Publications. Oregon State College student publications are listed below. Official publications of Oregon State College are listed on another page.

THE OREGON STATE DAILY BAROMETER, containing campus news and selected general and educational news, is 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. Payment of registration fees entitles every student to a subscription to the **DAILY BAROMETER**.

THE BEAVER, the yearbook of the Associated Students, is a pictorial record of student life, published in May.

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 AND FACULTY DIRECTORY, "Fussers Guide," is published by the Oregon State chapters of Sigma Delta Chi, Alpha Delta Sigma, and Theta Sigma Phi.

Clubs and Societies. Serving the varied interests of students—social, intellectual, recreational, and professional—many clubs and societies are maintained on the Oregon State College campus in addition to those mentioned above. Most clubs and societies are open to students without regard to the schools in which they are registered. In some cases, especially in clubs professional in nature, membership is limited to students in a particular school or major.

A service purpose is dominant in the following organizations:

ALPHA PHI OMEGA
CAMPUS RELIGIOUS COUNCIL
ROOK AND ROOKESS COUNSELORS

ROUND TABLE (affiliated with YW-YMCA)
STUDENT RED CROSS UNIT
TALONS
THANES

A wide range of interests is represented in such organizations as the following:

ASSOCIATED MARRIED STUDENTS
BERNARD DALY CLUB
CALIFORNIA CLUB
COSMOPOLITAN CLUB
FUTURE TEACHERS OF AMERICA
GEOGRAPHERS ASSOCIATION
LOWER DIVISION COUNCIL
MICROPHONE CLUB
MOUNTAIN CLUB

OSC RIFLES
PERSHING RIFLES
PSYCHOLOGY CLUB
STUDENT PLATFORM SERVICE
STUDENTS FOR DEMOCRATIC ACTION
STUDENT PEACE COUNCIL
TAFFRAIL
YOUNG DEMOCRATS
YOUNG REPUBLICAN CLUB

Professional interests are served by the following:

Science:

AMERICAN CHEMICAL SOCIETY
EQUANIMITAS (premedical)
GEOLOGICAL SOCIETY
PRENURSING CLUB

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS
AMERICAN FOUNDRYMEN'S SOCIETY
AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS
AMERICAN SOCIETY OF CIVIL ENGINEERS
AMERICAN SOCIETY OF MECHANICAL ENGINEERS
COMMUNICATIONS CLUB
ENGINEERING STUDENT COUNCIL
INSTITUTE OF AERONAUTICAL SCIENCE
INSTITUTE OF RADIO ENGINEERS
SOCIETY OF HEATING AND VENTILATING ENGINEERS
SOCIETY FOR THE ADVANCEMENT OF MANAGEMENT
SOCIETY OF AMERICAN MILITARY ENGINEERS
SOCIETY OF AUTOMOTIVE ENGINEERS

Agriculture:

AGRICULTURAL EXECUTIVE COUNCIL
CAMPUS 4-H CLUB
DAIRY CLUB
FARM CROPS CLUB
FARM ECONOMICS FORUM
FIN AND ANTLER
FOOD TECHNOLOGY CLUB
FUTURE FARMERS OF AMERICA
HORTICULTURE CLUB
INSTITUTE OF FOOD TECHNOLOGY
POULTRY CLUB
SOILS CLUB
WITHEYCOMBE CLUB

Forestry:

FORESTRY CLUB
PRESS RADIO GUILD

Business and Technology:

ACCOUNTING CLUB
BUSINESS AND TECHNOLOGY CLUB

Home Economics:

CAMPUS 4-H CLUB
HOME ECONOMICS CLUB

Engineering:

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS
AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

Pharmacy:

AMERICAN PHARMACEUTICAL ASSOCIATION

Student and Alumni Government and Cooperation

OREGON State College students are organized for self-government. Students, alumni, and parents of students cooperate in serving the interests of undergraduates, the institution, higher education, and the commonwealth.

Associated Students. The students of Oregon State College are organized for self-government. All campus-wide programs such as Homecoming, Dads Day, Mothers Weekend, Senior Weekend, Campus Chest Drive, and special emphasis weeks are sponsored and coordinated through the Associated Students. The Associated Women Students, a group within the general student body organization, coordinates, sponsors, and supervises activities of all women students' organizations.

Each entering class forms an organization which retains its identity throughout the four undergraduate years 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 institution. Classes returning for their silver anniversary jubilee also make gifts as an expression of their loyalty and appreciation toward their alma mater.

The Associated Independent Students unifies independent students for participation in campus life and government. Panhellenic supervises intersorority activities and their coordination with campus life and government. The Interfraternity Council supervises fraternity activities and coordinates them into the general student-body program. The House Presidents' Council is a policy-forming organization composed of presidents of all women's living groups which formulates social standards and regulations within women's living groups and on the campus.

Oregon State Dads Club. The Dads Club of Oregon State College, composed of fathers or male guardians of students attending Oregon State College, has as its purpose to preserve the traditions and the future usefulness of the institution; to cooperate with the administration of higher education in Oregon; and to cooperate with similar organizations throughout the state.

Oregon State Mothers Club. The Mothers Club of Oregon State College is open to all mothers and other women interested in furthering the interests and welfare of students of Oregon State College. "Once an Oregon State Mother, Always an Oregon State Mother." Individual units of Mothers clubs are organized in many communities of the state. Also, there are clubs of mothers of individual fraternity, dormitory, and cooperative residence groups. Annual meeting of the state organization is held on campus Mothers Weekend.

Alumni Association. Informed, organized alumni backing of college projects is provided by the Oregon State College Alumni Association. Another important function is the publishing of THE OREGON STATER, the monthly alumni magazine.

Attendance at Oregon State makes one eligible for membership in the association. Annual dues are \$3.00 and include a year's subscription to THE OREGON STATER. A life membership costs \$60.00 and may be paid in ten cumulative installments of \$6.00 each over a period of ten years.

Officers and directors of the association are elected at the annual business meeting which is held in June. Directors serve for a three-year period and officers are elected annually. Officers and directors are:

IRENE CARL, '20, Portland	President
G. A. POWELL, '21, Long Beach, California	Vice President
H. WHITESIDE, '34, Corvallis	Treasurer
ROBERT P. KNOLL, '48, Corvallis	Director of Alumni Relations
JAMES G. BARRATT, '50, Corvallis	Assistant Director of Alumni Relations
RALPH FLOBERG, '41, Portland	Director
WARREN REID, '34, Portland	Director
G. ALLEN BROWN, '23, Portland	Director
ROBERT HIRSTEL, '41, Portland	Director
LOYD CARTER, '20, Portland	Director
FRED RAMSEY, '30, Corvallis	Director
ARTHUR LOWE, '36, Corvallis	Director
VICTOR NUNENKAMP, '43, Astoria	Director
LYLE SPECHT, '41, Tillamook	Director
MAURICE SHEPARD, '33, McMinnville	Director
DOUG CHAMBERS, '41, Salem	Director
MRS. DERWOOD SMITH, '43, Albany	Director
MARCUS CORWIN, '39, Eugene	Director
GEORGE ELDEN, '32, Grants Pass	Director

GLENN GREGG, '23, Bend	Director
GEORG WERNMARK, '30, The Dalles	Director
WILLIAM WOODFORD, '36, Medford	Director
PERCY MURRAY, '24, Klamath Falls	Director
EVERETT REYNOLDS, '39, La Grande	Director
FRED HILL, '36, Pendleton	Director
GEORGE SCOTT, '29, Baker	Director
MYRON WESTERING, '22, Chicago	Director
BERNARD MAINWARING, '20, Nampa, Idaho	Director
LINDSAY SPIGHT, '25, San Francisco, California	Director
JOHN SPURLOCK, '27, Sacramento, California	Director
RICHARD FORD, '29, Longview, Washington	Director
LOIS BATES, '37, Seattle, Washington	Director
JEAN HALL, '51, Portland	Student Member
JOHN THOMAS, '52, Newark, New Jersey	Student Member

Oregon State College Federation. The Oregon State College Federation, organized in 1951, includes representatives of the Associated Students, the Mothers Club, the Dads Club, the Alumni Association, the Department of Intercollegiate Athletics, and the Century Club. Its purpose is to coordinate, implement, and encourage the activities of the various member groups in behalf of Oregon State College and its students. Officers are:

MAURICE KAEGI	Chairman
MRS. JOHN WIEMAN	Secretary
DON HAYS	Treasurer

Oregon State College Foundation

ON SEPTEMBER 9, 1947, the State Board of Higher Education approved the establishment of the Oregon State College Foundation. Shortly thereafter, articles of incorporation for this new organization formed to accept gifts in behalf of Oregon State College were filed with the Secretary of State. The object of the corporation, as stated in the articles, is to aid and promote educational and charitable activities and purposes, and specifically, to solicit, acquire, receive, hold, manage, construct, use, maintain, lease, exchange, and dispose of all kinds of property, whether acquired absolutely or in trust, for the benefit of Oregon State College. Substantial gifts have been received and the Foundation has become an important adjunct to the advancement of the work of Oregon State College.

The members of the Board of Trustees are:

- E. C. SAMMONS, President, United States National Bank, Portland
- R. M. KERR, Attorney, Equitable Building, Portland
- ALBERT BAUER, Vice President, Woodbury and Co., Portland
- R. K. BRODIE, Vice President, Proctor and Gamble, Cincinnati, Ohio
- G. E. SPAIN, Vice President, Caterpillar Tractor Co., Peoria, Illinois
- DON HOLTGATE, Trust Officer, Pacific National Bank, San Francisco, California
- CLAUDE F. PALMER, President, Photo-Art Commercial Studios, Portland
- MRS. RAMOND KINSER, Past President, OSC Mothers Club, Portland
- DR. A. L. STRAND, President, Oregon State College, Corvallis

Councilors are:

- MRS. WILBUR CARL, President, Oregon State College Alumni Association
- M. C. KAEGI, President, Oregon State College Dads Club
- MRS. OSCAR PAULSON, President, Oregon State College Mothers Club

Lower Division

Faculty

RALPH COLBY, Ph.D., Dean of Lower Division.
FRANK LOVERN PARKS, Ph.D., Head Counselor.
LENA CURRIER EMERSON, Secretary to the Dean.

Arts and Letters

Architecture

PROFESSOR SINNARD (department head).
ASSISTANT PROFESSORS JEPPSEN, WASSON*.
INSTRUCTORS ELLIS, LAUDERDALE.

Art

PROFESSOR GILKEY (department head).
ASSOCIATE PROFESSORS FIELD, FOX.
ASSISTANT PROFESSOR WASSON*.
INSTRUCTORS FOSTER, GUNN, JAMESON, KOSANOVIC.

English

PROFESSORS S. H. PETERSON (department head), CHILDS, COLBY, H. B. NELSON,
M. E. SMITH.
ASSOCIATE PROFESSORS JENKINS, MUNFORD.
ASSISTANT PROFESSORS BEEBE, FOREMAN, GIBSON, GROSHONG, JURGENSON,
MCELFRESH (emeritus), NORRIS, SCHROEDER.
INSTRUCTORS BUTTS, CLAYES, COMBELLACK, DANIELS, G. G. ELLISON, M. L.
LAWRENCE, O. C. LAWRENCE, LIGON, LINDBERG, LUDWIG, MALAMUD,
MOUNT, RICE, E. D. SMITH, SNIPPER, WILSON.

Journalism

PROFESSORS SHIDELER (department head), MCINTOSH (emeritus).
ASSISTANT PROFESSOR LAKE.
INSTRUCTORS GISH, ZWAHLEN.

Landscape Architecture

ASSOCIATE PROFESSORS MARTEL (department head), SOLBERG.
PROFESSOR PECK (emeritus).

Modern Languages

PROFESSOR MARTIN (department head).
ASSOCIATE PROFESSORS BOURBOUSSON*, KUNEY, LEWIS.
ASSISTANT PROFESSORS JURGENSON, KRAFT.
ACTING INSTRUCTORS GOMEZ, VILLEGAS, YANG.

* On leave of absence, 1950-51.

Music

PROFESSORS WALLS (director), L. J. PETRI (emeritus), P. PETRI (emeritus).
 ASSOCIATE PROFESSOR GRAY.
 ASSISTANT PROFESSORS BRYE, MESANG, SITES.
 INSTRUCTORS BASKAM, O'CONNOR, ROBERTS.

Speech

PROFESSORS C. B. MITCHELL (department head), KNOLL, WELLS, YOUNG.
 ASSOCIATE PROFESSORS CORTRIGHT, WINGER.
 ASSISTANT PROFESSORS C. N. HARRIS, LIVINGSTON.
 INSTRUCTORS DOLER, KAISER, KRUEGER, ULNIC.

*Social Science**Economics*

PROFESSORS M. N. NELSON (department head), DREESEN (emeritus), JENSEN.
 ASSOCIATE PROFESSORS BOWEN, HIGHSMITH, MYATT, RUBIN, VATTER.
 ASSISTANT PROFESSORS BETT, FRIDAY, HEINTZELMAN*.
 INSTRUCTOR BROOKS.

History

PROFESSORS J. W. ELLISON (department head), C. K. SMITH, VAUGHN
 (emeritus).
 ASSOCIATE PROFESSOR R. W. SMITH.
 ASSISTANT PROFESSORS BERKELEY, BERRY.

Philosophy

PROFESSOR WARRINGTON (department head).
 ASSISTANT PROFESSOR HOVLAND.
 INSTRUCTOR BOCK.

Political Science

PROFESSORS SWARTHOUT (department chairman), DUBACH (emeritus), POLING,
 SWYGARD.
 ASSISTANT PROFESSORS LAPALOMBARA*, MADDOX.
 INSTRUCTORS MCCLENAGHAN, WALTER.

Psychology

PROFESSORS CHAMBERS (department head)†, BRUMBAUGH (emeritus), SHER-
 BURNE (acting head).
 ASSISTANT PROFESSORS CROOKS, HAGEN, R. D. HARRIS.
 INSTRUCTORS GOLDSMITH, HOLMES, JONES, MANTAY.

* On leave of absence, 1950-51.

† Died February 21, 1951.

Religion

PROFESSOR WARRINGTON (department head).
ASSISTANT PROFESSOR HOVLAND.
INSTRUCTOR BOCK.

Sociology

PROFESSORS BAKKUM (department head)*, DANN (acting head).
ASSOCIATE PROFESSORS PARKS, PLAMBECK.
INSTRUCTOR SIMERVILLE.

General Statement

FRESHMAN and sophomore work in the liberal arts and sciences is unspecialized. The work is offered through the Lower Division 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.

Courses in arts and social sciences are offered in the Lower Division (pages 119-147). Courses in biological and physical sciences including mathematics are offered in the School of Science (pages 169-205).

Lower Division Liberal Arts and Sciences

Purpose. 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.

Group Requirements. 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: **LITERATURE**, **SCIENCE** (including the biological and physical sciences and mathematics), and **SOCIAL SCIENCE**. Students intending to major in the liberal arts and sciences must

* On sabbatical leave, 1950-51.

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 usually numbered from 100 to 110 and from 200 to 210. A list of courses applicable in meeting group requirements is printed on pages 148-150. (For group requirements for students in the professional schools see page 81.)

Required Courses. Besides fulfilling group requirements, lower-division students must take required work in English Composition, Hygiene, Physical Education, and Air, Military, or Naval Science, as stated on pages 80-81. 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 page 119.

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 the Junior Certificate, the Junior Certificate with Honors Privileges, or the Lower-Division Certificate, depending on their objectives and attainments. See pages 80-82.

Lower Division and Service Departments

ALL departments of instruction at Oregon State College not included in the major departments and schools, except the departments of Air Science and Tactics, Military Science and Tactics, Naval Science, and Physical Education, are administered under the Dean of Lower Division.

Under the plan adopted for the Oregon State System of Higher Education, major work in the fields of arts and letters, architecture and allied arts (including art and architecture and landscape architecture), journalism, music, and social science is confined to the University of Oregon. Lower-division work in these fields may be taken at Oregon State College. Similarly, in certain fields in which major work is confined to Oregon 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 at the beginning of the freshman year the institution at which major

work is offered, 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.

Lower-division and service departments at Oregon State College are listed in two main groups as follows:

ARTS AND LETTERS: English, Modern Languages, Speech. For convenience the following departments are listed alphabetically with this group, Architecture, Art, Journalism, Landscape Architecture, Music.

SOCIAL SCIENCE: General Social Science, Economics, History, Philosophy, Political Science, Psychology, Sociology. For convenience the Department of Religion is listed with the Social Science departments.

Curricula

LOWER-DIVISION LIBERAL ARTS AND SCIENCES

Junior Certificate
Junior Certificate with Honors Privileges
Lower-Division Certificate

	Term hours		
	F	W	S
Freshman Year			
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
Air, Military, or Naval Science (men)	2-3	2-3	2-3
¹ Physical Education	1	1	1
² Departmental or school requirements or exploratory electives	4-3	4-3	4-3
	16	16	16
Sophomore Year			
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
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
² Departmental or school requirements or exploratory electives	8-6	8-6	8-6
	16	16	16

LOWER-DIVISION PROFESSIONAL CURRICULA

Oregon State College offers lower-division curricula leading to the Junior Certificate in the following professional fields: Architecture and Allied Arts, Journalism, and Music. Students will be aided in the selection of lower-division studies preparing them for majoring in these fields at the upper-division level at the University of Oregon. Preparatory Dental, Medical, and Nursing Education curricula are offered through the School of Science (pages 166-168).

Arts and Letters

INSTRUCTION in English, Modern Languages, and Speech aims to help the student to think clearly, to read with discrimination, to express himself effectively, and to appreciate literature. Oregon State College offers lower-division and service courses in these departments for students planning to major in these fields at the University, and for students majoring in other fields. Similarly, the courses in architecture, art, journalism, landscape architecture, and music are intended, not only to lay the foundation for major work at the University, but also to serve the needs of students majoring in other fields.

¹General Hygiene (PE 150), 1 term hour for men, 2 term hours for women, must be taken in place of physical education one term of the freshman year.

²Chosen with the approval of the dean of the Lower Division or the dean of the School of Science. If one of the year sequences in group requirements is deferred to the sophomore year, the opportunity for school requirements or electives in the freshman year is correspondingly increased.

Architecture

COURSES in architecture and allied arts include lower-division professional and service courses intended to serve the cultural and informational needs of students interested in building construction and to form part of a minor for students majoring in certain other fields. Professional courses permit a student to prepare to major in architectural design, structural design, or interior design in the upper division at the University of Oregon.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- AA 178. House Planning and Architectural Drawing.** 3 hours any term. Aim is to stimulate appreciation and criticism of domestic architecture. Small-house planning and drawing with particular reference to the needs of students in Agriculture, Engineering, Forestry, and Home Economics. Professor Sinnard, Assistant Professors Wasson and Jeppsen, Mr. Ellis, Mrs. Lauderdale.
- AA 179, 180. House Planning and Architectural Drawing.** 3 hours each term. (AA 179 winter, AA 180 fall or spring.) Small-house construction; detail drawing; development of working drawings begun in AA 178; presentation plans, advanced planning, and design. Prerequisite for either course: AA 178. Professor Sinnard.
- AA 211, 212, 213. Graphics I.** 2 or 3 hours each term. Principles of orthographic projection and descriptive geometry; application to construction of plans and elevations; projections of points, lines, and planes; location of shades and shadows; mechanical and freehand perspective techniques; media and techniques of architectural presentation. Mr. Ellis.
- AA 220, 221, 222. Construction I.** 2 or 3 hours each term. Materials and methods of architectural construction; individual research and observation; sketching existing examples; class discussion. Professor Sinnard, Assistant Professor Jeppsen, Mr. Ellis.
- AA 223. Elements of Interiors.** 2 hours. Introduction to scope, aim, and technique of interior design intended to give understanding of professional field. All work done in drafting room. Open to nonmajor students with consent of instructor. Assistant Professors Wasson and Jeppsen.
- AA 297. Lower-Division Architectural Design.** 1 to 3 hours each term. Through lectures and individual problems the fundamental principles of architectural design are studied. The student is oriented in the methods, concepts, and ideals that make up the field of architectural design and planning. In a two-year sequence a progressive series of related problems is studied and executed by presentation in plan, elevation, isometric, perspective, and model. Staff.

Art

INDIVIDUAL creative work in the basic principles of drawing, painting, sculpturing, and designing, in the different media, techniques, and crafts, is offered in the Department of Art, together with instruction in art history and appreciation. Students majoring in other fields may take art as a minor

or specific art subjects as service courses. Students may elect the courses in preparation for majoring in art or architecture at the University of Oregon or elsewhere.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- AA 114, 115, 116. **Survey of Visual Arts (History and Appreciation).** 3 hours each term.
Creative fundamentals and functions of architecture, painting, sculpture, and other arts. Historical and contemporary works of best of man's creations studied to develop an individual taste and increased appreciation. Three terms required of students who expect to major in the School of Architecture and Allied Arts at the University of Oregon. Recommended for home economics students.
- AA 160, 161. **Color and Composition.** 3 hours each term.
Studio classes in the everyday use of the principles of composing or creating with lines, colors, and textures. Required in the School of Home Economics.
- AA 195. **Basic Design.** 2 hours each term, three terms.
Instruction through individual projects, leading to creative mastery of basic design in major visual arts and understanding of design factors involved in professional art fields. Three terms required of students who expect to major in the School of Architecture and Allied Arts at the University of Oregon. The work is correlated with that of AA 114, 115, 116.
- AA 254. **Leathercraft.** 2 or 3 hours each term, two terms.
Design and production of leathercraft objects.
- AA 255. **Ceramics.** 2 or 3 hours each term, two terms.
Introduction to pottery making materials and techniques.
- AA 257. **Jewelry.** 2 or 3 hours.
Design, tools, and techniques of jewelry introduced through individual student problems in semiprecious materials.
- AA 258. **Art Metalcraft.** 2 or 3 hours.
Design and hand execution of useful and decorative objects in copper, brass, and bronze.
- AA 259. **Art Craft.** 2 or 3 hours each term, two terms.
Application of original designs to textile and other materials by block and silk-screen printing.
- AA 275, 276, 277. **Graphic Arts.** 2 or 3 hours each term.
Workshop instruction in making and printing engravings, etchings, lithographs, linoleum cuts, and wood cuts.
- AA 281, 282, 283. **Industrial Arts Drawing and Design.** 3 hours each term.
Freehand drawing with studio experience in the design of industrial-arts objects, workshop techniques in art crafts. AA 281, 282 required for all industrial arts majors. AA 283 required for industrial arts education majors.

- AA 290. **Lower-Division Painting.** 2 or 3 hours each term, three terms.
Offered in oil and mixed painting techniques. Individual creative expression and progress are encouraged, as well as pursuit of special interests in painting. Three terms required of students who expect to major in drawing and painting at the University of Oregon.
- AA 291. **Lower-Division Drawing.** 2 or 3 hours each term, three terms.
Primary means of art expression and communication. Principles of composition and techniques of fine draughtsmanship presented in specialized classes such as fashion illustrating, sketching, and figure sketching. Three terms required of students who expect to major in the School of Architecture and Allied Arts at the University of Oregon.
- AA 292. **Lower-Division Composition.** 2 or 3 hours each term, three terms.
Basic creative composing with colors, lines, and textures in casein and water colors. Abstract compositions leading into representational problems develop individual creativeness.
- AA 293. **Elementary Sculpture.** 2 or 3 hours each term, three terms.
Creative clay and plaster modeling and stone and wood carving; technical methods developed in conjunction with expressive design.
- AA 294. **Scientific Illustration.** 2 or 3 hours each term, two terms.
Freehand technical drawing adapted to needs of students in science and forestry.
- AA 295. **Display Design.** 2 or 3 hours each term, two terms.
Practical design experience in commercial art lettering, layouts, packaging, and display advertising. Offered for Pharmacy, Agriculture, and Business and Technology students.

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 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, poetry, and short story; and a more intensive study of the major authors. Three-term sequences in literature, although preferably taken three terms in order as numbered, may be taken any one term separately or in any order.

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 and the short story.

English K. All entering students are required to take an examination in English. Those who receive a low rating 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.

COURSES IN LITERATURE

LOWER-DIVISION COURSES

Eng 101, 102, 103. **Literature Survey.** 3 hours each term.

History of English literature in general outline. Fall: from beginnings to seventeenth century. Winter: seventeenth and eighteenth centuries. Spring: nineteenth century. Professor Nelson, Assistant Professor Schroeder.

*Eng 104, 105, 106. **Introduction to Literature.** 3 hours each term.

Aim is to stimulate appreciation and criticism of literature. The emphasis throughout is on ideas and motives. Professor Peterson and staff.

Eng 131. **Directed Recreational Reading.** 1 or 2 hours.

Readings and discussions based on the principle of interest. For students in professional schools and others who do not take other literature courses. Not applicable toward literature group requirement. Prerequisite: consent of instructor. Associate Professor Jenkins, Assistant Professor Norris.

Eng 201, 202, 203. **Shakespeare.** 3 hours each term.

The important historical plays, comedies, and tragedies. Prescribed for major. Professor Smith.

Eng 253, 254, 255. **American Literature.** 3 hours each term.

American literature from its beginnings to the present day. Professors Childs and Nelson, Associate Professor Jenkins.

Eng 261, 262. **Individual Authors.** 3 hours fall and winter.

Attention each term is focused on a single author, with attention also to other writers of same period who may be compared profitably with him. Authors studied: Browning, Tennyson, and others. Professor Smith, Assistant Professor Gibson.

Eng 263. **Great Books.** 3 hours spring.

The Bible, the Odyssey, Arabian Nights, Divine Comedy, Autobiography of Benvenuto Cellini, Don Quixote, Pilgrim's Progress, Gulliver's Travels, Faust, etc.; contribution to western culture. Professor Smith.

Eng 264, 265, 266. **Continental European Literature.** 3 hours each term.

A survey of those writers, chiefly modern and contemporary, whose works have in translation become part of our literary heritage and which aid in understanding the world today. Fall term: Romance; winter term: Germanic; spring term: Slavic. Professor Colby.

Eng 271, 272, 273. **Contemporary Literature.** 3 hours each term.

The contemporary American novel; modern drama; American poetry. Professor Peterson.

Eng 274. **The Short Story.** 3 hours any term.

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.

* Students may register for only one of the two sequences, Eng 101-3 and Eng 104-6.

Eng 275. The Bible as Literature. 3 hours spring.

Designed to enlarge appreciation of the art and beauty of Bible folklore, storytelling, history, poetry, drama, wisdom literature, oratory, and essay. Theology and dogma are avoided. Assistant Professor Gibson.

UPPER-DIVISION SERVICE COURSES

Eng 327, 328, 329. Survey of Russian Culture. 3 hours each term.

Achievements of old and new Russia in the fields of art, science, music, literature, and education that have contributed significantly to western civilization. Not applicable toward literature group requirement. Assistant Professor Jurgenson.

Eng 331, 332, 333. The Democratic Tradition in Literature. 3 hours each term.

Study and search of the most significant utterances on democracy in the literature of western civilization from ancient times to the present. Not open to freshmen and sophomores except by permission of instructor. Professor Childs.

Eng 376. The Novel. 3 hours winter.

Aim is to enrich the student's background of knowledge of the novel and prepare him for critical appreciation of fiction. Professor Peterson.

COURSES IN WRITTEN ENGLISH

LOWER-DIVISION SERVICE COURSES

English K. 1 hour fall or winter.

A one-term refresher course in English fundamentals. The student must pass the English placement examination or English K before he is permitted to register for Eng 111. Three recitations. Staff.

Eng 91, 92, 93. English for Foreign Students. 1 to 3 hours each term.

Practice in vocabulary building, reading, writing, speaking, and comprehension of spoken discourse, adapted to needs of individual. For undergraduate foreign students it is recommended that this sequence precede Eng 111 until proficiency in English is established. Three periods. Staff.

Eng 111, 112, 113. English Composition. 3 hours each term.

Composition and rhetoric; frequent written themes in the various forms of discourse; special attention to fundamentals and to organization of papers. Courses must be taken in sequence. Prerequisite: English placement examination. Professor Peterson, staff.

Eng 115. Effective Reading. 3 hours any term.

Designed to help students develop better comprehension and greater speed in their reading. Three recitations. Staff.

Eng 211. Vocabulary Building. 3 hours any term.

Methods of building individual vocabulary; analysis of words; meaning in context. Designed to increase reading comprehension and effective use of language. Staff.

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. Assistant Professor Beebe.

Eng 217. Business English. 3 hours any term.

Modern practices in business correspondence; analysis and writing of all types of correspondence. Prerequisite: Eng 113. Mr. Ligon.

Eng 218. Creative Writing. 3 hours any term.

Creative expression in prose forms. For students in professional schools who desire training and practice in such writing as may be called for in their vocational or cultural pursuits. Prerequisite: Eng 113. Assistant Professor Beebe.

Eng 227. Technical Report Writing. 3 hours any term.

Application of principles learned is made to specific needs and interests of students having papers in progress during the term. Prerequisite: Eng 113 or equivalent. Mr. Ligon.

Eng 230. Effective Writing. 3 hours.

Practice in composition to develop exactness and facility of expression; course varied to suit individual needs. Prerequisite: Eng 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 113. Professor Nelson, Assistant Professor Foreman.

COURSES IN LIBRARY

UPPER-DIVISION SERVICE COURSES

Lib 381. Secondary-School Library. 3 hours.

Aims to aid in planning, organizing, and administering a public school library. Relation of library to curriculum; acquisition, processing, care, and use of library materials; routines; records. Prerequisite: junior standing.

Lib 386. Literature for High-School Libraries. 3 hours.

Books and periodicals for public-school students, including reading for information and recreation. Various approved lists are examined. Individual books are considered critically. Prerequisite: junior standing. Assistant Professor Norris.

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 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.

Students intending to major in journalism at another college or university may take two years of college work at Oregon State College. At the University of Oregon, only upper-division and graduate students are admitted to the School of Journalism. Prejournalism students are advised, while in the Lower

Division, to complete as many courses as possible in liberal arts. They should consult the catalog of the institution to which they intend to transfer to determine the required and recommended courses. They should also gain proficiency in the use of the typewriter and should engage in extracurricular activities in journalism.

Students desiring to combine journalism with agriculture to prepare for positions in the field of agricultural journalism may major in general agriculture with a minor in journalism. (See page 212.) A minor in journalism is likewise available in the School of Home Economics. A teaching minor in journalism is also offered in the School of Education.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

J 111, 112. Elementary Journalism. 3 hours each term.

Journalistic style of writing; workings of the press, both general and technical. J 111 is required for eligibility to editorial staffs of student publications. J 111 offered each term; J 112, spring term. Assistant Professor Lake, Mr. Gish.

J 211. Copyediting. 3 hours any term.

Copy reading, head writing, proof reading, and make-up; actual experience in editing copy. Required for advanced positions on the BAROMETER. Prerequisite: J 111. Two lectures; 1 laboratory period. Lectures, Assistant Professor Lake; laboratory, Professor Shideler, Assistant Professor Lake.

J 223. Editorial Writing. 3 hours fall.

Materials, style, and arrangement of periodical editorials; training in writing editorials; policy and ethics; make-up of editorial page of farm and trade journals. Prerequisite: J 111. Professor Shideler.

UPPER-DIVISION SERVICE COURSES

J 312. Special Feature Articles. 3 hours 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. Mr. Gish.

J 313. Public Information Methods. 3 hours winter.

Planning and executing informational campaigns; methods of informing the public of public affairs and other enterprises in which it has an interest. Prerequisite: J 111. Professor Shideler.

J 314. Technical Writing. 3 hours winter or spring.

Writing and editing popular and scientific bulletins; preparing reports and writing articles for scientific publications; preparing radio manuscripts. Prerequisite: J 111. Mr. Gish.

J 351, 352, 353. Journalism Projects. 2 hours each term.

Application of news-writing, copyediting, feature-writing, and technical-writing principles; actual experience through work on student publications and preparation of articles for trade and technical publications or specialized material for general publications. Prerequisite: J 111, 211, and consent of instructor. One lecture; 1 laboratory period. Professor Shideler.

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 in plant propagation, soils, surveying, and other practical phases of the profession.

Field Trips. Supervised field trips are conducted to acquaint students with the solutions to landscape design and construction problems.

Student Drawings and Models. All student drawings and models remain the property of the department.

Lower-Division Curriculum. A student may complete a lower-division curriculum in landscape architecture at Oregon State College and transfer to the University of Oregon for the last three years of professional work.

Landscape Construction and Maintenance. A curriculum in landscape construction and maintenance is offered in the Department of Horticulture. This is a four-year curriculum leading to the degree of Bachelor of Science. Students in this curriculum register in the School of Agriculture beginning with the freshman year. (See pages 222-223.)

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- LA 279. **Home-Ground Planning.** 3 hours any term.
Organization and improvement of rural and urban home grounds; drafting. One lecture; 2 two-hour drafting periods. Associate Professor Solberg.
- LA 290. **Lower-Division Landscape Design.** 2 hours each term.
Design of city and suburban residence properties and other design problems of three acres or less. Prerequisite: LA 279 or consent of instructor. Associate Professor Martel.

UPPER-DIVISION COURSES

- LA 326, 327, 328. **Plant Materials.** 3 hours each term.
Trees, shrubs, vines, and perennials and their uses in plant composition. Associate Professor Martel.
- LA 356, 357, 358. **History and Literature of Landscape Architecture.** 2 hours each term.
Story of gardens as an outgrowth of living conditions of the times from early Egyptian to the modern American. Associate Professor Martel.
- LA 359, 360, 361. **Maintenance and Construction.** 3 hours each term.
Maintenance of private and public landscapes; construction of landscape features and structures. Prerequisite: LA 279. Associate Professor Solberg.
- LA 379. **Landscape Architecture.** 3 hours spring.
Arrangement of features and elements in recreation areas. Prerequisite: LA 279. Two lectures; 1 two-hour drafting period. Associate Professor Solberg.

- LA 382, 383, 384. **Layout of Small Properties.** 2 or 3 hours each term. The city lot, small suburban properties, and other areas; sketch plans, finished renderings, and contour problems. Prerequisite: LA 279, 290. Two three-hour laboratory periods. Associate Professor Solberg.
- LA 390. **Intermediate Landscape Design.** 3 hours. Continuation and enlargement of LA 290. Prerequisite: LA 290. Associate Professor Martel.
- LA 392, 393, 394. **Planting Plans.** 2 hours each term. Planting plans; estimates of costs; construction and seasonal care of the planting areas. Prerequisite: LA 290, 326, 327, 328. Two three-hour laboratory periods. Associate Professor Solberg.

Modern Languages

IN THE Department of Modern Languages instruction is offered in Chinese, French, German, Portuguese, Russian, and Spanish. The lower-division and service courses in these languages are planned to meet the demand for practical use of the language as well as the cultural needs of all students, to provide the foreign-language requirements found in scientific and technical curricula and needed in connection with various professions, 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. Elements of pronunciation, grammar, reading, and conversation. Three recitations; 2 hours practice in conversation. Assistant Professor Kraft.
- GL 4, 5, 6. **Second-Year German.** 2, 3, or 5 hours each term.
 (a) For 3 hours credit: grammar, composition; reading of modern German authors. (b) For 2 hours credit: 2 two-hour practice periods in conversation, including student discussion of current topics and systematic vocabulary building. (c) For 5 hours credit: (a) and (b) combined. Prerequisite: GL 1, 2, 3, or equivalent. Assistant Professor Kraft.
- GL 201, 202, 203. **German Literature.** 3 hours each term. Reading of masterpieces of various periods; general survey of German literature. Prerequisite: GL 4, 5, 6, or equivalent. Assistant Professor Kraft.

* A special section of GL 1, 2, 3 for engineering students is offered for 3 hours each term.

UPPER-DIVISION SERVICE COURSES

(Courses 300-399 are open to lower-division students.)

- GL 311, 312, 313. **German Literature.** 3 hours each term.
Reading of masterpieces of various periods; general survey of German literature. Prerequisite: GL 4, 5, 6, or equivalent. Not open to students who have taken GL 201-203. Assistant Professor Kraft.
- GL 320, 321, 322. **Scientific German.** 1, 2, or 3 hours each term.
Recommended to students interested in science or medicine. Articles in science, surgery, history of medicine, and current clinical literature are read. A maximum of 3 term hours may be taken under each course number. Prerequisite: consent of instructor. Associate Professor Lewis.

COURSES IN ORIENTAL LANGUAGES: CHINESE

LOWER-DIVISION COURSES

- OL 1, 2, 3. **First-Year Chinese.** 4 hours each term.
Essentials of colloquial Mandarin with emphasis on conversation and easy reading. Prerequisite: consent of instructor. Three recitations; 2 periods conversational drill. Mr. Yang.

COURSES IN ROMANCE LANGUAGES: FRENCH

LOWER-DIVISION COURSES

- *RL 1, 2, 3. **First-Year French.** 4 hours each term.
Elements of pronunciation, grammar, reading, and conversation. Three recitations; 2 hours practice in conversation. Associate Professors Kuney, Bourbousson.
- RL 4, 5, 6. **Second-Year French.** 2, 3, or 5 hours each term.
(a) For 3 hours credit: grammar, composition; reading of modern French authors. (b) For 2 hours credit: 2 two-hour practice periods in conversation, including student discussion of current topics and systematic vocabulary building. (c) For 5 hours credit: (a) and (b) combined. Associate Professors Kuney, Bourbousson.
- 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 Bourbousson.
- RL 211, 212, 213. **Directed Reading in French.** 1 or 2 hours each term.
Reading in French in the field of the student's major. Students who register for 1 hour any term may register for an additional hour in a subsequent year. Prerequisite: consent of instructor. Associate Professor Kuney.

UPPER-DIVISION SERVICE COURSES

- RL 311, 312, 313. **French Literature.** 3 hours each term.
(Third-year French.) Masterpieces of various periods; general survey. Prerequisite: two years of college French or equivalent. Not open to students who have taken RL 201-203. Associate Professor Kuney.

* A special section of RL 1, 2, 3 for engineering students is offered for 3 hours each term.

COURSES IN ROMANCE LANGUAGES: PORTUGUESE

LOWER-DIVISION COURSES

- *RL 21, 22, 23. **First-Year Portuguese (Brazilian).** 4 hours each term. Elements of pronunciation, grammar, reading, and conversation. Three recitations; 2 periods in conversation practice. Associate Professor Kuney.
- RL 217, 218, 219. **Directed Reading in Portuguese.** 1 to 2 hours each term. Reading in Portuguese to aid students to maintain facility in the language. Prerequisite: consent of instructor. Associate Professor Kuney.

COURSES IN ROMANCE LANGUAGES: SPANISH

LOWER-DIVISION COURSES

- *RL 11, 12, 13. **First-Year Spanish.** 4 hours each term. Elements of pronunciation, grammar; reading and conversation. Three recitations; 2 periods in conversation practice. Professor Martin, Mr. Gomez, Mr. Villegas.
- RL 14, 15, 16. **Second-Year Spanish.** 2, 3, or 5 hours each term.
(a) For 3 hours credit: grammar, composition; reading of modern Spanish authors. (b) For 2 hours credit: 2 two-hour practice periods in conversation, including student discussion of current topics and systematic vocabulary building. (c) For 5 hours credit: (a) and (b) combined. Professor Martin, Mr. Gomez, Mr. Villegas.
- 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, Mr. Gomez.
- RL 214, 215, 216. **Directed Reading in Spanish.** 1 or 2 hours each term. Reading in Spanish in the field of the student's major. Students who register for 1 hour any term may register for an additional hour in a subsequent year. Prerequisite: consent of instructor. Professor Martin.

UPPER-DIVISION SERVICE COURSES

- RL 341, 342, 343. **Spanish Literature.** 3 hours each term. (Third-year Spanish.) Masterpieces of various periods; general survey. Prerequisite: two years of college Spanish or equivalent. Not open to students who have taken RL 207-209. Professor Martin, Mr. Gomez.

COURSES IN SLAVIC LANGUAGES: RUSSIAN

LOWER-DIVISION COURSES

- SL 1, 2, 3. **First-Year Russian.** 4 hours each term. Elements of pronunciation, grammar, reading, and conversation. Three recitations; 2 periods in conversation practice. Assistant Professor Jurgenson.
- SL 4, 5, 6. **Second-Year Russian.** 2, 3, or 5 hours each term.
(a) For 3 hours credit: review of grammar, composition; reading of newspapers, periodicals, and modern Russian authors. (b) For 2 hours credit: 2 two-hour practice periods in conversation, including student discussion of current books and systematic vocabulary building. (c) For 5 hours credit: (a) and (b) combined. Prerequisite: SL 1, 2, 3, or equivalent. Assistant Professor Jurgenson.

* Special sections of RL 21, 22, 23, and one of RL 11, 12, 13, are offered for 3 hours each term for engineering students.

UPPER-DIVISION SERVICE COURSES

SL 320, 321, 322. **Scientific Russian.** 1, 2, or 3 hours each term.

Provides opportunity to study beyond second year and to read in various fields of science. Assistant Professor Jurgenson.

Music

MUSICAL activities at Oregon State College are considered an essential part of campus life. A wide variety in the offerings of the Department of Music makes it possible for students interested in furthering their musical education to find some activity to suit their individual needs and abilities. They may choose to participate in music solely for its general cultural and avocational contributions to their well-being, or by following a planned course of study they may lay the foundation for majoring in music at the University of Oregon.

Musical Activities. The Bands, Orchestra, Glee Club, Madrigal Club, and A Cappella Choir are open to all students in the College after consultation with the directors. Each organization is presented in concert every term. Various small vocal and instrumental ensemble groups are organized for the benefit of the more advanced performers. Recitals by members of the faculty and advanced students are held each year.

Teaching Minor. Students who are preparing to enter some field of teaching for which training is given at Oregon 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 minors in music (vocal and instrumental) see SCHOOL OF EDUCATION.

Individual Instruction. Individual instruction is defined as private lessons for which one credit hour is offered for one lesson a week, or two credit hours for two lessons a week, for a term. Instruction is offered in piano, organ, voice, and the instruments of the band and orchestra. Students may register for individual instruction at any time, but no credit will be allowed for less than one lesson a week for a full term.

Any phase of individual instruction may be taken as an elective by any student throughout four years, a maximum of 12 credit hours applying toward a B.A. or B.S. degree.

Regulations. Students are expected to consult the departmental office regarding regulations governing registration, attendance, public performance of music students, etc.

Fees. All fees for private music lessons must be paid in advance at the Business Office. No deduction is made for lessons missed by the student nor will such lessons be made up except in the case of serious illness. All students are expected to do their practicing in the practice rooms provided by the College unless other arrangements are made specifically with the departmental office. The schedule of music fees is as follows:

INDIVIDUAL INSTRUCTION (private lessons):	Per term
Piano, Voice, Stringed Instruments, Organ	
One lesson a week, one-half hour (1 term hour credit)	\$30.00
Two lessons a week, one-half hour each (2 term hours credit)....	\$50.00
Wind Instruments	
One lesson a week, one-half hour (1 term hour credit)	\$20.00
Two lessons a week, one-half hour each (2 term hours credit)	\$40.00

	<i>Per term</i>
GROUP INSTRUCTION (one lesson a week—50 minutes):	
Voice, Stringed Instruments, Piano	\$15.00
Wind Instruments	\$10.00
PRACTICE ROOM RENTAL—with piano:	
One-half hour a day, a term	\$ 2.50
One hour a day, a term	\$ 4.00
Two hours a day, a term	\$ 7.00
Three hours a day, a term	\$10.00
PRACTICE ROOM RENTAL—without piano:	
One hour a day, a term	\$ 2.50
ORGAN RENTAL:	
One hour a day, a term	\$ 7.50
ORCHESTRA AND BAND INSTRUMENTS:	
Viola, cello, bassoon, and oboe are available for practice purposes for \$3.00 a 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 repaired at student's expense.	

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- Mus 111, 112, 113. Theory.** 3 hours each term.
Music fundamentals, scales, key relationships, intervals, triads; harmonizations of various triad and seventh chords in all positions, nonchord tones, free harmonization and simple modulation; keyboard work, chord recognition, sight-singing, and analysis correlated with written work. Five periods.
- Mus 121. Introduction to Music Literature.** 1 hour any term.
Designed to give the student a wide acquaintance with music of different styles and periods through lecture and frequent use of phonograph recordings. Recommended for all students in the College. Required of home-economics students; elective to others. Two lectures.
- Mus 122, 123. Introduction to Music Literature.** 1 hour each term, winter and spring.
Continuation of Mus 121 with greater specialization of topics studied.
- Mus 180. Accompanying and Sight Reading.** 1 hour each term.
Practical experience in playing studio and rehearsal accompaniments for vocal and instrumental soloists and ensembles. Prerequisite: consent of instructor.
- Mus 190. Individual Instruction.** 1 or 2 hours any term.
Individual instruction in piano, organ, voice, and the instruments of band and orchestra. Term hours on basis of number of lessons a week.
- Mus 191. Group Instruction—Voice.** 1 hour each term, three terms.
- Mus 192. Group Instruction—Stringed Instruments.** 1 hour each term, three terms.
- Mus 193. Group Instruction—Wind and Percussion.** 1 hour each term, three terms.
- Mus 211, 212, 213. Theory.** 2 hours each term.
Continuation of Mus 113 involving use of secondary and altered chords in harmonization and analysis of master works; modulation and keyboard harmony further developed. Three meetings.

Mus 290. The College Chorus. 1 hour each term.

Membership is open to all students in the College subject to tryout. Two weekly rehearsals of the Glee Club (men) and the Madrigal Club (women), and one rehearsal of the two groups combined. Concert of standard choral works each term.

Mus 295. The College Band. 1 hour each term.

The Oregon State Bands are maintained for those students who are qualified musicians and wish to continue their activity while in college. Division I band is a concert organization of men and women who have obtained membership by tryout. Division II band is maintained for those who need more experience and training to meet the standards of the concert band. The marching band, which plays at all football and basketball games, parades, etc., is composed of all men in the Division I and II bands. The membership of all three groups is interchangeable at the discretion of the conductor.

Mus 296. The College Orchestra. 1 hour each term.

The College Orchestra is a symphonic group including all instruments common to such an organization. Membership is automatically open to all string players and those wind and percussion players who, in the opinion of the conductor, can meet the special requirements of the orchestra.

UPPER-DIVISION SERVICE COURSES

Mus 311, 312. Band Arranging. 2 hours each term.

Scoring and arranging for the full concert and military band as well as for smaller combinations of instruments.

Mus 314, 315. Orchestration. 2 hours each term.

Applied problems in scoring and arranging for the full orchestra and such small groups and combinations of instruments as may be encountered in the average community. Includes a complete survey of the range and possibilities of the various orchestral instruments as applied to the problem of arranging.

Mus 321, 322. Instrumental Conducting. 2 hours each term.

Basic conducting techniques and score reading for conductors of instrumental groups. Practical experience conducting campus organizations.

Mus 324, 325. Choral Conducting. 2 hours each term.

Basic conducting techniques and score reading for conductors of choral groups. Practical experience conducting campus organizations.

Mus 334, 335, 336. Band Organization. 2 hours each term.

Band administration; rehearsal procedures; organizing and developing ensembles; survey of band literature; program building.

Mus 380. Accompanying and Sight Reading. 1 hour each term.

For advanced piano students. Enrollment under the direction of the department office.

Mus 390. Individual Instruction. 1 or 2 hours any term.

Advanced study of piano, organ, voice, and the instruments of the band and orchestra. Term hours on the basis of number of lessons a week.

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 effective 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.

Well-equipped radio studios in addition to those at station KOAC are maintained by the department for those wishing to acquire a knowledge of and practice in the use of radio techniques.

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 each year, and much individual attention is given to students who wish to prepare for such work.

A clinic is maintained by the department for those who are handicapped with the various speech impediments, such as stammering, lispings, 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.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Sp 111, 112, 113. **Extempore Speaking.** 3 hours each term.

Development and presentation of original speeches; vocabulary building; pronunciation; voice, gesture, bearing; organization; delivery; speeches for special occasions; the extended address. Professor Mitchell, staff.

Sp 120. **Voice and Diction.** 3 hours any term.

Use of vocal mechanism; tone production and speech sounds; applied phonetics; vocabulary building; principles that underlie good social, business, platform, and radio speech. Associate Professor Winger, Assistant Professor Harris.

Sp 121. **Interpretation I.** 3 hours any term.

Fundamental training in analysis and presentation of printed materials; emotional reactions that give color and interest; expressive voice and body; correction of faulty habits. Professor Young, Associate Professor Cortright, Mr. Ulnic.

- Sp 122. **Interpretation II.** 3 hours any term.
Continuation of Sp 121. Interpretation of more advanced literary materials; intensive work in characterization. Prerequisite: Sp 121. Professor Young, Associate Professor Cortright.
- Sp 123. **Interpretation III.** 3 hours spring.
Advanced work in expressive body and voice; choral reading; interpretation of dramatic literature. Prerequisite: Sp 121, 122. Professor Young, Associate Professor Cortright.
- Sp 190. **Corrective Speech.** 1 hour each term, maximum 3 hours.
Designed specifically for students afflicted with speech disorders (one to three hours in one term, or extended over several terms according to need); group meetings of the class, supplemented by clinical periods devoted to individual diagnosis and treatment. Mr. Krueger.
- Sp 211. **Oratory Squad.** 3 hours.
Original manuscript speeches; preparation for intercollegiate competition. Prerequisite: Sp 111, 121, consent of instructor. Professors Mitchell and Wells, Mr. Doler.
- Sp 214. **Extempore Speaking Squad.** 3 hours.
Preparation for intercollegiate competition. Prerequisite: Sp 111, 112, consent of instructor. Professor Mitchell, Associate Professor Winger, Assistant Professor Harris.
- Sp 217. **Debating.** 3 hours.
Argumentation principles; analysis and brief-drawing; debate participation. Prerequisite: consent of instructor. Professors Mitchell and Knoll, Mr. Doler.
- Sp 220. **Argumentation.** 3 hours any term.
Theory; brief-drawing; collection and handling of evidence; construction of speeches. Each student works out several briefs and delivers several speeches. Prerequisite: Sp 111. Professor Knoll.
- Sp 221. **Speech Composition.** 3 hours fall or winter.
Textbook work; study of models; lectures, composition exercises, writing a term speech; mastery of audience psychology and effective style. Prerequisite: Sp 111. Professor Wells.
- Sp 231. **Parliamentary Procedure.** 3 hours.
Rules of parliamentary procedure and practice in their application; forming temporary and permanent organizations; preparation of constitutions and by-laws. Students serve as chairman and secretary and learn how to conduct meetings efficiently. Associate Professor Winger.
- Sp 232. **Group Discussion.** 3 hours.
Techniques and practice in preparing, leading, and participating in the many types of discussion used by extension workers, club leaders, teachers, and all business, technical, and professional people, during conferences, specialized recitations, panels, lecture-forums, and symposiums. Prerequisite: Sp 111. Associate Professor Winger.
- Sp 244. **Stagecraft and Lighting.** 3 hours any term.
Methods of constructing scenery and stage properties; lighting equipment and basic principles of lighting; practical experience in lighting, backstage procedures, designing and construction of settings including realistic and suggestive. Professor Young, Associate Professor Cortright, Mr. Ulnic.

- Sp 247, 248, 249. **Community Drama.** 3 hours each term.
Training for participation and leadership in community dramatics; the community-drama idea; play selection; stage technique and acting; costume and make-up; short cuts in craftsmanship; directing and play production. Prerequisite: Sp 121. Professor Young, Associate Professor Cortright, Mr. Ulnic.
- Sp 251. **Workshop Theater.** 1 to 3 hours any term.
For participation in campus plays, credit totaling not more than 6 hours is given on recommendation of the instructor. Prerequisite: consent of instructor. Professors Mitchell and Young, Associate Professor Cortright, Mr. Ulnic.
- Sp 291. **Speech Science.** 3 hours.
Scientific basis of speech; nature and purpose of speech; origin and development in race and individual; anatomy and physiology of speech mechanisms, both peripheral and nervous; physics of speech sounds; phonetic elements; psychological aspects. Professor Wells.
- UPPER-DIVISION SERVICE COURSES
- Sp 312. **Oratory Squad.** 3 hours.
Continuation of Sp 211. Professors Mitchell, Wells, Mr. Doler.
- Sp 315. **Extempore Speaking Squad.** 3 hours.
Continuation of Sp 214. Professor Mitchell, Associate Professor Winger, Assistant Professor Harris, Mr. Doler.
- Sp 318. **Debating.** 3 hours.
Continuation of Sp 217. Professors Mitchell, Knoll, Mr. Doler.
- Sp 334, 335, 336. **Radio Speaking.** 3 hours each term.
Voice and diction as they pertain to radio; special techniques; radio speeches and continuity; program building; some practice broadcasting over KOAC. Prerequisite: Sp 111, 120, 121, or consent of instructor. Assistant Professor Livingston, Mr. Kaiser.
- Sp 392. **Speech Defects.** 3 hours.
Nature, causes, diagnosis, and treatment of speech defects. For students requiring knowledge of speech problems of children and adolescents. (See also Sp 190.) Professor Wells, Mr. Krueger.
- Sp 393. **Speech Clinic.** 3 hours.
Student acquires a knowledge of speech clinical procedures. Continual practical experience in handling clinical cases, including taking of case history, making diagnosis, and giving remedial treatment. Prerequisite: Sp 291, 392. Professor Wells, Mr. Krueger.
- Sp 413. **Oratory Squad.** 3 hours.
Continuation of Sp 312. Professors Mitchell, Wells, Mr. Doler.
- Sp 416. **Extempore Speaking Squad.** 3 hours.
Continuation of Sp 315. Professor Mitchell, Associate Professor Winger, Assistant Professor Harris.
- Sp 419. **Debating.** 3 hours.
Continuation of Sp 318. Professors Mitchell, Knoll, Mr. Doler.

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.

Oregon 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 of Oregon, 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. Year sequences in general social science are offered at both the lower-division and the upper-division levels.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

SSc 101, 102, 103. Background of Social Science. 3 hours each term.

Introduction to and orientation in the social sciences. Factors that influence an individual's behavior and his adjustment to contemporary social groups; special attention to scientific methods and their application in the social sciences. Associate Professor Parks.

UPPER-DIVISION SERVICE COURSES

SSc 441, 442, 443. International Politics and National Power. 3 hours each term.

First term: conduct of American foreign relations and basic policy problems affecting power position of the United States. Second term: international politics and factors contributing to national power; historical and contemporary manner in which states deal with each other; power position of individual states and blocs of states with reference to military, economic, social, geographic, and psychological factors and the stability and effectiveness of political institutions. Third term: national power and international organization; transition from absolute sovereignty to participation in international organizations; character of the League of Nations and the United Nations and their effect on national power. Required of Naval R.O.T.C. students; designed to provide a general background in international relations for others.

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. Under the Department of Economics, courses in Human Geography are also offered.

COURSES IN ECONOMICS

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, unemployment, business cycles, regulation of railways and public utilities. A three-term sequence.
- Ec 211. **Outlines of Economics.** 4 hours any term.
Economic institutions and their relation to individual and group conduct; income flow; production, distribution, and exchange of wealth; impact on consumer under varying political-economic systems.
- Ec 212. **Outlines of Economics.** 3 hours any term.
A rapid survey of the principles of economics and economic institutions. Restricted to science and upper-division professional school students.
- Ec 213, 214. **Principles of Economics.** 4 hours each term, winter and spring.
Similar to Ec 201, 202, 203. A two-term sequence.
- Ec 215. **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.

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 310. **Economics of National Security.** 3 hours fall.
Economic basis of national security; industrial mobilization; stabilization of civilian economy; national budget and fiscal and monetary policy under a security program; foreign aid policies.
- Ec 411. **Economics of Consumption.** 3 hours spring.
Economic principles applied to consumer problems; wealth consumption; living standards; living costs; budgeting; consumer markets; choice in buying; conservation policies; consumption theories. Prerequisite: elementary economics.
- Ec 412. **Economics of Public Utilities.** 4 hours winter.
Development of public utilities in the United States; their economic and legal characteristics; problems of regulation, rates, services, and finance. Prerequisite: introductory course in economics.
- *Ec 413. **Money and Banking.** (g) 4 hours fall or spring.
Nature and functions of money; factors affecting price; forms of money; functions of banks; history of banking; Federal Reserve Bank Act; American and foreign banking systems. Prerequisite: elementary economics.
- Ec 418. **Public Finance.** (g) 3 hours winter.
Public expenditures, local, state, and national; taxes, customs, and fees; land taxation; proposed reforms; war finance; bonds versus taxes; management of national and local debts. Prerequisite: elementary economics.

* Applicable toward a graduate major in Division of Agricultural Economics, School of Agriculture.

- Ec 420. Business Combinations.** 3 hours spring.
Historical development and present status of American business combinations; cooperatives, trade associations, trusts, holding companies, and consolidations; monopolies; fair and unfair practices, monopoly price problems; control. Prerequisite: elementary economics.
- Ec 421. Business Fluctuations.** 3 hours winter.
Variations in economic activity viewed in historical perspective; fluctuations and cycles; prosperity and depression; measurement and control. Prerequisite: elementary economics.
- Ec 425. Labor Problems.** (g) 4 hours winter.
Industrial revolution; trade unions; strikes and lockouts; trade agreements; conciliation and arbitration; immigration; unemployment; women and children in industry; prison labor. Prerequisite: elementary economics.
- Ec 426. Collective Bargaining and Labor Legislation.** 4 hours spring.
Wages and hours; unemployment; labor relations and social insurance; collective bargaining; legal, social, and economic implications of the labor movement. Prerequisite: elementary economics.
- Ec 427. Comparative Economic Systems.** 3 hours fall.
Analysis and critical appraisal of contemporary economic systems: capitalism, socialism, communism. Prerequisite: elementary economics.
- *Ec 435. Transportation.** (g) 3 hours winter.
Development of systems of transportation; organization and financing; effect of competition; freight classification; rates and fares; government control; state and Federal regulation. Prerequisite: elementary economics.
- *Ec 440. International Trade.** (g) 4 hours spring.
Theory of international trade; nature and effects of government bounties, subsidies, import and export duties; commercial policies of nations; consular service; ocean routes and carriers. Prerequisite: elementary economics.
- *Ec 475, 476, 477. Current Economic Theory and Problems.** (g) 3 hours each term.
Economic theories and relation to current problems; value, price, distribution, money and credit, public credit and finance, foreign trade and exchange, etc. Prerequisite: elementary economics.

GRADUATE SERVICE COURSES

Courses numbered 400-499 and designated (g) may be taken for credit toward a graduate minor.

COURSES IN HUMAN GEOGRAPHY

LOWER-DIVISION COURSES

- HG 101. Human Geography.** 3 hours any term.
World survey of geographic fundamentals emphasizing human adjustments to climatic conditions and physical environment; geographical regions of the world in respect to environmental conditions and human activities. Assistant Professor Heintzelman and staff.
- HG 102. Economic Geography.** 3 hours any term.
Survey of world's commercial commodities: energy, iron and ferro-alloys, major metals, forests, selected fibers and foods; their quantity, quality, and distribution; United States sources of supply. Professor Jensen and staff.

* Applicable toward a graduate major in Division of Agricultural Economics, School of Agriculture.

HG 103. Geography of North America. 3 hours any term.

Regional analysis of North America, including Canada and Alaska but not Mexico. Prerequisite: HG 101 or permission of instructor. Associate Professor Myatt.

HG 201. Regional Geography of Latin America. 3 hours.

Regional analysis of Latin America, including Mexico and Caribbean America; emphasis on commercial development in Latin American nations. Prerequisite: HG 101 or permission of instructor. Professor Jensen.

HG 202. Regional Geography of Europe. 3 hours.

Study of Europe outside U.S.S.R. For each region emphasis is on implications of environment on human and economic adjustments that have been made or may be achieved in future. Prerequisite: HG 101 or permission of instructor. Assistant Professor Heintzelman.

HG 203. Regional Geography of Asia. 3 hours.

Regional study of Asiatic continent including Japan; geographic regions with emphasis on human and economic conditions and implications of geography for present and future. Prerequisite: HG 101 or permission of instructor. Associate Professor Highsmith.

HG 204. Regional Geography of Africa. 3 hours.

Regional study of African continent with emphasis on commercial significance and on areas of growing industrialization. Prerequisite: HG 101. Associate Professor Myatt.

HG 211. Regional Geography of Pacific Northwest. 3 hours fall or spring.

Analysis of human and economic geography of Pacific Northwest with special attention to Oregon. Prerequisite: HG 101 or consent of instructor. Associate Professor Myatt.

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 history of man, his governmental, economic, social, religious, intellectual, and esthetic activities, from earliest times to present, in Europe, Asia, and the Americas. Special effort is made to relate past to contemporary events and institutions. Professor Ellison and staff.

Hst 204. History of the Far East. 3 hours.

Introduction to history, civilization, and political, economic, cultural, and social problems of modern China, Japan, India, Korea, South Asia, and the Pacific Islands. Applies toward group requirement in Social Science. Professor Ellison.

Hst 206. Modern Russia. 3 hours.

Aims to enrich student's knowledge of political, diplomatic, economic, and social development of Russia from the revolution of 1905 to the present. Prerequisite: Hst 201, 202, 203 or consent of instructor. Professor C. K. Smith.

Hst 207, 208. England and the British Empire. 3 hours each term fall and winter.

Political, social, and economic developments of modern Britain in relation to growth of the Empire, development of the Dominions, and present role of the Commonwealth in world affairs. Hst 207, 208 when followed by Hst 209 satisfy group requirement in Social Science. Prerequisite: Hst 201, 202, 203 or consent of instructor. Professor C. K. Smith.

Hst 209. The World Since 1914. 3 hours spring.

Developments in Europe and the world since the first World War: the peace settlement; the dictatorships; the Munich period; the second World War; the postwar crisis. With Hst 207, 208 satisfies the group requirement in Social Science. Prerequisite: Hst 201, 202, 203 or consent of instructor. Professor C. K. Smith.

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, Associate Professor R. W. Smith, Assistant Professors Berkeley, Berry.

Hst 230, 231, 232. Great Americans in Thought and Action. 2 hours each term.

A study in personality and leadership of men and women who have been outstanding in various fields of endeavor, great movements, and critical periods. Professor Ellison.

UPPER-DIVISION SERVICE COURSES

Hst 341, 342, 343. Main Currents in American Thought. 3 hours each term.

Growth of American thought, ideals, and institutions; analysis of the contributions to American culture by schools, newspapers, magazines, motion pictures, radio, art, literature, and philosophy. Prerequisite: Hst 224, 225, 226. Assistant Professor Berkeley.

Hst 360, 361. Latin-American Civilization. 3 hours each term.

Native civilizations of Mexico, Central America, and South America; impact and blending of these cultures with those of Spain and Portugal in colonial age; struggle for independence; development of Latin-American republics to present. Hst 360, 361 with PS 418 constitute a year sequence in Latin-American studies. Associate Professor R. W. Smith.

Hst 377. History of Oregon. 3 hours any term.

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. 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 201, 202, 203. Introduction to Philosophy.** 3 hours each term.
A unified year sequence but work of the three terms may be taken in any order. Phl 201 is a study of elementary problems of knowledge and nature in terms of historical development of philosophy; Phl 202, philosophy of ethics; Phl 203 considers social philosophy with special attention to philosophy of history.
- Phl 211, 212, 213. Practical Life Philosophies.** 2 hours each term.
The developing philosophy of the American way of life; a study of the foundations of the world's major political systems; basic values underlying the various methods of solving social values.
- Phl 214, 215, 216. Modern Logic and Scientific Method.** 3 hours each term.
A unified year sequence; Phl 214 is prerequisite to the other two terms except by special consent of instructor. Nature of argument, proof, fallacies, syllogistic reasoning; relation between probability and truth; scientific method in social and physical sciences; a study of scientists to determine their method and philosophy.

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. The public administration program is designed to help prepare students majoring in technical fields who contemplate careers in public service.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- PS 201, 202. American National Government.** 3 hours each term.
First term: basic principles of American political system; organization of national government. Second term: powers and functions of national government. PS 201 may be taken separately but is prerequisite for PS 202. Staff.
- PS 203. State and Local Governments.** 3 hours any term.
Practical operation and contemporary reforms in government at state and local level in the United States. Professor Swarthout, Assistant Professor Maddox, Mr. McClenaghan.
- PS 204. European Governments.** 3 hours winter or spring.
Government in England, Russia, France, Germany, Italy; a comparative study of the ideology, origin, structure and operation of the political systems in other countries. Assistant Professor Maddox, Mr. McClenaghan.
- PS 231, 232, 233. Current Affairs.** 2 hours each term.
Designed to acquaint student with current political, economic, and sociological problems and developments that arise on both domestic and international levels, and to encourage objective analysis and discussion of these events in order to mold responsible citizens. Open to freshmen and sophomores only. Mr. Walter.

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 331. **Current Affairs.** 2 hours.

For juniors and seniors only. Similar to PS 231 except that more extensive readings are expected and more attention is given to background material. Mr. McClenaghan.

PS 415. **Municipal Government.** (g) 3 hours spring.

Organization, functions, and present-day problems of city and town governments. Prerequisite: PS 201, 203, or consent of instructor. Professor Swarthout.

PS 417. **International Relations.** (g) 3 hours fall or spring.

Survey of international relations from the emergence of the modern state system to the present time. Designed to provide the student with essential backgrounds and to show the significance and interrelationships of international law, war, power politics, peaceful settlement of disputes, and international organization.

PS 418. **Latin-American Relations.** (g) 3 hours spring.

Critical study of internal social, economic, and political factors in Latin America as they relate to developing patterns of government; foreign relations, particularly extension of inter-American security system and role of Western Hemisphere in power struggle. With Hst 360 and 361 forms a full year sequence in Latin-American Studies on the upper-division level. Professor Swygard.

PS 419. **Pacific Area Relations.** (g) 3 hours winter.

Emergence of nationalism, changing patterns of government and political relationships; American policy; problems of security and commercial relationship. Professor Swygard.

PS 431, 432, 433. **Public Administration.** (g) 3 hours each term.

PS 431: principles of public administration; administrative organization and procedures; place of administration in American government. PS 432: administrative functions; public personnel and fiscal problems and practices; public relations. PS 433: basic administrative law; control of administrative agencies; powers, limitations, and remedies. PS 431 or 433 may be taken as a single course. Prerequisite: PS 201, 203, or equivalent, and senior standing. Professor Swarthout, Assistant Professor Maddox.

SSc 441, 442, 443. **International Politics and National Power.** 3 hours each term.

See GENERAL SOCIAL SCIENCE, page 137.

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 a 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.
Conditions of healthy mental development and of effective reactions to life and college environment; habits, attitudes, and reactions of the efficient mind. No credit is given to students who have taken Ed 102.
- Psy 201, 202, 203. Elementary Psychology.** 3 hours each term.
Introductory study of material of general experimental psychology, learning, memory, perception, imagination, sensation, attention, reasoning, instinct, emotion, will, etc. Terms must be taken in sequence.
- Psy 204, 205, 206. Elementary Psychology Laboratory.** 1 hour each term.
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. Terms must be taken in sequence.
- Psy 207, 208. General Psychology.** 3 hours each term.
A study of the fundamental facts of human equipment and behavior; instinct, emotion, sensation, feeling, memory, imagination, suggestion, will, reason, and personality. A two-term sequence; with Psy 209 forms a year's sequence.
- Psy 209. Applied Psychology.** 3 hours any term.
Application of psychology to business and industrial problems; measurement, prediction and influence of individual and group behavior; industrial psychology research. Intended primarily for students in business and technology. Prerequisite: Psy 203 or Psy 207, 208.
- Psy 212. Applied Psychology.** 3 hours.
Management of people through human understanding; socio-psychological aspects of personnel methods; development, use, and evaluation of such methods. For engineering, forestry, and agriculture students. Not open to students who have taken Psy 201, 202, 203, or Psy 207, 208, 209.

UPPER-DIVISION SERVICE COURSES

- Psy 411. Mental Hygiene.** (g) 3 hours.
Principles and application of mental hygiene to problems of the individual in home, school, and occupational situations. Prerequisite: Psy 203, or Psy 207, 208.
- Psy 431. Industrial Psychology.** (g) 3 hours.
Psychological characteristics of employees and psychological requirements of occupations; employee appraisal through development and use of evaluating instruments and recording of evaluations; psychological factors involved in maintaining employee fitness and morale. Prerequisite: Psy 203, or Psy 207, 208.
- Psy 471, 472, 473. Individual Differences.** (g) 3 hours each term.
Theories in regard to individual differences; experimental evidence; importance in personal, educational, and social adjustments; guiding and directing normal development. Prerequisite: Psy 203 or Psy 207, 208. First two terms may be taken independently; the third term must be preceded by both the others.

Psy 474, 475, 476. **Psychological Tests and Testing.** (g) 3 hours each term.

Theory and practice of test administration, scoring, and interpretation; administration, scoring, and interpretation of individual tests in fields of mental abilities, special aptitudes, interests, personality, and nonacademic achievement; administration, scoring, and interpretation of group tests in the same areas. Must be taken in sequence. Prerequisite: Psy 203 or Psy 207, 208.

GRADUATE SERVICE COURSES

Courses numbered 400-499 and designated (g) may be taken for credit toward a graduate minor.

Religion

ESTABLISHMENT of a chair of Religion at Oregon State College 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, director 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 fall.

Special attention is given to the times and conditions out of which the New Testament writings came and the problems that give rise to the Christian movement.

R 220. **The Sermon on the Mount.** 2 hours any term.

A study of the philosophy of Jesus' teaching as embodied in a selected passage.

R 225. **The Prophets and Their Message.** 2 hours winter.

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.

R 230. **History of Christian Thought.** 3 hours winter.

Rise and spread of the Christian religion; thought of its various leaders; movements within Christianity; present tendencies in religious thought.

R 231. **The American Religious Heritage.** 2 hours.

Development of main religious groups in America: Catholicism, Judaism, Protestantism; role of the churches; current trend toward ecumenicity.

Eng 275. The Bible as Literature. 3 hours spring.

Designed to enlarge appreciation of the art and beauty of Bible folklore, story telling, history, poetry, drama, wisdom literature, oratory, and essay. Theology and dogma are avoided. Assistant Professor E. K. Gibson.

UPPER-DIVISION COURSES

R 370. Principles of Religious Leadership. 2 hours spring.

A practical study of religious leadership. Open only to students actually engaged in some form of leadership in a religious organization that serves as laboratory work for the study.

R 461. Philosophy of Religion. 3 hours fall.

Basic convictions underlying religious thinking; values, God, problem of good and evil, immortality, human nature, religious experience.

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.

R 463. Psychology of Religion. 3 hours spring.

The bearing of psychology on religious thought and action, both past and present; psychology of prayer, conversion, faith, mysticism, and worship.

Sociology

ALL the lower-division instruction in sociology, like that in the related social sciences, is intended to contribute to the task of training 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 designed also 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; collective behavior; community and social organization; social interaction; social change and its effects. In third term: social problems and application of sociologic principles. Students who have taken Soc 212 should confer with instructor before enrolling for any term of this sequence. Professor Bakkum and staff.

Soc 212. General Sociology. 3 hours any term.

An abridgment of Soc 201, 202. Not open to students who have taken Soc 201, 202, 203. Professor Bakkum and staff.

Soc 215. Elements of Cultural Anthropology. 3 hours.

Meaning and definition of culture; its growth and diffusion; man as creator and participant; comparison and study of variation of cultures with particular reference to peoples of Pacific areas.

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. Sociology of the Family. 3 hours.

Evolution of matrimonial institutions; legal status; economic and social aspects; the new woman's movement in relation to the family; divorce problem. Prerequisite: upper-division standing. Professor Dann.

Ed 314. Educational Sociology. 3 hours.

Analysis of contributions of sociology to educational problems and practices. School of Education students may count this course toward the 36 required hours of education. Prerequisite: introductory sociology. Professor Bakkum.

Soc 364. Sociology of Rural Life. 3 hours.

Rural life and institutions contrasted with urban; community, family, school, church, recreation, and welfare activities in the rural setting; field observation. Professor Bakkum.

Soc 411, 412. Social Problems. (g) 3 hours each term.

Current social problems; field observation. The contents of the work are varied to meet the needs of particular groups. School of Education students whose work in this sequence covers social education may count 3 hours of credit so earned toward required hours of education if approved by the dean. Either term may be taken separately. Prerequisite: introductory sociology. Professors Bakkum and Dann, Associate Professor Plambeck.

Soc 465. Sociology of Urban Life. 3 hours spring.

Introduction to the study of urban society; history, structure, functions, and problems of the modern city. Prerequisite: introductory sociology. Professor Dann.

Soc 474. Social Psychology. (g) 3 hours.

Biological and social functions of human behavior; individual and social adjustments; behavior in presence of others; social psychology of institutions; social conflict. Prerequisite: introductory sociology. Professor Bakkum.

Soc 475. Community Organization and Leadership. 3 hours.

Social and psychological aspects of leadership; group and community organization and structure; recreational, economic, and program-planning aspects of group and community activities. Prerequisite: introductory sociology or permission of instructor in charge. Professor Bakkum.

GRADUATE SERVICE COURSES

Courses numbered 400-499 and designated (g) may be taken for credit toward a graduate minor.

Group Courses

Sequences in liberal arts and sciences, applicable in meeting group requirements, are offered by the Lower Division and the School of Science. These courses may also be taken as electives. The lists are revised on recommendation of the Joint Committee on Liberal Arts Requirements appointed by the President on nomination of the Dean of the Lower Division and the Dean of the School of Science. The committee is assisted by the Curriculum Council in matters of curriculum coordination. Descriptions of the courses in the following lists are printed under the several departmental headings in the two schools.

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.
- Eng 253, 254, 255. American Literature, 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.

Other Acceptable Sequences or Combinations

School of Science freshmen or sophomores may choose one course from List I below, one course from List II below, and a third from either. Students in the Lower Division may do so with the dean's approval. *Indicated sequences (reading horizontally) are preferable.*

LIST I

- Eng 101, 102, 103. Literature Survey.
- Eng 104, 105. Introduction to Literature.
- Eng 253, 254, 255. American Literature.
- Eng 271, 272. Contemporary Literature.
- Eng 274. The Short Story. Eng 376. The Novel†
- Eng 263. Great Books.
- Eng 264, 265, 266. Continental European Literature.

LIST II

- Eng 106. Introduction to Literature.
- Eng 273. Contemporary Literature.
- Eng 275. The Bible as Literature.
- Eng 261. Browning. Eng 262. Tennyson.
- Eng 201, 202, 203. Shakespeare.

School of Science students who have to postpone completion of the requirements in Literature to the upper-division years may choose any of the sequences or combinations listed above or one of the following:

- Eng 331, 332, 333. The Democratic Tradition in Literature, 3 hours each term.
- GL 311, 312, 313. German Literature, 3 hours each term.
- RL 311, 312, 313. French Literature, 3 hours each term.
- RL 341, 342, 343. 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 200. Bacteriology Laboratory, 2 hours. (See Interdepartmental Combinations, next page.)
- Bac 201, 202, 203. Elementary Bacteriology, 3 hours each term.
- Bac 204, 205, 206. General Bacteriology, 3 hours each term.

Botany

- Bot 201, 202. General Botany, 3 hours each term. Bot 203. Field Botany, 3 hours. (See Interdepartmental Combinations, next page.)

Chemistry

- Ch 101, 102, 103. General Chemistry, 3 hours each term.
- Ch 104, 105, 106. General Chemistry, 4 hours each term.
- Ch 201, 202, 203. General Chemistry, 3 hours each term.
- Ch 204, 205. General Chemistry, 4 or 5 hours each term.
- Ch 206. Qualitative Analysis, 4 or 5 hours.

* Students may choose either Eng 101, 102, 103 or Eng 104, 105, 106, but may not take both sequences for credit.

† Not open to freshmen; open to sophomores by permission of the instructor.

Entomology

Ent 200. General Entomology, 5 hours. (See Interdepartmental Combinations, below.)

Geology

G 201, 202, 203. Geology, 3 hours each term. (May be accompanied by G 204, 205, 206. Geology Laboratory, 1 hour each term.)

Mathematics

Mth 100. Intermediate Algebra, 4 hours; Mth 101, 102, 103. Elementary Analysis, 4 hours each term; Mth 109. Elements of Statistics, 4 hours. (Any three terms in this group.)

Mth 104, 105, 106. Mathematics of Business and Industry, 3 hours each term.

Mth 201, 202, 203. Differential and Integral Calculus, 4 hours each term.

Physics

Ph 101, 102, 103. Engineering Physics, 3 hours each term.

Ph 201, 202, 203. General Physics, 4 hours each term.

Ph 204, 205, 206. Astronomy, 3 hours each term.

Psychology

Psy 201, 202, 203. Elementary Psychology, 3 hours each term, accompanied by Psy 204, 205, 206. Elementary Psychology Laboratory, 1 hour each term.

Zoology

Z 200. General Zoology, 5 hours. (See Interdepartmental Combinations, below.)

Z 201, 202, 203. General Zoology, 3 hours each term.

Interdepartmental Combinations (open to Lower Division freshmen and sophomores if they have their Dean's approval): Any two of the four following:

Bac 200. Bacteriology Laboratory and Bac 230. Principles of Bacteriology, total of 5 hours.

Bot 201, 202. General Botany, 6 hours.

Ent 200. General Entomology, 5 hours.

Z 200. General Zoology, 5 hours.

SOCIAL SCIENCE GROUP**Sequences in one department****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.

Ec 213, 214. Principles of Economics, 4 hours each term. Ec 215. Economic Development of the United States, 4 hours.

HG 101. Human Geography, 3 hours.

HG 102. Economic Geography, 3 hours.

HG 103. Geography of North America, 3 hours.

HG 201. Regional Geography of Latin America, 3 hours.

HG 202. Regional Geography of Europe, 3 hours.

HG 203. Regional Geography of Asia, 3 hours.

HG 204. Regional Geography of Africa, 3 hours.

Any two of following with HG 101 may be counted as a sequence: HG 102, 103, HG 201, 202, 203.

HG 201, 202, 203, 204 (any three terms) may be counted as a sophomore sequence.

History

Hst 201, 202, 203. History of Western Civilization, 3 hours each term.

Hst 204. History of the Far East, 3 hours.

Hst 206. Modern Russia, 3 hours.

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 224, 225, 226. History of American Civilization, 3 hours each term.

Hst 204 or 206 may be substituted for Hst 203.

Hst 207, 208, 209 constitute a year sequence.

Political Science

PS 201, 202. American National Government, 3 hours each.

PS 203. State and Local Government, 3 hours.

PS 204. European Governments, 3 hours.

Any two of the following with PS 201 may be counted as a sequence: PS 202, 203, 204.

Philosophy

Phl 201, 202, 203. Introduction to Philosophy, 3 hours each term.

Psychology

- Psy 201, 202, 203. Elementary Psychology, 3 hours each term. (May be accompanied by Psy 204, 205, 206. Elementary Psychology Laboratory, 1 hour each term.)
 Psy 207, 208. General Psychology, 3 hours each term. Psy 209. Applied Psychology, 3 hours.

Sociology

- Soc 201, 202, 203. Elements of Sociology, 3 hours each term.

Sequences in two departments

Students may take two terms in one department as indicated in first list below and one term in another department as indicated in the second list. (Lower Division students must have the Dean's approval.)

Principal Department (two terms):

- Ec 213, 214. Principles of Economics, 4 hours each term.
 Hst 201, 202, 203. History of Western Civilization, 3 hours each term. (Any two terms.)
 Hst 203. History of Western Civilization, 3 hours. Hst 226. History of American Civilization, 3 hours.
 Phl 201. Introduction to Philosophy, 3 hours. *Either*: Phl 202 or 203. Introduction to Philosophy, 3 hours each term.
 PS 201. American National Government, 3 hours. *Either* PS 202. American National Government, 3 hours, or PS 203. State and Local Government, 3 hours, or PS 204. European Governments, 3 hours.
 Psy 207, 208. General Psychology, 3 hours each term.

Second Department (one term):

- Ec 212. Outlines of Economics, 3 hours.
 Hst 203. History of Western Civilization, 3 hours.
 Hst 209. The World Since 1914, 3 hours.
 Hst 226. History of American Civilization, 3 hours.
 PS 201. American National Government, 3 hours.
 PS 204. European Governments, 3 hours.
 Soc 212. General Sociology, 3 hours.
 Soc 215. Elements of Cultural Anthropology, 3 hours.

Sequences in three departments

Three courses from the following lists, not more than one from any group: (Lower Division students must secure the Dean's approval.)

- Ec 211. Outlines of Economics, 4 hours, or Ec 212. Outlines of Economics, 3 hours.
 Hst 203. History of Western Civilization, 3 hours, or Hst 209, The World Since 1914, 3 hours, or Hst 226. History of American Civilization, 3 hours.
 PS 201. American National Government, 3 hours, or PS 204. European Governments, 3 hours.
 Soc 212. General Sociology, 3 hours.

Junior and senior sequences

School of Science students who have had to postpone completion of the requirements in Social Science to the upper-division years may choose any of the sequences or combinations listed above or one of the following:

- SSc 441, 442, 443. International Politics and National Power, 3 hours each term.
 Hst 341, 342, 343. Main Currents in American Thought, 3 hours each term.
 *PS 417. International Relations, 3 hours; PS 418. Latin-American Relations, 3 hours; PS 419. Pacific Area Relations, 3 hours.
 *PS 431, 432, 433. Public Administration, 3 hours each term.

Or they may take one of the following combinations of two terms of work in one department and one term in a second department selected from the two lists below.

Principal Department (two terms):

- Ec 211. Outlines of Economics, 4 hours (or Ec 212. Outlines of Economics, 3 hours) and Ec 413. Money and Banking, 4 hours.
 Hst 341, 342. Main Currents in American Thought, 3 hours each term.
 PS 415. Municipal Government, 3 hours, and PS 431. Public Administration, 3 hours.
 PS 417. International Relations, 3 hours; PS 418. Latin-American Relations, 3 hours; PS 419. Pacific Area Relations, 3 hours. (Any two of these courses.)
 Soc 212. General Sociology, 3 hours, and Soc 474. Social Psychology, 3 hours.

Second Department (one term):

- Ec 212. Outlines of Economics, 3 hours.
 Hst 203. History of Western Civilization, 3 hours.
 Hst 209. The World Since 1914, 3 hours.
 Hst 226. History of American Civilization, 3 hours.
 PS 201. American National Government, 3 hours, or PS 203. State and Local Government, 3 hours.
 Soc 212. General Sociology, 3 hours.

* Preferably but not necessarily taken in order.

School of Science

Faculty

FRANCOIS ARCHIBALD GILFILLAN, Ph.D., Dean of the School of Science.

GRAYDON TALMADGE CREWS, M.S., Science Student Personnel Adviser.

MARILYN RUTH YOUNG, Secretary to the Dean.

*General Science**

PROFESSORS HANSEN (department chairman), JENSEN.

ASSOCIATE PROFESSORS HIGHSMITH, WILLIAMSON.

ASSISTANT PROFESSORS BEER, BROOKS.

GRADUATE FELLOW ROEST.

GRADUATE ASSISTANTS BROGAN, LITTLE, NEWELL†.

Bacteriology and Hygiene

PROFESSORS SIMMONS (department chairman), C. L. ANDERSON, BOLLEN, COPSON (emeritus), ELLIKER, LANGTON.

ASSISTANT PROFESSOR GERHARDT.

INSTRUCTORS A. W. ANDERSON, TAKALO.

GRADUATE ASSISTANTS BUTTERWORTH, COLDWELL, EVENSON, SOIKE.

RESEARCH ASSISTANT MACGREGOR.

Botany

PROFESSORS DIETZ (department chairman), ATWOOD (emeritus), GILFILLAN (general manager, Institute of Marine Biology), GILKEY, MILBRATH, OWENS (emeritus), SANBORN (emeritus).

ASSOCIATE PROFESSORS BELKENGREN, PHINNEY, ROTH, F. H. SMITH, YOUNG.

ASSISTANT PROFESSORS CHILCOTE, L. E. JONES.

INSTRUCTORS JENSEN, LUND (technician), MARTIN, NICOL.

GRADUATE FELLOW HEUSSER.

GRADUATE ASSISTANTS ALDRICH, B. J. MILLER, OWEN, P. PACKARD.

Chemistry

PROFESSORS GILBERT (department chairman), BUTTS, CALDWELL, CHELDELIN, CHRISTENSEN, FRIEDMAN, FULTON (emeritus), J. S. JONES (emeritus), KURTH, MEHLIG (emeritus), PEASE, RICHARDSON.

ASSOCIATE PROFESSORS LOGAN, SCHULEIN, SCOTT, WILLIAMS.

ASSISTANT PROFESSORS DECIUS, FREUND, HUSTON, MARVELL, NORRIS, REESE.

INSTRUCTORS R. W. PARKINSON, WANG.

* 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.

† Resigned December 1950.

RESEARCH ASSOCIATES R. COAD, KING.

RESEARCH FELLOWS HALE, HERBER, HERGERT (wood chemistry), JAWORSKI, NYGAARD, ROBINS.

DUPONT FELLOW EVANS.

TEACHING FELLOWS BEAUDREAU, BUSH, P. COAD, DAVIS, FURLONG, KARASEK, LAPORE, LEDEEN, MILLER, MOORE, ROBERTI, ROGERS, SIEGLE, SNIPPER, WHIPPLE.

GRADUATE ASSISTANTS BAIRD, BENNETT, DILLE, HAMMILL, HILLER, JAMES, KANZELMEYER, MAGOON, MICKELSEN, MINER, NELSON, ODELL, ROBERTSON, SCHAEFFER, SHOEMAKER, V. H. SMITH, TERANISHI, THEISEN, THOMAS, TURRELL, VANMETER.

RESEARCH ASSISTANTS CULBERTSON, GEISZLER, LABBE, MASTERS, WM. SMITH, STEWART.

Entomology

PROFESSORS MOTE (department head), SCULLEN.

ASSOCIATE PROFESSORS CHAMBERLIN, MARTIN.

INSTRUCTOR WALLACE.

GRADUATE ASSISTANTS Y. H. CHANG, TANNER.

Geology

PROFESSORS ALLISON (department chairman), HODGE, PACKARD (emeritus), SANBORN (emeritus), WILKINSON.

INSTRUCTORS BOYD, HINTZE.

GRADUATE ASSISTANTS DAWSON, HARRIS, LEWIS, NESBIT, SHELTON.

Mathematics

PROFESSORS MILNE* (department head), BEATY (emeritus), CLARK, HOSTETTER, LONSETH, McALISTER (emeritus), G. A. WILLIAMS (acting department head 1950-51).

ASSOCIATE PROFESSORS EVES, KIRKHAM, LI, POOLE, SAUNDERS.

ASSISTANT PROFESSORS ARNOLD, BREWER, MANNING, PRICE, STONE.

INSTRUCTORS BAKKUM, EHLERS, GODARD, GYSBERS.

TEACHING FELLOWS HOGGATT, NICKEL, PEARSON, WHITBECK, WIRSHUP.

GRADUATE ASSISTANTS ANSELONE, BANKS, BROWN, COBURN, OLIVE, RALL, STEARMAN, THOMPSON.

Nursing Education†

PROFESSOR DOLTZ (director of department).

ASSISTANT PROFESSOR SLOCUM.

* On leave of absence 1950-51.

† Members of the faculty of the Department of Nursing Education, University of Oregon Medical School, Portland.

Physics

PROFESSORS YUNKER (department chairman), W. B. ANDERSON (emeritus), BOYNTON (emeritus), BRADY, WENIGER.

ASSOCIATE PROFESSORS DEMPSTER*, GARMAN, MORGAN, VARNER, VINYARD.

ASSISTANT PROFESSORS BOLINGER, NICODEMUS.

INSTRUCTORS BYERS, CHURCH, DAY, DECKER, LINCOLN, MAILLARD, PEARSON, PEOPLES, WALKER.

Science Education

ASSOCIATE PROFESSOR WILLIAMSON (department chairman).

PROFESSORS DIETZ, FRIEDMAN, GORDON, LANGTON, SIMMONS, WILKINSON.

ASSOCIATE PROFESSORS EVES, MARTIN, MORRIS.

INSTRUCTORS CREWS, DAY.

Zoology

PROFESSORS GORDON (department chairman), ALLMAN, C. L. ANDERSON, DE LAUBENFELS, DORNFELD, GILFILLAN (general manager, Oregon Institute of Marine Biology), KRUEGER, WULZEN (emeritus).

ASSOCIATE PROFESSORS OSBORN (emeritus), PRATT.

ASSISTANT PROFESSORS HILLEMANN, STORM.

AMERICAN CANCER SOCIETY FELLOW ROSA.

TEACHING FELLOWS PIMENTEL, ROSLANSKY, WALKER, YANCEY.

GRADUATE ASSISTANTS ADAMS, BENNINGTON, DAVIS, DUNLAP, HILL, MCGOWAN, WILSON†, YONCE†.

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 Oregon State College. The School of Science performs a three-fold function; it provides:

1. Liberal-arts education with majors in science leading to degree 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 who take science 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 colleges; for study in medicine, dentistry, nursing, or medical technology; 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.

* On sabbatical leave 1950-51.

† Resigned December 1950.

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 professional schools.

Major Curricula

The departments of General Science, Bacteriology and Hygiene, Botany, Chemistry, Entomology, Geology, Mathematics, Physics, and Zoology provide the usual undergraduate majors in their respective fields. 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. Most curricula permit election of at least one-half of a student's work outside 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 should elect appropriate courses in a professional school.

The undergraduate department curricula are printed on pages 158-166.

General Science Majors. The general science majors have been organized to meet the needs of students with 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 page 159.

Interdepartmental Majors. For students interested in the developing fields 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. Preparation for science teaching is coordinated through the Department of Science Education (see pages 200-201 and 287-289).

Special Curricula

To meet the needs of special groups of students, the School of Science offers special curricula (1) for premedical students, (2) for pre dental students, (3) for pre nursing students, and (4) for students preparing to be medical laboratory technicians. Students may likewise prepare for entrance to schools

of veterinary medicine, optometry 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 advisory committee to insure a selection of studies that will satisfy medical-school entrance requirements and the cultural needs of students planning to enter the profession of medicine. At Oregon State College the chairman of this committee is Dr. E. J. Dornfeld, professor of zoology.

For entrance to a standard medical school the student must not only complete certain prescribed work but also show an aptitude for medical studies. The medical college admission test of the Association of American Medical Colleges is given each year 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 entrance requirements of the University of Oregon Medical School are as follows:

(1) **High-School Preparation.** Applicants for admission are required to have satisfactorily completed four years in an accredited high school, or its equivalent.

Recommended High-School Course. The following high-school course, which meets all the formal requirements, is strongly recommended:

<i>Units</i>		<i>Units</i>	
English	4	Latin	2
Algebra	1½	History	1
Geometry	1	German or French	2
Physics	1	Electives	1½
Chemistry	1		
Total	15		

Students entering college with less than the amount of work recommended in these fields (especially mathematics and science) may find it necessary to devote more than the minimum of three years to collegiate premedical preparation.

(2) **Collegiate Preparation.** The Medical School requires for admission at least three academic years of preparatory work (138 term hours exclusive of credit in military or naval science). The following work is prescribed:

	<i>Term hours</i>
Chemistry	23
General inorganic, which may include qualitative analysis	12
Quantitative analysis, emphasis on volumetric analysis	3
Organic	8
Biology	15
General biology or zoology	9
Selections from general embryology, vertebrate anatomy, or general physiology	6
Physics	12
Mathematics	6
English	9
Total prescribed credit	65

Foreign language is not specifically required for admission to the Medical School, but some knowledge of a major modern foreign language (German, French, Russian, Spanish) is highly recommended as a part of the cultural training of a physician. Students anticipating research in the medical sciences should obtain a basic knowledge of German and French. The premedical student should keep in mind that some medical schools require credit in foreign language for admission.

The work in organic chemistry must include the chemistry of both aliphatic and aromatic compounds. Biochemistry will not be accepted toward meeting the requirement. Students electing additional work are advised to take a course in elementary physical chemistry. At least 25 per cent of all chemistry credit must be received for laboratory work.

Human anatomy is not accepted toward meeting the minimum requirements in biology. Students electing additional work are advised to take courses in genetics, evolution, embryology, vertebrate anatomy, histological technique, or general physiology.

The work in physics must include the divisions of mechanics, heat and sound, light and electricity. Students electing additional work are advised to take further courses in electricity or atomic physics.

The work in mathematics should be of standard college grade, and include subjects such as algebra, elementary analysis, or trigonometry. Students electing additional work in mathematics are advised to take calculus.

Recommended Elective Subjects. The student preparing to study medicine is advised to plan a balance in elective courses between courses in liberal arts and courses beyond the minimum requirements in subjects prescribed for admission to the Medical School. Subjects suggested are: history, economics, sociology, psychology, English, public speaking, foreign language, mathematics, biology, embryology, general physiology, physics (especially elementary electronics), and elementary physical chemistry.

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 at the institution at which he received his premedical preparation, before entering upon the work of the third year at the Medical School. Under Oregon State College regulations, a maximum of 48 term hours of work in medicine may be counted as credit earned in residence toward the bachelor's degree.

Before entering the Medical School, the student should satisfy all requirements for junior standing and all requirements for a degree (including Oregon 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 science courses prescribed in the premedical curriculum, will satisfy all major requirements in general science. Students selecting other liberal-arts majors in the School of Science must satisfy all major requirements before entering the Medical School, except that Biochemistry (BCh 411, 412), offered at the Medical School, may be counted toward the satisfaction of the major requirements in chemistry, and Physiology (Phy 412) toward the major requirements in zoology.

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 Oregon State College on making arrangements acceptable to the loan fund administration. The Premedical Curriculum is printed on page 166.

Predental Curriculum. Oregon State College offers a two-year and a three-year predental curriculum to prepare students for admission to the University of Oregon Dental School or other standard dental schools. Both curricula satisfy the requirements established by the Council of Dental Education of the American Dental Association for admission to dental schools. Students completing the three-year curriculum may qualify for a bachelor's degree after one year of dental-school work.

The two-year curriculum satisfies the minimum predental requirements of the Council on Dental Education: "The minimum educational requirement for admission to a dental school is the successful completion of two years of study in a liberal arts college. . . . The college course must include a year's work in English, in biology, in physics, and in inorganic chemistry, and a half year's work in organic chemistry. The work in the sciences must include laboratory practice as well as didactic instruction." The counselor for all predental students is Dr. Ivan Pratt, associate professor of zoology.

The two-year and three-year curricula are printed on pages 166-167.

Preveterinary Curriculum. Oregon State College offers a two-year curriculum for students planning to enter a school of veterinary medicine. Preveterinary requirements vary somewhat in the various schools of veterinary medicine, and a student who has selected a school to which he plans to apply for admission should write that school and obtain information regarding ad-

mission requirements. That information should be brought to the adviser when the student enrolls at Oregon State College. The counselor for pre-veterinary students is Dr. Ivan Pratt, associate professor of zoology.

The curriculum is printed on pages 167-168.

Prenursing Curriculum. The Department of Nursing Education of the University of Oregon Medical School offers a four-year curriculum which leads to the Bachelor of Science degree and prepares for state examination for nurse registration. The student takes five terms of pre-nursing work at Oregon State College at Corvallis, at the University of Oregon at Eugene, or at another accredited college or university. The pre-nursing curriculum is completed with one term of work on the campus of the Medical School (during which the student satisfies academic requirements for junior standing), and is followed by ten terms of clinical instruction coordinated with practice in the hospitals and clinics of the Medical School. At Oregon State College the adviser of students in the Prenursing Curriculum is Assistant Professor Olive A. Slocum.

Students in nursing education who take their pre-nursing work at Oregon State College receive their degrees from Oregon State College.

The Prenursing Curriculum is printed on page 168.

Curriculum for Medical Technicians. The two-year Curriculum in Preparation for Medical Technicians (page 168) 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 in two years all the courses listed here, 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. The counselor for students pursuing this curriculum is Professor J. E. Simmons of the Department of Bacteriology and Hygiene.

Requirements for Admission and Graduation

The student's aim for his first two years in college should be to obtain a broad general education and to determine upon a field in which he desires a major. During this time, he should, if possible, complete all lower-division requirements and receive junior standing.

The science advisers, representing the different departments of the School, help students in the selection of specific courses prerequisite to major work. In the science curricula (pages 158-166), suggested lower-division programs are included to aid students in meeting the requirements for junior standing 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 the 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 School 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 Bacteriology and Hygiene, Botany, Chemistry, Entomology, Geology, Mathematics, Physics, and Zoology. For the requirements for the M.A., M.S., and Ph.D. degrees see GRADUATE SCHOOL.

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 Natural History Building, and the Physiology Laboratory. The Department of Mathematics occupies the third and fourth floors of Education Hall; the Department of Geology occupies the first floor of Education Hall and the main portion of the Paleontology Laboratory; the Department of Chemistry occupies Chemistry Hall. The Department of Physics occupies the Physics Building and a part of the Mines 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 more than 131,000 plants, the Department of Entomology collection of insects numbering nearly 200,000 specimens, the Department of Zoology collection of representative birds of Oregon, the Braly Ornithological collection in the Natural History Building, and the extensive geological collection 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. The institute, located on a 100-acre tract between Coos Bay and the Pacific, occupies a group of 20 buildings erected by the Civilian Conservation Corps. A specially built 33-foot launch is used for exploring and collecting. The institute is administered under an executive committee of which the Dean of the School of Science is general manager.

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. 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 School.

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 125 in any major curricula. The maximum number of hours required for a major in any department is 74. 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), 1 term hour for men, 2 term hours for women, is taken one term in place of physical education.
- c. Students expecting to meet the language requirements for a B.A. degree or to obtain a reading knowledge of Russian, German, or French in preparation for graduate work may

- elect a language in the freshman and sophomore years. If two years of a language are elected in the freshman and sophomore years, the completion of the group requirement in either Literature or Social Science may be postponed until the junior year. Students expecting to major in certain of the science curricula may have to 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. This requirement may be met by either Psy 207, 208 or Psy 201, 202, 203.
- 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 SCIENCE¹

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.

	Term hours		
	F	W	S
Freshman Year			
Approved group requirement in Science	3-5	3-5	3-5
English Composition (Eng 111, 112, 113)	3	3	3
Elementary Analysis (Mth 101, 102, 103) or approved Science elective	4	4	4
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
Electives	0-3	0-3	0-3
	16	16	16
Sophomore Year			
Group requirement in Literature	3	3	3
Sophomore Science sequence	3-5	3-5	3-5
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
² Approved electives	7-4	7-4	7-4
	16	16	16
Junior Year			
Group requirement in Social Science	3	3	3
³ Approved upper-division Science	4	4	4
² Approved electives	9	9	9
	16	16	16
Senior Year			
³ Approved upper-division Science	4	4	4
² Approved electives	12	12	12
	16	16	16

DEPARTMENT OF BACTERIOLOGY AND HYGIENE¹

Undergraduate majors: Bacteriology with emphasis, if desired, on one of the fields of the graduate majors.

Graduate majors: Bacteriology, Dairy Bacteriology, Food Bacteriology, Hygiene and Sanitation, Industrial Bacteriology, Physiology of Bacteria, Soil Bacteriology.

	Term hours		
	F	W	S
Freshman Year			
General Botany (Bot 201, 202)	3	3	5
General Zoology (Z 200)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
General Chemistry (Ch 204, 205)	5	5	5
Qualitative Analysis (Ch 206)	5	5	5
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
Electives	1	1	1
	15-16	15-16	16-17

¹See GENERAL NOTES on pages 158-159.

²The electives may include courses in health education leading to special preparation in that field. See SCIENCE EDUCATION.

³These 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.

	Term hours		
	F	W	S
Sophomore Year			
Group requirement in Literature	3	3	3
Organic Chemistry (Ch 226, 227)	5	5	---
Quantitative Analysis (Ch 234)	---	---	5
General Bacteriology (Bac 204, 205)	3	3	---
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
Electives	2	2	4
	16-17	16-17	15-16
Junior Year			
Group requirement in Social Science	3	3	3
General Physics (Ph 201, 202, 203)	4	4	4
Elementary Physical Chemistry (Ch 340)	---	---	3
Approved upper-division bacteriology courses	3	6	6
¹ Approved electives	6	3	0
	16	16	16
Senior Year			
Approved upper-division bacteriology courses	5	5	5
² Approved electives	10	10	10
Seminar (Bac 407)	1	1	1
	16	16	16

DEPARTMENT OF BOTANY³

Undergraduate majors: General Botany with emphasis, if desired, on one of the fields of the graduate majors.

Graduate majors: Cytology, Ecology, Morphology, Mycology, Plant Pathology, Physiology, Systematic Botany.

	Term hours		
	F	W	S
Freshman Year			
Group requirement in Literature	3	3	3
General Botany (Bot 201, 202), Field Botany (Bot 203)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
⁴ General Chemistry (Ch 101, 102, 103)	3	3	3
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Electives	1-0	1-0	1-0
Physical Education	1	1	1
	16	16	16
Sophomore Year			
Group requirement in Social Science	3	3	3
⁵ Principles of Plant Physiology (Bot 331), Structure of Economic Plants (Bot 371), Systematic Botany (Bot 321)	4	4	4
⁶ German, French, Russian, or Spanish	3-4	3-4	3-4
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
Approved electives	3-1	3-1	3-1
	16	16	16
Junior Year			
⁷ Principles of Plant Ecology (Bot 341), Microtechnique (Bot 370), Principles of Plant Pathology (Bot 351)	4	4	4
Elementary Analysis (Mth 101, 102)	---	4	4
General Zoology (Z 201, 202, 203)	3	3	3
⁸ Approved electives	9	5	5
	16	16	16

¹Mathematics, modern language, recommended for those who plan to obtain the Ph.D.
²Mathematics, modern language, biochemistry and physical chemistry recommended for those who plan to obtain the Ph.D.

³See GENERAL NOTES on pages 158-159.

⁴Students 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.
⁵Bot 321, or 341, 351 may be taken spring term of either the sophomore or junior year; Bot 341 or 351 may be taken fall term of the junior year.

⁶Students having taken high-school German, French, or Spanish should continue the language. Those planning professional training in botany should elect to follow First-year German with Scientific German, or other first-year language with an appropriate reading course.

⁷Students 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
General Physics (Ph 201, 202, 203)	4	4	4
Statistical Methods (Mth 445)	3	---	---
Seminar (Bot 407)	1	1	1
Geology (G 201, 202, 203)	3	3	3
Electives	5	8	8
	16	16	16

DEPARTMENT OF CHEMISTRY¹

Undergraduate and graduate majors: Agricultural Chemistry, Analytical Chemistry, Biochemistry, Electrochemistry, Inorganic and Metallurgical Chemistry, Organic Chemistry, Physical (including Colloidal) Chemistry, Forest Products Chemistry.

	Common Freshman Year		
	Term hours		
	F	W	S
General Chemistry (Ch 204, 205)	5	5	---
Qualitative Analysis (Ch 206)	---	---	5
Elementary Analysis (Mth 101, 102, 103)	4	4	4
English Composition (Eng 111, 112, 113)	3	3	3
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
	15-16	15-16	15-16

	Common Sophomore Year		
	Term hours		
	F	W	S
² Chemical Theory (Ch 241)	4	---	---
² Quantitative Analysis (Ch 232, 233)	---	5	5
General Physics (Ph 201, 202, 203)	4	4	4
² Calculus (Mth 201, 202, 203)	4	4	4
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
Elective	1	---	---
	16-17	16-17	16-17

MAJOR IN CHEMISTRY

Analytical Chemistry, Electrochemistry, Inorganic and Metallurgical Chemistry, Organic Chemistry, Physical (including Colloidal) Chemistry, Forest Products Chemistry.

	Junior Year ³		
	Term hours		
	F	W	S
Organic Chemistry (Ch 430, 431, 432)	5	5	5
Physical Chemistry (Ch 440, 441, 442)	4	4	4
German	4	4	4
Group requirement in Literature or Social Science	3	3	3
	16	16	16

	Senior Year		
	Term hours		
	F	W	S
⁴ Approved upper-division chemistry courses	4	4	4
Group requirement in Social Science or Literature	3	3	3
⁵ Electives	9	9	9
	16	16	16

MAJOR IN AGRICULTURAL CHEMISTRY

(See Common Freshman and Sophomore Years above.)

	Junior Year		
	Term hours		
	F	W	S
Organic Chemistry (Ch 430, 431, 432)	4-5	4-5	4-5
Physical Chemistry (Ch 440, 441, 442)	4	4	4
Group requirement in Literature	3	3	3
⁶ Electives including Biological Science sequence	5-4	5-4	5-4
	16	16	16

¹See GENERAL NOTES on page 158.

²Students majoring in agricultural chemistry or biochemistry take Ch 234, 351, 352 instead of Ch 232, 233, 241, and take a Life Science elective instead of Mth 203.

³The student is encouraged to take, if possible, a year of modern physics (Ph 311, 312, 313) in his junior year.

⁴The 12 hours of advanced chemistry must be courses having prerequisites of 3 years of chemistry and must include 3 hours of actual laboratory work.

⁵Electives must include at least 5 term hours in humanities, social science, or biological science in addition to the group requirements in these fields.

⁶Junior or senior electives must include at least 9 hours of Life Sciences, which may include approved courses in agriculture or home economics.

	Senior Year		
	Term hours		
	F	W	S
Approved electives in biochemistry or plant physiological chemistry	5	5	5
Group requirement in Social Science	3	3	3
German	4	4	4
Statistical Methods (Mth 445)	3	---	---
¹ Electives	1	4	4
	16	16	16

MAJOR IN BIOCHEMISTRY

(See Common Freshman and Sophomore Years, page 161.)

	Junior Year		
	Term hours		
	F	W	S
Organic Chemistry (Ch 430, 431, 432)	5	5	5
Physical Chemistry (Ch 440, 441, 442)	4	4	4
² Biological Science sequence	5	5	5
Group requirement in Literature	3	3	3
	17	17	17

Senior Year

Approved electives in Biochemistry	5	5	5
Group requirement in Social Science	3	3	3
German	4	4	4
Statistical Methods (Mth 445)	3	---	---
Electives	---	3	3
	15	15	15

DEPARTMENT OF ENTOMOLOGY³

Undergraduate and graduate majors: Entomology, Applied Entomology, Bee Culture, Forest Entomology.

Freshman Year⁴

	Term hours		
	F	W	S
General Zoology (Z 200)	5	---	---
General Entomology (Ent 200)	---	5	---
Principles of Bacteriology (Bac 230)	---	---	3
Bacteriology Laboratory (Bac 200)	---	---	2
English Composition (Eng 111, 112, 113)	3	3	3
⁵ General Chemistry (Ch 204, 205), Qualitative Analysis (Ch 206)	5	5	5
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
	16-17	16-17	16-17

Sophomore Year

Principles of Forest Entomology (Ent 321), Introduction to Economic Entomology (Ent 314), Introduction to Bee Culture (Ent 335)	3	4	3
Entomological Nomenclature and Literature (Ent 352)	3	---	---
General Botany (Bot 201, 202), Field Botany (Bot 203)	3	3	3
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
Group requirement in Literature	3	3	3
Electives	---	2	3
	15-16	15-16	15-16

Junior Year

Group requirement in Social Science	3	3	3
Approved upper-division courses in Entomology	3	3	5
Historical Entomology (Ent 353)	4	4	---
Principles of Plant Pathology (Bot 351)	4	---	---
⁶ Electives	6	6	8
	16	16	16

Senior Year

Seminar (Ent 407)	1	1	1
⁶ Electives	15	15	15
	16	16	16

¹Junior or senior electives must include at least 9 hours of Life Sciences, which may include approved courses in agriculture or home economics.²Approved Life Science electives.³See GENERAL NOTES on page 158.⁴Students planning to major in Forest Entomology should confer with Dr. W. J. Chamberlin.⁵Prospective professional entomologists should elect Ch 251, 252, and 254, or their equivalent as early as convenient.

DEPARTMENT OF GEOLOGY¹

Undergraduate and graduate majors: General Geology, Paleontology, Professional Geology.

MAJOR IN GENERAL GEOLOGY

	Term hours		
	F	W	S
Freshman Year			
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
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
Electives	3-2	3-2	3-2
	16	16	16
Sophomore Year			
Group requirement in Language and Literature or Social Science	3	3	3
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
Geology electives	3	3	3
Electives	7-6	7-6	7-6
	16	16	16
Junior Year			
Upper-division Geology	4	4	4
Electives	12	12	12
	16	16	16
Senior Year			
Upper-division Geology	4	4	4
Electives	12	12	12
	16	16	16

MAJOR IN PALEONTOLOGY

For a major in paleontology, students will follow the curriculum in professional geology, making substitutions indicated.

MAJOR IN PROFESSIONAL GEOLOGY

	Term hours		
	F	W	S
Freshman Year			
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
Intermediate Algebra (Mth 100), Elementary Analysis (Mth 101, 102)	4	4	4
Engineering Drawing (GE 111, 112, 113)	2	2	2
Physical Education and Hygiene	1	1	1
Air, Military, or Naval Science (men)	2-3	2-3	2-3
	16-17	16-17	16-17
Sophomore Year			
Group requirement in Literature	3	3	3
Mineralogy (G 312, 313, 314)	4	4	4
² Chemistry	3-5	3-5	3-5
Physical Education	1	1	1
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Electives	2-0	2-0	2-0
	15-16	15-16	15-16
Junior Year			
Group requirement in Social Science	3	3	3
³ Upper-division Geology sequence	4	4	4
⁴ General Physics (Ph 201, 202, 203)	4	4	4
Plane Surveying (CE 226)	3	---	---
⁵ Advanced Field Geology (G 380)	---	---	3
⁶ Electives	2	5	2
	16	16	16

¹See GENERAL NOTES on page 158.²Ch 204, 205, 206 recommended if schedules permit.³Usual sequences are G 321, 322, 323; G 340, 341, 442; and G 412, 413, 414.⁴Paleontology students may substitute Z 201, 202, 203.⁵G 380 may be taken during the summer.⁶Recommended courses are Ch 232, 233 or 340; Ph 311, 312, 313; Mth 201, 202, 203, mining, metallurgy, hydraulics.

	Senior Year		
	Term hours		
	F	W	S
¹ Upper-division Geology sequence	4	4	4
Seminar (G 407)	1	1	1
² Advanced sequence in Science or Engineering	3-5	3-5	3-5
³ Electives	8-6	8-6	8-6
	16	16	16

DEPARTMENT OF MATHEMATICS⁴

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 Literature	3	3	3
Elementary Analysis (Mth 101, 102, 103)	4	4	4
English Composition (Eng 111, 112, 113)	3	3	3
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
Electives	3-2	3-2	3-2
	16	16	16

	Sophomore Year		
	F	W	S
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
Group requirement in Social Science	3	3	3
Physical or Biological Science	3	3	3
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
Electives	3-2	3-2	3-2
	16	16	16

	Junior Year		
	F	W	S
Upper-division Mathematics	6	6	6
Physical or Biological Science	3	3	3
Electives	7	7	7
	16	16	16

	Senior Year		
	F	W	S
Upper-division Mathematics	3	3	3
⁵ Electives	13	13	13
	16	16	16

DEPARTMENT OF PHYSICS⁴

Undergraduate major: Physics (Classical and Modern, including Measurements).

Graduate majors: Physics with theses in any of the Classical branches, Modern Physics, Electronics, Meteorology, Photography, Radio, and Applied Physics.

	Freshman Year		
	Term hours		
	F	W	S
Engineering Physics (Ph 101, 102, 103)	3	3	3
Elementary Analysis (Mth 101, 102, 103)	4	4	4
English Composition (Eng 111, 112, 113)	3	3	3
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
Electives	3-2	3-2	3-2
	16	16	16

	Sophomore Year		
	F	W	S
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)	5	5	5
Quantitative Analysis (Ch 234)			5
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
Elective	1-0	1-0	1-0
	16	16	16

¹Usual sequences are G 321, 322, 323; G 340, 341, 442; and G 412, 413, 414.²Recommended courses are Ch 232, 233 or 340; Ph 311, 312, 313; Mth 201, 202, 203, mining, metallurgy, hydraulics.³Students contemplating graduate work are advised to elect German, French, or Russian.⁴See GENERAL NOTES on page 158.⁵Include supporting science courses for students planning graduate work in mathematics.

	Term hours		
	F	W	S
Junior Year			
Group requirement in Literature	3	3	3
Mechanics (Ph 314, 315)	4	4	.....
Heat Measurements (Ph 353) .....	.....	.....	4
Electrical Measurements (Ph 331, 332, 333)	3	3	3
General Botany (Bot 201, 202)	3	3	.....
General Zoology (Z 200) .....	.....	.....	5
Electives	3	3	1
	16	16	16
Senior Year			
Group requirement in Social Science	3	3	3
Electronics and Radio (Ph 337, 338, 339)	3	3	3
Photography (Ph 361)	3	.....	.....
Light (Ph 465, 466) .....	.....	3	3
Electives	7	7	7
	16	16	16

DEPARTMENT OF SCIENCE EDUCATION²

Undergraduate and graduate majors: Biological Science (General Biology, Health Education, Human Biology), General Science, Mathematics, Physical Science.

The minimum requirements for students preparing to teach in any of the fields of this department are printed on pages 290-291. Additional courses are necessary to complete the requirements for a major in either the School of Science or the School of Education. For students qualifying for a degree in the School of Science, four-year programs in all majors are outlined according to objectives of students. Students who complete both human biology and health education teaching majors (page 291) meet the requirements for a major in the School of Science.

DEPARTMENT OF ZOOLOGY³

Undergraduate majors: Zoology with emphasis, if desired, on one of the fields of the graduate majors.

Graduate majors: Anatomy and Embryology, Physiology, Invertebrate Zoology and Parasitology, Cellular Biology, Natural History and Ecology.

	Term hours		
	F	W	S
Freshman Year			
English Composition (Eng 111, 112, 113)	3	3	3
General Zoology (Z 200)	5	(5)	(5)
General Entomology (Ent 200) or Bacteriology Laboratory (Bac 200) and Principles of Bacteriology (Bac 230) or General Botany (Bot 201, 202) .....	.....	(3-5)	(3-5)
General Chemistry (Ch 204, 205)	5	5	.....
Qualitative Analysis (Ch 206) .....	.....	.....	5
Physical Education	1	1	1
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Electives in biological sciences	(5)	5	5
	16-17	16-17	16-17
Sophomore Year			
Group requirement in Literature	3	3	3
Comparative Vertebrate Embryology (Z 326) and Comparative Vertebrate Anatomy (Z 324, 325)	4	4	4
Mathematics sequence	4	4	4
Physical Education	1	1	1
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Electives	1	1	1
	15-16	15-16	15-16
Junior Year			
Group requirement in Social Science	3	3	3
Physiology (Z 331, 332, 333) or equivalent	3	3	3
Genetics (Z 341) .....	.....	3	.....
Electives	10	7	10
	16	16	16

¹Suggestions: mathematics, photography, modern languages, physics. German, Russian, or French is recommended for students planning to earn the Ph.D. degree.

²See GENERAL NOTES on page 158.

	Term hours		
	F	W	S
Approved electives in invertebrate zoology	4	4	...
Zoology option (see major requirements in Zoology, item 6, page 201)	3-4	3-4	3-4
Electives	9-8	9-8	13-12
	16	16	16

PREMEDICAL CURRICULUM¹

(School of Science and Medical School)

A minimum of 138 term hours exclusive of air, military, or naval science is required before entering the Medical School. (See pages 155-156.)

	Term hours		
	F	W	S
English Composition (Eng 111, 112, 113)	3	3	3
General Chemistry (Ch 204, 205)	5	5	...
Qualitative Analysis (Ch 206) .....	...	...	5
General Zoology (Z 200)	5	...	...
Group requirement in Literature .....	...	3	3
² Elementary Analysis (Mth 101 and 102) .....	...	4	4
³ Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
	16-17	18-19	18-19

Sophomore Year

Group requirement in Literature	3	...	...
Genetics (Z 341) .....	...	3	...
⁴ Evolution (Z 345) or elective .....	...	...	3
Comparative Vertebrate Embryology (Z 326), Comparative Vertebrate Anatomy (Z 324, 325)	4	4	4
Organic Chemistry (Ch 226, 227), Quantitative Analysis (Ch 234)	5	5	5
Group requirement in Social Science	3	3	3
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
	18-19	18-19	18-19

Junior Year

General Physics (Ph 201, 202, 203)	4	4	4
German, French, Russian, or Spanish	4	4	4
⁴ Electives	8	8	8
	16	16	16

MAJOR IN SCIENCE AT OREGON 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. Biochemistry taken at medical school may be applied toward a major in chemistry, and physiology toward a major in zoology.

THREE-YEAR PREMEDICAL CURRICULUM¹

Freshman Year

	Term hours		
	F	W	S
English Composition (Eng 111, 112, 113)	3	3	3
² General Chemistry (Ch 101, 102, 103) or	3	3	3
General Chemistry (Ch 204, 205)	(5)	(5)	...
Qualitative Analysis (Ch 206) .....	...	...	(5)
General Zoology (Z 200)	5	...	...
Basic Design (AA 195) .....	...	...	2
Intermediate Algebra (Mth 100) .....	...	4	...
Elementary Analysis (Mth 101) .....	...	...	4
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
Elective .....	...	3	...
	14-17	16-18	15-17

¹See GENERAL NOTES on page 158.²Students beginning with Intermediate Algebra (Mth 100) may omit Mth 102.³Premedical and premedical students who elect Naval Science should pursue a four-year curriculum leading to a degree, either in zoology or general science. Physics must be included in the sophomore year.⁴Students should confer with their premedical adviser in the selection of all electives.⁵Those taking General Chemistry (Ch 101, 102, 103) must complete Qualitative Analysis (Ch 206) before enrolling for Organic Chemistry (Ch 226). See Sophomore Year.

	Term hours		
	F	W	S
Sophomore Year			
Group requirement in Social Science		6	3
General Physics (Ph 201, 202, 203)	4	4	4
Comparative Vertebrate Embryology (Z 326)	4		
Comparative Vertebrate Anatomy (Z 324, 325)		4	4
Qualitative Analysis (Ch 206)	5		
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
Elective			3
	16-17	17-18	17-18
Junior Year¹			
Organic Chemistry (Ch 226, 227)	5	5	
Quantitative Analysis (Ch 234)			5
Group requirement in Literature	3	3	3
Electives in art, languages, literature, music, and social science	7-9	7-9	7-9
	15-17	15-17	15-17

TWO-YEAR PRE-DENTAL CURRICULUM²

This curriculum should be attempted only by students with excellent high-school records. The student must have completed a year of high-school chemistry.

	Term hours		
	F	W	S
Freshman Year			
English Composition (Eng 111, 112, 113)	3	3	3
General Chemistry (Ch 204, 205)	5	5	
Qualitative Analysis (Ch 206)			5
General Zoology (Z 200)	5		
English Literature or Social Science		3	3
Intermediate Algebra (Mth 100)		4	4
Elementary Analysis (Mth 101)	2	2	2
Air or Military Science (men)	1	1	1
Physical Education	1	1	
	16	18	18
Sophomore Year			
Organic Chemistry (Ch 226, 227)	5	5	
Quantitative Analysis (Ch 234)			5
General Physics (Ph 201, 202, 203)	4	4	4
Basic Design (AA 195)	2		
Comparative Vertebrate Embryology (Z 326)	4		
Comparative Vertebrate Anatomy (Z 324, 325)		4	4
Air or Military Science (men)	2	2	2
Physical Education	1	1	1
Electives	1	3	3
	19	19	19

PRE-VETERINARY CURRICULUM³

See pages 156-157.

	Term hours		
	F	W	S
Freshman Year			
English Composition (Eng 111, 112, 113)	3	3	3
General Chemistry (Ch 204, 205, 206) or (Ch 101, 102, 103)	5-3	5-3	5-3
General Zoology (Z 200)			5
Introduction to Literature (Eng 104, 105)	3	3	
Social Science	3	3	3
Air or Military Science (men)	2	2	2
Physical Education	1	1	1
	17-15	17-15	19-17

¹On successful completion of the three-year program and 48 term hours (32 semester hours) of dental-school work, the student may be awarded a bachelor's degree in general science. If two years of a language are completed during the three-year program, the student may satisfy requirements for the bachelor of arts degree.

²See GENERAL NOTES on page 158.

³This curriculum is designed to meet the requirements for admission to the College of Veterinary Medicine, State College of Washington.

⁴Students who take Ch 101, 102, 103 instead of Ch 204, 205, 206 must take Ch 206, 5 term hours, in summer session following freshman year.

	Term hours		
	F	W	S
Sophomore Year			
Organic Chemistry (Ch 226, 227)	5	5	---
Physiological Chemistry (Ch 330, 331)	---	2	3
Comparative Vertebrate Embryology (Z 326)	4	---	---
General Bacteriology (Bac 204, 205)	---	3	3
Social Science	3	3	6
Art, Literature, Language, Music	3	3	3
Air or Military Science (men)	2	2	2
Physical Education	1	1	1
	18	19	18

PRENURSING CURRICULUM¹

FOUR-YEAR DEGREE CURRICULUM

See page 157.

	Term hours		
	F	W	S
Freshman Year			
General Chemistry (Ch 104, 105, 106)	4	4	4
English Composition (Eng 111, 112, 113)	3	3	3
English Literature (approved)	3	3	3
Backgrounds of Nursing (Nur 111, 112, 113)	1	1	1
Elementary Psychology (Psy 201)	---	---	3
Physical Education	1	1	1
Liberal-arts electives	4	4	1
	16	16	16

Sophomore Year

At Oregon State College:			
General Zoology (Z 201, 202)	3	3	---
Elements of Sociology (Soc 201, 202)	3	3	---
Food Preparation (FN 218)	3	---	---
Nutrition (FN 225)	---	3	---
Elementary Psychology (Psy 202, 203)	3	3	---
Physical Education	1	1	---
Liberal-arts electives	4	4	---
At the Medical School:			
Anatomy (An 311)	---	---	4
Bacteriology (Bac 230)	---	---	5
Organic and Biochemistry (Ch 255)	---	---	5
Elementary Pharmacology (Phc 213)	---	---	2
Elementary Nursing Arts (Nur 210)	---	---	1
	17	17	17

CURRICULUM IN PREPARATION FOR MEDICAL TECHNICIANS²

See page 157.

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	3	3	3
General Chemistry (Ch 104, 105, 106)	4	4	4
Literature or approved elective	3	3	3
General Hygiene (PE 150)	---	---	2
Physical Education	1	1	---
	17	17	18

Sophomore Year

General Bacteriology (Bac 204), Pathogenic Bacteriology (Bac 332, 333)	3	3	3
Organic Chemistry (Ch 226, 227)	5	5	---
or			
Organic Chemistry (Ch 221) and Elements of Biochemistry (Ch 250)	(4)	(4)	---
Quantitative Analysis (Ch 234)	---	---	5
Abridged General Physics (Ph 211, 212)	3	3	---
Elementary Physiology (Z 233)	---	---	5
Physical Education	1	1	1
Approved electives	5-6	4-5	3
	17	16	17

¹B.S. degree from Oregon State College. Students who wish to take a longer period of time to fulfill prenursing requirements may do so with the consent of the adviser.

²Students who wish to take a longer period of time to fulfill medical-technician requirements may do so with approval of the adviser.

General Science

CERTAIN phases of the instructional work of the School of Science are of general character, broader in scope and objective than any of the departments. The Department of General Science is peculiarly the ally of all 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 both to students majoring in science and to students in the professional schools.

Through a general science major students pursue a broad program of study in science, either for a liberal-arts degree or as preparation for professional service involving general science. Through the interdepartmental undergraduate and graduate majors students pursue one of the newer sciences such as biophysics, geophysics, life sciences, seismology, and other fields involving joint majors.

The survey courses in biological and physical sciences 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 science group requirement or as part of a teaching major or minor, 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. For general students and those majoring in fields other than biology. Three lectures; 1 two-hour laboratory period. Assistant Professor Beer.

GS 104, 105, 106. Physical Science Survey. 4 hours each term.

Fundamental principles of physics, chemistry, astronomy, and geology; development and application of the scientific method. For students majoring in fields other than the physical sciences who wish a broad view of the principles of several physical sciences. Three lectures; 1 one-hour laboratory-recitation period. Mr. Crews.

GS 261, 262, 263. Cartography. 3 hours each term.

Study and practice in techniques of cartography, field mapping, and reproduction methods essential to professional workers. Map layout and field sketching; projections, color, and advanced mapping. One lecture; 2 three-hour laboratory periods. Professor Jensen.

UPPER-DIVISION COURSES

GS 341. Bioecology. 3 hours.

Interrelations of plants and animals in their life processes, and their reaction upon the environment. Human relations and bioeconomics stressed. Prerequisite: one year of biological science and junior standing. Two lectures; 3 hours laboratory and field work. Assistant Professor Beer.

GS 342. Biogeography. 3 hours.

Plant and animal distribution; development of faunas and floras; biogeographic areas. Prerequisite: one year of biological science, GS 341, and junior standing. Two lectures; 3 hours laboratory and field work. Assistant Professor Beer.

GS 401. Research. Terms and hours to be arranged.**GS 403. Thesis.** Terms and hours to be arranged.**GS 405. Reading and Conference.** Terms and hours to be arranged.**GS 407. Seminar.** 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. Offered alternate years. Offered 1951-52. Professor Gilfillan.

GS 421, 422, 423. Classics of Science. (G) 2 hours each term.

Works notable in the development of science, studied for (1) significance to science and (2) form; biographies of men of science studied as background. Prerequisite: eighteen hours of upper-division science, or equivalent. Offered alternate years. Not offered 1951-52. Professor Gilfillan.

GS 461, 462, 463. Physical Geography. 3 hours each term.

Physical aspects of earth's surface; their description, analysis, classification, interpretation, distribution, and interrelationships. Fall: climatology. Winter: climatography. Spring: land forms. GS 461 and 463 may be taken separately, but 461 is prerequisite to 462. Prerequisite: upper-division standing and one year of college geography or physical science. Professor Jensen, Associate Professor Highsmith.

GS 467, 468, 469. Natural Resources of United States. (G) 3 hours each term.

Present utilization and problems, potential development. Fall: land, soil, and water resources. Winter: resources of the seas and natural vegetation. Spring: mineral resources. Prerequisite: two years upper-division science including GS 461, 462, 463 or equivalent. Two two-hour periods. Professor Jensen, Associate Professor Highsmith.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

GS 501. Research. Terms and hours to be arranged.**GS 503. Thesis.** Terms and hours to be arranged.**GS 505. Reading and Conference.** Terms and hours to be arranged.**GS 507. Seminar.** Terms and hours to be arranged.

Bacteriology and Hygiene

BACTERIOLOGY, especially through its application 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 its importance. The graduate majors include general bacteriology, industrial bacteriology, dairy bacteriology, food bacteriology, hygiene and sanitation, and soil bacteriology. As agriculture and allied fields are vital in Oregon industrial life, a valuable and practical field of research is open to the student taking advanced work in agricultural bacteriology. Similarly, the recent trend toward industrialization in certain parts of the state, with attendant increases in population densities, demands more bacteriologists with specialized training in sanitation.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

***Bac 200. Bacteriology Laboratory.** 2 hours.

May be taken only with Bac 230, which combination may be used in meeting science group requirement. Two two-hour laboratory periods.

***Bac 201, 202, 203. Elementary Bacteriology.** 3 hours each term.

Bacteriology of food and water supplies; sanitation and hygiene; infectious disease; sewage disposal, etc. Two lectures; 1 two-hour laboratory period.

***Bac 204, 205, 206. General Bacteriology.** 3 hours each term.

Bac 204: Characteristics of bacteria, yeasts, molds, viruses and related organisms; elementary technique in cytology, taxonomy, and physiology. Bac 205: Application of microbiology to dairy, soils, industry, sanitation and the home. Bac 206: Fundamental factors in growth and death of microorganisms; systematic identification of microorganisms and a study of their metabolisms. Prerequisite: one year of chemistry. Two lectures; 2 two-hour laboratory periods. Bac 204 is offered each term.

Bac 230. Principles of Bacteriology. 3 hours spring.

Fundamentals of bacteriology with application to agriculture, industry, sanitation, disease. Prerequisite: one year of chemistry.

Bac 261. Sanitary Bacteriology. 3 hours.

Principles of bacteriology as applied to problems of community and municipal sanitation. Two lectures; 2 two-hour laboratory periods.

UPPER-DIVISION COURSES

Bac 321. Sanitation. 3 hours winter.

Sanitation in home, school, city, with particular reference to control of communicable diseases and their relation to foods, rodents, swimming pools, eating establishments, insects, ventilation, industrial hygiene, etc. Prerequisite: one term of general bacteriology or equivalent.

Bac 332, 333. Pathogenic Bacteriology. 3 hours each term.

Confined strictly to the microorganisms associated with disease in man. Prerequisite: Bac 204. Two lectures; 2 two-hour laboratory periods. Professor Simmons.

Bac 341. Clinical Laboratory Procedure. 3 hours fall.

Microscopic and clinical examination of body fluids such as blood, urine, gastric contents, exudates, transudates, stools, etc., usually carried out to aid the physician in making a diagnosis of pathological processes in man. Prerequisite: Bac 332, 333. Two lectures; 2 two-hour laboratory periods. Professor Simmons.

* Students may receive credit only for Bac 230 with Bac 200; or for Bac 204; or for Bac 201, 202, 203.

Bac 351. Serology. 3 hours.

Theories of immunity and application of serological procedures to diagnosis, treatment, and prevention of disease. Prerequisite: Bac 333. Two lectures; 2 two-hour laboratory periods. Professor Simmons.

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.** 1 hour each term. Staff.**Bac 411. Dairy Bacteriology.** (g) 3 hours winter.

Physiological activities of dairy microorganisms; production and processing milk and cream with emphasis on sanitation and public health problems. Prerequisite: Bac 204 and Ch 221, 226, or 250. Two lectures; 2 two-hour laboratory periods. Professor Elliker.

Bac 412. Dairy Bacteriology. (G) 3 hours spring.

Continuation of Bac 411. Microbiology of milk products; a more thorough study of specific problems in dairy microbiology and training in advanced techniques. Prerequisite: Bac 411. Two lectures; 2 two-hour laboratory periods. Professor Elliker.

Bac 421. Soil Bacteriology. (G) 4 hours.

Relation of microorganisms to soil fertility; biochemistry of humus decomposition; nitrogen-fixation; ammonification. Prerequisite: Bac 204. Two lectures; 3 two-hour laboratory periods. 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. Professor Bollen.

Bac 425, 426. Community Health Problems. (g) 3 hours each term.

Application of the principles of hygiene to sanitary, statistical, governmental, epidemiological, and sociological problems. Prerequisite: junior or senior standing. Acceptable toward major in hygiene and sanitation but not toward bacteriology major. Professor Anderson.

Bac 431. Bacteriological Technique. (G) 5 hours fall.

Intensive study of the fundamental principles involved in the study of bacteria. Prerequisite: Bac 206 or equivalent and two years of chemistry. Three lectures; 2 two-hour laboratory periods. Professor Bollen.

Bac 441. Systematic Bacteriology. (G) 3 hours winter.

Taxonomy and nomenclature; history of bacterial classification; International Rules of Nomenclature and Bacteriological Code; Bergey's Manual. Prerequisite: Bac 206 or equivalent and two years of chemistry. Professor Bollen.

Bac 442. Systematic Bacteriology Laboratory. (G) 2 hours winter.

Laboratory studies to accompany Bac 441. Prerequisite: Bac 431. Two two-hour laboratory periods. Professor Bollen.

Bac 451. Physiology of Bacteria. (G) 3 hours spring.

Bacterial growth, reproduction, and death factors of environment; digestion and metabolism; microbial nutrition enzymes and fermentations. Prerequisite: Bac 206 and organic chemistry. Assistant Professor Gerhardt.

- Bac 452. **Physiology of Bacteria Laboratory.** (G) 2 hours spring.
Laboratory studies to accompany Bac 451. Prerequisite: Bac 442. Two two-hour laboratory periods. Assistant Professor Gerhardt.
- Bac 453. **Epidemiology.** 3 hours spring.
Causes and behavior of communicable diseases in general population; factors influencing occurrence of epidemics; basic principles underlying control. Prerequisite: Bac 205 or equivalent. Acceptable toward major in hygiene and sanitation but not toward bacteriology major. Professor Anderson.
- Bac 460. **Food Bacteriology.** (g) 3 hours fall.
Role of microorganisms in sanitary production and handling of foods; control of microorganisms in relation to health and disease; methods of examining foods. Prerequisite: Bac 205 or equivalent. Two lectures; 2 two-hour laboratory periods. Professor Simmons.
- Bac 480. **History of Bacteriology.** (G) 3 hours fall.
Rise and development of bacteriology in reference to medicine and industry. Prerequisite: one year upper-division bacteriology. Offered alternate years. Not offered 1951-52.
- Bac 490. **Industrial Microbiology.** (G) 3 hours winter.
Microorganisms in industrial processes; technology of production of organic acids, solvents, antibiotics, and enzymes of microbiological origin. For advanced students in bacteriology, chemistry, and chemical engineering. Prerequisite: one year bacteriology, two years of chemistry, consent of instructor. Two lectures; 2 two-hour laboratory periods. Offered alternate years. Offered 1951-52. Assistant Professor Gerhardt.

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. Staff.
- Bac 530. **Marine Bacteriology.** 3 hours summer.
Microorganisms of ocean water, their ecology and economic importance. Prerequisite: one year upper-division bacteriology. Given in summer session at Institute of Marine Biology. Two lectures; 2 two-hour laboratory periods.
- Bac 551, 552. **Advanced Bacterial Physiology.** 3 hours each term, fall and winter.
Growth, fermentation, and death of microorganisms; emphasis on the morphology, cytology, and cell microchemistry. Prerequisite: Bac 451 or equivalent; organic and physical chemistry. One lecture; 2 two-hour laboratory periods. Professor Bollen and Assistant Professor Gerhardt.
- Bac 553. **Biochemistry of Bacteria.** 3 hours spring.
Changes that microorganisms induce in the substratum; isolation and identification of fermentation products; factors involved in fermentative variability. Prerequisite: Bac 551, 552, and Organic Analysis. One lecture; 2 two-hour laboratory periods.

Botany

THE courses offered 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 wishing a liberal-arts major in botany.

In the professional field it is proposed to meet the needs of students preparing (1) to be plant pathologists, plant physiologists, ecologists, taxonomists, or for other specialized positions at experiment stations, in the United States Department of Agriculture, or in other research institutions, or to teach botany or do 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 paleontology.

The herbarium collections total more than 131,000 specimens, including over 77,283 classified specimen sheets of higher plants, 10,000 unmounted specimens, 40,000 packets of parasitic fungi, 2,318 myxomycetes, 800 packets of bryophytes, and 1,000 packets of algae.

The Oregon Institute of Marine Biology on Coos Bay provides unusual opportunities for field work and research with marine plants during the summer session. Courses are offered at the upper-division and graduate levels. Credit obtained applies directly at Oregon State College or may be transferred to another institution. It is recommended that all majors spend one summer in residence at the Institute.

Excellent greenhouse facilities are available at Oregon State College for botanical instruction and research.

An extensive and diversified research program relating to plant disease is conducted in the Botany Department by state and federal investigators. This involves the use of modern equipment and techniques in laboratory, greenhouse, and field. A number of graduate students are granted research assistantships and are thus enabled to gain valuable training in research under the guidance of these state experiment station workers. Occasionally a graduate student may obtain part-time employment and experience under some of the federal plant pathologists.

Botany students also have a special advantage 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. General Botany. 3 hours each term.

How plants get their food, grow, differentiate, and reproduce. Three two-hour conference periods.

Bot 203. Field Botany. 3 hours spring.

Introductory taxonomy and ecology of native flowering plants. One lecture; 1 recitation; 2 two-hour laboratory periods.

*Bot 211. Elementary Botany. 3 hours fall.

Morphology and economic importance of the algae, fungi, mosses, and ferns; structure, physiology, and development of seed plants. One lecture; 1 recitation; 2 two-hour laboratory periods. Associate Professor Smith.

* Credit not allowed to students who have taken Bot 201, 202.

UPPER-DIVISION COURSES

- Bot 314. **Agrostology**. 3 hours spring.
Taxonomy of grasses. Special emphasis on ecology and identification vegetatively and in flower. Range and pasture ecology; requirements, distribution, and value of range grasses. Prerequisite: Bot 203. Two lectures; 2 two-hour laboratory periods. Assistant Professor Chilcote.
- Bot 315. **Forest Pathology**. 3 hours winter.
Damage, nature, cause, and prevention of tree diseases and timber defects. Prerequisite: Bot 201, 202. One lecture; 2 two-hour laboratory periods. Associate Professor Roth.
- Bot 316. **Aquatic Plants**. 3 hours fall.
Food plants of wild fowl, particularly of Pacific Coast; identification and distribution of species; growth-limiting factors. Prerequisite: Bot 203 or equivalent. One lecture; 2 three-hour laboratory periods. Professor Gilkey.
- Bot 320. **Fungous Deterioration of Wood Products**. 3 hours winter.
Relation of decay in standing timber to decay of wood products; fungous deterioration of logs, lumber, and remanufactured products; destruction of plywood, bonding materials, wood pulp; decay in structures. Prerequisite: Bot 201, 202. Two lectures; 1 three-hour laboratory period. Offered alternate years. Offered 1951-52. Associate Professor Roth.
- Bot 321. **Systematic Botany**. 4 hours spring.
Principles of classification; families and orders; collection and identification of higher plants. Prerequisite: Bot 201, 203 or equivalent. Two lectures; 2 three-hour laboratory periods. Professor Gilkey.
- Bot 331. **Principles of Plant Physiology**. 4 hours any term.
Physiology of living plants with 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. Associate Professor Belkengren.
- Bot 341. **Principles of Plant Ecology**. 4 hours fall or spring.
Interrelationships of plant and environment; succession and ecological structure of the plant community; economic ecology. Prerequisite: Bot 201, 202, 203. Two lectures; 2 two-hour laboratory periods. Assistant Professor Chilcote.
- Bot 351. **Principles of Plant Pathology**. 4 hours fall or spring.
Cause, symptoms, effects, spread, and control of plant diseases; laboratory examination of typical specimens. Prerequisite: Bot 201, 202. Two lectures; 3 two-hour laboratory periods. Professor Dietz, Associate Professor Roth.
- Bot 370. **Microtechnique**. 4 hours winter.
Principles and practices in preparation of permanent microscopic slides of plant materials. Prerequisite: Bot 201, 202. Three three-hour laboratory periods. Associate Professor Smith.
- Bot 371. **Structure of Economic Plants**. 4 hours winter.
Morphology, anatomy, reproduction of economic plants. Prerequisite: Bot 201, 202. Two lectures; 2 three-hour laboratory periods. Associate Professor Smith.
- 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.** Terms and hours to be arranged.
- Bot 411, 412, 413. **Morphology.** (G) 4 hours each term.
Fall: algae, fungi, lichens; winter: bryophytes, pteridophytes; spring: spermatophytes. Prerequisite: Bot 201, 202, 203 and three terms upper-division botany or zoology. Two lectures; 2 three-hour laboratory periods. Associate Professor Phinney.
- Bot 421, 422, 423. **Advanced Systematic Botany.** (G) 3 hours each term.
Field and laboratory studies of higher plants; phylogeny; preferred systems; evaluation of taxonomic criteria. Prerequisite: Bot 321 and 371, or equivalent. One lecture; 2 three-hour (or 3 two-hour) laboratory periods. Professor Gilkey.
- Bot 431, 432, 433. **Advanced Plant Physiology.** (G) 3 hours each term.
Plant-water relationships; synthesis and metabolism of organic compounds; mineral nutrition; hormones; bioelectric phenomena. Prerequisite: Bot 331 and one term organic chemistry. Associate Professor Belkengren.
- Bot 434, 435, 436. **Research Methods in Plant Physiology.** (G) 2 hours each term.
Laboratory paralleling Bot 431, 432, 433. Assigned readings and conferences. Prerequisite or parallel: Bot 431. Two three-hour laboratory periods. Associate Professor Belkengren.
- Bot 441, 442, 443. **Advanced Plant Ecology.** (G) 3 hours each term.
Environmental factors; applied ecology; bioeconomics; conservation; plant indicators; autoecology. Prerequisite: Bot 321 and 341, or equivalent. Two lectures; 1 three-hour laboratory period. Assistant Professor Chilcote.
- Bot 451. **Research Methods in Plant Pathology.** (G) 3 hours fall.
Problems involved in study and research on fungus, bacterial, and virus diseases of plants. Prerequisite: Bot 331, 351, and 370, or equivalent. One lecture; 2 three-hour laboratory periods. Associate Professor Roth.
- Bot 452. **Field and Truck Crop Diseases.** (g) 3 hours winter.
Chief diseases of field crops and vegetables; control. Prerequisite: Bot 351 or equivalent. Three two-hour periods. Offered alternate years. Not offered 1951-52. Associate Professor Roth.
- Bot 453. **Fruit Diseases.** (g) 3 hours spring.
Chief diseases of fruits and their control. Prerequisite: Bot 351 or equivalent. Three two-hour periods. Offered alternate years. Not offered 1951-52. Associate Professor Roth.
- Bot 461, 462, 463. **Mycology.** (G) 3 hours each term.
Morphology, identification and classification of the fungi. Prerequisite: Bot 411 or equivalent. One lecture; 2 three-hour laboratory periods. Associate Professor Roth.
- Bot 470. **Cytological Microtechnique.** (G) 4 hours spring.
Making slides for cytological study of reduction divisions. Prerequisite: Bot 370. Three three-hour laboratory periods. Offered alternate years. Offered 1951-52. Associate Professor Smith.
- Bot 471. **Plant Anatomy.** (G) 3 hours fall.
Microscopic structure and development of plant tissues. Prerequisite: Bot 201, 202, 371 and two terms of upper-division botany, or equivalent. One lecture; 2 three-hour laboratory periods. Associate Professor Smith.

- Bot 472. **Plant Cytology.** (G) 4 hours spring.
Cell components; 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. Associate 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.
GENERAL SEMINAR.
PHYSIOLOGY AND ECOLOGY SEMINAR.
PLANT PATHOLOGY SEMINAR.
- Bot 511. **Fresh-water Algae.** 4 hours spring.
Taxonomy and ecology of the fresh-water algae. Prerequisite: Bot 411. Two lectures; 2 three-hour laboratory periods. Associate Professor Phinney.
- Bot 541. **Plant Geography.** 3 hours fall.
Distribution, development, and history of vegetation areas of the world, particularly North America; paleogeography; paleobotany; paleoecology. Prerequisite: Bot 321, 341, 441. Two lectures; 1 three-hour laboratory period. Offered alternate years. Offered 1951-52. Assistant Professor Chilcote.
- Bot 542. **Plant Communities.** 3 hours winter.
Major plant communities, their structure, composition, and phytosociological status; ecology of principal species. Emphasis on North America and the Pacific Northwest. Prerequisite: Bot 321, 331, 341, 442, 470. Two lectures; 1 three-hour laboratory period. Offered alternate years. Offered 1951-52. Assistant Professor Chilcote.
- Bot 543. **Field Ecological Methods.** 3 hours spring.
Statistical analysis of the plant community; measurement of the physical environment; use of ecological instruments. Prerequisite: Bot 341, 443, 542. One lecture; 2 three-hour laboratory periods. Assistant Professor Chilcote.
- Bot 551. **Virus Diseases of Plants.** 3 hours fall.
Nature and properties of plant viruses; plant reactions; classification and nomenclature; transmission; control. Prerequisite: Bot 351, six hours upper-division biological science, and consent of instructor. Two lectures; 1 three-hour laboratory period. Professor Milbrath.
- Bot 552. **Bacterial Diseases of Plants.** 3 hours winter.
Symptoms and control of bacterial plant diseases; determination; classification; parasitism of causal agents. Prerequisite: Bot 351, Bac 204, six hours upper-division biological science, and consent of instructor. Two lectures; 1 three-hour laboratory period. Offered alternate years. Offered 1951-52. Associate Professor Young.

- Bot 553. **Fungus Diseases of Plants.** 3 hours spring.
Symptoms and control of fungus diseases; phenomena of infection and development of host-parasite relationships. Prerequisite: Bot 351 or equivalent, 6 hours of upper-division botany. Two lectures; 1 three-hour laboratory period. Professor Dietz.
- Bot 554. **Nematode Diseases of Plants.** 3 hours spring.
Principles of nematology; identification and biology of plant-parasitic and free-living nematodes with special emphasis on symptomatology and control of nematode diseases of crops. Prerequisite: Bot 351 or equivalent, 6 hours of upper-division biological science and consent of instructor. Two lectures; 1 three-hour laboratory period. Mr. Jensen.
- Bot 560. **Plant Disease Control.** 3 hours spring.
Methods and materials applied to control parasitic diseases of plants. Prerequisite: Bot 351, Ch 226, 227, or equivalent. Two lectures; 1 three-hour laboratory period. Offered alternate years. Not offered 1951-52. Associate Professor Young.

Chemistry

IN THE first three years of the chemistry curricula 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 second or third 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 forest products chemistry. In addition the student is urged to broaden his training by utilizing some of the large numbers of elective hours to take courses in the humanities.

The Department of Chemistry aims to prepare its major students for (1) graduate work in pure or applied chemistry; (2) governmental work under the Civil Service; (3) teaching positions in colleges, universities, junior colleges, and secondary schools; (4) positions as research chemists and technical experts in commercial testing laboratories of all types, and in chemical industries; (5) 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 curricula serve 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, physics, and biology, substantially equivalent to that required of undergraduate students in the several chemistry curricula.

The curriculum, staff, library, and laboratory facilities of the Department of Chemistry have been examined by the Committee on Professional Training of Chemists of the American Chemical Society. Graduating chemistry majors are approved as having met all requirements of the American Chemical Society.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- *Ch 101, 102, 103. **General Chemistry.** 3 hours each term.
For students in agriculture, home economics, and other fields requiring a general course. It does not include qualitative analysis. One lecture; 1 recitation; 1 three-hour laboratory period. Students whose college aptitude test scores indicate the need will be required to attend one extra recitation per week without additional credit.
- *Ch 104, 105, 106. **General Chemistry.** 4 hours each term.
Required for nursing-education and medical-technician students. One lecture; 2 recitations; 1 three-hour laboratory period. (See statement under Ch 101 concerning aptitude examinations.)
- *Ch 130. **Descriptive General Chemistry.** 3 hours spring.
Nonlaboratory course as an aid to better understanding of the numerous chemical developments in the commercial and industrial world; particularly for forestry students. May not be substituted for other chemistry courses.
- *Ch 201, 202, 203. **General Chemistry.** 3 hours each term.
Course content particularly adapted for students in engineering. One lecture; 1 recitation; 1 three-hour laboratory period.
- *Ch 204, 205. **General Chemistry.** 4 or 5 hours each term.
The basic principles of general chemistry for students majoring in chemistry, chemical engineering, or premedical, and for others requiring extensive knowledge of the subject. Two lectures; 1 recitation; 2 three-hour laboratory periods. Students registered for 4 credits take but one laboratory period.
- *Ch 206. **Qualitative Analysis.** 4 or 5 hours spring or fall.
Chemistry of selected metallic elements and semimicro qualitative analysis. A sequence with Ch 204 and 205, or with Ch 101, 102, 103. Two lectures; 1 recitation; 2 three-hour laboratory periods.
- *Ch 221. **Organic Chemistry.** 4 hours.
Organic chemistry adapted to use of home-economics students. Prerequisite: Ch 103. Two lectures; 2 three-hour laboratory periods.
- *Ch 226. **Organic Chemistry.** 5 hours.
Carbon compounds of the aliphatic series. Prerequisite: Ch 206. Two lectures; 1 recitation; 2 three-hour laboratory periods.
- *Ch 227. **Organic Chemistry.** 5 hours winter or spring.
An intensive study of the chemistry of the aromatic series. Prerequisite: Ch 226.
- *Ch 232, 233. **Quantitative Analysis.** 4 or 5 hours each term, winter and spring.
Fundamental principles and laboratory practice. Prerequisite: Ch 206. Two lectures; 2 or 3 three-hour laboratory periods.
- *Ch 234. **Quantitative Analysis.** 5 hours fall or spring.
Principles of gravimetric analysis and volumetric analysis. Designed for pharmacy and premedical students and medical technicians. Prerequisite: Ch 103. Two lectures; 3 three-hour laboratory periods.

* Certain courses cover somewhat similar ground, and credit cannot be had for duplication. For any sequence or combination of General Chemistry courses the terminal course being Ch 103, a maximum of 9 term hours is allowed; the terminal course being 106, a maximum of 12 term hours is allowed; the terminal course being Ch 206, a maximum of 15 term hours is allowed. Credit for Ch 221 will not be allowed if Ch 226 is taken. Ch 251 and Ch 226 will not both be credited. Ch 226, Ch 227, and Ch 432 can be used as a sequence, but this does not give upper-division credit for Ch 226, 227. Credit cannot be had for both Ch 232 and Ch 234.

- Ch 241. **Chemical Theory.** 4 hours fall.
Theory and calculations in inorganic chemistry as a foundation for industrial chemistry. Prerequisite: Ch 206. Three lectures; 1 two-hour computation period.
- Ch 242. **Quantitative Analysis for Chemical Engineering Students.** 4 hours.
Brief course covering theory and practice in typical methods of gravimetric and volumetric analysis. Prerequisite: Ch 241. Two lectures; 2 three-hour laboratory periods.
- Ch 243. **Commercial Methods of Analysis.** 4 hours spring.
Theory and practice in analysis and testing of water, oil, gaseous, and solid fuels and other materials of industrial importance. Prerequisite: Ch 242. Two lectures; 2 three-hour laboratory periods.
- Ch 250. **Elements of Biochemistry.** 4 hours winter.
Proteins, carbohydrates, fats, and other compounds having biochemical significance; fundamentals of analysis as applied in this work. Prerequisite: Ch 221 or equivalent. Two lectures; 2 three-hour laboratory periods.
- Ch 251, 252. **Organic and Agricultural Biochemistry.** 5 hours fall, 3 hours winter.
Fall: a one-term course in organic chemistry for students in agriculture, intended to provide a background for elementary biochemistry. Prerequisite: Ch 103. Three lectures; 2 three-hour laboratory periods. Winter: an introductory study of the chemistry and biochemistry of carbohydrates, lipids and proteins. Prerequisite: Ch 251 or equivalent. Two lectures; one recitation.
- Ch 253. **Agricultural Biochemistry.** 2 hours winter.
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.
The chemistry involved and techniques employed in winning various metals from ores, including principles of fire assaying; special attention to chemical treatment and analysis of Northwest chemicals. Prerequisite: Ch 206. One lecture; 1 five-hour laboratory period. Professor Caldwell.
- Ch 330, 331. **Physiological Chemistry.** 2 hours winter, 3 hours spring.
For home economics, pharmacy, and bacteriology students. Prerequisite: Ch 251 or 227. One lecture, 1 three-hour laboratory period, winter; 2 lectures, 1 three-hour laboratory period, spring. Professor Pease.
- *Ch 340. **Elementary Physical Chemistry.** 3 hours.
Kinetic theory, atomic structure, molecular weights, classification of elements, solubility, ionization, colloids, hydrogen-ion measurements, electrochemistry. The use of mathematics minimized. Prerequisite: Ch 203 or equivalent and some knowledge of physics.

* Credit will not be given for Ch 340 if Ch 440, 441, 442 are taken later.

- Ch 350, 351, 352. **Agricultural Chemistry.** 3 hours each term.
Fundamental analytical chemistry of carbohydrates, lipids, proteins, food industries products, feed materials, fertilizers, insecticides, etc. Stresses instrumental and chemical methods. Intensive reading and laboratory work. Prerequisite: organic and quantitative analysis. One lecture; 2 three-hour laboratory periods. Assistant Professor Reese.
- 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.
- 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.** 1 hour each term.
- Ch 411, 412, 413. **Advanced Inorganic Chemistry.** (g) 2 hours each term.
Chemistry of inorganic elements and compounds from the standpoint of the periodic table and atomic structure; inorganic isomerism and complex compounds; chemical conversion of inorganic materials for industrial use. Prerequisite: three years college chemistry. Staff.
- 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.
- Ch 418. **History of Chemistry.** (G) 3 hours.
Rise and development of chemical theories and laws. Prerequisite: three years of chemistry. Professor Friedman.
- Ch 419. **Advanced Qualitative Analysis.** (G) 4 hours fall.
Advanced theory of qualitative analysis with particular attention to the analysis of anions and the less common elements, together with practice in dissolving resistant materials. Prerequisite: three years of college chemistry. Two lectures; 2 three-hour laboratory periods.
- Ch 420, 421, 422. **Advanced Quantitative Analysis.** (g) 3 hours each term.
Analytical procedures such as those of electroanalysis, fuel analysis, analysis of nonferrous alloys, water, iron, and steel. Prerequisite: three years college chemistry. One lecture; 2 three-hour laboratory periods.
- Ch 423. **Organic Quantitative Microanalysis.** (G) 3 hours.
Laboratory practice in methods of quantitative organic microanalysis. Prerequisite: Ch 233, 432. One lecture; 2 three-hour laboratory periods. Professor Christensen.
- Ch 424. **Chemical Microscopy.** (g) 3 hours fall.
Theory and use of microscope in microscopical measurements, quantitative analysis of mixtures, identification of organic compounds, optical crystallography, crystallization phenomena, etc. Prerequisite: three years of college chemistry, college physics. One lecture; 2 three-hour laboratory periods. Associate Professor Williams.
- Ch 425. **Instrumental Analysis.** (G) 3 hours winter.
Principles and practice in the use of special optical and electrical instrumental methods of analysis; spectroscopy, colorimetry, spectrophotometry, etc. Prerequisite: Ch 442. One lecture; 2 three-hour laboratory periods. Associate Professor Williams.

- Ch 426. **Gas, Oil, and Fuel Analysis.** (g) 3 hours.
Analysis of natural, artificial, and flue gases; gas calorimetry; coal calorimetry; physical testing of oils. Prerequisite: three years college chemistry. One lecture; 2 three-hour laboratory periods. Associate Professor Williams.
- Ch 427, 428, 429. **Advanced Laboratory Methods.** (G) 2 hours each term.
Principles and practice in fractionation, crystallization, filtration, adsorption, extraction, hydrogenation, and chlorination. Prerequisite: Ch 432, 442. One lecture; 1 three-hour laboratory period. Professor Christensen.
- Ch 430, 431, 432. **Organic Chemistry.** (g) 4 or 5 hours each term.
Compounds of carbon; compounds important from the theoretical, technical, and biological standpoints; aliphatic compounds; aromatic series. Prerequisite: two years of college chemistry. For 4 hours credit: 3 lectures; 1 three-hour laboratory period. For 5 hours credit: 3 lectures; 2 three-hour laboratory periods. Professor Christensen.
- 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. Professor Pease.
- Ch 434, 435, 436. **Organic Preparations.** (G) 1 or 2 hours each term.
Important methods of synthesis, such as Grignard's, Friedel-Craft's, Perkins' reaction, and others. Prerequisite: Ch 432 or equivalent. One three-hour laboratory period per hour of credit. Professor Pease.
- Ch 437, 438, 439. **Organic Chemistry.** (G) 2 hours each term.
Continuation of Ch 432. Emphasis on the methods of synthesis, interpretation of reactions, and structure of organic compounds. Two lectures. Staff.
- Ch 440, 441, 442. **Physical Chemistry.** (g) 4 hours each term.
Molecular weights, properties of liquids, solids and solutions, chemical equilibrium, reaction kinetics, electrochemistry, atomic and molecular structure. Prerequisite: quantitative analysis, and calculus. Three lectures; 1 three-hour laboratory period. Professor Gilbert, Assistant Professor Decius.
- Ch 443. **Chemical Literature.** (G) 1 hour fall.
Use of the chemical literature; character of various chemical journals, dictionaries, reference books, and other sources of information. 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, fugacity 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. Designed to precede Ch 465. A knowledge of thermodynamics is desirable preparation. Prerequisite: Ch 442. Associate Professor Scott.
- Ch 448, 449. **Colloidal Chemistry.** (G) 3 hours each term.
Properties and preparation of substances in the colloidal state. Laboratory courses Ch 467 and 468 accompany this course. Prerequisite: three years of college chemistry. Professor Friedman.

- Ch 450, 451, 452. **Biochemistry.** (G) 3 or 5 hours each term.
Fall: carbohydrates, proteins and fats of importance in biological systems.
Winter: vitamins and enzymes. Spring: metabolism. Prerequisite: organic chemistry. Three lectures; 2 three-hour laboratory periods. Professors Butts and Cheldelin.
- Ch 453. **Plant Physiological Chemistry.** (G) 5 hours spring.
Prerequisite: Ch 451. Professor Cheldelin.
- Ch 454, 455, 456. **Agricultural Biochemical Methods.** (G) Hours to be arranged.
Advanced theory and practice on the chemistry of colloids, carbohydrates, lipids, amino acids and proteins, vitamins, enzymes, pigments, etc., of both plant and animal significance. Emphasis on newer analytical methods and techniques, both instrumental and chemical. Prerequisite: organic chemistry and quantitative analysis. Assistant Professor Reese.
- Ch 457. **Dairy Chemistry.** (g) 3 hours.
Physical, physiochemical, and chemical properties of milk and milk products; chemistry of the individual constituents of milk, including the enzyme systems; principles involved in processing dairy products. Prerequisite: Ch 251. Ch 340 recommended. Professor Richardson.
- Ch 458. **Dairy Chemistry Laboratory.** (g) 2 hours.
Laboratory course to accompany Ch 457. Two three-hour laboratory periods. Professor Richardson.
- Ch 460, 461. **Pulp and Paper Chemistry.** (G) 3 hours winter and spring.
Fundamental chemical processes of pulp and paper industry. Prerequisite: Ch 470. Professor Friedman.
- Ch 462. **Pulp and Paper Chemistry.** (G) 3 hours spring.
Chemical evaluation of cellulose pulps. Measurements of bleachability; alpha, beta, and gamma cellulose; pulp viscosity; copper number; cellulose fractionations. Prerequisite: Ch 460. One lecture; 2 three-hour laboratory periods. Professor Friedman.
- Ch 465. **Applied Electrochemistry.** (G) 3 hours winter.
Laboratory study and calculations of fundamental phenomena underlying applied electrochemistry, such as polarization, overvoltage, corrosion, electrode potentials; laboratory instruments. Prerequisite: Ch 442. One lecture; 1 recitation; 1 four-hour laboratory period. Associate Professor Schulein.
- 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. Associate Professor Schulein.
- Ch 467, 468. **Colloidal Chemistry Laboratory.** (G) 1 hour each term.
Prerequisite or parallel: Ch 448, 449. Professor Friedman.
- Ch 470. **Wood Chemistry.** (G) 3 hours fall.
Components of wood and related materials. Prerequisite: organic chemistry. Professor Kurth.

- Ch 471. **Chemical Analysis of Wood and Related Products.** (G) 3 hours winter.

Laboratory methods of analysis of woods and related fibrous materials. Prerequisite: analytical and organic chemistry. One lecture; 2 three-hour laboratory periods. Professor Kurth.

- Ch 480, 481, 482. **Physical Chemistry.** (G) 2 hours each term.

Review of fundamentals and more advanced study of physical chemistry principles. Prerequisite: Ch 442 or equivalent. Staff.

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 have all the facilities of the laboratory at their disposal and 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.

Descriptive chemistry of several groups of nonmetals and metals, complex compounds, acid-base reactions and reactions in nonaqueous solvents. Prerequisite: Ch 442. Assistant Professor Huston.

- Ch 516, 517, 518. **Radiochemistry.** 2 hours each term.

Radioactivity, nuclear properties, nuclear reaction, and associated nuclear-chemical phenomena; application to theoretical and applied chemistry; instrumentation and laboratory techniques. Prerequisite: Ch 442. Assistant Professor Norris.

- Ch 520, 521, 522. **Advanced Analytical Chemistry.** 3 hours each term.

Two terms devoted to development of principles underlying modern methods of analytical chemistry; one term to application of these principles to the analytical chemistry of the elements. Prerequisite: Ch 442. Assistant Professor Freund.

- Ch 530, 531, 532. **Selected Topics in Organic Chemistry.** 2 hours each term.

Topics: (1) Organic nitrogen compounds, Professor Pease; (2) Carbohydrates, Professor Pease; (3) Terpenes, Professor Pease; (4) Organic-metallic compounds, Associate Professor Logan; (5) Steroids; (6) Heterocyclic compounds, Professor Christensen. Prerequisite: Ch 432 or equivalent.

- Ch 533, 534, 535. **Theoretical Organic Chemistry.** 2 hours each term.

A three-term sequence on the theories of organic chemistry. Physical basis for structural organic chemistry, reaction mechanisms. Prerequisite: Ch 439, 482 or equivalent and consent of instructor. Assistant Professor Marvell.

- 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; 1 lecture, 2 laboratory periods, spring. Professor Pease.

- Ch 540, 541, 542. **Advanced Physical Chemistry.** 2 hours each term.
Theories of atomic and molecular structure; calculation of thermodynamic functions from spectral data. Newer theories of solution; phase rule and its applications. Prerequisite: Ch 442. Professor Gilbert, Assistant Professor Decius.
- Ch 543, 544, 545. **Advanced Physical Chemistry.** 2 hours each term.
Experimental methods of determining molecular structure; the nature of the chemical bond; kinetics; photochemistry; low temperature phenomena. Prerequisite: Ch 442. Professor Gilbert, Assistant Professor Decius.
- Ch 550, 551, 552. **Selected Topics in Biochemistry.** 3 hours each term.
Nonsequence courses designed to acquaint student with recent advances in biochemistry and their application to special fields of study. 1951-52: Ch 550, Chemistry of the Protein Molecule; Ch 551, Endocrinology; Ch 552, Chemotherapy. Prerequisite: Ch 452 or equivalent. Professors Cheldelin and Butts, Assistant Professor Reese.
- 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.

Entomology

ENTOMOLOGY courses are planned to acquaint the student with the proper relationship of entomology to general agriculture and forestry, to train for commercial honey production, to prepare 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 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 four fields: entomology, applied entomology, bee culture, and forest entomology. Advanced courses are planned to equip students specializing in entomology with a fundamental groundwork in the science sufficient to prepare them for effective service in applied entomology or for advanced research study.

The insect collection consists of nearly 200,000 insects, a large part of which are named and classified. This collection of insects serves the institution and the department in performing the following functions: (1) undergraduate class instruction; (2) graduate student research; (3) research by staff members conducted under a general research grant; (4) research by staff members conducted on agricultural pests; (5) technical advisory service—determination of injurious and beneficial insects and preparation of letters about control sent in by the county agricultural agents and citizens of Oregon.

Certain types of commercial and inspection work may not require more training than is represented by the bachelor's degree. 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.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSE

Ent 200. **General Entomology.** 5 hours winter.

For students whose principal interest is in biology. Classification, biology, morphology, physiology. Three lectures; 2 two-hour laboratory periods. Associate Professor Martin.

UPPER-DIVISION COURSES

- Ent 314. **Introduction to Economic Entomology.** 4 hours fall or winter.
Primarily for agriculture students; typical economic insect forms; insect-pest control. Prerequisite: one year of chemistry or one term of zoology. Two lectures; 2 two-hour laboratory periods. Associate Professor Martin.
- Ent 321. **Principles of Forest Entomology.** 3 hours fall.
For majors in forest entomology. Forest losses due to insects; the groups responsible; prevention and control. Prerequisite: one year of forestry, or Ent 200 or equivalent. Two lectures; 1 two-hour laboratory period. Associate Professor Chamberlin.
- Ent 322, 323. **Forest Entomology.** 3 hours each term, winter and spring.
Insects injurious to forests and forest products; forest-insect surveys; control. Prerequisite: Ent 321. Two lectures; 1 two-hour laboratory period. Associate Professor Chamberlin.
- Ent 324. **Insects Injurious to Forest Products.** 3 hours fall.
A consideration of the damage by insects to timber products both raw and finished and to metals and concrete. Required of students in Forest Products. Two lectures; 1 two-hour laboratory demonstration or outside assignment. Associate Professor Chamberlin.
- Ent 335. **Introduction to Bee Culture.** 3 hours spring.
Habits and life history; management for honey production; pollination of fruit and seed crops. Prerequisite: upper-division standing or consent of instructor. Two lectures; 1 three-hour laboratory period. Professor Scullen.
- Ent 341. **Aquatic Entomology.** 4 hours spring.
Aquatic insects, ecologies, life histories, and economic importance as food of game fishes; survey techniques. Prerequisite: upper-division standing or consent of instructor. One lecture or recitation; 2 two-hour laboratory periods or field work. Associate Professor Martin.
- Ent 352. **Entomological Nomenclature and Literature.** 3 hours fall.
Entomological nomenclature; International Code; sources of entomological literature; Bureau of Entomology; periodicals and books; bibliographies; preparation of articles for scientific publications. Prerequisite: Ent 200 or equivalent. Associate Professor Chamberlin.
- Ent 353. **Historical Entomology.** 4 hours winter.
Insects of the ancients; early treatises; beginnings in America; introduced pests; Bureau of Entomology; early work in Oregon. Prerequisite: Ent 200 or equivalent. Associate Professor Chamberlin.
- Ent 373. **Entomological Technique.** 3 hours spring.
Rearing live insects; collecting and preserving; preparation of material for study. Prerequisite: Ent 200 or 314. One lecture; 2 three-hour laboratory periods. Associate Professor Martin.
- Ent 401. **Research.** Terms and hours to be arranged.
Approved problems carried on in library, laboratory, or field.
- 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. Two lectures; 1 two-hour laboratory period.
- Ent 412. **Insects Affecting Man and Animals.** (G) 4 hours.
Insects of man and animals; disease parasites, their carriers, and possible means of control. Prerequisite: fundamental courses in entomology or zoology. Three lectures; 1 three-hour laboratory period. Associate Professor Chamberlin.
- Ent 413. **Field and Truck-Crop Insects.** (G) 3 hours spring.
Major field and truck-crop insects and their control. Especially for farm crops, vegetable crops, and entomology students. Prerequisite: Ent 314, or equivalent. Two lectures; 1 two-hour laboratory period.
- Ent 414. **Insecticides.** 3 hours winter.
Old and new insecticides; insects they are effective in controlling; formulations; physical and chemical properties; methods of applications; residues, phytotoxicity; supplementary and auxiliary materials. Prerequisite: Ent 314. Two lectures; 1 three-hour laboratory period. Offered alternate years. Offered 1951-52. Assistant Professor Crowell.
- Ent 415. **Principles of Entomological Research.** (G) 3 hours winter.
Procedures in investigative entomological work; applied biometry; insect populations; problems in indirect and direct control of insects. Prerequisite: Ent 314 or equivalent. Two lectures; 1 recitation or outside assignment. Offered alternate years. Offered 1952-53. Associate Professor Martin.
- Ent 423. **Advanced Forest Entomology.** (G) 3 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) 4 hours spring.
Possibilities and limitations; artificial propagation of insects; examples of successes and failures; typical species. Prerequisite: Ent 352. Three lectures; 1 three-hour laboratory period. Associate Professor Chamberlin.
- Ent 451, 452, 453. **Advanced General Entomology.** (G) 3 hours each term.
Taxonomy of the several orders; intensive study in selected groups; phylogenetic relationships and distribution. Prerequisite: Ent 200 or 314, 373, or equivalent. Two recitations; 1 three-hour laboratory period. Associate Professor Chamberlin.
- Ent 472. **Insect Toxicology and Physiology.** (G) 3 hours winter.
Theories on mode of action of insecticides; methods of testing insecticides; general physiological functions of insects with emphasis on penetration of and possible toxic action of chemicals. Prerequisite: Ent 482, Z 233 or equivalent. Three lectures; 2 three-hour laboratory periods. Offered alternate years. Offered 1951-52. Assistant Professor Crowell.
- Ent 473. **Insect Ecology.** (G) 3 hours spring.
Environmental factors and their influence on insect development, distribution, and behavior. Prerequisite: Ent 200 or 314, 373. Two lectures; 1 three-hour laboratory period.

Ent 481, 482. **Insect Morphology.** (G) 3 hours each term.

Ent 481 (fall term 1951-52): morphology of the external skeleton of insects and its appendages. Ent 482 (winter term 1951-52): morphology of the internal organs of insects. Prerequisite: Ent 200 or 314, 373. Two lectures; 1 three-hour laboratory period. Associate Professor Martin.

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.

Ent 525. **Insect Transmission of Plant Viruses.** 3 hours.

Principles in insect transmission; separation of virus complexes by insects; families and genera containing important vectors; transmission in the field; control measures against insect vectors; practical experiments. Prerequisite: Ent 452, Bot 551. Two lectures; 1 three-hour laboratory period.

Geology

GEOLGY 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 undergraduate majors: one intended for students who are interested in geology for a liberal-arts degree; 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 including such topics as advanced petrology, geological engineering, oil geology, geophysical exploration methods, interpretation of aerial photographs, cartography, map interpretation, advanced studies in structure, stratigraphy, sedimentation, or paleontology. A field course of at least 9 hours is prerequisite to candidacy for an advanced degree.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

G 201, 202, 203. **Geology.** 3 hours each term.

Processes of nature by which earth's surface has been built up, deformed, and torn down; natural history and occurrence of common rocks and useful minerals; outline of history of earth and life.

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. One two-hour laboratory period.

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. Prerequisite: chemistry. Two lectures; 2 three-hour laboratory periods. Professor Wilkinson.

- G 315, 316, 317. **Mineralogy and Rock Study.** 4 hours each term.
Crystal forms, physical and chemical properties; identification of economic and rock-forming minerals; common rock types of special industrial importance. Prerequisite: one year of physical science. Two lectures; 2 two-hour laboratory periods. 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 three-hour laboratory or field period. Professor Allison.
- G 322. **Physiography.** 4 hours winter.
Development of the surface features of the earth by erosion, deposition, earth movements, and volcanism. Prerequisite: general geology. Three lectures; 1 three-hour laboratory or field period. Professor Allison.
- G 323. **Sedimentology.** 4 hours fall.
Genesis and subsequent history of stratified rocks; geologic processes concerned with sedimentation and cementation. Prerequisite: G 201, 202, 203. Three lectures; 1 three-hour laboratory or field period. Professor Allison.
- G 324, 325. **Engineering Geology.** 3 hours each term.
Application and use of geology in engineering and industrial arts. May be taken separately. Prerequisite: upper-division standing. Two lectures and field trips. Professor Hodge.
- G 330. **Life of the Past.** 3 hours fall.
History of life as recorded in the fossil record; invertebrates and lower vertebrates studied as illustrations of biological principles and relationships to higher animals. Prerequisite: one year of biology or geology. Mr. Boyd.
- G 331. **Geologic History of Mammals.** 3 hours winter.
Rise and development of the mammals with special attention to certain groups of ancient animals that once lived on the Pacific Coast. Prerequisite: one year of biology or geology. Mr. Boyd.
- 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 arts. Prerequisite: one year of biology or geology.
- G 340, 341. **Invertebrate Paleontology.** 4 hours each term.
Major fossil invertebrates; stratigraphic succession of fossil invertebrate faunas. Prerequisite: general geology or one year of any biological science. Two lectures; 2 three-hour laboratory periods. (G 340, 341, 442 form a sequence.) Mr. Boyd.
- G 350. **Rocks and Minerals.** 3 hours fall.
This course gives opportunity to become acquainted with rocks and minerals without having to meet the requirements of the more technical courses. Especially useful to students expecting to teach general science. Prerequisite: upper-division standing. Two lectures; 1 two-hour laboratory period. 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. Prerequisite: upper-division standing. Professor Hodge.

- G 355. **Economic Geology and Mineral Resources.** 3 hours fall.
Origin, occurrence, uses, and economic and political importance of geological resources, including coal, petroleum, metallic and nonmetallic minerals, ground water, and water power. Prerequisite: upper-division standing. Professor Hodge.
- G 380. **Advanced Field Geology.** 3 to 9 hours.
Geologic mapping and surveying methods; intensive study of a small area. Conducted in a summer camp of seven weeks; may be taken successive summers for credit up to 12 hours each summer, maximum 27 hours. Prerequisite: one year of general geology. Professor Wilkinson.
- 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 studied megascopically and microscopically to train in recognition, classification, and interpretation of earth materials. Prerequisite: G 312, 313, 314. Two lectures; 2 three-hour laboratory periods. 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. Two lectures; 2 three-hour laboratory periods. Professor Hodge.
- G 420. **Interpretation of Geophysical Data.** (G) 3 hours.
Physical methods now used in mining and oil prospecting, with particular emphasis on the geologic interpretation of data obtained by these methods. Prerequisite: Ph 203, G 321, 323. Professor Wilkinson.
- G 421, 422. **Mining Geology and Industrial Minerals.** 4 hours each term.
Origin, occurrence, exploration, mining, technology, and uses of metals, nonmetallic minerals, and other geologic resources. Prerequisite: G 315, 316, 317, or G 312, 313, 314. Three lectures; 1 two-hour laboratory period and field trips. Mr. Hintze.
- G 423. **Oil Geology.** 4 hours spring.
Origin, occurrence, exploration, and technology of oil and gas. Prerequisite: G 201, 202, 203. Three lectures; 1 two-hour laboratory period. Mr. Hintze.
- 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. Mr. Boyd.
- G 431. **Geologic History of North America.** (G) 4 hours.
The geologic development of the North American continent. Prerequisite: G 323. Mr. Hintze.
- G 432. **Geologic History of the Pacific Coast.** (G) 4 hours.
The geologic history of the Pacific Coast of North America. Prerequisite: G 323, 340, 341. Mr. Hintze.

- G 440. **Micropaleontology.** (g) 4 hours.
Collecting, preparation, classification, and identification of micro-fossils; biology and bionomics of living foraminifers; elements of biostratigraphy and ecologic evaluation of fossil foraminiferal assemblages. Prerequisite: three years of geology or zoology, G 340. Two lectures; 2 three-hour laboratory periods. Mr. Boyd.
- G 441. **Advanced Micropaleontology.** (G) Terms and hours to be arranged.
Faunal and systematic studies of microfossils; stratigraphic succession of West Coast Cenozoic microfaunas. Prerequisite: G 440. Mr. Boyd.
- G 442. **Paleobotany.** (g) 4 hours spring.
Paleobotanically important plants; plant history revealed in fossil record; Tertiary floras of Oregon. Prerequisite: general geology or general botany. Two lectures; 2 three-hour laboratory periods. Associate Professor Phinney.

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. **Petroleum Geology.** 3 hours.
Origin, occurrence, and exploration of natural gas, petroleum, and oil shales. Prerequisite: G 321. Two lectures; 1 three-hour laboratory period. Professor Hodge.
- G 521, 522. **Economic Geology.** 3 hours each term.
Origin, occurrence, and economic significance of important geological resources, including metallic and nonmetallic minerals, coal, building stone, ground water, and water power. Prerequisite: G 312, 313, 314. Two lectures; 1 three-hour laboratory period. 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 students with the training in rigorous thinking and analytical processes that are a fundamental part of a liberal-arts education; to supply the mathematical preparation desirable for students in professional schools, for prospective teachers, and for statisticians; and 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 101, 102, 103. (2) Business and Technology students—Mth 104, 105, 106. (3) Science students—Mth 100, 101, 102; Mth 101, 102, 103; Mth 201, 202, 203.

Computational and Consulting Service. The Department of Mathematics operates a consulting and computational service available to schools, departments, or staff members wishing assistance or advice in connection with mathematical problems, laborious calculations, statistical analysis, and design of experiments. Calculating machines, mathematical tables, and other computational aids are available.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Mth 5. **Elementary Mathematics.** 1 hour.

Numerical calculations, designed for students entering with a deficiency in elementary school mathematics. Three recitations.

*Mth 10. **Elementary Algebra.** 4 hours.

Mth 20. **Elementary Geometry.** 4 hours.

Mth 30. **Solid Geometry.** 2 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. Prerequisite: Mth 100 or equivalent.

*Mth 104, 105, 106. **Mathematics of Business and Industry.** 3 hours each term.

Algebra and mathematics of finance. Mth 104 not open to students receiving credit in Mth 100.

Mth 109. **Elements of Statistics.** 4 hours.

Mth 201, 202, 203. **Differential and Integral Calculus.** 4 hours each term.

Prerequisite: Elementary Analysis or equivalent.

Mth 230. **Spherical Trigonometry and Rudiments of Navigation.** 2 hours spring.

Prerequisite: Mth 101 or equivalent.

UPPER-DIVISION COURSES

Mth 311. **History of Elementary Mathematics.** 3 hours.

Brief history of our oldest science; its beginnings in relation to social problems; reciprocal effect of mathematics on society. Prerequisite: upper-division standing. Staff.

Mth 321, 322. **Differential Equations.** 3 hours each term.

Applied ordinary differential equations for engineers. Prerequisite: calculus.

* A maximum total of 4 term hours will be given for Mth 10 and Mth 104, and for Mth 100 and Mth 105.

- Mth 341, 342. **Applied Statistics.** 3 hours each term.
 Statistical methods as applied to industrial and engineering experimentation and quality control. Prerequisite: calculus, or consent of instructor. Mr. Gysbers.
- Mth 405. **Reading and Conference.** Terms and hours to be arranged. Staff.
- Mth 410. **Foundations of Elementary Mathematics.** (g) 3 hours.
 Fundamental concepts and logical structure of arithmetic, algebra, and geometry. Designed for prospective teachers of high-school mathematics and mathematics majors. Prerequisite: calculus. Associate Professor Eves.
- *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. Professor Williams.
- *Mth 412. **Higher Algebra.** (G) 3 hours.
 Determinants, linear dependence, matrices, linear transformations, invariants, and quadratic forms. Prerequisite: calculus. Professor Williams.
- *Mth 413. **Advanced Plane Analytic Geometry.** (g) 3 hours.
 Prerequisite: calculus. Professor Williams.
- *Mth 414. **Solid Analytic Geometry.** (G) 3 hours.
 Prerequisite: calculus. Professor Williams.
- *Mth 415. **Advanced Geometry.** (G) 3 hours.
 Euclidean geometry from a modern point of view. Prerequisite: calculus. Professor Williams.
- *Mth 416. **Projective Geometry.** (G) 3 hours.
 Introduction to analytic and synthetic projective geometry. Prerequisite: calculus. Professor Williams.
- Mth 419. **Non-Euclidean Geometry.** (G) 3 hours.
 Prerequisite: one year of calculus. Associate Professor Eves.
- Mth 421, 422. **Differential Equations.** (g) 3 hours each term.
 Ordinary differential equations for mathematics and science majors and others who plan further study in mathematics. Prerequisite: calculus. Staff.
- Mth 423. **Partial Differential Equations.** (G) 3 hours.
 Introduction to concepts and methods of partial differential equations of first and higher orders; applications to problems of physics and engineering. Prerequisite: differential equations. Professor Hostetter.
- 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. Assistant Professor Arnold.
- Mth 425. **Vector Analysis.** (G) 3 hours.
 Modern vector and matrix methods with applications for students of physics, engineering, and mathematics. Prerequisite or parallel: differential equations. Professor Hostetter.

* Offered alternate years.

- Mth 426. Mathematical Theory of Probability.** (G) 3 hours.
Methods of calculating probabilities with applications to scientific problems. Offered when sufficient demand. Prerequisite: calculus. Professor Lonseth.
- Mth 431, 432, 433. Advanced Calculus.** (G) 3 hours each term.
Aim is (1) to examine critically some of the results of the calculus, (2) to study the calculus of several variables. Prerequisite: elementary calculus. Assistant Professor Arnold.
- 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. Associate Professor Kirkham.
- *Mth 445, 446, 447. Statistical Methods.** (g) 3 hours each term.
Statistical methods for research workers; limitations and applications of methods. Prerequisite: senior standing and Mth 100 or equivalent. Associate Professor Li.
- Mth 454. Theory of Numbers.** (G) 3 hours.
Properties of integers, Euclid's algorithm, diophantine equations, prime numbers, congruences, residues of powers and quadratic residues. Prerequisite: algebra and upper-division standing. Assistant Professor Brewer.
- Mth 461, 462, 463. Theory of Groups.** (G) 3 hours each term.
Permutation groups; linear groups. Prerequisite: calculus. Assistant Professor Manning.
- Mth 471, 472, 473. Differential Geometry of Curves and Surfaces.** (G) 3 hours each term.
The metric geometry of 3-space with an introduction to the tensor theory of Riemannian space. Prerequisite: differential equations. Associate Professor Eves.
- Mth 481, 482. Fluid Dynamics.** (G) 3 hours each term.
Fundamental mathematical concepts of subsonic, transonic, and supersonic flow, with applications to modern aerodynamics. Prerequisite: calculus and consent of instructor. Mr. Ehlers.

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.

* Credit will not be allowed for both sequences, Mth 341, 342, and Mth 445, 446.

- *Mth 511, 512, 513. **Functions of a Complex Variable.** 3 hours each term.
Introduction to analytic functions, fundamental for advanced study in mathematics. Professor Clark.
- Mth 514. **Calculus of Variations.** 3 hours.
Offered on demand. Professor Hostetter.
- *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. Professors Milne, Lonseth.
- Mth 526, 527. **Vectors, Matrices, and Tensors.** 3 hours each term.
Modern matrix and tensor analysis with applications to mechanics, elasticity, fluid dynamics, and electricity. Prerequisite: Mth 425 or equivalent. Professor Hostetter.
- Mth 551, 552, 553. **Functions of Real Variables.** 3 hours each term.
Convergence, continuity, special functions, Riemann and Lebesgue integrals, Fourier series, theory of Hilbert space. Professor Clark.
- Mth 554, 555. **Modern Algebra.** (G) 3 hours each term.
Recent theories showing variety of possible mathematical systems, applications. Prerequisite: calculus and consent of instructor. Associate Professor Poole.
- Mth 561, 562, 563. **Mathematics in Engineering and Physics.** 3 hours each term.
Analytical methods in obtaining solutions of problems in engineering and physics. Dynamics, vibrating systems, boundary value problems in electricity and elasticity, operational calculus, numerical methods. Assistant Professor Stone.

Nursing Education

THE prenursing curriculum offered by Oregon State College is devoted chiefly to general and basic subjects in preparation for professional work at the Medical School and its hospitals and clinics. The Department of Nursing Education also offers to registered nurses advanced curricula in nursing specialties, credit for which may be applied toward a degree. (See Bulletin of the Department of Nursing Education.)

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- Nur 111, 112, 113. **Backgrounds of Nursing.** 1 hour each term.
Backgrounds of modern social and health movements; relation to evolution of nursing as a profession; present aims and problems in nursing at home and abroad. Assistant Professor Slocum.

UPPER-DIVISION COURSES

- Nur 311, 312, 313. **Modern Nursing Problems.** 1 hour each term.
Present aims and problems of nursing at home and abroad. Open only to registered nurses.

* Offered alternate years.

Physics

UNDERGRADUATE students may major in physics either for a liberal arts degree or as preparation for professional service in physics and allied fields. 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 lay the foundations of a reading knowledge of German, Russian, or French, or all. In special cases courses in closely related departments, involving considerable study of physical principles, may be accepted as part of a major in physics.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- Ph 101, 102, 103. **Engineering Physics.** 3 hours each term.
Studies in general physics adapted to students in engineering. Sequence is started each term if demand is sufficient. One lecture; 2 recitations; 2 one-hour laboratory periods. Mr. Decker, Mr. Day, Mr. Church, and others.
- Ph 161. **Rudiments of Photography.** 2 hours.
For students not having the science prerequisite for Ph 361. Does not admit to Ph 362. One lecture; 1 two-hour laboratory period. Associate Professor Garman and others.
- Ph 191. **Rudiments of Meteorology.** 1 hour.
For students desiring to know something about the weather. Mr. Lincoln.
- 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 Morgan and others.
- Ph 204, 205, 206. **Astronomy.** 3 hours each term.
Descriptive treatment. Coordinate system; astronomical instruments; the solar system; star types and groupings. Two lectures; 1 two-hour period of observation or laboratory. Mr. Byers.
- Ph 211, 212. **Abridged General Physics.** 3 hours each term.
Mechanics, placing only slight emphasis on rotary motion; heat; electricity. One lecture; 2 recitations; 2 one-hour laboratory periods. Mr. Day and others.

UPPER-DIVISION COURSES

- Ph 311, 312, 313. **Introduction to Modern Physics.** 3 hours each term.
Kinetic theory, the electron, radioactivity; photoelectricity, thermionic emission, X-rays, electronic devices, gaseous conduction, cosmic rays. Prerequisite: college physics. Two lectures; 1 two-hour laboratory period. Professor Brady and others.
- Ph 314, 315. **Mechanics.** 4 hours fall and winter.
Applications of calculus and other mathematical methods to problems in mechanics; treatment of experimental data; characteristic errors and method of least squares. Prerequisite: Ph 103 or 203; Mth 203. Three lectures; 1 two-hour computation period. Associate Professor Dempster.

- Ph 331, 332, 333. **Electrical Measurements.** 3 hours each term.
Electrical theory and electrical and magnetic measurements. Prerequisite: Ph 103 or 203. Fall and winter: two lectures; 1 two-hour laboratory period. Spring: one lecture; 2 two-hour laboratory periods. Associate Professor Varner.
- Ph 334. **Fundamentals of Radio.** 3 hours spring.
Underlying principles; vacuum tubes; circuits; antennas and wave propagation; construction and use of transmitting and receiving equipment. Prerequisite: one year of college physics. One lecture; 2 two-hour laboratory periods. Associate Professor Vinyard.
- Ph 337, 338, 339. **Electronics and Radio.** 3 hours each term.
Theory; vacuum tubes; circuits; antennas; wave propagation; audio, radio, and very high frequency measurements. Prerequisite: general or engineering physics, a second year of physics or electrical engineering or equivalent. One lecture; 2 two-hour laboratory periods. Associate Professor Vinyard.
- Ph 353. **Heat Measurements.** 4 hours.
Heat theory and heat measurements. Prerequisite: college physics; Mth 103. Two lectures; 2 two-hour laboratory periods. Associate Professor Varner.
- Ph 361. **Photography.** 3 hours any term.
The hand camera, developing, printing, toning, enlarging. Prerequisite: college chemistry or physics or previous photographic experience, with consent of instructor. One lecture; 2 two-hour laboratory periods. Associate Professor Garman and others.
- Ph 362. **Photography.** 3 hours any term.
Commercial photography; view cameras, chemicals, and solutions; copying, photography of small objects, lighting, photo-sketching, lantern slides. Prerequisite: Ph 361. One lecture; 2 two-hour laboratory periods. Associate Professor Garman.
- Ph 363. **Photography.** 3 hours spring.
Continuation of Ph 362. Composition; exteriors, interiors, flashlights, telephoto lenses, infrared. One lecture; 2 two-hour laboratory periods. Associate Professor Garman.
- 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.** 1 hour each term.
- Ph 411, 412, 413. **Biophysics.** (G) 3 hours each term.
Physical phenomena and measurements applied to biological problems. Prerequisite: one year of college physics; one year of college biology; senior standing in one of the biological or physical sciences. Two lectures; 1 two-hour laboratory period. Offered 1951-52. Associate Professor Dempster.
- Ph 431, 432, 433. **Experimental Electronics and High-Frequency Measurements.** (G) 3 hours each term.
Microwaves; electronic and high-frequency techniques; modern electronic devices and research methods as applied to physics, chemistry, engineering, psychology, and medicine. Prerequisite: Ph 339 or EE 463. One lecture; 2 two-hour laboratory periods. Professor Yunker.

- Ph 434. **X-Rays.** (G) 3 hours.
Production, circuits, spectra, diffraction. Prerequisite: Ph 313, Mth 203. Two lectures; 1 two-hour laboratory period. Assistant Professor Bolinger.
- Ph 461, 462, 463. **Advanced Photography.** (G) 3 hours each term.
Color, X-ray and ultraviolet photography; stereophotographs, photostats; photomicrography, photography of cathode ray screens. Students may enter any term. Prerequisite: Ph 362. One lecture; 2 two-hour laboratory periods. Associate Professor Garman.
- Ph 465, 466. **Light.** 3 hours winter and spring.
Geometric and physical optics. Prerequisite: Ph 313 and calculus. Two lectures; 1 two-hour laboratory period. Professor Weniger.
- Ph 467. **The Physics of Light Production.** (G) 3 hours.
Radiation and the development of modern illuminants. Prerequisite: courses in light or illumination. Three lectures; occasional laboratory work. Professor Weniger.
- Ph 471, 472, 473. **Atomic and Nuclear Physics.** (G) 3 hours each term.
Atomic and nuclear structure as revealed by studies of photoelectricity, spectra, crystal structure, radioactivity, etc.; fission and availability of nuclear energy. Prerequisite: calculus and Ph 313 or graduate standing in chemistry or electrical engineering. Associate Professor Dempster.
- Ph 490. **Basic Meteorology.** 3 hours.
Elementary study of weather phenomena; weather instruments; interpretation of the weather map and general principles of forecasting. Prerequisite: college physics. Two lectures; 1 two-hour laboratory period. Mr. Lincoln.
- Ph 491. **Physical Meteorology.** (G) 3 hours winter.
Physics of the atmosphere; applications of meteorology to specialized fields; statistical analysis of climatological data. Prerequisite: calculus; Ph 490. Mr. Decker.
- Ph 492. **Introduction to Modern Meteorology.** (G) 3 hours spring.
Air-mass and frontal analysis; surface and upper-level weather charts; modern forecasting methods; applications to aviation flight planning. Prerequisite: Ph 491. Two lectures; 1 two-hour laboratory period. Mr. Day.

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.

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

- 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 510. **Laboratory Arts.** Terms and hours to be arranged.
Demonstration and laboratory techniques; care, adjustment, and design of apparatus. Prerequisite: one year of upper-division college physics. Lectures, assigned readings, and laboratory. Staff.
- Ph 511, 512, 513. **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: three years of physics; differential equations. Assistant Professor Nicodemus.

- Ph 514, 515, 516. **Modern Physical Theories.** 3 hours each term.
Electron theory, relativity, the quantum theory, wave mechanics. Prerequisite: Ph 513. Offered 1952-53. Assistant Professor Nicodemus.
- Ph 517, 518. **Quantum Mechanics.** 3 hours each term.
Schroedinger's equation, in one and several dimensions; matrix mechanics, Dirac's transformation theory; applications to problems in atomic and nuclear physics. Prerequisite: Ph 473, 513; either Mth 523 or Mth 563. Associate Professor Dempster.
- Ph 521. **Dynamics.** 3 hours.
LaGrangian and Hamiltonian mechanics. Prerequisite: Ph 513 and differential equations. Associate Professor Dempster.
- Ph 523. **Statistical Mechanics.** 3 hours.
Prerequisite: Ph 513. Associate Professor Dempster.
- Ph 531, 532. **Electromagnetic Theory.** 3 hours each term.
A mathematical discussion of the theories of electricity, mainly classical. Prerequisite: Ph 513. Offered 1951-52. Associate Professor Varner.
- Ph 537. **Conduction of Electricity Through Gases.** 3 hours.
Processes taking place at electrodes, in the gas, and at walls of tube; glow, arc, and spark discharges. Prerequisite: Ph 313, 339. Two lectures; 1 three-hour laboratory period. Professor Brady.
- Ph 541. **Sound.** 3 hours.
Sound and its applications; acoustics; ultrasonics. Prerequisite: Ph 315 or equivalent. Three lectures; occasional laboratory. Associate Professor Morgan.
- Ph 551. **Thermodynamics.** 3 hours.
Thermodynamics and heat transfer. Prerequisite: Ph 513. Offered 1952-53. Associate Professor Varner.
- Ph 552. **Kinetic Theory.** 3 hours.
Prerequisite: Ph 551. Offered 1952-53. Associate Professor Varner.
- Ph 562, 563. **Optics.** 3 hours each term.
Physical optics; theory of optical instruments; spectroscopy. Prerequisite: Ph 466, 513. Two lectures; 1 three-hour laboratory period. Assistant Professor Bolinger.
- Ph 573. **Neutron Physics and Nuclear Reactors.** 3 hours.
Properties of neutrons; interaction of nuclei; nuclear fission; neutron diffusion, moderators, reflectors; elementary pile theory. Prerequisite: Ph 518. Associate Professor Dempster.
- Ph 582. **History and Philosophy of Physics.** 3 hours winter.
Prerequisite: four years of physics. Offered 1952-53. Physics staff.
- Ph 592. **Astrophysics.** 3 hours.
Stellar spectroscopy, photometry, and radiometry. Prerequisite: Ph 313, 466. Offered 1952-53. Associate Professor Dempster.
- Ph 593. **Geophysics.** 3 hours.
Prerequisite: G 321, Ph 333, and differential equations. Offered 1951-52. Associate Professor Vinyard.

Science Education

PROFESSIONAL preparation for prospective teachers of biological and physical science and mathematics is afforded by the Department of Science Education, which is a joint department within the School of Science and the School of Education. Students preparing to teach science in secondary schools may major in one of the sciences, or in general science, according to the degree of emphasis on subject matter or professional preparation. The combination of subjects to be taught, and the scope of preparation desired, influence the choice of major school.

The requirements for the State High-School Teacher's Certificate are printed on pages 287-289. Approved teaching majors and minors in science are printed on pages 290-291; these minimum requirements may be supplemented by additional courses in the several fields. The teaching majors in general biology, general science, mathematics, and physical science provide electives that permit flexibility in selection of courses. The majors in health education and human biology are made up of required courses and may well be augmented by additional courses in biology and related fields. A wide range of health-education courses is available in the schools of Science, Education, Agriculture, Engineering, and Home Economics, and the Division of Physical Education. Both undergraduate and graduate majors in hygiene and sanitation are offered in the Department of Bacteriology and Hygiene.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSE

- SEd 123. **Introduction to Health Education.** 3 hours spring.
Historical background and underlying philosophy of health education; study of statistical facts that indicate need for health education; survey of modern practices in, and organizations for, health education; opportunities for professional work in field.

UPPER-DIVISION COURSES

- F 360. **Conservation of Natural Resources.** (See FORESTRY.)
- 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 408. **Methods and Materials.** 3 hours any term.
(b) Biological Science. (f) Mathematics. (g) Physical Science. See Ed 408, page 303.
- *GS 411, 412, 413. **History of Science.** (G) (See GENERAL SCIENCE.)
- *GS 421, 422, 423. **Classics of Science.** (G) (See GENERAL SCIENCE.)
- SEd 431, 432, 433. **School Health Problems.** (G) 3 hours each term.
Maintenance of health of school children; communicable diseases; school sanitation; planning of school buildings; health of school child; hygiene of instruction. Prerequisite: Ed 311, 312, 313, and one year of upper-division biology. Professor Langton.

* May be included in graduate majors and minors in science education.

SEd 441, 442, 443. **Health Education.** (G) 3 hours each term.

Philosophy and principles of health education; organization and administration; health instruction and its use in secondary schools and in adult health education. Prerequisite: Ed 311, 312, 313, and one year of upper-division biology. Associate Professor Morris.

SEd 481. **Alcohol Studies in School Curriculum.** (G) 3 hours.

Incorporation of scientific information about alcohol in school curriculum; physiological, psychological, sociological, and legal aspects of alcoholism. Prerequisite: 24 hours upper-division education.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

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.

Ph 510. **Laboratory Arts.** (See PHYSICS.)

May be included in graduate majors and minors in science education.

SEd 598. **Science Curriculum in Secondary Schools.** 3 hours.

Trends, problems, and procedures in junior-high and secondary-school science program. Prerequisite: 24 hours upper-division education including Ed 415. Associate Professor Williamson.

Zoology

BASIC requirements for an undergraduate major in zoology, whether for a liberal-arts degree or as preparation for professional study at the graduate level, are:

1. General Zoology (Z 200) or equivalent. One term General Entomology (Ent 200) or Bacteriology Laboratory (Bac 200) and Principles of Bacteriology (Bac 230); or both General Botany (Bot 201) and Field Botany (Bot 203).
2. Comparative Vertebrate Anatomy (Z 324, 325) and Comparative Vertebrate Embryology (Z 326).
3. Physiology (Z 331, 332, 333 or equivalent).
4. Genetics (Z 341).
5. Eight term hours of approved electives in invertebrate zoology. It is recommended that this work be taken at a marine station.
6. One of the following options:
 - A. Minimum of nine term hours selected from: Natural History of Oregon III (Z 376), Ornithology (Z 371), Mammalogy (Z 372), Herpetology (Z 473), Animal Ecology (Z 483).
 - B. Eight or more term hours selected from: Comparative Vertebrate Histology (Z 461), Microtechnique (Z 462), Experimental Embryology (Z 463).
 - C. Microtechnique (Z 462) and any two of the courses listed under option A, above.
7. Cognate courses as follows: general chemistry and qualitative analysis; one year of college mathematics.

Students may specialize in one of the following divisions within the department: (1) anatomy and embryology, (2) physiology, (3) invertebrate zoology and parasitology, (4) cellular biology, (5) natural history and ecology. The major student should see the instructor in charge of the division of specialization regarding options, additional cognate courses, and electives.

Both undergraduate and graduate majors in zoology are urged to attend a summer session at a marine station or at an inland field laboratory. Candidates for the Doctor of Philosophy degree are strongly advised to spend one summer at a marine station.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

*Z 114, 115, 116. **Human Biology.** 3 hours each term.

Man's place in animal kingdom; human anatomy and physiology; development, heredity, evolution; relations to diseases and parasites; human ecology. Professor Anderson.

*Z 200. **General Zoology.** 5 hours any term.

An introduction to the basic topics in present-day zoology. For zoology and other biology majors, students in agriculture, and others. Three lectures; 2 three-hour laboratory periods. Professor de Laubenfels.

*Z 201, 202, 203. **General Zoology.** 3 hours each term.

For premedical, pre dental, pre nursing, pharmacy, physical education, psychology, fish and game management students, and others. Two lectures; 1 recitation; 1 two-hour laboratory period. Professor de Laubenfels.

†Z 233. **Elementary Physiology.** 5 hours spring.

For students in medical technicians' curriculum, pharmacy, and others desiring a general course in human physiology. Three lectures; 2 two-hour laboratory periods. Professor de Laubenfels.

UPPER-DIVISION COURSES

Z 321, 322. **Elementary Human Anatomy.** 3 hours each term, fall and winter.

Designed especially to meet the needs of physical education students. Prerequisite: Z 114, 115, 116, or equivalent. Two lectures; 1 two-hour laboratory period. Professor Allman.

Z 323. **Applied Human Anatomy.** 3 hours spring.

The applied phases of anatomy are considered. Designed especially for physical-education students. Prerequisite: Z 321, 322. Two lectures; 1 two-hour laboratory period. Professor Allman.

Z 324, 325. **Comparative Vertebrate Anatomy.** 4 hours winter and spring.

Gross dissection and comparison of organ systems in representative vertebrates. Prerequisite: Z 200 or Z 203. Two lectures; 2 three-hour laboratory periods. Assistant Professor Hillemann.

Z 326. **Comparative Vertebrate Embryology.** 4 hours fall.

Comparative study of the development of several representative vertebrate forms. Prerequisite: Z 200 or Z 203. Two lectures; 2 three-hour laboratory periods. Assistant Professor Hillemann.

* Combinations for which full credit is granted: Z 114, 115, 116; or Z 201, 202, 203; or Z 200, 203.

† Credit is not granted for both Z 233 and Z 331, 332.

- *Z 331, 332. **Physiology.** 3 hours fall and winter.
Especially for students majoring in home economics, pharmacy, zoology, and physical education. Prerequisite: Z 200 or Z 203, or consent of instructor. Two lectures; 1 two-hour laboratory period. Professors Allman, de Laubenfels.
- Z 333. **Physiology.** 3 hours spring.
Continuation of Z 331, 332. Professor de Laubenfels.
- Z 336. **Applied Human Physiology.** 3 hours spring.
Applied phases of physiology. Designed especially for students majoring in physical education. Prerequisite: Z 331, 332. Two lectures; 1 two-hour laboratory period. Professor Allman.
- Z 341. **Genetics.** 3 hours fall.
Lectures on the principles of heredity and their application to agriculture, medicine, and human eugenics; nature of gene action; genetics and evolution. Prerequisite: Z 200 or Z 203, or consent of instructor. Assistant Professor Storm.
- Z 345. **Evolution.** 3 hours winter.
Evidences of evolution from comparative anatomy, embryology, physiology, geographic distribution, and paleontology; genetic mechanisms involved; natural selection. Prerequisite: Z 341. Assistant Professor Storm.
- Z 371. **Ornithology.** 3 hours spring.
Structure, classification, distribution, and life habits of birds. Prerequisite: Z 200 or Z 203. Two lectures; 1 three-hour laboratory period. Assistant Professor Storm.
- Z 372. **Mammalogy.** 3 hours winter.
Classification, distribution, life habits, and identification of mammals. Prerequisite: Z 200 or Z 203. Two lectures; 1 three-hour laboratory period. Assistant Professor Storm.
- Z 374, 375. **Natural History of Oregon I, II.** 3 hours each term, fall and winter.
The environment: influence of topography, climate, and plant cover on distribution of animals. Common invertebrates: local distribution, habits, collection and maintenance in laboratory. Prerequisite: one year of biology. Two lectures; 1 three-hour laboratory period. Professor Gordon.
- Z 376. **Natural History of Oregon III.** 4 hours spring.
Identification, distribution, and habits of common land vertebrates. Prerequisite: Z 374, 375, or consent of instructor. Two lectures; 2 three-hour laboratory periods. Professor Gordon.
- Z 377. **Ichthyology.** 3 hours spring.
Morphology, taxonomy, physiology, development, and evolution of fishes. Prerequisite: Z 200 or Z 203. Two lectures; 1 three-hour laboratory period. Not offered 1951-52.
- 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.** 1 hour each term.

* Credit is not granted for both Z 233 and Z 331, 332.

- Z 410. **Zoological Literature.** (G) 1 hour fall.
Use of zoological literature; character of zoological journals and reference works. Prerequisite: one year of upper-division zoology. Professor Dornfeld.
- Z 413. **History of Zoology.** (G) 3 hours winter.
Rise and development of zoological theories and laws. Prerequisite: one year of upper-division zoology. Assistant Professor Hillemann.
- Z 415. **Mathematical Aspects of Biology.** 1 hour winter.
Means; toxicity, growth and distribution curves. Prerequisite: one year of upper-division biology. Professor Krueger.
- Z 431, 432, 433. **Advanced Physiology.** (G) 5 hours each term.
Neuromuscular system, central nervous system, autonomic system, circulation, respiration, gastro-enterology, kidney secretion, metabolism. Prerequisite: general zoology, histology, comparative vertebrate anatomy, general chemistry or equivalents. Three lectures; 2 three-hour laboratory periods. Professor Krueger.
- Z 434. **Endocrinology.** (G) 3 hours fall.
Functions of the glands of internal secretion. Prerequisite: physiology, organic chemistry. Professor Krueger.
- Z 442. **Drosophila Genetics.** (G) 2 hours spring.
Experiments on *Drosophila* to illustrate operation of hereditary mechanisms. Prerequisite: Z 341. Two three-hour laboratory periods. Professor Dornfeld.
- Z 451, 452. **Invertebrate Zoology.** (G) 4 hours each term, fall and winter.
The structure, classification, distribution, and life histories of the invertebrates. Prerequisite: two years of zoology. Two lectures; 2 three-hour laboratory periods. Associate Professor Pratt.
- Z 456. **Parasites of Man.** (G) 4 hours spring.
Identification, bionomics, prophylaxis, treatment and geographic distribution of the parasites of man. Prerequisite: two years of biology. Two lectures; 2 three-hour laboratory periods. Associate Professor Pratt.
- Z 461. **Comparative Vertebrate Histology.** (G) 5 hours fall.
Comparative microscopic study of tissues and organs, with special attention to their evolutionary relationships and functional adaptations. Prerequisite: Z 324, 325, 326. Three lectures; 3 two-hour laboratory periods. Professor Dornfeld.
- Z 462. **Microtechnique.** (G) 4 hours winter.
Principles and practice in methods of preparing histological, embryological and cytological specimens for microscopic study. Prerequisite: two years of biology. One lecture; 3 three-hour laboratory periods. Professor Dornfeld.
- Z 463. **Experimental Embryology.** (G) 4 hours spring.
Mechanics of cleavage and gastrulation; inductors and organizers; gradient fields; integration; regeneration; genic action. Prerequisite: Z 324, 325, 326. Three lectures; 1 three-hour laboratory period. Professor Dornfeld.
- Z 473. **Herpetology.** (G) 3 hours fall.
Classification, distribution, life habits, and identification of amphibians and reptiles. Prerequisite: two years of zoology and consent of instructor. Two lectures; 1 three-hour laboratory period. Assistant Professor Storm.

Z 475. Methods in Field Zoology. (G) 4 hours fall.

Problems, principles, and methods in field zoology, including wildlife photography. Prerequisite: two years of upper-division biology. Three lectures; 1 three-hour laboratory period. Professor Gordon, Assistant Professor Storm.

Z 483. Animal Ecology. (G) 3 hours spring.

Living animals in relation to their environment. Prerequisite: two years of biology, or consent of instructor. Two lectures; 1 three-hour laboratory period. Professor Gordon.

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.**Z 508. Advanced Field Zoology.** 2 to 6 hours.

Methods used in field work; intensive studies of limited areas. Conducted field trips of variable length as conditions require. Prerequisite: senior or graduate standing and consent of instructor. Professor Gordon and staff.

Z 521. Advanced Vertebrate Embryology. 4 hours fall.

Lectures on embryonic and fetal physiology; laboratory work on the later stages of morphogenesis (organogeny); student projects in developmental anatomy and physiology. Prerequisite: Z 331, 332, and 326 or equivalent. Assistant Professor Hillemann.

Z 551. Biology of Protozoa. 3 hours fall.

Morphology, physiology, and ecology of freshwater, marine, terrestrial, and parasitic protozoa. Prerequisite: Z 451, 452. Two lectures; 1 three-hour laboratory period. Associate Professor Pratt.

Z 553. Invertebrate Embryology. 3 hours spring.

Cleavage, organogeny, and larval development of marine and freshwater invertebrates. Prerequisite: Z 451, 452. Two lectures; 1 three-hour laboratory period. Associate Professor Pratt.

Z 558. Parasitology. 3 hours winter.

Collection, preparation, and identification of parasites; serological testing for parasitic infections; culturing of parasitic forms; systematics; evolution and phylogeny of parasitism. Prerequisite: Z 456 or equivalent. Two lectures; 1 three-hour laboratory period. Associate Professor Pratt.

Z 561, 562, 563. Biology of the Cell. 3 hours each term.

Physics and chemistry of protoplasm; cellular physiology; chromosomes in genetics and evolution; physiology of the gene. Prerequisite: Z 461, 462, 463. Two lectures; 1 three-hour laboratory period. Professor Dornfeld.

Z 581. Zoogeography. 3 hours winter.

Factors affecting distributions of animals; general principles; faunal areas of world and of North America. Prerequisite: Z 371, 372, and 483, or consent of instructor. Professor Gordon.

School of Agriculture

Faculty

FREDERICK EARL PRICE, B.S., Dean of the School of Agriculture.
WILLIAM ALFRED SCHOENFELD, M.B.A., Professor Emeritus of Agriculture.
Dean and Director of Agriculture, 1931-50.
WILLIAM MARTIN LANGAN, B.S., Agricultural Student Personnel Adviser.
GEORGE L. CROWE, Accountant.

Agricultural Economics

ASSOCIATE PROFESSOR BLANCH (acting department head).
PROFESSORS HOLLANDS, KUHLMAN, MUMFORD, POTTER (emeritus).
ASSOCIATE PROFESSOR PLATH.
ASSISTANT PROFESSORS HYER, KORZAN, VROOMAN.

Agricultural Education

ASSISTANT PROFESSOR TEN PAS (acting department head).
PROFESSOR GIBSON (emeritus).
INSTRUCTOR JEAN.

Agricultural Engineering

PROFESSORS RODGERS (department head), GILMORE (emeritus), SINNARD.
ASSOCIATE PROFESSORS CROPSEY, LUNDE.
ASSISTANT PROFESSORS JEWELL, KIRK, WOLFE.
INSTRUCTOR LONG.

Animal Husbandry

PROFESSORS MCKENZIE (department chairman), BOGART, HAAG, NELSON.
ASSOCIATE PROFESSORS OLIVER, POULTON.
ASSISTANT PROFESSORS JOHNSON, WARNICK.

Dairy Husbandry (including Dairy Manufacturing)

PROFESSORS BRANDT (department head), JONES, RICHARDSON, WILSTER.
ASSOCIATE PROFESSOR WOLBERG.

Farm Crops

PROFESSORS HILL (department head), FORE.
ASSOCIATE PROFESSORS FOOTE, FREED, KANIPE, POULTON.
ASSISTANT PROFESSOR COWAN.
INSTRUCTOR SCHUDEL.

Fish and Game Management

PROFESSOR DIMICK (department head).

ASSOCIATE PROFESSOR LONG.

ASSISTANT PROFESSORS BOND, KUHN.

Food Technology

PROFESSORS WIEGAND (department head), LITWILLER.

ASSOCIATE PROFESSORS ONSDORFF, WORTHINGTON.

ASSISTANT PROFESSORS NIVEN, SAMUELS.

Horticulture

PROFESSORS HARTMAN (department head), BOUQUET (emeritus), DURUZ, FRAZIER.

ASSOCIATE PROFESSORS APPLE, WADSWORTH, ZIELINSKI.

INSTRUCTORS BLANEY, NIELSEN.

Poultry Husbandry

PROFESSOR PARKER (department head).

ASSOCIATE PROFESSORS BERNIER, COONEY.

ASSISTANT PROFESSOR HARPER.

Soils

PROFESSORS POWERS (department head), RUZEK, STEPHENSON.

ASSOCIATE PROFESSOR MARSH.

ASSISTANT PROFESSOR DANNEN.

Veterinary Medicine

PROFESSORS SHAW (department head), DICKINSON.

ASSOCIATE PROFESSOR SCHNAUTZ.

INSTRUCTOR SULLIVAN.

General Statement

UNDERGRADUATE curricula offered in the School of Agriculture lead to degrees of Bachelor of Science and Bachelor of Agriculture, and graduate curricula lead to degrees of Master of Science and Doctor of Philosophy. The curricula are planned to prepare young men and 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, in the United States Department of Interior, Bureau

of Land Management, or in agricultural colleges as teachers, investigators, extension specialists, county agricultural agents, 4-H club leaders, as teachers of agriculture in secondary schools, or as specialists 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, working in the ornamental nursery-stock industry, teaching practical ornamental gardening, maintenance of golf courses, contracting and construction on new properties, and in other similar occupations.

The curriculum in agriculture with agricultural engineering emphasis prepares for college extension work; sales and development work with manufacturers of implements such as tractors and farm equipment; service as agricultural specialists with building materials and equipment companies; the commercial field, including the farm implement and lumber retail business; service as managers or operators of farms where the knowledge of drainage, farm structures, and machinery and power equipment is important.

In the food technology 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.

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 (see page 80). 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.

On the following pages the four-year curricula, all leading to the bachelor's degree, are outlined in this order:

GENERAL AGRICULTURE

General Agriculture with Agricultural Engineering Emphasis

General Agriculture with Minor in Journalism

AGRICULTURAL ECONOMICS

AGRICULTURAL EDUCATION

AGRICULTURAL TECHNOLOGY

ANIMAL HUSBANDRY

Animal Husbandry

Range Management

DAIRY HUSBANDRY

Dairy Production

Dairy Products Industries

FARM CROPS

FISH AND GAME MANAGEMENT

FISHERIES

FOOD TECHNOLOGY

HORTICULTURE

Pomology and Vegetable Crops
Floriculture and Nursery Management
Landscape Construction and Maintenance

POULTRY HUSBANDRY**SOILS**

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 a 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.

One-Year and Two-Year Curricula. A one-year curriculum in Dairy Products Industries is offered to train students for positions as butter makers, cheese makers, ice cream makers, and milk plant operators. Practical and sanitation phases of dairy processing are emphasized.

The School of Agriculture offers a two-year curriculum leading to a Certificate in Agriculture (see page 224). The purpose is to provide training for students who are farming or planning to engage in farming or in nontechnical fields of agriculture, who are unable to take a four-year curriculum.

Advanced Degrees. Opportunities are provided in all the departments of the School of Agriculture for graduates of Oregon 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 agricultural economics, animal industries, and plant industries. See GRADUATE SCHOOL.

Annual Canners and Frozen-Food Packers School. The annual two-week Canners and Frozen-Food Packers School, established in 1921, 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.

Facilities. The work in agriculture is centered in Agriculture Hall where are located the administrative offices of the School of Agriculture, the Agricultural Experiment Station, and the Federal Cooperative Extension Service. Agriculture Hall, constructed of brick and concrete, consists of a four-story

central unit 66 by 140 feet with wings to the north and south, each 72 by 130 feet and three stories high. United States Department of Agriculture cooperative research workers also occupy offices and laboratories in this building. Other buildings of the School of Agriculture include the Agricultural Engineering Building, Agricultural Utilities Building, Withycombe Hall (which houses the Dairy and Animal Husbandry departments), Food Technology Building, the Greenhouses, the Stock Judging Building, the Poultry Building, the Veterinary Clinic Building, and the stables and barns. Some of the facilities of the School of Agriculture are described in detail under the divisions and departments.

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
General Chemistry (Ch 101, 102, 103)	3	3	3
General Botany (Bot 201, 202)	3	3	.....
Agricultural Resources (AEc 111) .....	.....	3	.....
Elements of Agronomy I (FC 111)	3	(3)	(3)
Elements of Horticulture (Hrt 111)	(3)	.....	3
Introduction to Animal Husbandry (AH 121)	(3)	(3)	3
Poultry Production (PH 121)	(3)	(3)	3
Dairy Husbandry (DH 121)	3	.....	3
Agricultural Engineering Survey (AE 111)	(3)	3	.....
¹ Physical Education	1	1	1
² Air or Military Science	2	2	2
	15	15	15

Common Sophomore Year

Sophomore 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
³ Organic and Agricultural Biochemistry (Ch 251) or Agricultural Statistics (AEC 221) or Elementary Journalism (J 111)	5	.....	(3)
⁴ General Bacteriology (Bac 204) or Stock Judging I (AH 131)	(3)	3	.....
⁵ Soil Drainage and Irrigation (SIs 213) or General Zoology (Z 200) .....	.....	.....	3-5
Soils (SIs 211, 212)	3	3	3
Principles of Economics (Ec 201, 202, 203)	3	3	3
⁶ Elements of Agronomy II (FC 211) or Plant Propagation (Hrt 311)	(3)	3	.....
Principles of Farm Management (AEc 211) .....	.....	.....	3
Physical Education	1	1	1
² Air or Military Science	2	2	2
	17	18	15-17

¹General Hygiene (PE 150), 1 term hour, is taken one term in place of physical education.

²Students desiring to register for Naval Science instead of Air or Military Science should consult with the Dean of Agriculture.

³Farm Management and Agricultural Economics students take statistics; Agricultural Journalism students take J 111, 211.

⁴Animal Husbandry students will take Stock Judging I (AH 131) as sophomores and General Bacteriology (Bac 204) as juniors.

⁵Animal, Dairy, and Poultry Husbandry students will take General Zoology (Z 200), 5 hours.

⁶Horticulture students will take Plant Propagation (Hrt 311).

Curriculum in General Agriculture

B.S. Degree

(See Common Freshman and Sophomore years.)

	Term hours		
	F	W	S
Junior Year			
Principles of Agricultural Marketing (AEc 341)	3	3	3
Animal Breeding I (AI 315) or Plant Genetics I (FC 315)	3	4	4
Introduction to Economic Entomology (Ent 314)	(4)	4	4
Elementary Journalism (J 111)	3	3	3
Extempore Speaking (Sp 111)	3	3	3
¹ Electives	12	6	17
	18	16	17
Senior Year			
American National Government (PS 201)	3	3	3
¹ Electives	15	15	17
	18	15	17

Curriculum in General Agriculture with Agricultural Engineering Emphasis

B.S., B.Agr. Degrees

	Term hours		
	F	W	S
Freshman Year			
General Chemistry (Ch 101, 102, 103)	3	3	3
Agricultural Engineering Problems (AE 101, 102, 103)	1	1	1
Forging and Welding (IE 250)	2	2	2
Elements of Horticulture (Hrt 111)	3	3	3
Farm Mechanics (AE 221)	3	3	3
Introduction to Animal Husbandry (AH 121)	3	3	3
General Botany (Bot 201, 202)	3	3	3
Elements of Agronomy I (FC 111)	3	3	3
Extempore Speaking (Sp 111)	3	3	3
Physical Education or General Hygiene	1	1	1
² Air or Military Science	2	2	2
Elective (Lower-Division course in Agriculture)	2	2	3
	15	16	16
Sophomore Year			
English Composition (Eng 111, 112, 113)	3	3	3
Elementary Analysis (Mth 101, 102, 103)	4	4	4
Outlines of Economics (Ec 211)	4	4	4
Social Science	3	3	3
Soils (Sls 211, 212)	3	3	3
Principles of Farm Management (AEc 211)	3	3	3
² Air or Military Science	2	2	2
Physical Education	1	1	1
	17	16	16
Junior Year			
General Bacteriology (Bac 204)	3	3	3
Abridged General Physics (Ph 211, 212)	3	3	3
Engineering Drawing (GE 111, 112)	2	2	2
House Planning and Architectural Drawing (AA 178)	3	3	3
Farm Motors and Tractors (AE 311)	3	3	3
Plane Surveying (CE 226)	3	3	3
Automobile Mechanics (AE 313)	3	3	3
Farm Electricity (AE 331)	3	3	3
Elementary Journalism (J 111)	3	3	3
Machine Tool Practices (IE 260)	3	3	3
Farm Implements (AE 231)	3	3	3
Principles of Accounting (BA 211a)	2	2	2
Soil Drainage and Irrigation (Sls 213)	3	3	3
² Air or Military Science or electives	3	3	3
Electives	3	4	4
	17	17	17

¹Electives 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.

²Students desiring to register for Naval Science instead of Air or Military Science should consult with the Dean of Agriculture.

	Senior Year		
	Term hours		
	F	W	S
Farm Buildings (AE 361)	3	.....	.....
Elementary Hydraulics (CE 322) .....	.....	3	.....
Pumps and Irrigation Equipment (AE 321) .....	.....	.....	3
Seminar (AE 407) .....	.....	.....	1
¹ Air or Military Science or electives	3	3	3
Electives	9	9	9
	15	15	16

Curriculum in General Agriculture with Minor in Journalism

B.S. Degree

(See Common Freshman and Sophomore years.)

	Junior Year		
	Term hours		
	F	W	S
Extempore Speaking (Sp 111) .....	.....	.....	3
Editorial Writing (J 223) or approved elective	3	.....	.....
Public Information Methods (J 313) .....	.....	3	.....
Elementary Journalism (J 112) .....	.....	.....	3
Journalism Projects (J 351, 352, 353) or approved electives	2	2	2
Rudiments of Photography (Ph 161) or (Ph 361) .....	.....	.....	2
Principles of Agricultural Marketing (AEC 341) .....	.....	3	.....
Introduction to Economic Entomology (Ent 314)	4	(4)	.....
Electives (upper-division courses in Agriculture)	3	3	3
Electives	5	6	4
	17	17	17

	Senior Year		
	Term hours		
	F	W	S
Special Feature Articles (J 312)	3	.....	.....
Technical Writing (J 314) .....	.....	3	.....
Radio Speaking (Sp 334, 335, 336)	3	3	3
American National Government (PS 201) .....	.....	.....	3
Soil Fertility Lectures (Sls 424) .....	.....	3	.....
Farm Crops (upper division) .....	.....	3	.....
Horticulture (upper division)	3	.....	.....
Dairy Production (upper division)	3	.....	.....
Animal Husbandry (upper division) .....	.....	.....	3
Electives	5	5	8
	17	17	17

Curriculum in Agricultural Economics²

B.S., B.Agr. Degrees³

(See Common Freshman and Sophomore years.)

	Junior Year		
	Term hours		
	F	W	S
Farm Organization (AEC 312)	3	.....	.....
Principles of Agricultural Marketing (AEC 341)	3	.....	.....
Cooperative Marketing (AEC 342) .....	.....	3	.....
Economic Development of Agriculture (AEC 331) .....	.....	.....	3
⁴ Farm Accounting (AEC 311) or Principles of Accounting (BA 211, 212) .. (3)	.....	3	.....
Animal Nutrition I (AI 311)	4	.....	.....
Sociology of Rural Life (Soc 364) .....	.....	.....	3
American National Government (PS 201) .....	.....	.....	3
Extempore Speaking (Sp 111) .....	.....	3	.....
Elementary Journalism (J 111) .....	.....	3	.....
Applied Statistics (AEC 321) .....	.....	.....	3
Business Law (BA 411)	3	.....	.....
Electives	2-5	6	6
	15-18	18	18

¹Students desiring to register for Naval Science instead of Air or Military Science should consult with the Dean of Agriculture.

²In cooperation with production departments concerned, students may emphasize the marketing of fruits, vegetables, dairy products, poultry, livestock, or farm crops.

³For B.S. degree, students take at least 36 term hours in science or 36 term hours in social science or 45 term hours in science and social science.

⁴Farm Accounting will be taken by those students electing the farm management option.

	Senior Year		
	AGRICULTURAL ECONOMICS OPTION		
	Term hours		
	F	W	S
Money and Banking (Ec 413)	4	.....	.....
Transportation (Ec 435) .....	.....	3	.....
Current Economic Theory and Problems (Ec 475, 476, 477)	3	3	3
Agricultural Finance (AEc 431) .....	.....	3	.....
Agricultural Prices (AEc 451)	3	.....	.....
Agricultural Economics (AEc 411) .....	.....	.....	3
Consumption of Agricultural Products (AEc 412) .....	.....	3	.....
Seminar (AEc 407) .....	.....	.....	1
Electives	6	4	9
	16	16	16
FARM MANAGEMENT OPTION			
Enterprise Cost and Profits (AEc 414) .....	.....	3	.....
Applied Farm Management (AEc 422) .....	.....	.....	3
Federal Programs and the Farmer (AEc 418) .....	.....	2	.....
Agricultural Appraisal (AEc 425) .....	.....	.....	3
Agricultural Finance (AEc 431) .....	.....	3	.....
Agricultural Prices (AEc 451)	3	.....	.....
Seminar (AEc 407) .....	.....	.....	1
Electives	12	9	9
	15	17	16

Curriculum in Agricultural Education

B.S. Degree

(See Common Freshman Year.)¹

	Sophomore Year		
	Term hours		
	F	W	S
English Composition (Eng 111, 112, 113)	3	3	3
² Outlines of Economics (Ec 212)	3	(3)	(3)
Soils (Sls 211, 212)	3	3	.....
Principles of Agricultural Marketing (AEc 341)	(3)	3	.....
Elements of Agronomy II (FC 211)	(3)	3	.....
Stock Judging I (AH 131)	3	(3)	.....
Principles of Farm Management (AEc 211) .....	.....	3	3
General Psychology (Psy 207, 208)	(3)	3	3
American National Government (PS 201)	3	(3)	(3)
Elementary Journalism (J 111)	(3)	(3)	3
Vocational Education in Agriculture (AEc 220) .....	.....	3	3
³ Air or Military Science	2	2	2
Physical Education	1	1	1
	18	18	17
Junior Year			
Animal Nutrition I (AI 311)	4	.....	.....
Forging and Welding (IE 250)	2	(2)	.....
Farm Motors and Tractors (AE 311)	(3)	(3)	3
Farm Mechanics (AE 221)	(3)	3	.....
Farm Organization (AEc 312)	3	.....	.....
Farm Accounting (AEc 311) .....	.....	3	.....
Enterprise Costs and Profits (AEc 414) or Agricultural Appraisal (AEc 425) .....	.....	(3)	3
Diseases of Livestock (VM 341)	4	.....	.....
Secondary Schools in American Life (Ed 311)	(3)	3	(3)
Educational Psychology (Ed 312)	(3)	3	(3)
Principles of Teaching (Ed 313)	(3)	(3)	3
⁴ Methods and Materials (Ed 408) .....	.....	.....	3
Seminar (Records) (AEc 407) .....	.....	.....	2
⁵ Air or Military Science	3	3	3
General Bacteriology (Bac 204) .....	.....	3	.....
	16	18	17

¹Agricultural Education majors are advised to take one term of General Botany (Bot 201) and one term of General Zoology (Z 200) instead of two terms of botany.

²Or Ec 211, 4 hours.

³Students desiring to register for Naval Science instead of Air or Military Science should consult with the Dean of Agriculture.

⁴Ed 408 is taken two terms (total 6 term hours). It may be begun spring term of junior year if desired.

	Term hours		
	F	W	S
Senior Year			
¹ Methods and Materials (Ed 408)	(3)	3	(3)
² Seed Production (FC 414) or Forage Crops (FC 324)	3	---	(3)
³ Supervised Teaching (Ed 415)	(9)	9	---
History of Oregon (Hst 377)	3	(3)	(3)
Oregon School Law and Oregon System of Education (Ed 316)	2	2	2
The Agricultural Curriculum (AEd 417)	---	---	3
⁴ Seminar (Records) (AEd 407)	3	(3)	(3)
⁵ Reading and Conference (AEd 405)	(3)	(3)	3
Introduction to Economic Entomology (Ent 314)	4	---	---
⁶ Air or Military Science	3	3	3
	18	17	11

Curriculum in Agricultural Technology

B.S. Degree

	Term hours		
	F	W	S
Freshman Year			
English Composition (Eng 111, 112, 113)	3	3	3
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
⁵ Physical Education	1	1	1
⁶ Air or Military Science	2	2	2
	16	16	16
Sophomore Year			
Principles of Economics (Ec 201, 202, 203)	3	3	3
Plant Genetics I (FC 315) or Animal Breeding I (AI 315)	(3)	3	---
General Bacteriology (Bac 204)	---	3	---
Lower-division Science sequence (see Group Courses)	3	3	3
Agriculture electives from courses numbered 211 to 299	---	3	9
⁶ Air or Military Science	2	2	2
Physical Education	1	1	1
Electives	6	---	---
	15	18	18
Junior and Senior Years			
Extempore Speaking (Sp 111)	3	---	---
Elementary Journalism (J 111)	---	3	---
American National Government (PS 201)	3	---	---
⁶ Electives	27	27	30
	33	30	30

¹Ed 408 is taken two terms (total 6 term hours). It may be begun spring term of junior year if desired.

²Not required of students taking advanced Military Science.

³Supervised Teaching will be offered in the fall or winter term and will consist of one full term away from the college while registered for: Ed 415, 9 term hours; AEd 407, 3 term hours; AEd 405, 3 term hours.

⁴Students desiring to register for Naval Science instead of Air or Military Science should consult with the Dean of Agriculture.

⁵General Hygiene (PE 150), 1 term hour for men, 2 term hours for women, is taken one term in place of physical education.

⁶Not less than 24 term hours of upper-division courses in agriculture including 3 hours of Seminar.

Curricula in Animal Husbandry

B.S. Degree

Animal Husbandry Range Management

ANIMAL HUSBANDRY

(See Common Freshman and Sophomore years.)

Junior Year

	Term hours		
	F	W	S
Types and Market Classes of Livestock (AH 331) .....	.....	3	.....
Animal Breeding I (AI 315)	3	.....	.....
Anatomy of Domestic Animals (VM 320)	3	.....	.....
Physiology of Domestic Animals (VM 321, 322) .....	.....	3	3
General Bacteriology (Bac 204) .....	.....	3	.....
Farm Accounting (AEc 311) .....	.....	3	.....
Animal Breeding II (AI 316) .....	.....	3	.....
Principles of Agricultural Marketing (AEc 341)	3	.....	.....
Business Law (BA 411) .....	.....	.....	3
American National Government (PS 201)	3	.....	.....
Extempore Speaking (Sp 111) .....	.....	.....	3
Electives	5	2	8
	17	17	17

Senior Year

Animal Nutrition II (AI 411)	4	.....	.....
Diseases of Livestock (VM 441, 442, 443)	3	3	3
Range Management (AH 341)	3	.....	.....
Beef Cattle and Sheep Production (AH 415) .....	.....	4	.....
Livestock Economics (AEc 440) .....	.....	.....	3
Seminar (AH 407) .....	.....	.....	1
Elementary Journalism (J 111)	3	.....	.....
Electives	4	10	10
	17	17	17

RANGE MANAGEMENT

Freshman Year

	Term hours		
	F	W	S
General Chemistry (Ch 101, 102, 103)	3	3	3
General Botany (Bot 201, 202), Field Botany (Bot 203)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
Extempore Speaking (Sp 111) .....	.....	3	.....
General Zoology (Z 200) .....	.....	.....	5
Introduction to Animal Husbandry (AH 121)	3	.....	.....
Physical Education	1	1	1
¹ Air or Military Science	2	2	2
	15	15	17

Sophomore Year

Organic and Agricultural Biochemistry (Ch 251, 252)	5	3	.....
Principles of Economics (Ec 201, 202, 203)	3	3	3
Systematic Botany (Bot 321) .....	.....	.....	4
Elements of Agronomy I (FC 111)	3	.....	.....
General Bacteriology (Bac 204) .....	.....	.....	3
Soils (Sls 211, 212)	3	3	.....
Elementary Analysis (Mth 101) .....	.....	.....	4
Elements of Agronomy II (FC 211) .....	.....	3	.....
Physical Education	1	1	1
¹ Air or Military Science	2	2	2
	17	15	17

Junior Year

Range Management (AH 341)	3	.....	.....
Range Improvement and Maintenance (FC 319) .....	.....	3	.....
Statistical Methods (Mth 445)	3	.....	.....
Forest Engineering (FE 123, 223) .....	.....	3	4
Principles of Plant Physiology (Bot 331)	4	.....	.....
Principles of Plant Ecology (Bot 341) .....	.....	.....	4
Agrostology (Bot 314) .....	.....	.....	3
Forest Land Use (F 311) or Farm Forestry (F 344) .....	.....	3	.....
Wildlife Management (FG 281, 282) or Forest Wildlife Management (FG 310, 311)	3	3	.....
Electives	4	4	6
	17	16	17

¹Students desiring to register for Naval Science instead of Air or Military Science should consult with the Dean of Agriculture.

	Senior Year		Term hours		
	F	W	S		
Range Methods (AH 441)	4	.....	.....	.....	.....
Elective (range management) AH or FC .....	.....	2-3	.....	.....	.....
Beef Cattle and Sheep Production (AH 415) .....	.....	4	.....	.....	.....
Animal Nutrition II (AI 411)	4	.....	.....	.....	.....
Agricultural Land Economics (AEc 462) or Public Land Policies (AEc 461) .....	.....	.....	3	.....	(3)
Elementary Journalism (J 111) .....	.....	.....	3	.....	.....
American National Government (PS 201) .....	.....	.....	.....	3	.....
Diseases of Livestock (VM 341)	4	.....	.....	.....	.....
Electives	5	3-4	.....	.....	13
	17	16	16	.....	.....

Curricula in Dairy Husbandry

B.S. Degree

Dairy Production Dairy Products Industries

DAIRY PRODUCTION

(See Common Freshman and Sophomore years.)

	Junior Year		Term hours		
	F	W	S		
Animal Nutrition II (AI 411)	4	.....	.....	.....	.....
Anatomy of Domestic Animals (VM 320)	3	.....	.....	.....	.....
Physiology of Domestic Animals (VM 321, 322) .....	.....	3	3	.....	.....
Dairy Herd Management (DH 322) .....	.....	3	.....	.....	.....
Dairy Cattle Selection by Types (DH 321) .....	.....	.....	3	.....	.....
Dairy Products Standards (DH 118) .....	.....	.....	1	.....	.....
Animal Breeding I (AI 315)	3	.....	.....	.....	.....
Handling and Processing Milk (DH 210)	3	.....	.....	.....	.....
Extempore Speaking (Sp 111) .....	.....	3	.....	.....	.....
Elementary Journalism (J 111) .....	.....	3	.....	.....	.....
American National Government (PS 201) .....	.....	.....	3	.....	.....
Electives	3	6	7	.....	.....
	16	18	17	.....	.....

Senior Year

Principles of Agricultural Marketing (AEc 341)	3	.....	.....	.....	.....
Dairy Cattle Feeding (DH 422) .....	.....	.....	.....	.....	3
Seminar (DH 407)	1	1	1	.....	.....
Diseases of Livestock (VM 441, 442, 443)	3	3	3	.....	.....
Dairy Bacteriology (Bac 411) .....	.....	3	.....	.....	.....
Dairy Chemistry (Ch 457) .....	.....	3	.....	.....	.....
Electives	9	6	9	.....	.....
	16	16	16	.....	.....

DAIRY PRODUCTS INDUSTRIES

(For the one-year terminal curriculum, see page 224.)

Freshman Year

Students may take the curriculum common for all students in the four-year agricultural curricula or they may take the following courses during the freshman year:

	Term hours		
	F	W	S
Dairy Husbandry (DH 121)	3	.....	.....
General Chemistry (Ch 101, 102, 103)	3	3	3
Biological Science Survey (GS 101, 102, 103)	4	4	4
Agricultural Resources (AEc 111) .....	.....	.....	3
English Composition (Eng 111, 112, 113)	3	3	3
Testing Milk and Cream (DH 122) .....	.....	1	.....
Mental Hygiene (Psy 111) .....	.....	3	.....
Dairy Products Standards (DH 118) .....	.....	.....	1
¹ Air or Military Science	2	2	2
Physical Education	1	1	1
	16	17	17

¹Students desiring to register for Naval Science instead of Air or Military Science should consult with the Dean of Agriculture.

	Term hours		
	F	W	S
Sophomore Year			
Handling and Processing Milk (DH 210)	3	.....	.....
American National Government (PS 201) .....	.....	.....	3
Intermediate Algebra (Mth 100)	4	.....	.....
Abridged General Physics (Ph 211, 212) .....	.....	3	3
Organic and Agricultural Biochemistry (Ch 251)	5	.....	.....
General Bacteriology (Bac 204) .....	.....	3	3
Introduction to Literature (Eng 105, 106) .....	.....	3	3
Principles of Economics (Ec 201, 202, 203)	3	3	3
Elementary Journalism (J 111) .....	.....	.....	3
Extempore Speaking (Sp 111) .....	.....	3	.....
¹ Air or Military Science	2	2	2
Physical Education	1	1	1
	18	18	18

Junior Year			
Butter Manufacturing (DH 312)	3	.....	.....
Cheese Manufacturing (DH 313) .....	.....	3	.....
Ice Cream Manufacturing (DH 314) .....	.....	.....	3
Dairy Products Laboratory (DH 315, 316, 317)	2	2	2
Dairy Bacteriology (Bac 411, 412) .....	.....	3	3
Dairy Chemistry (Ch 457) .....	.....	3	.....
Dairy Chemistry Laboratory (Ch 458) .....	.....	2	.....
Dairy Judging (DH 425)	2	.....	.....
Principles of Accounting (BA 211, 212)	3	3	.....
Radio Speaking (Sp 334) .....	.....	.....	3
Business English (Eng 217)	3	.....	.....
² Electives	3	2	6
	16	18	17

Senior Year			
Milk Plant Operation (DH 416) .....	.....	3	.....
Dry and Condensed Milk (DH 411)	3	.....	.....
Milk Marketing (AEc 444) .....	.....	3	.....
Dairy Technology (DH 412, 413) .....	.....	3	3
Principles of Agricultural Marketing (AEc 341)	3	.....	.....
Seminar	1	1	1
Dairy Food Specialties (DH 414) .....	.....	.....	3
Dairy Plant Management (DH 415) .....	.....	.....	2
Electives	11	8	8
	18	18	17

Curriculum in Farm Crops

B.S. Degree

(See Common Freshman and Sophomore Years.)

For the four-year curriculum in Range Management, see pages 215-216.

	Term hours		
	F	W	S
Junior Year			
Plant Genetics I (FC 315)	3	.....	.....
Principles of Plant Pathology (Bot 351)	4	.....	.....
Cereal Production Lectures (FC 322) .....	.....	3	.....
Cereal Morphology (FC 323) .....	.....	2	.....
Principles of Plant Physiology (Bot 331) .....	.....	.....	4
Principles of Agricultural Marketing (AEc 341) .....	.....	3	.....
Farm Accounting (AEc 311) .....	.....	3	.....
Introduction to Economic Entomology (Ent 314) .....	.....	4	.....
Extempore Speaking (Sp III) .....	.....	.....	3
Elementary Journalism (J 111)	3	.....	.....
American National Government (PS 201)	3	.....	.....
Forage Crops (FC 324) .....	.....	.....	3
Electives	3	3	6
	16	18	16

¹Students desiring to register for Naval Science instead of Air or Military Science should consult with the Dean of Agriculture.

²Students who wish to emphasize merchandising of dairy products should elect courses in business and related fields, while those interested in dairy processing should elect additional courses in Science.

	Senior Year		
	Term hours		
	F	W	S
Seed Production (FC 414)	3	---	---
Crop Inspection (FC 411)	---	4	---
Plant Genetics II (FC 417)	3	---	---
Soil Physics Lectures (Sls 421)	3	---	---
Soil Fertility Lectures (Sls 424)	---	3	---
Animal Nutrition II (AI 411)	4	---	---
Seminar (FC 407)	1	1	1
Electives	3	9	13
	17	17	14

Curriculum in Fish and Game Management

B.S. Degree

	Freshman Year		
	Term hours		
	F	W	S
English Composition (Eng 111, 112, 113)	3	3	3
General Zoology (Z 200)	5	---	---
Wildlife Conservation (FG 251, 252)	3	3	---
Wildlife Technique (FG 261)	---	---	3
Tree Identification (F 153)	---	---	3
Elements of Agronomy I (FC 111)	---	3	---
Agricultural Engineering Survey (AE 111)	---	---	3
Extempore Speaking (Sp 111)	---	3	---
*Air or Military Science	2	2	2
Physical Education	1	1	1
	14	15	15

	Sophomore Year		
	Term hours		
	F	W	S
Economics and Social Sciences	3	3	3
General Chemistry (Ch 101, 102, 103)	3	3	3
Wildlife Management (FG 281, 282, 283)	3	3	3
General Botany (Bot 201, 202), Field Botany (Bot 203)	3	3	3
Animal Breeding I (AI 315)	3	---	---
Mammalogy (Z 372)	---	3	---
Ornithology (Z 371)	---	---	3
*Air or Military Science	2	2	2
Physical Education	1	1	1
	18	18	18

	Junior Year		
	Term hours		
	F	W	S
Management of Game Birds (FG 451, 452, 453)	3	3	3
Aquatic Plants (Bot 316)	3	---	---
Principles of Plant Ecology (Bot 341)	---	---	4
Anatomy of Domestic Animals (VM 320)	3	---	---
Physiology of Domestic Animals (VM 321, 322)	---	3	3
Agricultural Statistics (AEc 221)	---	3	---
Economic Ichthyology (FG 274, 275)	3	3	---
Introduction to Economic Entomology (Ent 314)	---	4	---
Electives	4	---	6
	16	16	16

	Senior Year		
	Term hours		
	F	W	S
American National Government (PS 201)	---	---	3
Invertebrate Zoology (Z 451, 452)	4	4	---
Management of Big Game (FG 457, 458)	3	---	3
Management of Fur Bearers (FG 460)	---	3	---
Management of Game Fish (FG 454, 455, 456)	3	3	3
Wildlife Food Crops (FC 318)	3	---	---
Parasitic Diseases of Domestic and Game Animals (VM 361)	---	4	---
Rudiments of Photography (Ph 161)	2	---	---
Technical Writing (J 314)	---	---	3
Electives	3	3	3
	18	17	15

*Students desiring to register for Naval Science instead of Air or Military Science should consult with the Dean of Agriculture.

Curriculum in Fisheries

B.S. Degree

	Term hours		
	F	W	S
Freshman Year			
English Composition (Eng 111, 112, 113)	3	3	3
General Chemistry (Ch 101, 102, 103)	3	3	3
General Zoology (Z 200)	5	.....	.....
Wildlife Conservation (FG 251, 252)	3	3	.....
Wildlife Technique (FG 261) .....	.....	.....	3
Elementary Analysis (Mth 101, 102) .....	.....	4	4
¹ Air or Military Science	2	2	2
Physical Education	1	1	1
	17	16	16
Sophomore Year			
Principles of Economics (Ec 201, 202, 203)	3	3	3
Economic Ichthyology (FG 274, 275, 276)	3	3	3
Organic and Agricultural Biochemistry (Ch 251, 252)	5	3	.....
Quantitative Analysis for Agricultural Students (Ch 254) .....	.....	.....	3
Comparative Vertebrate Embryology (Z 326)	4	.....	.....
Comparative Vertebrate Anatomy (Z 324, 325) .....	.....	4	4
¹ Air or Military Science	2	2	2
Physical Education	1	1	1
	18	16	16
Junior Year			
Commercial Fisheries (FG 464, 465, 466)	3	3	3
General Bacteriology (Bac 204, 205) .....	.....	3	3
Animal Nutrition II (AI 411) .....	.....	.....	4
Extempore Speaking (Sp 111)	3	.....	.....
Elementary Journalism (J 111) .....	.....	3	.....
Statistical Methods (Mth 445, 446)	3	3	.....
Principles of Food Preservation (FT 250)	3	.....	.....
Preservation of Meats and Marine Products (FT 254) .....	.....	.....	3
Genetics (Z 341)	3	.....	.....
Electives	1	4	3
	16	16	16
Senior Year			
Management of Game Fish (FG 454, 455, 456)	3	3	3
Invertebrate Zoology (Z 451, 452)	4	4	.....
Aquatic Entomology (Ent 341) .....	.....	.....	4
Comparative Vertebrate Histology (Z 461)	5	.....	.....
Microtechnique (Z 462) .....	.....	4	.....
American National Government (PS 201) .....	.....	.....	3
Technical Writing (J 314) .....	.....	.....	3
Electives	4	5	3
	16	16	16

Curriculum in Food Technology

B.S. Degree

	Term hours		
	F	W	S
Freshman Year			
English Composition (Eng 111, 112, 113)	3	3	3
General Chemistry (Ch 101, 102, 103)	3	3	3
Intermediate Algebra (Mth 100)	4	.....	.....
General Botany (Bot 201, 202) .....	.....	3	3
Food Plant Mechanics (AE 115, 116, 117)	2	2	2
Elements of Horticulture (Hrt 111) .....	.....	.....	3
Extempore Speaking (Sp 111) .....	.....	3	.....
¹ Air or Military Science	2	2	2
Physical Education, General Hygiene	1	1	1
	15	17	17

¹Students desiring to register for Naval Science instead of Air or Military science should consult with the Dean of Agriculture.

	Term hours		
	F	W	S
Sophomore Year			
Principles of Food Preservation (FT 250)	3	---	---
Principles of Canning Fruits and Vegetables (FT 251)	---	3	---
American National Government (PS 201)	---	---	3
Organic and Agricultural Biochemistry (Ch 251, 252)	5	3	---
Quantitative Analysis for Agricultural Students (Ch 254)	---	---	3
Abridged General Physics (Ph 211, 212)	---	3	3
General Bacteriology (Bac 204, 205)	---	3	3
Food Bacteriology (Bac 460)	3	---	---
Outlines of Economics (Ec 212)	---	3	---
Applied Psychology (Psy 209)	3	---	---
¹ Air or Military Science	2	2	2
Physical Education	1	1	1
	<u>17</u>	<u>18</u>	<u>15</u>
Junior Year			
Food Technology (FT 321, 322)	3	3	---
Industrial Food Fermentations (FT 341)	3	---	---
Principles of Agricultural Marketing (AEc 341)	---	3	---
Principles of Accounting (BA 211a)	---	---	3
² Electives in curricular option	9	9	13
	<u>15</u>	<u>15</u>	<u>16</u>
Senior Year			
Seminar (FT 407)	1	1	1
Frozen Foods (FT 412, 413)	---	3	3
Regulatory Control of Food Products (FT 421)	3	---	---
Human Relations in Business and Industry (BA 497)	---	3	---
² Electives in curricular option	12	9	12
	<u>16</u>	<u>16</u>	<u>16</u>

Curricula in Horticulture

B.S. Degree

*Pomology and Vegetable Crops Floriculture and Nursery Management
Landscape Construction and Maintenance*

POMOLOGY AND VEGETABLE CROPS (See Common Freshman and Sophomore Years.)

	Term hours		
	F	W	S
Junior Year			
Basic Horticulture (Hrt 315)	3	---	---
History and Literature of Horticulture (Hrt 317)	---	3	---
Fruit and Nut Production (Hrt 331)	---	---	4
Vegetable Production (Hrt 341)	---	---	3
Principles of Plant Physiology (Bot 331)	4	---	---
Principles of Economic Entomology (Ent 314)	---	4	---
Principles of Plant Pathology (Bot 351)	---	---	4
Principles of Food Preservation (FT 250)	3	---	---
Plant Genetics I (FC 315)	3	---	---
Home-Ground Planning (LA 279)	---	3	---
Extempore Speaking (Sp 111)	---	3	---
Electives	4	4	6
	<u>17</u>	<u>17</u>	<u>17</u>

¹Students desiring to register for Naval Science instead of Air or Military Science should consult with the Dean of Agriculture.

²Curricular options are available in Inspection and Control, Production, Administration and Marketing, Research, and Food Engineering. Students should consult with adviser on selection of an option.

Recommended courses for **PROCESSING OPTION**: Refrigeration and Cold Storage (ME 363), 3 hours; Sanitary Bacteriology (Bac 261), 3 hours; Frozen Foods (FT 413, 414), 6 hours; Dairy Cattle Feeding (DH 422), 3 hours; Applied Psychology (Psy 209), 3 hours.

Recommended courses for **COMMERCIAL OPTION**: Voice and Diction (Sp 120), 3 hours; Principles of Accounting (BA 213), 3 hours; Business Law (BA 411, 412, 413), 9 hours; Applied Psychology (Psy 209), 3 hours; Money and Banking (Ec 413), 4 hours; Merchandising and Selling (SS 436), 3 hours; Analysis of Financial Statements (BA 427), 3 hours.

Senior Year

NORM

	Term hours		
	F	W	S
Spraying, Dusting, and Fumigation (Hrt 415)	3	---	3
Home-Ground Planning (LA 279)	3	---	---
Principles of Agricultural Marketing (AEC 341)	3	---	---
Cooperative Marketing (AEC 342) or Methods of Research (Hrt 411)	---	3	---
Business Law (BA 411) or Horticultural Plant Breeding (Hrt 413)	---	---	3
Farm Accounting (AEC 311) or Principles of Accounting (BA 211)	---	3	---
Elementary Journalism (J 111)	---	---	3
	6	6	9

POMOLOGY

Senior year norm	6	6	9
Fruit Handling and Distribution (Hrt 431)	---	4	---
Systematic Pomology (Hrt 433)	4	---	---
Fruit Insects (Ent 411)	3	---	---
Fruit Diseases (Bot 453)	---	---	3
American National Government (PS 201)	---	3	---
Electives	4	4	5
	17	17	17

VEGETABLE CROPS

Senior year norm	6	6	9
Vegetable Handling and Distribution (Hrt 441)	3	---	---
Systematic Vegetable Crops (Hrt 443)	3	---	---
Field and Truck Crop Insects (Ent 413)	---	---	3
Field and Truck Crop Diseases (Bot 452)	---	3	---
American National Government (PS 201)	3	---	---
Electives	2	8	5
	17	17	17

FLORICULTURE AND NURSERY MANAGEMENT

Freshman Year

	Term hours		
	F	W	S
General Botany (Bot 201, 202), Field Botany (Bot 203)	3	3	3
General Chemistry (Ch 101, 102, 103)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
Elements of Horticulture (Hrt 111)	3	---	---
General Floriculture (Hrt 151)	---	3	---
Home-Ground Planning (LA 279)	---	---	3
Physical Education, General Hygiene	1	1	1
¹ Air or Military Science	2	2	2
	15	15	15

Sophomore Year

Lower-Division Landscape Design (LA 290)	2	2	2
Soils (Sls 211, 212)	3	3	---
² Organic and Agricultural Biochemistry (Ch 251)	5	---	---
Outlines of Economics (Ec 212)	3	---	---
American National Government (PS 201)	---	3	---
Approved course in Social Science	---	---	3
Plant Propagation (Hrt 311)	---	3	---
Greenhouse Construction and Management (Hrt 313)	---	3	---
Flower Arrangement (Hrt 253)	---	---	3
Herbaceous Plant Materials (Hrt 355)	---	---	3
Principles of Plant Physiology (Bot 331)	---	---	4
Physical Education	1	1	1
¹ Air or Military Science (men)	2	2	2
	16	17	18

¹Students desiring to register for Naval Science instead of Air or Military Science should consult with the Dean of Agriculture.

²Other science courses may be substituted for Ch 251 with the approval of the major professor.

	Term hours		
	F	W	S
Junior Year			
¹ Commercial Floriculture (Hrt 351, 352, 353)	3	3	3
Plant Materials (LA 326, 327, 328)	3	3	3
Basic Horticulture (Hrt 315)	3	---	---
History and Literature of Horticulture (Hrt 317)	---	3	---
Spraying, Dusting, and Fumigation (Hrt 415)	---	---	3
Principles of Plant Pathology (Bot 351)	4	---	---
Introduction to Economic Entomology (Ent 314)	---	4	---
Plant Genetics I (FC 315)	3	---	---
General Bacteriology (Bac 204)	---	---	3
Elementary Journalism (J 111)	---	---	3
Electives	3	3	3
	19	16	18

Senior Year			
Principles of Accounting (BA 211, 212)	3	3	---
Planting Plans (LA 392, 393, 394)	2	2	2
Flower Shop Operation (Hrt 451)	3	---	---
Handling and Distribution of Florist Crops (Hrt 453)	3	---	---
Horticultural Plant Breeding (Hrt 413)	---	---	3
Business Law (BA 413)	---	---	3
Extempore Speaking (Sp 111)	---	3	---
Salesmanship (BA 465)	---	---	3
Electives	4	7	4
	15	15	15

LANDSCAPE CONSTRUCTION AND MAINTENANCE

	Term hours		
	F	W	S
Freshman Year			
General Botany (Bot 201, 202), Field Botany (Bot 203)	3	3	3
General Chemistry (Ch 101, 102, 103)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
History and Literature of Landscape Architecture (LA 356, 357, 358)	2	2	2
Elements of Horticulture (Hrt 111)	3	---	---
General Floriculture (Hrt 151)	---	3	---
Home-Ground Planning (LA 279)	---	---	3
Physical Education, General Hygiene	1	1	1
*Air or Military Science (men)	2	2	2
	17	17	17

Sophomore Year			
Lower-Division Architectural Design (AA 297)	1	1	---
House Planning and Architectural Drawing (AA 178, 180)	3	---	3
Lower-Division Landscape Design (LA 290)	2	2	2
Soils (Sls 211, 212)	3	3	---
American National Government (PS 201)	---	3	---
Basic Horticulture (Hrt 315)	3	---	---
Approved courses in social science	---	3	3
Plane Surveying (CE 221, 223)	3	---	3
Plant Propagation (Hrt 311)	---	3	---
Elementary Journalism (J 111)	---	---	3
Physical Education	1	1	1
*Air or Military Science (men)	2	2	2
	18	18	17

Junior Year			
Plant Materials (LA 326, 327, 328)	3	3	3
Intermediate Landscape Design (LA 390)	3	3	3
Maintenance and Construction (LA 359, 360, 361)	3	3	3
Biological Science Survey (GS 101)	4	---	---
Principles of Plant Physiology (Bot 331)	---	---	4
History and Literature of Horticulture (Hrt 317)	---	3	---
Electives	3	3	3
	16	15	16

¹Students majoring in nursery management will take Nursery Management (Hrt 361, 362, 363) instead of Commercial Floriculture.

²Students desiring to register for Naval Science instead of Air or Military Science should consult with the Dean of Agriculture.

	Senior Year		
	Term hours		
	F	W	S
Planting Plans (LA 392, 393, 394)	2	2	2
Layout of Small Properties (LA 382, 383, 384)	2	2	2
Principles of Plant Pathology (Bot 351)	4	---	---
Introduction to Economic Entomology (Ent 314)	---	4	---
Photography (Ph 361)	---	3	---
Nursery Management (Hrt 361)	3	---	---
Spraying, Dusting, and Fumigation (Hrt 415)	---	---	3
Herbaceous Plant Materials (Hrt 355)	---	---	3
Lawns and Turfs (FC 313)	2	---	---
Extempore Speaking (Sp 111)	---	3	---
Electives	3	2	5
	16	16	15

Curriculum in Poultry Husbandry

(See Common Freshman and Sophomore Years.)

	Junior Year		
	Term hours		
	F	W	S
Animal Nutrition II (AI 411)	4	---	---
Principles of Agricultural Marketing (AEc 341)	3	---	---
Turkey Management (PH 351)	3	---	---
Farm Buildings (AE 361)	3	---	---
Incubation (PH 321)	---	3	---
Farm Accounting (AEc 311)	---	3	---
Elementary Journalism (J 111)	---	3	---
Anatomy and Physiology of the Fowl (VM 311)	---	3	---
Poultry Judging (PH 341)	---	2	---
American National Government (PS 201)	---	---	3
Diseases of Poultry (VM 351)	---	---	4
Brooding (PH 322)	---	---	3
Electives	3	3	6
	16	17	16

	Senior Year		
	Term hours		
	F	W	S
Extempore Speaking (Sp 111)	---	3	---
Animal Breeding I (AI 315)	3	---	---
Poultry Feeding (PH 411)	4	---	---
Marketing Poultry Products (PH 421)	4	---	---
Poultry Plant Management (PH 431)	---	---	3
Poultry Breeding (PH 441)	---	---	3
Seminar (PH 407)	---	1	1
Electives	5	12	8
	16	16	15

Curriculum in Soils

B.S. Degree

(See Common Freshman and Sophomore Years.)

	Junior Year		
	Term hours		
	F	W	S
Plant Genetics I (FC 315)	3	---	---
Plant Propagation (Hrt 311)	---	3	---
Principles of Plant Physiology (Bot 331)	---	---	4
Animal Nutrition II (AI 411) or Fruit and Nut Production (Hrt 331)	4	---	(4)
Farm Accounting (AEc 311)	---	3	---
Irrigation Farming (Sls 311)	3	---	---
Soil Conservation (Sls 413)	---	3	---
American National Government (PS 201)	---	---	3
Soil Bacteriology (Bac 421)	---	4	---
Climatology (Sls 319)	---	---	2
Elementary Journalism (J 111)	3	---	---
Electives	3	3	5
	16	16	14

¹In this curriculum the major is composed of courses in horticulture, soils, farm crops, and plant materials. The required courses listed cover the requirements of 36 term hours for a major, including 24 hours of upper-division work.

	Senior Year			Term hours		
	F	W	S	F	W	S
Western Land and Water Laws (Sls 411)					3	
Introduction to Economic Entomology (Ent 314)	4					
Extempore Speaking (Sp 111)	3					
Soils of Oregon (Sls 431)					2	
Soil Survey (Sls 432)						3
Regional Farm Management Problems (AEc 420)					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
Seminar (Sls 407)	1			1		1
Irrigation Investigations (Sls 414)	3					
Electives					3	6
	16			17		15

One-Year Terminal Curriculum in Dairy Products Industries

	Certificate			Term hours		
	F	W	S	F	W	S
Dairy Husbandry (DH 121)	3					
Handling and Processing Milk (DH 210)	3					
Butter Manufacturing (DH 114)					3	
Cheese Manufacturing (DH 115)						3
Ice Cream Manufacturing (DH 116)					1	
Testing Milk and Cream (DH 122)						1
Dairy Product Standards (DH 118)					8	1
Dairy Product Plant Practices (DH 111, 112, 113)	8			8		8
Electives					3	3
	17			15		15

Two-Year Curriculum in Agriculture

	Certificate in Agriculture			Term hours		
	First Year			Second Year		
	F	W	S	F	W	S
¹ Science	3	3	3			
Elements of Agronomy I (FC 111)	3					
Elements of Horticulture (Hrt 111)						3
Introduction to Animal Husbandry (AH 121)	3					
² Poultry Husbandry (PH 121)					3	
Dairy Husbandry (DH 121)					3	
Agricultural Engineering Survey (AE 111)	3					
Air or Military Science	2			2		2
³ Physical Education	1			1		1
Electives					3	6
	15			15		15
Principles of Farm Management (AEc 211)						3
Farm Accounting (AEc 311)					3	
Elements of Agronomy II (FC 211)						3
Diseases of Livestock (VM 341)				4		
Farm Structures (AE 461) or House Planning and Architectural Drawing (AA 178)				3		
American National Government (PS 201)					3	
Public Speaking						3
Air or Military Science	2			2		2
Physical Education	1			1		1
Electives				5	6	5
	15			15		17

¹Courses in the basic sciences may be selected from the following: Biological Science Survey, Physical Science Survey, Chemistry, Botany, Zoology, Entomology.

²Students 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.

³General Hygiene (PE 150), 1 term hour for men, 2 term hours for women, is taken one term in place of physical education.

Agricultural Economics

INSTRUCTIONAL work in agricultural economics affords excellent preparation for students who intend to engage in business related to agriculture or who expect to farm. It also provides the basic training for professional careers as teachers, research workers, and extension specialists in agricultural economics. 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. Through the Agricultural Experiment Station, investigations are being conducted dealing with (a) rural taxation, (b) marketing, (c) transportation, (d) cost of production, (e) farm organization, (f) farm business analysis, (g) economic trends and the market situation and outlook for Oregon's leading agricultural commodities. Through the Extension Service, market news and agricultural situation and outlook materials 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. Leased-wire connections are maintained with the leading markets of the country. Through them, daily and even hourly market reports are received. Every effort is made to co-ordinate the work in agricultural economics with that of other subject matter departments in the School of Agriculture.

A reading and seminar room is maintained for the convenience of the student. Reference materials and drafting tables are available.

Opportunity for graduate work leading to the master's and doctor's degrees is provided for in the upper-division and graduate courses offered by this department combined with the offerings of other departments appropriate for minors. Investigational work in the Agricultural Experiment Station conducted within the department of agricultural economics affords the advanced student excellent opportunities for field work and thesis study.

The curriculum in agricultural economics (pages 212-213) includes courses designed to meet the needs of students interested in the marketing of farm products as well as the broader economic relationships, together with sufficient work in agricultural science and technique to give the student a scientific concept of the industry. This training lays a foundation for a business career with marketing organizations, 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 and 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.

The farm management option (see page 213) is designed for those students in agricultural economics who wish to place special emphasis on farm management. It deals with (1) the organization and operation of the farm as a business enterprise; (2) the cost of production; and (3) agricultural land appraisal. Its aim is to correlate and synchronize the various phases of production on the farm in such a way as to result in a smoothly running, efficient business from which continuous maximum returns may be obtained. The farm management option is designed to give the student a broad, well-rounded training in all phases of agriculture and to prepare him for successful farm operation and management. It emphasizes those studies that will best fit him for

success. The work also prepares students for professional work as farm managers and supervisors, county agricultural agents, FHA farm supervisors, extension specialists, 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 in the field of farm management.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- AEc 111. Agricultural Resources.** 3 hours spring.
Agricultural resources of the world, the United States, and Oregon; a broad survey of agriculture, including soil, climate, topography, institutions, and population, and their relation to present-day agricultural problems. Two lectures; one recitation. Associate Professor Plath.
- AEc 211. Principles of Farm Management.** 3 hours spring.
Farming as a business; factors affecting success in farming such as volume of business, rates of production, labor and capital efficiency, combination of enterprises, and farm layouts; types of farming; farm leases; selecting and buying a farm. Prerequisite: SIs 212. Two lectures; 1 two-hour laboratory period. Associate Professor Blanch.
- AEc 221. Agricultural Statistics.** 3 hours winter.
Use of statistical methods in fields of business and agriculture; methods of tabular and graphic presentation of statistical data; study of basic statistical devices and how they are used to simplify and present statistical data. Assistant Professor Korzan.

UPPER-DIVISION COURSES

- AEc 311. Farm Accounting.** 3 hours winter.
Inventories; financial statements; enterprise analyses; income tax reports. One lecture; 1 recitation; 1 two-hour laboratory period. Prerequisite: AEc 211. Assistant Professor Hyer.
- AEc 312. Farm Organization.** 3 hours fall.
Application of farm management principles to the organization of the individual farm; trips to farms showing specific organizational features; organization plans for selected farms. Prerequisite: AEc 211. Two lectures; 1 three-hour laboratory period. Associate Professor Blanch.
- AEc 313. Operation Efficiency.** 3 hours spring.
Farm work simplification stressing economical use of labor, machinery, buildings, and fencing on farms of different types and sizes. Prerequisite: AEc 211. Two lectures; 1 two-hour laboratory period. Professor Kuhlman.
- AEc 321. Applied Statistics.** 3 hours spring.
Development and use of statistical techniques; interpretation of economic statistics and statistical methods; statistical methods as research tool. Prerequisite: AEc 221. Two recitations; 1 two-hour laboratory period. Assistant Professor Korzan.
- 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. Offered alternate years. Offered 1952. Prerequisite: Ec 203. Assistant Professor Vrooman.

- AEc 341. Principles of Agricultural Marketing.** 3 hours.
Marketing staple, semistaple, and perishable products; producing areas; routes; middlemen; cooperative marketing associations; costs; standardization; prices; marketing system. Prerequisite: Ec 203 or 214.
- AEc 342. Cooperative Marketing.** 3 hours.
Organization, management, and operation of cooperative marketing associations; policies; membership relations; sales; public relations. Prerequisite: AEc 341.
- AEc 343. Cooperative Accounting.** 3 hours winter.
Application of accounting principles to cooperative type of corporation; emphasis on accounting for pools, members' equities, allocation of reserves to comply with federal and state tax legislation. Prerequisite: BA 211, 212 or equivalent.
- AEc 401. Research.** Terms and hours to be arranged.
- AEc 405. Reading and Conference.** Terms and hours to be arranged.
- AEc 407. Seminar.** 1 hour each term.
- AEc 411. Agricultural Economics.** (G) 3 hours spring.
Application of economic principles to agricultural problems, and particularly to agricultural policies established by state and federal agencies. Prerequisite: Ec 203 or 214.
- AEc 412. Consumption of Agricultural Products.** (G) 3 hours.
Principles governing demand for and consumption of Oregon's farm products as affected by nutritional needs, consumption habits, dependability, distribution, packaging, transportation, advertising, income levels, and legislation; competition with other foods and with nonfood items; industrial uses. Prerequisite: AEc 341.
- AEc 414. Enterprise Costs and Profits.** (G) 3 hours winter.
Northwest farm, livestock, and orchard enterprises; competition; causes of failure; size, capital, labor, and maintenance; production possibilities and markets; costs, prices, profits. Prerequisite: AEc 211, 311, or equivalent. Assistant Professor Hyer.
- AEc 418. Federal Programs and the Farmer.** (G) 2 hours winter.
Discussion of federal and state programs (PMA, FHA, SCS, BAE, state and county committees) as they affect the operation of Oregon farms. Prerequisite: Ec 203, AEc 211, or equivalent. Professor Mumford.
- AEc 420. Regional Farm Management Problems.** (G) 3 hours.
Problems of individual farmers in different types of farming areas of the United States in adapting their farm programs to existing physical and economic conditions; differences in labor and capital requirements; characteristic landlord-tenant agreements and problems. Prerequisite: Ec 203, AEc 312 or equivalent. Associate Professor Blanch.
- AEc 422. Applied Farm Management.** (G) 3 hours spring.
Organization and management plan for a specific farm, applying student's knowledge of production and management. Prerequisite: AEc 211, 312, or equivalent. Field trips, laboratory periods, and weekly round table. Professor Kuhlman.

- AEc 425. Agricultural Appraisal.** (G) 3 hours spring.
Field work in appraisal of farms of different types, land areas, farm enterprises; commercial and federal appraisal methods. Prerequisite: SIs 213, AEc 414, 420, or equivalent. Weekly field trips. Professor Kuhlman.
- AEc 431. Agricultural Finance.** (G) 3 hours winter.
Principles of credit and finance as applied to agriculture; credit requirements of agriculture; existing credit agencies, strength and weakness. Prerequisite: Ec 203, upper-division standing. Associate Professor Blanch.
- AEc 440. Livestock Economics.** (G) 3 hours spring.
Economic and financial phases of livestock speculation; trends in production and costs; marketing and financing in livestock enterprises. Prerequisite: AI 311 or 411. Professor Potter.
- AEc 444. Milk Marketing.** (G) 3 hours winter.
Marketing as affected by economic and state or federal sanitary controls; state and federal milk control measures and their administration. Prerequisite: AEc 341, DH 410, or consent of instructor. Assistant Professor Korzan.
- AEc 451. Agricultural Prices.** (G) 3 hours fall.
Price trends; prices of agricultural and nonagricultural products; prices in relation to production and marketing programs; elasticity functions. Prerequisite: AEc 221, 341 or equivalents. Assistant Professor Vrooman.
- AEc 461. Public Land Policies.** (G) 3 hours spring.
Economic, legislative, and historical background of public policies; present land-policy problems and proposed solutions. Prerequisite: upper-division standing. Associate Professor Plath.
- AEc 462. Agricultural Land Economics.** (G) 3 hours winter.
Supply of agricultural land; demand for agricultural land; population pressure on land; economic principles governing land use; institutional factors. Prerequisite: Ec 203, upper-division standing. Associate Professor Plath.
- AEc 471. Agricultural Labor.** (G) 3 hours.
Seasonality of demand; migratory labor; year-round labor; family labor; transportation; social security; bargaining and unionization. Prerequisite: AEc 341.

GRADUATE COURSES

- Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit. Courses Ec 413, 435, 440, 475, 476, 477, 510, 511, 512, 513 (Department of Economics) may be taken as part of a graduate major in agricultural economics.
- 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.
- Ec 510, 511. History of Economic Thought.** 3 hours each term.
Contribution of greatest economic thinkers from earliest times to present with particular attention to schools of thought. Limited to students who have been accepted as candidates for an advanced degree in Division of Agricultural Economics.

- Ec 512, 513. **Economic History.** 3 hours each term.
Economic history of Europe and United States (alternate years) with emphasis on major trends in agriculture, manufacturing, trade, transportation, money, banking, and finance. Limited to students who have been accepted as candidates for an advanced degree in Division of Agricultural Economics.
- AEc 522. **Types and Systems of Farming.** Terms and hours to be arranged.
Types and systems of farming in the United States. Farm capital requirements; land utilization; livestock; labor, equipment, and farm marketing factors. Prerequisite: AEc 211, 221, 312, 341, 414, or equivalent.
- AEc 523. **Farm Tenure and Administration.** Terms and hours to be arranged.
Forms of farm tenure and their relation to capital requirements, production and income. Prerequisite: AEc 211, 312, or equivalent.
- AEc 524. **Advanced Agricultural Appraisal.** Terms and hours to be arranged.
Appraisal of farm structures, perennial plantings, reclamation district lands, range, and submarginal areas. Field work. Prerequisite: AEc 418, 425, or equivalent.
- AEc 561, 562, 563. **Land Problems.** 2 hours each term.
Contemporary land problems and policies with reference to distribution of major land uses, reclamation, conservation, and techniques and objectives of land planning and classification. Prerequisite: AEc 461, 462. Associate Professor Plath.
- AEc 571, 572, 573. **Marketing Problems.** 2 hours each term.
Agricultural policy since World War I; distribution of national income; effects on producing groups, those engaged in marketing farm products, and consumers. Prerequisite: consent of instructor.

Agricultural Education

THE Department of Agricultural Education is responsible for the training of teachers and supervisors of agriculture in high schools and other secondary schools, and in schools and classes for adult farmers and young men not enrolled in the regular day schools. Special consideration is given to the provisions of the federal laws for vocational education commonly known as the Smith-Hughes Act and the George-Barden Act. Included within the scope of this department are certain field activities including follow-up service for new teachers and involving the preparation of instructional material for use by agricultural instructors in cooperation with staff members of the School of Agriculture.

The Department of Agricultural Education is a joint department within the School of Agriculture and the School of Education.

Opportunities and Demand for Agricultural Teachers. The strong demand for teachers of vocational agriculture in Oregon, in states of the Pacific Region including Hawaii, and throughout the United States as a whole, is expected to continue for a number of years, if not indefinitely. The George-Barden Act approximately doubled the federal funds previously provided for vocational-agriculture education. Publications explaining the work and opportunities in teaching vocational agriculture are available on request.

Requirements for Teaching Agriculture. Teachers of agriculture need fundamental knowledge and a high level of practical ability in most of the departmental fields of the School of Agriculture. At the beginning of his college course the prospective teacher should confer 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 to this field of teaching. Attention of students interested in teaching vocational agriculture is directed to the curriculum on pages 213-214.

Requirements in Agriculture:

- (1) Graduation from a college of agriculture of standard rank.
- (2) 80 term hours, or equivalent, of special work in agriculture. Courses depend somewhat on previous training and experience and the recommendations of the head of the department. The suggested sequence and distribution of courses are given in the major curriculum on pages 213-214.

Requirements in Education and for Certification:

- (1) **Course requirements in Education:** Beginning teachers of agriculture should have a minimum of 18 term hours in education in the four-year curriculum including courses in methods and materials, and supervised teaching. (See courses listed in curriculum, pages 213-214.)
- (2) **Vocational Teaching Certificate:** The curriculum in agricultural education, pages 213-214, or its equivalent, is designed to fulfill the requirements for the vocational teaching certificate. The State Director of Vocational Education will issue this certificate to applicant after he has determined his qualifications for teaching vocational agriculture and after applicant has been placed in teaching position.
- (3) It is expected that persons who have been employed to teach vocational agriculture, after receiving the vocational certificate and completing the four-year curriculum, will continue systematic work in education and agriculture as needed through short summer courses and otherwise during the period of their employment in full-time teaching. Such work may carry college credit leading to a master's degree.

Graduate Study and Apprentice Teaching in Agricultural Education. For returning veterans and others who wish to continue their studies beyond the four-year curriculum in agricultural education and a bachelor's degree, a program of experience and graduate study leading to a master's degree will be developed to meet individual needs. A portion of such experience may be in the form of apprentice teaching for graduate credit, whereby students of approved standing are placed in high-school centers and outstanding departments of agriculture under the general supervision of the Department of Agricultural Education and the immediate supervision of the local agriculture instructor, who serves also in the capacity of supervising teacher. Apprentice teachers may be employed in some instances as part-time or even full-time teachers of vocational agriculture and may be recognized as regular teachers of vocational agriculture in two-teacher departments.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSE

AEd 220. Vocational Education in Agriculture. 2 hours.

Principles and development of vocational education in agriculture; significance of national aims and objectives in vocational education.

UPPER-DIVISION COURSES

Ed 341. Rural Education. 3 hours.

Utilizing rural, social, and economic environment to vitalize high-school instruction, achieve social objectives of education, and increase farm, home, and town-country efficiencies; continuation and rural extension education. Prerequisite: upper-division standing. Assistant Professor Ten Pas.

- 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. **Methods and Materials.** 3 hours any term.
Assistant Professor Ten Pas.
- Ed 415. **Supervised Teaching.** 3 to 9 hours any term.
Assistant Professor Ten Pas.
(See page 303.)
- AEd 417. **The Agriculture Curriculum.** (G) 3 hours.
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. Assistant Professor Ten Pas.
- AEd 418. **Adult Education in Agriculture.** (G) 3 hours.
Developing programs for young and adult farmer groups. Students participate in recruiting, organizing, and teaching evening classes in the vicinity of Corvallis. Prerequisite: Ed 313, AEd 417. Assistant Professor Ten Pas.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

- 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.
Enables agriculture teachers in service to continue their professional improvement; conferences, follow-up instruction, supervision, correspondence, reports. Prerequisite: Ed 311, 312, 313.
- AEd 533. **Rural Survey Methods.** 3 hours.
Technique of surveys; analyzing, interpreting, and using results in evaluating and formulating programs in agricultural education; field studies. Prerequisite: Ed 311, 312, 313, teaching experience.
- AEd 541. **Community Programs of Agricultural Education.** 3 hours.
Developing the natural and human resources of a community through agricultural education. Prerequisite: Ed 415, AEd 417.

Agricultural Engineering

THE Department of Agricultural Engineering is a joint department within the School of Engineering and the School of Agriculture. The department offers three types of instruction: (1) a curriculum leading to a Bachelor of Science degree in Engineering (see 321-322), (2) a curriculum leading to a Bachelor of Science degree in Agriculture with Agricultural Engineering Emphasis (commonly referred to as the vocational option), and (3) service courses for students majoring in other departments. The vocational option is designed

to train the student who is interested in farming, extension work, farm service work in rural electrification, farm implement sales, retailing of lumber and building materials in rural communities, or other work requiring a wider knowledge of agriculture with less emphasis on the technical phases of engineering.

The increasing importance of modern machinery and equipment in reducing the cost of production, together with the improvement of rural living conditions, demands in any branch of agriculture a more complete and effective grasp of the principles 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. Facilities are provided in the Agricultural Engineering Building for teaching and experimental work in farm power, farm machinery, farm water supply and irrigation equipment, farm shop, farm building, automobile mechanics, and rural electrification. The farm-motors laboratory contains several makes and types of stationary gas engines, sectionalized automobile and tractor motors, and accessories. A Prony brake for determining the power output of stationary engines is also included. Modern equipment and demonstrational material are loaned to the institution by leading manufacturers and distributors for study and operation by the students.

A well-lighted drafting room with modern equipment is available for students studying farm structures. Various samples of building materials, models, and several modern farm buildings are available for observation and study.

Courses in farm construction and maintenance are taught in laboratories equipped for the purpose. Farm water systems, centrifugal and turbine pumps for sprinkler irrigation pumping, and similar equipment are available for instruction purposes.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

AE 101, 102, 103. Agricultural Engineering Problems. 1 hour each term.

Lectures and problems dealing with the four major fields of agricultural engineering to train the student in engineering habits of work. One lecture; 1 two-hour computation period. Professor Rodgers, Assistant Professor Wolfe.

AE 111. Agricultural Engineering Survey. 3 hours each term.

Principles of mechanics, hydraulics, and electricity applied to farm problems; essential mathematics. Spring term especially for students in fish and game and range management. One lecture; 2 two-hour laboratory periods. Mr. Long.

AE 115, 116, 117. Food Plant Mechanics. 2 hours each term.

Mechanical and architectural drawing; blueprint reading; bill of materials; elementary food-plant layouts; motors; controls; wiring; power transmission. For students in food technology. One lecture; 2 two-hour laboratory periods. Assistant Professor Kirk.

AE 221. Farm Mechanics. 3 hours any term.

Use of hand and power tools for wood and metal working, arc and acetylene welding, construction of wood and metal farm appliances, concrete work, estimating costs and bills of material. Prerequisite: IE 250 or equivalent. One lecture; 2 three-hour laboratory periods. Assistant Professor Kirk.

AE 231. Farm Implements. 3 hours spring.

Principles of construction, operation, and hitching of equipment used for seed-bed preparation; planting, fertilizing, cultivation, and harvesting machinery. Two lectures; 1 three-hour laboratory period. Professor Rodgers.

UPPER-DIVISION COURSES

AE 311. Farm Motors and Tractors. 3 hours any term.

Farm motors and accessories, carburetors, magnetos, ignition, governing, cooling, lubricating systems; fuels and oils; testing, timing, trouble hunting. Two recitations; 1 three-hour laboratory period. Associate Professor Lunde.

AE 312. Automobile Mechanics. 3 hours fall.

The automobile and its parts; their functions, adjustment and simple repairs; latest developments. Two recitations; 1 three-hour laboratory period. Associate Professor Lunde.

AE 313. Automobile Mechanics. 3 hours winter or spring.

Practical repairing and minor overhauling of automobiles, tractors, and trucks, with emphasis on preventive maintenance, lubrication, engine tune-up, brake adjusting, etc. Prerequisite: AE 311 or 312. One lecture; 2 three-hour laboratory periods. Associate Professor Lunde.

AE 314. Automobile Mechanics. 3 hours spring.

Engine rebuilding, advanced electrical testing, repairing and rebuilding of electrical accessories, use of precision equipment of all types commonly found in up-to-date repair shops. Prerequisite: AE 313. Two recitations; 1 three-hour laboratory period. Associate Professor Lunde.

AE 321. Pumps and Irrigation Equipment. 3 hours spring.

Operation and testing of pumps and sprinkler irrigation equipment. Prerequisite: CE 322. Two lectures; 1 three-hour laboratory period. Assistant Professor Wolfe.

AE 331. Farm Electricity. 3 hours winter.

Fundamentals of electricity, wiring, electric motors, and the use of electricity on the farm. Prerequisite: AE 111 or equivalent. Two lectures; 1 three-hour laboratory period. Associate Professor Cropsey.

AE 341. Use of Explosives. 2 hours winter.

Use of explosives in removing stumps and boulders; stump burning and charpitting; use in ditch and rock blasting. One recitation; 30 hours laboratory and field work arranged during term. Assistant Professor Wolfe.

AE 361. Farm Buildings. 3 hours fall or winter.

Building materials, their adaptability and use; concrete, masonry, and frame construction and details; blueprint reading; cost estimating; lighting; ventilation; equipment; water supply and sewage disposal. Individual laboratory problems are given to students majoring in dairy, poultry, or animal husbandry. Prerequisite: junior standing. One lecture; 2 three-hour laboratory periods.

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 435. Household Utilities. (G) 3 hours fall.

Considerations in selection, installation, and use of major home services including heat, light, water, and sewage disposal; equipment and supplies requisite for major use of services, their placement, operation, and needs; motors for household appliances. For men and women interested in housing and household equipment. Prerequisite: AA 178, AE 451. Two lectures; 1 three-hour laboratory period. Associate Professor Cropsey.

AE 451. Rural House Planning. (g) 3 hours winter.

Structural materials and methods of construction; fundamental design of typical dwellings using planning and building standards developed by Agricultural Experiment Station and other research. Prerequisite: AA 178 and senior standing. One lecture; 2 two-hour laboratory periods. Professor Sinnard.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

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.

Animal Husbandry

COURSES in animal husbandry are planned to fit the student to produce the highest grade of livestock in the most economical and businesslike manner. Special attention is given to the training of students for careers in professional agriculture such as agricultural extension, Smith-Hughes teaching, livestock breeding and feeding operations, and livestock artificial breeding associations. The organization of range management, an integral part of the livestock industry, in the departments of Animal Husbandry and Farm Crops makes it possible for the student to prepare himself equally well for the plant and animal phases of the livestock business. This organization also sets the stage for training men interested in technical range work with any of the state or federal land-management agencies or research organizations.

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 thoroughly treated, a special effort being made to keep him in close touch with the financial facts of the industry. Students taking animal husbandry as a specialty are expected not to devote their entire time to livestock, but on the contrary to familiarize themselves also with veterinary science, crop production, soil sciences, range management, marketing, and other phases of agriculture as well as general education subjects.

Students majoring in animal husbandry (see curriculum on page 215) are given a very free range of electives so that they may fit their programs to their own particular needs.

The department is particularly well equipped to offer work for undergraduate and graduate students in livestock genetics, reproduction physiology, animal nutrition, and range management. Thus a well-balanced program can be developed that will take into account the individual student's interests and capabilities.

The livestock barns, of modern design, and the pastures are on the west, adjacent to the campus. Five hundred acres of typical Willamette Valley hill land used in the sheep-breeding and range- and pasture-management studies provide an excellent laboratory for pasture management and commercial sheep work. Camp Adair lands recently acquired by the College provide an excellent outdoor laboratory. These lands consist of 6,200 acres—approximately 3,600 acres of forested land and 2,600 acres of farm and pasture lands administered by the Schools of Forestry and of Agriculture, respectively—and provide outstandingly good opportunities for the study of land use and management problems. Ordinary demonstration work with livestock is carried on in the stock judging pavilion. Laboratory facilities are available for training in livestock genetics, reproduction physiology including artificial insemination, animal nutrition, meats, and wool.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- AH 121. Introduction to Animal Husbandry.** 3 hours any term.
Economic importance and geographical distribution of beef cattle, horses, swine, sheep, and goats; feeding, care, management, and marketing of animals and products. Three one-hour lecture-demonstration periods. Professor Bogart, Assistant Professors Johnson, Warnick.
- AH 131. Stock Judging I.** 3 hours fall or winter.
Types of farm animals studied by score cards and comparative methods; acceptable types for market and breeding purposes; market types of feeder and fat livestock. Beef cattle, sheep, swine, and horses studied. Three two-hour laboratory periods. Associate Professor Oliver.
- AH 231. Stock Judging II.** 3 hours winter.
Practical judging of all kinds of livestock, with trips to fairs and stock farms. Prerequisite: at least 3 term hours in stock judging. Three two-hour laboratory periods. Assistant Professor Johnson.

UPPER-DIVISION COURSES

See also ANIMAL INDUSTRIES, page 237.

- AH 317. Breeds of Livestock.** 3 hours winter.
Breeds of sheep, swine, horses, and beef cattle; their development, breeding, types, and best uses. Prerequisite: AI 315, or equivalent. Two recitations; 1 two-hour laboratory period.
- AH 326. Meats.** 3 hours any term.
Meats of all meat animals; butchering; cuts; judging meat; sanitation and inspection; abattoirs, packing houses, retail markets. Prerequisite: junior standing and consent of instructor. One lecture; 2 three-hour laboratory periods. Associate Professor Oliver.
- AH 327. Pork Processing.** 3 hours spring.
All operations from slaughtering of hogs to processing pork products. Prerequisite: AH 326. Two lectures; 1 three-hour laboratory period. Associate Professor Oliver.
- AH 331. Types and Market Classes of Livestock.** 3 hours winter.
Classification of all kinds of livestock, market types of animals on foot and in carcass. Prerequisite: AH 131. Three three-hour laboratory periods. Associate Professor Oliver.

- AH 341. **Range Management.** 3 hours fall.
Principles and practices of range and pasture management, orientation in land-use management. Prerequisite: Bot 203 or equivalent and upper-division standing.
- AH 401. **Research.** Terms and hours to be arranged.
- AH 405. **Reading and Conference.** Terms and hours to be arranged.
- AH 407. **Seminar.** 1 hour spring. Professor McKenzie.
- AH 412. **Livestock Feeding.** (G) 3 hours winter.
Practices of best stockmen; investigations carried on by experiment stations. Prerequisite: AI 311 or 411. Professor Nelson.
- AH 415. **Beef Cattle and Sheep Production.** (G) 4 hours.
Feeding, care, and management for maintenance, breeding, and fattening under farm and range conditions; selection of feeder steers and lambs. Prerequisite: AI 311 or 411. Three lectures; 1 two-hour laboratory period. Assistant Professor Johnson.
- AH 416. **Swine and Horse Production.** (G) 3 hours spring.
Feeding, care, and management of breeding and fattening swine; feeding, care, and management of horses, especially light horses. Prerequisite: AI 311 or 411. Two lectures; 1 two-hour laboratory period.
- AH 418. **Wool and Mohair.** (G) 3 hours fall.
Commercial value; physical and chemical structure; preparation and marketing; judging; sorting; grading; scouring; manufacture. Two lectures; 1 two-hour laboratory period. Professor Nelson.
- AH 422. **Livestock Genetics.** (G) 4 hours spring.
Inheritance of anatomical and physiological abnormalities; sex and autosomal linkage; systems of breeding in livestock production; genetic significance in inbreeding and crossbreeding; improvement through breeding; inheritance of color. Prerequisite: AI 315 or Z 341. Two lectures; 2 two-hour laboratory periods. Professor Bogart.
- AH 423. **Reproduction Problems.** (G) 3 hours spring.
Breeding efficiency of livestock; effect of nutritional, genetic, and physiological factors; care and management of young and breeding animals; artificial insemination. Prerequisite: AI 316, 311 or 411. Assistant Professor Warnick.
- AH 431. **Stock Judging III.** 1 hour fall.
Judging and selection of swine, sheep, and beef cattle; emphasis on differences between show-ring and ranch-production standards. Prerequisite: AH 231 or equivalent. Two two-hour laboratory periods. Assistant Professor Johnson.
- AH 441. **Range Methods.** (G) 4 hours fall.
Methods in evaluating ranges; techniques for measurement of forage utilization, range condition, and trend and inventory; field problems; use of aerial photographs and application of sampling theory. Prerequisite: Bot 381 or equivalent, AH 341, and consent of instructor. Three lectures; 1 three-hour laboratory period. Associate Professor Poulton.

AH 442. Range Management Planning. (G) 3 hours winter.

Administration and management of range lands; elements of range management applied to range-management problems; making and executing plans. Prerequisite: AH 441. Offered alternate years. Not offered 1951-52. Two lectures; 1 three-hour laboratory period. Associate Professor Poulton.

AH 443. Advanced Range Management. (G) 2 hours winter.

Current technical developments in range management, both domestic and foreign. Prerequisite: AH 441 or consent of instructor. Offered alternate years. Offered 1951-52. One lecture; 1 two-hour laboratory period. Associate Professor Poulton.

GRADUATE COURSES

See also ANIMAL INDUSTRIES, below.

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

AH 501. Research. Terms and hours to be arranged.**AH 503. Thesis. Terms and hours to be arranged.****AH 505. Reading and Conference. Terms and hours to be arranged.****AH 507. Seminar. Terms and hours to be arranged.**

Animal Industries

COURSES in animal industries for both undergraduate and graduate students 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

UPPER-DIVISION COURSES

AI 311. Animal Nutrition I. 4 hours fall.

Application of nutrition to the feeding of farm, game, and fur-bearing animals; functions of the various nutrients in the animal body; feeding standards and nutritive ratios; adaptability of feeds to animal functions. Primarily for students who have not had organic chemistry; not recommended for animal, dairy, or poultry husbandry majors. Prerequisite: Ch 103. Professor Nelson.

AI 315. Animal Breeding I. 3 hours fall.

Principles of heredity as applied to the breeding of domestic animals and fowls. Professor Bogart.

AI 316. Animal Breeding II. 3 hours winter.

The male and female genital organs; estrus, semen; fertility and factors affecting it—nutritional, genetical, hormonal, etc.; artificial insemination. Course is designed to help the student analyze the fertility complex and exercise control over breeding efficiency through management of livestock and poultry. Professor McKenzie.

AI 411. Animal Nutrition II. (g) 4 hours fall.

Nutrition principles; requirements for growth, maintenance, reproduction and lactation; functions and metabolism of nutrients in the animal body; relation of chemical composition of feeds to their functions in the animal body. Prerequisite: Ch 251. It is recommended that animal husbandry majors take Ch 252 before taking this course. Professor Haag.

GRADUATE COURSE

Course AI 411 may be taken for graduate credit.

AI 511. Animal Nutrition. 5 hours winter.

Nutritional research methods; energy concepts; protein metabolism; mineral and vitamin requirements; dietary deficiency disorders. Prerequisite: Ch 251, AI 411 or their equivalent. Offered alternate years. Not offered 1951-52. Professor Haag.

Dairy Husbandry

TWO four-year curricula are offered in the field of dairying: (1) Dairy Production and Management, (2) Dairy Products Industries. A one-year terminal curriculum is offered in Dairy Products Industries. Prospective students who are interested in dairying should study the detailed curricula printed on other pages. If a student interested in dairying has no choice between the production or the processing field at the beginning of his freshman year, he may select the curriculum common for freshman agricultural students. If he has made up his mind at the beginning of the sophomore year, he should consult his adviser who will assist him in selecting the courses which will give him the training he desires.

Dairy Production. Students who expect to be farmers with dairy cattle as the basis of their livestock operations and particularly those who want to become breeders of purebred dairy cattle should take the courses under the curriculum in Dairy Production. This curriculum is also recommended to those who desire a professional career, such as a dairy extension specialist, technician for artificial insemination association, high school agricultural teacher in a dairy community, fieldman for a dairy plant, salesman and field specialist for commercial feed manufacturer, milk inspector, or almost any occupation related to or touching upon the dairy farm. It likewise trains students for advanced work leading to such professional positions as instructors and research workers in colleges and universities, in state or federal service, and in industrial organizations which touch the production field.

In the commercial feed manufacturing business, a strong demand has developed for sales and field servicemen who are qualified in both the fields of dairy and poultry production. The opportunities in this field are excellent and the type of training needed may be taken under the Dairy Production and Management curriculum with the addition of carefully selected courses in Poultry Husbandry after joint consultation with advisers in both departments.

Dairy Products Industries. In the Dairy Products Industries curriculum, students in the junior and senior years may emphasize either processing or merchandising according to electives chosen. All students receive broad training in subjects that are basic to dairy products industries. In the processing field, the courses train for technical positions whereas in the merchandising field the emphasis is more on business and merchandising. Both options permit the liberal selection of electives. Students are encouraged to consult their advisers frequently because substitution of courses is encouraged to meet their special interests.

The Dairy Products Industries curriculum trains men for positions as superintendents or managers of enterprises engaged in the manufacture, distribution, and marketing of dairy products. The type of training qualifies those who may have responsibility in the purchase of raw materials, manufac-

turing supplies, and equipment. Excellent training is also offered here in the field of milk sanitation, quality improvement, dairy inspection, dairy products grading, and in the technical laboratory work involved in the quality control of the finished product.

A close relationship exists between the Production and the Industries curricula and adjustment of courses between them to meet special interests or needs of students is encouraged. This is also true of students who have a fitness and desire for advanced studies. They are provided an opportunity to pursue the more basic and fundamental courses in chemistry, physics, bacteriology, mathematics, economics, etc., that fit them for work in industrial research, academic institutions, state and federal experiment stations, and certain marketing organizations.

One-Year Curriculum in Dairy Products Industries. A one-year curriculum is offered to train students for positions as butter makers, cheese makers, ice cream makers, and milk plant operators. Practical and sanitation phases of dairy processing are emphasized. There is a strong demand for men with this type of training.

Facilities for Teaching and Research. The Department operates a dairy farm which is stocked with about 150 head of purebred dairy cattle. The dairy barn, uniquely located adjacent to splendid irrigated pastures, is modern and provides facilities for the production of milk of high quality. Students assist in the operation of the herd. A laboratory and experimental bull barn for artificial insemination and milk secretion studies are available immediately adjacent to the barn and are used extensively in giving advanced training to four-year dairy students.

The new Dairy Products Laboratory located in Withycombe Hall is modern and spacious. It embodies the latest developments in dairy plant construction. Other laboratories in the same building are equipped for teaching and research in the technological and production phases of the industry. Instruction in dairy bacteriology and dairy chemistry are given in the School of Science, in courses closely correlated with those given in the Department of Dairy Husbandry.

DESCRIPTION OF COURSES

COURSES IN ONE-YEAR TERMINAL CURRICULUM

- DH 111, 112, 113. **Dairy Products Plant Practices.** 8 hours each term.
Sanitation of the dairy plant; testing dairy products; operation of steam and refrigeration plant; general plant routine and maintenance; processing milk and cream; manufacture of dairy products; preparation for State Department of Agriculture examinations for weigher and tester, pasteurizer operator, milk and cream grader, and butter maker; reading assignments. Students participate 24 hours a week, hours arranged, in the daily work of the dairy products laboratory under supervision. Prerequisite: consent of instructor.
- DH 114. **Butter Manufacturing.** 3 hours fall.
Professor Wilster.
- DH 115. **Cheese Manufacturing.** 3 hours winter.
Professor Wilster.
- DH 116. **Ice Cream Manufacturing.** 3 hours spring.
Professor Wilster.

LOWER-DIVISION COURSES

- DH 118. **Dairy Products Standards.** 1 hour spring.
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 121. **Dairy Husbandry.** 3 hours any term.
Economic importance and geographical distribution of dairy cattle; management practices; methods and importance of dairy manufacturing. Three one-hour lecture-discussion periods. Associate Professor Wolberg.
- DH 122. **Testing Milk and Cream.** 1 hour winter.
Practice in testing milk, cream, buttermilk, skim milk for fat; sediment, acidity, and specific gravity determinations. One two-hour laboratory period. Associate Professor Wolberg.
- DH 210. **Handling and Processing Milk.** 3 hours fall.
Basic principles and modern methods of handling and processing milk, cream, buttermilk, and other products normally sold by city milk plants; sanitation requirements; legal state standards. Two lectures; 1 three-hour laboratory period at Dairy Barn and in Dairy Products Laboratory. Professor Wilster.

UPPER-DIVISION COURSES

- DH 312. **Butter Manufacturing.** 3 hours fall.
Prerequisite: DH 121, Ch 251. Professor Wilster.
- DH 313. **Cheese Manufacturing.** 3 hours winter.
Prerequisite: DH 121, Ch 251. Professor Wilster.
- DH 314. **Ice Cream Manufacturing.** 3 hours spring.
Prerequisite: DH 121, Ch 251, Ph 211, 212. Professor Wilster.
- DH 315, 316, 317. **Dairy Products Laboratory.** 2 hours each term.
Must parallel DH 312, 313, 314 for students majoring in dairy products industries. One five-hour and 1 three-hour laboratory period. Professor Wilster.
- DH 320. **Herd Record Systems.** 3 hours winter.
Methods of recording breeding, calving, health, identification, registration, and production for dairy herd operations; study of artificial insemination records, herd improvement association and official testing procedures. Prerequisite: DH 121, 122. Associate Professor Wolberg.
- DH 321. **Dairy Cattle Selection by Types.** 3 hours spring.
Correlation of form with milk production; gross breed characteristics; comparative judging; show-ring terminology; fitting for show. Prerequisite: DH 121. Three two-hour laboratory periods. Elective.
- DH 322. **Dairy Herd Management.** 3 hours winter.
Breed characteristics, adaptabilities, and selection; factors affecting growth and development; factors influencing quality and quantity of milk; records; cost of production. 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 411. **Dry and Condensed Milk.** (g) 3 hours fall.
Principles and methods of manufacture of condensed and dry milk products; trips to manufacturing plants. Prerequisite: DH 312, 313, 314, 315, 316, 317, two terms physics, one term organic chemistry. Professor Wilster.
- DH 412, 413. **Dairy Technology.** (G) 3 hours, winter and spring.
Principles of detergency and methods of evaluating detergents and chemical sterilizers; water conditioning; application of chemical and physical methods to the laboratory control of products and processes; application of tests for quality of milk powder, casein, dried whey, and other by-products; methods of analysis of dairy products. Prerequisite: Ch 458. Ch 254 is recommended. Professor Richardson.
- DH 414. **Dairy Food Specialties.** (g) 3 hours spring.
Principles and methods of manufacturing food products from milk, including cheese varieties, process cheese, cheese foods, spreads, whey products, cultured milks, frozen milk and milk products; state and federal standards. Prerequisite: DH 312, 313, 314, 316. Two lectures; 1 four-hour laboratory period. Professor Wilster.
- DH 415. **Dairy Plant Management.** 2 hours spring.
Efficient operation of dairy plants; costs of processing milk and of preparing dairy products for market. Supplementary lectures by dairy plant managers. Prerequisite: DH 312, 313, 314, senior standing, and consent of instructor. Professor Wilster.
- DH 416. **Milk Plant Operation.** (g) 3 hours winter.
Advanced methods and practices; detailed study of plant equipment; heat transfer; emphasis on application of quality, sanitation, and efficiency tests; methods to correct defects in products normally handled in modern milk plant. Prerequisite: DH 210, Bac 411, Ch 457. Two lectures; 1 three-hour laboratory period. Professor Wilster.
- DH 417. **Butter, Cheese, and Ice Cream Manufacturing.** 3 hours fall.
Principles and practices of modern manufacturing methods. For students in business and technology and fields other than dairy products industries. Prerequisite: Bac 204. Professor Wilster.
- 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 feedstuffs for dairy cattle, calves and heifers, herd sire; feeding for milk production and reproduction; investigational technique. Prerequisite: AI 411. Professor Jones.
- DH 425. **Dairy Judging.** 2 hours fall.
Judging of dairy cattle with trips to fairs, stock farms. Prerequisite: DH 321. Associate Professor Wolberg.
- DH 426. **Artificial Insemination of Dairy Cattle.** 2 hours winter.
Laboratory work in technique of artificial insemination of dairy cattle. Prerequisite: VM 322 and consent of instructor. Two three-hour laboratory periods. Associate Professor Wolberg.
- DH 430. **Utilization of Dairy Products.** (G) 3 hours spring.
Comprehensive survey of nutritive value of milk and milk products; principles of preserving nutritive quality; byproducts, their composition and utilization in food and nonfood products. Prerequisite: senior standing and consent of instructor. Professor Richardson.

DH 431. Pedigree Studies. (G) 2 hours.

Inheritance of foundation blood lines of major dairy breeds; selection of cattle on basis of pedigree, performance of ancestors, and other inherited characteristics. Prerequisite: DH 320, 322, 421. One lecture; 1 three-hour laboratory period. Professor Jones.

DH 432. Milk Secretion. (G) 3 hours spring.

Hereditary and nutritional factors affecting milk secretion; role of hormones, management, diseases, and environmental factors in relation to milk secretion; development of udder. Prerequisite: DH 322, 422. Two lectures; 1 three-hour laboratory period. Offered alternate years. Offered 1952. Staff.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

DH 501. Research. Terms and hours to be arranged.**DH 503. Thesis. Terms and hours to be arranged.****DH 505. Reading and Conference. Terms and hours to be arranged.****DH 507. Seminar. Terms and hours to be arranged.**

Extension Methods

INSTRUCTION in the Department of Extension Methods is intended to supplement that of the subject matter departments in the training of students for positions as county extension agents in agriculture, as 4-H club and home economics extension workers, as extension specialists, and as specialists in similar professional fields in which extension methods are commonly used. It will give agricultural and home economics students who plan to live on farms a better understanding of how to take advantage of the services available through county extension agents.

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.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

EM 405. Reading and Conference. Terms and hours to be arranged.**EM 411, 412. Extension Methods. (G) 3 hours each term, two terms.**

History and organization of extension work; methods employed by extension specialists, county agricultural and home demonstration agents, 4-H club leaders, etc. EM 411 fall term; EM 412 spring term, optional with professor and conditional upon student interest.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

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 primary purpose of the major curriculum (pages 217-218) is 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 trained for leadership along agricultural and general lines and to provide scientific training 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, some 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 crops, fiber flax, cereals, and hops form a distinct instructional asset. A large collection of the best books, periodicals, and other publications 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; the weed research program provides the most recent information on weed control.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

FC 111. Elements of Agronomy I. 3 hours any term.

Tillage and production; seed selection; identification; rotation; economics of crop production. Winter term adapted to needs of fish and game management studies. Prerequisite to all farm-crops courses except FC 311, 317. One lecture; 1 recitation; 1 two-hour laboratory period.

FC 211. Elements of Agronomy II. 3 hours.

Economic production, rotation, storage, costs, marketing, uses, and improvement of the important forage and pasture crops and their seeds, and the root crops. Prerequisite: FC 111. Two lectures; 1 two-hour laboratory period. Associate Professor Foote, Assistant Professor Cowan.

UPPER-DIVISION COURSES

FC 311. Potato Growing. 2 hours spring.

Production; improvement; storage; cost; marketing; distribution; uses; experimental work; varietal studies; identification, judging, and scoring. One lecture; 1 recitation. Professor Hill.

FC 313. Lawns and Turfs. 2 hours fall.

Turf plants and seeds; seedbed preparation, seeding, fertilization, management, weed and pest control for lawns, golf courses, grass nurseries, etc. One recitation; 1 two-hour laboratory period. Mr. Schudel.

FC 315. Plant Genetics I. 3 hours fall.

Principles of elementary genetics; nature of genes and chromosomes; mitosis; meiosis; simple and modified ratios; quantitative inheritance; linkage; and application of genetic facts to plant improvement. Two lectures; 1 laboratory period. Assistant Professor Cowan.

FC 317. Weed Eradication. 3 hours spring.

Weed types; habits of growth; legislation; prevention, control, and eradication; noxious, persistent, perennial, and poisonous weeds of ranch and range. Prerequisite: FC 211. Two lectures; 1 two-hour laboratory period. Associate Professor Freed.

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; seed and plant supplies and markets. Prerequisite: FC 111. One lecture; 1 two-hour laboratory period. Mr. Schudel.

FC 319. Range Improvement and Maintenance. 3 hours winter.

Reseeding, improvement, and maintenance of range, cut-over, overflow, marginal, and other grazing lands. Prerequisite: FC 211 or equivalent. Two lectures; 1 two-hour laboratory period. Mr. Schudel.

FC 322. Cereal Production Lectures. 3 hours winter.

Cereals and allied grains; distribution; adaptability; ecological relationship; seed treatment; markets; manufacture and movement in commerce. Prerequisite: FC 111, Bot 202, or equivalent. Professor Fore.

FC 323. Cereal Morphology. 2 hours winter.

Morphological and taxonomic characters of common cereals; identification; seed structure in relation to cereal manufacturing processes. Two two-hour laboratory or field periods. Associate Professor Foote.

FC 324. Forage Crops. 3 hours spring.

Cultivated hay and pasture; grasses and legumes; pasture establishment and management; hay and silage production; forage crop improvement. Prerequisite: FC 211. Two lectures; 1 two-hour laboratory period.

FC 331. Seed Testing Technique. 3 hours winter or spring.

Technique of purity and germination tests in accordance with official procedures; use and care of laboratory equipment and supplies. Prerequisite: FC 211, Bot 202, or equivalents. Three two-hour laboratory periods. Associate Professor Kanipe.

- 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.
Inspection, grading, and valuation of cereals, hay, forage, potatoes, beans, seeds, stock feeds, etc. 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.
Production, distribution, and use of seed crops; inspection, certification, and legislation. Prerequisite: FC 111, 211, senior standing. Professor Hill.
- FC 415. **Plant Breeding.** (G) 3 hours spring.
Practical application of genetics to improvement of field and horticultural plants. Prerequisite: FC 315, senior standing, and consent of instructor. Two lectures; 1 two-hour laboratory period. Professor Fore.
- FC 416. **Field-Plot Technique.** (G) 3 hours spring.
Experimental procedures, methods, and techniques of field plot experimentation; application of experimental designs to field crop research and interpretation of experimental results. Prerequisite: Mth 445, 446, or equivalent. Two lectures; 1 two-hour laboratory period. Professor Foote.
- FC 417. **Plant Genetics II.** (G) 3 hours fall.
Theories and principles of plant inheritance studies. Prerequisite: FC 315 and consent of instructor. Two lectures; 1 two-hour laboratory period. Professor Foote.
- FC 420. **Conservation Cropping.** (G) 2 hours winter.
Crops and cropping systems which will replenish and maintain soil organic matter and will provide maximum protection against soil losses; plants for specific conservation problems such as dike and stream bank protection, soil flowing, and sodded waterways. Prerequisite: FC 211 and senior standing.

For the four-year curriculum in Range Management see pages 215-216.

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.
- FC 515. **Plant Breeding.** 3 hours winter.
Underlying genetic and cytogenetic principles, methodologies and theories in improvement of cereal and forage crops. Consideration is given to current literature. Prerequisite: FC 415, 416, or equivalents. Associate Professor Foote, Assistant Professor Cowan.

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 fields of game and commercial fisheries.

Many of the courses are valuable to students in allied fields who wish to understand 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, 252. Wildlife Conservation.** 3 hours each term, fall and winter. Wildlife as a valuable economic and social resource; the need of its conservation through scientific administration and manipulation; the general problems of wildlife management; an introduction to the important wild animal groups of birds, mammals, and fishes. Associate Professor Long.
- FG 261. Wildlife Technique.** 3 hours each term, fall or spring. Techniques and equipment used by sportsmen in harvesting the game and fish crop; shotguns and elementary ballistics; bait and fly casting; hunting dogs; dressing and caring for flesh of game and fish. Two lectures; 1 recitation; 1 two-hour laboratory period. Associate Professor Long.
- FG 271, 272. Fur Farming.** 3 hours each term, winter and spring. Important fur-bearing mammals raised on fur farms; breeding, feeding, and sanitation; construction; marketing; judging pelts and animals; business principles. Assistant Professor Kuhn.
- FG 274, 275, 276. Economic Ichthyology.** 3 hours each term. Classification and distribution of fishes; general consideration to orders and families of fishes with special attention to those of economic and recreational importance in North America and adjacent marine areas. Prerequisite: Z 200. Two lectures; 1 recitation; 1 two-hour laboratory period. Assistant Professor Bond.
- FG 281, 282, 283. Wildlife Management.** 3 hours each term. Management principles applied to important wildlife species; measurements of animal populations and productivity; special attention directed to refuge management, hunting and predatory control, food and cover improvements, and other techniques used in increasing and decreasing wild animal populations. Prerequisite: Z 203, FG 252. Assistant Professor Kuhn.

UPPER-DIVISION COURSES

- FG 310, 311, 312. **Forest Wildlife Management.** 3 hours each term.
Game and fish management in forest areas; measurement and diagnosis of productivity; control of factors inimical to wildlife species; environmental improvements. Fall term: big game and fur animals; winter term: game and forest birds; spring term: game fishes.
- FG 320. **Rodent Control Methods.** 3 hours spring.
Classification, life histories, and control of rodents important in human disease transmission and in destruction of agricultural crops. Assistant Professor Kuhn.
- FG 341. **Fish and Game Law Enforcement.** 2 hours winter.
National and state game laws; law enforcement and scientific methods of evidence collection, preservation, and presentation. One lecture; 1 two-hour laboratory period. Assistant Professor Kuhn.
- 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, 453. **Management of Game Birds.** 3 hours each term.
Identification, distribution, life histories, ecology and management of important game bird species. Waterfowl and related forms, fall and winter terms; upland birds, spring term. Prerequisite: Z 371, FG 283. Two lectures; 1 three-hour laboratory or field period. Associate Professor Long.
- FG 454, 455, 456. **Management of Game Fish.** (G) 3 hours each term.
Freshwater fishes of North America, with special reference to trout, salmon, and spiny-rayed fishes; biologies of important species; limnology; management in relation to dams, fishladders, division ditches; pollution; farm fish ponds; and hatchery methods and techniques. Two lectures; 1 recitation; 1 two-hour laboratory period of field work. Assistant Professor Bond.
- FG 457, 458. **Management of Big Game.** (G) 3 hours fall and spring.
Species of game mammals; habits, distribution, management under natural conditions; values; laws. Prerequisite: Z 372, FG 282. Two lectures; 1 three-hour laboratory period or field work. Assistant Professor Kuhn.
- FG 460. **Management of Fur Bearers.** (G) 3 hours winter.
Species of wild fur-bearing mammals, identification, life histories, habits, distributions, economic importance and management. Prerequisite: Z 372, FG 283. Two lectures; 1 three-hour laboratory or field period. Assistant Professor Kuhn.
- FG 464, 465, 466. **Commercial Fisheries.** 3 hours each term.
Commercial fisheries; biologies of important species; values; harvesting; regulating fisheries resources. Two lectures; 1 three-hour laboratory or field trip. Professor Dimick.

GRADUATE COURSES

See also ANIMAL INDUSTRIES, pages 237-238.
Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

- FG 501. **Research.** Terms and hours to be arranged.
- FG 503. **Thesis.** Terms and hours to be arranged.

FG 505. Reading and Conference. Terms and hours to be arranged.

FG 507. Seminar. Terms and hours to be arranged.

Food Technology

FOOD Technology is the application of science to the commercial production, processing, packaging, distribution, preparation, and utilization of foods.

The curriculum in this field is designed to give students broad training in the basic sciences as a background for the courses in food technology—manufacturing, preserving, grading, packaging, standardizing, analyzing, control, and research. Work during the first two years is almost identical for all food technology students. Course work in the junior and senior years may be in one of four options: Inspection and Control, Food Production, Administration and Marketing, and Research and Graduate Study.

The teaching and laboratory work is geared to train the student in the various phases of the food industry, to give him knowledge of practical food processing techniques. Students are trained also for positions as food buyers, food inspectors, and for positions with allied industries needing food technologists. Lectures, demonstrations, laboratory exercises, pilot plant operations, and visits to commercial processing plants are parts of the instruction program.

The courses in food technology cover food manufacturing which includes canning, freezing, dehydrating, manufacture of preserves, jellies, and beverages, food inspection and grading, plant layout and equipment, plant sanitation, research methods, and work in marine food processing.

Programs for graduate study in food technology lead to master's and doctor's degrees. They are planned individually to meet each student's particular needs and interests. Research for a thesis is required for both advanced degrees.

Graduates of the department are equipped to work in food processing plants, research and control laboratories, sales departments, government food agencies, and other related organizations which deal with foods.

Short Courses. A course for men in the food processing industry is given each February. Basic fundamentals of canning and freezing work are included in the course which brings the latest developments in the food industry to these special students. Vital problems of the food industry are discussed in lectures and demonstrations, with qualified speakers representing industry, government, and education fields.

College students attend the course, and are given opportunities to meet commercial processors and industrial representatives who attend the school. Special effort is made to familiarize men from industry with the food technology students.

Equipment. The new Food Technology Building is one of the finest educational food laboratories in the United States. Designed to provide functional facilities for all types of food manufacturing, it is a modern, well-equipped food processing laboratory for teaching and research.

The two-story building contains a pilot plant for food manufacturing, separate laboratories for research work, classrooms, and an amphitheater for special lectures, movies, and demonstrations. The first floor is devoted to undergraduate classroom and laboratory space. The second floor provides space for graduate study and experiment station research.

Scientific laboratory equipment and precision instruments for basic and applied research make possible careful study of problems in the field, giving students an opportunity to become familiar with scientific tools of the industry.

Practical work in many fields of commercial food manufacturing, from canning, freezing, dehydrating, and fermenting to beverages, preserves, jellies, confections, and byproducts of agricultural crops, is possible with the new, modern facilities in the building.

Seafoods Laboratory. Research in marine product processing is the primary work of the Seafoods Laboratory, a branch of the Food Technology Department, located in Astoria. The laboratory works closely with the fishing industry, attacking problems of vital interest to marine processors. Studies in canning, freezing, and dehydrating fish are carried on extensively, and new fish products and precooked dishes are being developed. A test kitchen provides space for this experimental study in the development of new products.

Opportunity is also given students at the laboratory to study fish preservation and to become acquainted with various phases of the fish industry.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

FT 240. Food Industries Survey. 3 hours spring.

Survey of food industries in relation to climate, geographic location, raw materials, and supplies; production, financing, markets, labor, and transportation. Associate Professor Onsdorff.

FT 250. Principles of Food Preservation. 3 hours fall.

Fundamental physical and chemical principles governing food preservation by freezing, canning, drying, concentrating, salting, smoking, fermenting, carbonating. Two lectures; 1 three-hour laboratory period. Assistant Professor Samuels.

FT 251. Principles of Canning Fruits and Vegetables. 3 hours winter.

Principles of the basic operations in commercial canning procedures. Prerequisite: FT 250. Two lectures; 1 three-hour laboratory period. Assistant Professor Samuels.

FT 253. Commercial Canning Procedures. 3 hours spring.

Basic operations in commercial canning procedures. Prerequisite: FT 251. Two lectures; 1 three-hour laboratory period. Associate Professor Onsdorff.

FT 254. Preservation of Meats and Marine Products. 3 hours spring.

Fundamental principles, thermal death points; effect of acidity, vacuum, can fill, grading, seaming, retorting, storage, corrosion. Prerequisite: FT 250, Bac 204. Two lectures; 1 three-hour laboratory period. Associate Professor Onsdorff.

UPPER-DIVISION COURSES

FT 311. Food Processing Plant and Equipment. 3 hours winter.

Location; construction; equipment; operation; designing plants and estimating costs; machinery; field trips to processing plants. Two lectures; 1 three-hour laboratory period. Associate Professor Onsdorff.

FT 321, 322. Food Technology. 3 hours fall and winter.

Technological treatment of unit operation and processes in food manufacture, enzymes, food preservatives, spices, flavors, confections, bakery products. Prerequisite: Ch 252, Bac 205, or consent of instructor. Professor Litwiller.

- FT 331. **Dehydration of Food Products.** 3 hours fall.
Actual drying of foods; types of dehydrators and principles of dehydration; physical and chemical study of dehydrating products. Two lectures; 1 three-hour laboratory period. Associate Professor Onsdorff.
- FT 341. **Industrial Food Fermentations.** 3 hours fall.
Principles and practices of commercial food fermentations; methods involving pickling, brining, and others; adaptation of yeasts, molds, and bacteria to the production of food of this type. Prerequisite: Ch 252, Bac 205. Two lectures; 1 three-hour laboratory period. Associate Professor Onsdorff.
- FT 351. **Technology of Beverages.** 3 hours fall.
Fruit and vegetable juices and carbonated beverages involving filtration, sterilization, carbonation, and bottling. Prerequisite: Bac 205, Ch 252. Two lectures; 1 three-hour laboratory period. Associate Professor Onsdorff.
- FT 352. **Technology of Preserves and Jellies.** 3 hours spring.
Manufacture of jellies, preserves, marmalades, conserves, maraschino cherries, glacéd and candied fruits; testing yield, sugar, acidity, and pectin contents. Prerequisite: Ch 252, Bac 205. Two lectures; 1 three-hour laboratory period. Professor Litwiller.
- FT 371. **Inspection of Processed Food.** 3 hours any term.
Techniques of federal and state inspection and quality grading of processed foods; practical examination and quality grading of canned, frozen, and dehydrated food products. One lecture; 2 two-hour laboratory periods. Professor Litwiller.
- FT 372. **Detection of Food Adulterants.** 1 hour winter.
Practice in techniques used in control laboratories for detection of adulterants and contamination. Prerequisite: Bac 204. One three-hour laboratory period. Assistant Professor Samuels.
- FT 401. **Research.** Terms and hours to be arranged.
- FT 403. **Thesis.** Terms and hours to be arranged.
- FT 405. **Reading and Conference.** Terms and hours to be arranged.
- FT 407. **Seminar.** Terms and hours to be arranged.
- FT 412. **Frozen Foods.** 3 hours winter.
Principles, methods, and practices of commercial food freezing and locker plants. Designed for technical minors. Prerequisite: FT 250. Associate Professor Onsdorff.
- FT 413. **Frozen Foods.** (g) 3 hours winter.
Chemical and physical changes involved in preparation, freezing, and storage of foods, with special attention to modern methods of packing, handling, and distributing. Prerequisite: Ch 252, Bac 205, ME 363, or equivalent. Two lectures; 1 three-hour laboratory period. Professor Wiegand.
- FT 414. **Food Freezing.** (G) 3 hours spring.
Advanced theories and practices involved in freezing of foods and food products with emphasis on current developments. Prerequisite: FT 413. Two lectures; 1 three-hour laboratory period. Associate Professor Yang.

- FT 421. **Regulatory Control of Food Products.** (g) 3 hours fall.
Laws and regulations dealing with quality control of food products, with emphasis on labeling, adulteration, and sanitary aspects of production and distribution. Prerequisite: senior standing. Professor Litwiller.
- FT 423, 424. **Food Processing Control Methods.** (g) 3 hours winter and spring.
Methods of systematic examination of food products with practice in laboratory techniques of food analysis for quality control. One lecture; 2 three-hour laboratory periods. Prerequisite: Ch 252, 254, 350, 351, Bac 205. Professor Litwiller.
- FT 431. **Advanced Food Dehydration.** (G) 2 hours fall.
Quantitative consideration of factors affecting drying rates; equilibrium moisture contents; rise of modern type dehydrators; industrial moisture determination methods; humidity control in low-moisture dehydration. Offered alternate years. Prerequisite: FT 331. Associate Professor Worthington.
- FT 443. **Food Plant Sanitation.** (G) 2 hours spring.
Principles and practice of sanitation in food industries. Prerequisite: Ch 252, 254, 350, Bac 205. Assistant Professor Niven.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

- FT 501. **Research.** Terms and hours to be arranged.
- FT 503. **Thesis.** Terms and hours to be arranged.
- FT 505. **Reading and Conference.** Terms and hours to be arranged.
- FT 507. **Seminar.** Terms and hours to be arranged.
- FT 511. **Food Industries Research Methods.** 2 hours.
Designed to acquaint students with the scope and scientific methods used by the food industries in research and development. Associate Professor Worthington.
- FT 521. **Color and Flavor Evaluation.** 3 hours fall.
Basic theory as foundation for actual practice in measurement of food qualities and consumer acceptance, advantages and limitations of various techniques. Prerequisite: Mth 446, Ch 352. Associate Professor Worthington.
- FT 523. **Quality Control Systems.** 3 hours fall.
Scope, general principles, organization, and functioning of quality control systems; types of controls and points of application; sampling, specific food industries and food plants; field trips. Prerequisite: FT 371, 423. Associate Professor Worthington.
- FT 531. **Colloid and Protein Technology.** 3 hours fall.
Designed to acquaint students with application of colloids and proteins in food processing and food research. Prerequisite: Ch 252, 254, 350, 351, Bac 205. Assistant Professor Niven.
- FT 532. **Edible Oils.** 3 hours winter.
Production and processing of fats and oils which are used in food products; antioxidants for these products. Prerequisite: Ch 350, 351. Assistant Professor Niven.

FT 542. Food Fermentation. 3 hours winter.

Industrial utilization of fermentable foods and food wastes. Prerequisite: FT 341. Associate Professor Yang.

Horticulture

THE Department of Horticulture offers major work in pomology, vegetable crops, floriculture, nursery management, and landscape construction and maintenance. These courses of study represent the major phases of Oregon's extensive and highly diversified horticultural industry and afford students a wide choice as to vocations and careers in horticultural and related fields.

The curricula offered in pomology and vegetable crops cover the broad and general fields of fruit, nut, and vegetable growing, distribution and marketing. They aim to prepare students both for fruit and vegetable farming and for technical and executive positions. Adjustments of the curricula are made to accommodate students preparing for research and technical work with state and federal agencies, colleges and experiment stations, private laboratories, or research foundations.

The curricula in floriculture and nursery management provide intensive instruction in the scientific and applied phases of these professional fields and offer a fairly wide range of subjects intended to provide a liberal or cultural background. They aim to prepare students for participation in the various branches of the florist and nursery business and for positions as teachers, research workers, and technicians.

The curriculum in landscape construction and maintenance lays the foundation for professional careers in the laying out, planting, care, and supervision of country and municipal homes, parks, playground areas, and highway landscape developments. Emphasis is laid on the practical application of landscape knowledge and on the fundamentals of ornamental plant culture.

Students interested in advanced study may undertake graduate work in any of the branches enumerated. Graduate students are given wide latitude in their choice of courses and may elect freely from the broad curriculum of the College as a whole.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Hrt 111. Elements of Horticulture. 3 hours fall, winter, or spring.

A beginning course in the general field of horticulture. Application of principles underlying the culture and utilization of fruits, nuts, vegetables, and ornamental plants. Prerequisite to all horticultural courses except Hrt 253 and 411. One lecture; 1 recitation; 1 two-hour laboratory period.

Hrt 151. General Floriculture. 3 hours winter.

To acquaint the student with the field of floriculture, its development, its branches, and opportunities it offers as a vocation. Two lectures; 1 two-hour laboratory period.

Hrt 253. Flower Arrangement. 3 hours spring.

Basic principles of flower arrangement as applied to florist work. Two lectures; 1 two-hour laboratory period.

UPPER-DIVISION COURSES

- Hrt 311. **Plant Propagation.** 3 hours winter.
Methods of propagating or perpetuating plants by means of seeds, cuttings, layers, tubers, bulbs, budding, and grafting. Practice in the greenhouse, nursery, field, and orchard. One lecture; 2 two-hour laboratory periods.
- Hrt 313. **Greenhouse Construction and Management.** 3 hours winter.
Details of planning, layout, construction, and heating of modern greenhouses; factors involved in the efficient operation of a greenhouse range. Two lectures; 1 two-hour laboratory period.
- Hrt 315. **Basic Horticulture.** 3 hours fall.
Continuation of Hrt 111. Consideration and application of principles underlying horticultural practices and techniques. One lecture; 1 recitation; 1 two-hour laboratory period.
- Hrt 317. **History and Literature of Horticulture.** 3 hours winter.
Brief history of horticulture; systematic survey of the literature of horticulture acquainting the student with the sources of horticultural knowledge. One lecture; one recitation; 1 two-hour laboratory period in the library.
- Hrt 331. **Fruit and Nut Production.** 4 hours spring.
Problems of fruit and nut production; economics and geography of fruit and nut growing; heat, water, and light requirements of fruit plants; winter hardiness and frost prevention; orchard soil management; pollination, thinning, pruning, and other practices. Two lectures; one recitation; 1 two-hour laboratory period.
- Hrt 341. **Vegetable Production.** 3 hours spring.
Problems of general vegetable production; soils, fertilizers, irrigation, seeds, plants, crop rotation; disease and insect control. Two lectures; 1 two-hour laboratory period.
- Hrt 351, 352, 353. **Commercial Floriculture.** 3 hours each term.
Culture of cut flowers, pot plants, and forced bulbous crops grown on a commercial scale; modern techniques and recent research findings. Two lectures; 1 two-hour laboratory period.
- Hrt 355. **Herbaceous Plant Materials.** 3 hours spring.
Annual, biennial, and perennial flowering plants; their use, arrangement, and culture in commercial and home-garden production. Two lectures; 1 two-hour laboratory period.
- Hrt 361, 362, 363. **Nursery Management.** 3 hours each term.
Organization and management of nurseries; propagation techniques, planting, culture, digging, packing, and storing of nursery stock; inspection, quarantine regulations; transportation and marketing. One lecture; 1 recitation; 1 two-hour laboratory period.
- 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.** Terms and hours to be arranged.
- Hrt 411. **Methods of Research.** (G) 3 hours winter.
Procedures in investigative work; experimental design; statistical methods; analysis of research problems; reasoning and weighing of experimental evidence; briefs and outlines; preparation of research manuscripts. Two lectures; 1 recitation.

- Hrt 413. Horticultural Plant Breeding.** 3 hours spring.
Application of principles of genetics to improvement of horticultural plants; origin of horticultural strains and varieties; breeding techniques as applied to horticultural plants. Prerequisite: FC 315. One lecture; 1 recitation; 1 two-hour laboratory period.
- Hrt 415. Spraying, Dusting, and Fumigation.** (g) 3 hours spring.
Insect and disease control; preparation and application of sprays, dusts, and fumigants; spray combinations and compatibility; equipment; spray calendars and programs. One recitation; 2 two-hour laboratory periods.
- Hrt 431. Fruit Handling and Distribution.** (G) 4 hours winter.
Problems of fruit handling; harvesting, grading, packing, inspection, storage, transportation, and marketing. Two lectures; 1 recitation; 1 two-hour laboratory period.
- Hrt 433. Systematic Pomology.** (G) 4 hours fall.
Fruit taxonomy; fruit groups and botanical relationships; variety description; nomenclature and classification; judging and displaying. One lecture; 1 recitation; 2 two-hour laboratory periods.
- Hrt 441. Vegetable Handling and Distribution.** (G) 3 hours fall.
Harvesting; grading; packing; inspection; transportation; storage and distribution. One lecture; 1 recitation; 1 two-hour laboratory period.
- Hrt 443. Systematic Vegetable Crops.** (G) 3 hours fall.
Botanical relationships; variety descriptions and values; identification; classification; displaying and judging. One lecture; 2 two-hour laboratory periods.
- Hrt 451. Flower Shop Operation.** 3 hours fall.
Efficient operation of florist shops; advanced work in design of floral pieces. Restricted to students majoring in floriculture and nursery management. Two lectures; 1 two-hour laboratory period.
- Hrt 453. Handling and Distribution of Florist Crops.** 3 hours fall.
Problems of precooling, packaging, storing, transporting, and distributing florist crops. Two lectures; 1 two-hour laboratory period.

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.** Terms and hours to be arranged.
- Hrt 511. Horticultural Genetics Lectures.** 3 hours fall.
Special attention to application of genetic theories and fundamental principles in development of horticultural plants. Inheritance studies; mutation phenomena; polyploidy and interspecific hybridization. Prerequisite: FC 315, Hrt 413. Associate Professor Zielinski.
- Hrt 512. Horticultural Genetics Laboratory.** 2 hours.
Reports; field and laboratory problems involving hybridization, artificial induction of mutations, data analyses, readings, and genetic and cytological techniques. Prerequisite: FC 315, Hrt 413, 511. Two two-hour laboratory periods. Associate Professor Zielinski.

Hrt 513. Horticultural Genetics Lecture. 3 hours winter.

Continuation of Hrt 511. Associate Professor Zielinski.

Hrt 514. Horticultural Genetics Laboratory. 2 hours winter.

Continuation of Hrt 512. Associate Professor Zielinski.

Hrt 541. Vegetable Crop Problems. 4 hours.

Response of vegetable crops to environment; nutrition and management in relation to growth, yields, and quality. Prerequisite: Hrt 315, 341, or their equivalent. One lecture; other hours to be arranged. Professor Frazier, Associate Professor Apple.

Poultry Husbandry

COMMERCIAL poultry raising has developed at a rapid rate during the past twenty years. The breeding and production of chickens and turkeys in Oregon has become a highly specialized business. The great increase in human population in the state has created new markets for poultry and poultry products. There is reason to believe that with such advantages as good markets, mild climate, and adequate feed supplies, poultry production should continue to increase.

With the development of the chicken and turkey industries has come a demand for persons trained in poultry husbandry. Besides the actual production of eggs, broilers, and turkeys for market there are opportunities for efficient hatchery operators as well as chicken and turkey breeders. There is an increasing demand for federal and state extension and experiment station workers, field service men and feed specialists with feed companies, and personnel for processing concerns and cooperative associations.

In the major curriculum (page 223) 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 two with automatic egg turning, 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. Flocks of White Leghorns, New Hampshires, and representatives of other common breeds are kept in 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.

Another poultry farm located one mile from the main plant and comprising 60 acres is devoted to poultry breeding and rearing. A third farm of 50 acres is used exclusively for turkey instruction and research.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSE

PH 121. Poultry Production. 3 hours any term.

Economic importance and geographical distribution of poultry; correct management practices of farm poultry and of marketing poultry products. Two lectures; 1 two-hour laboratory period. Professor Parker, Associate Professor Cooney.

UPPER-DIVISION COURSES

- PH 321. **Incubation.** 3 hours winter.
The incubation requirements of chicken and turkey eggs. Students may work on a selected problem. Prerequisite: PH 121. One lecture; 2 two-hour laboratory periods. Associate Professor Cooney.
- PH 322. **Brooding.** 3 hours spring.
Brooding requirements of chickens and turkey poults; types of brooding equipment. Students are assigned a brooding project. Prerequisite: PH 321. Associate Professor Cooney.
- PH 341. **Poultry Judging.** 2 hours winter.
Judging poultry for standard and production qualities. Prerequisite: PH 121. Two two-hour laboratory periods. Offered alternate years. Professor Parker.
- PH 351. **Turkey Management.** 3 hours fall.
Practical details in the breeding, feeding, rearing, and marketing of turkeys. Prerequisite: PH 121. Two recitations; 1 two-hour laboratory period. Offered alternate years. Assistant Professor Harper.
- 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 winter and spring terms.
- PH 411. **Poultry Feeding.** (g) 4 hours fall.
Poultry feeds; feeding breeding stock, feeding for egg production; fattening for market; feeding appliances; compounding of rations. Prerequisite: PH 121, AI 411. Two recitations; 2 two-hour laboratory periods. Associate Professor Cooney.
- PH 421. **Marketing Poultry Products.** (g) 4 hours fall.
Preparation of poultry and eggs for market. Commercial handling of poultry products. Prerequisite: PH 121. Two lectures; 2 two-hour laboratory periods. Associate Professor Bernier.
- PH 431. **Poultry Plant Management.** (g) 3 hours spring.
Location, layout, and arrangement of buildings and equipment. Management practices. Visits to commercial poultry farms. Prerequisite: PH 322, 411. Two recitations; 1 two-hour laboratory period. Professor Parker.
- PH 441. **Poultry Breeding.** (G) 3 hours spring.
Inheritance of egg and meat production in domestic fowls. Prerequisite: PH 121, AI 315. Associate Professor Bernier.

GRADUATE COURSES

See also ANIMAL INDUSTRIES, pages 237-238.
Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

- 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.

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 223-224) is to give the student thorough training in fundamentals of agriculture, making him competent to manage a farm or preparing him for 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 greater 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 on 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 tiling or fertilizer employed.

Equipment. The Department of Soils is well equipped for offering research work. The experimental fields, greenhouses, laboratories, the library, and the plans and methods used in soil, irrigation, and drainage investigations, afford valuable opportunities to graduate students.

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, effect of irrigation on soils and crops, effect of tile drainage on 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 students build weirs, measure water, lay out distribution systems, make cement pipes for laterals, and test pumping machinery. On the drainage plots they measure the rate of discharge and the effect of drains and soil conditions on water table. 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).

Soil origin, formation, classification; soil moisture, heat, and air; effects of tillage, drainage, and irrigation; plant foods and fertilizers; rotations. Prerequisite: Ch 101, 102, 103. Two lectures; 1 three-hour laboratory period. Professor Ruzek, Assistant Professor Dannen.

- Sls 213. **Soil Drainage and Irrigation.** 3 hours spring.
Soil mapping, reclamation, and use; chain, level, and soil auger; installation of drains or irrigation systems; effect on soils and crops; cost and benefits. Two lectures; 1 three-hour laboratory period. Professor Ruzek, Assistant Professor Dannen.
- Sls 214. **Soils for Forestry Students.** 3 hours spring.
Origin, development, characteristics, and classification of forest soils; relation to vegetation, moisture reaction and fertility; soil management and conservation. Two lectures; 1 three-hour laboratory period. Professor Stephenson, Associate Professor Marsh.

UPPER-DIVISION COURSES

- Sls 311. **Irrigation Farming.** 3 hours fall.
Obtaining, distributing, and conserving irrigation waters; different crops under irrigation; costs and profits; duty of water; water rights; field studies. Prerequisite: Sls 212, 213. Two lectures; 1 three-hour laboratory period. Professor Powers, Associate Professor Marsh.
- Sls 319. **Climatology.** 2 hours spring.
Practical meteorology; observing and recording local weather and forecasting; climate of Oregon; effect of climate on agriculture. One recitation; 1 two-hour laboratory period.
- Sls 401. **Research.** 3 hours each term.
Soil, drainage, or irrigation work. 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.
Development of water laws; homestead laws, water rights, and irrigation codes in different states, particularly in Northwest; organization and administration of irrigation projects; water users associations. Professor Powers.
- Sls 413. **Soil Conservation.** (g) 3 hours winter.
Climate, topography, and soil in relation to erosion; soil mapping; control. Preparation for soil conservation service. Two recitations; 1 three-hour laboratory period. Assistant Professor Dannen.
- Sls 414. **Irrigation Investigations.** (G) 3 hours fall.
Irrigation literature and methods of investigation; field and laboratory studies of irrigation experiments; preparation of a thesis; field examinations of projects. One lecture; 2 three-hour laboratory periods. Professor Powers.
- Sls 421. **Soil Physics Lectures.** (g) 3 hours fall.
Soil origin, formation, physical composition, and classification; soil moisture, surface tension; osmosis, capillarity, diffusion, aeration, temperature. Prerequisite: Sls 212. Professor Stephenson.
- Sls 422. **Soil Physics Laboratory.** (g) 2 hours fall.
Determination and comparison of physical properties of soil types; physical effects of mulches, rotation, and cropping; sampling and judging; mechanical analysis. Two three-hour laboratory periods. Associate Professor Marsh.

- Sls 424. **Soil Fertility Lectures.** (g) 3 hours winter.
Composition and value of fertilizers and barnyard and green manures; maintenance and improvement of fertility; effect of the various crops and farming systems; rotation. Prerequisite: Sls 212. Professor Ruzek.
- Sls 425. **Soil Fertility Laboratory.** (g) 2 hours winter.
Laboratory work accompanying Sls 424. Two three-hour laboratory periods. Associate Professor Marsh.
- Sls 428. **Soil Management.** (G) 5 hours spring.
Occurrence, composition, productivity, plant-food requirements, comparative values, management of different soil types. Prerequisite: Sls 424, 425. Two recitations; 3 three-hour laboratory periods. Professor Powers, Associate Professor Marsh.
- Sls 431. **Soils of Oregon.** (g) 2 hours winter.
Distinguishing characteristics of the various soil types of Oregon. Prerequisite: Sls 212. Two one-hour recitations. Assistant Professor Dannen.
- Sls 432. **Soil Survey.** (G) 3 hours spring.
Classification of soils and soil areas; making regular and complete soil surveys; field trips report. Prerequisite: Sls 421 or 424, 431. Two lectures; 1 three-hour laboratory period. Assistant Professor Dannen.

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; distribution of United States soils. 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 controllable by agricultural practices; soil solution in relation to nutrient requirements of plants. Limited to advanced and graduate students. Professor Powers.
- Sls 514. **Soil Organic Matter.** 2 hours winter.
Humification processes; properties of humus; effect on soil reaction; biological processes and nutrient-supplying power of soil; relation of humus to soil conservation and to plant growth and adaptation. Professor Stephenson.

Veterinary Medicine

THE courses in veterinary medicine aim to 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-Veterinary Building.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

- VM 311. Anatomy and Physiology of the Fowl.** 3 hours winter.
Structure and physiology of body of fowl. Two lectures; 1 two-hour laboratory period. Professor Dickinson.
- VM 320. Anatomy of Domestic Animals.** 3 hours.
Foot, teeth, muscles of locomotion of horse; digestive, urinary, genital and respiratory systems; circulatory, muscular, and nervous systems. Three two-hour laboratory periods.
- VM 321, 322. Physiology of Domestic Animals.** 3 hours each term.
Functions of the body; physiological processes of all domestic animals with emphasis on horse and cow. Prerequisite: VM 311. Two lectures; 1 two-hour laboratory period.
- VM 341. Diseases of Livestock.** 4 hours fall.
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.
Poultry hygiene and sanitation; nature and cause of common poultry diseases; relation of management to control of poultry diseases. Prerequisite: VM 311. 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. Prerequisite: VM 311. Two lectures; 1 two-hour laboratory period. Professor Dickinson.
- VM 361. Parasitic Diseases of Domestic and Game Animals.** 4 hours winter.
Intensive study of 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.
Parasitic, infectious, and noninfectious diseases of domesticated animals. Prerequisite: VM 321, 322, or equivalent. Two recitations; 1 two-hour laboratory period. Professor Shaw.

GRADUATE COURSES

See also ANIMAL INDUSTRIES, pages 237-238.
Courses numbered 400-499 and designated (P) or (G)
may be taken for graduate credit.

- VM 501. **Research.** Terms and hours to be arranged.
- VM 503. **Thesis.** Terms and hours to be arranged.
- VM 505. **Reading and Conference.** Terms and hours to be arranged.
- VM 507. **Seminar.** Terms and hours to be arranged.

School of Business and Technology

Faculty

CLIFFORD ELGES MASER, Ph.D., Dean of the School of Business and Technology.

JEAN WEBERG, B.S., Secretary to the Dean.

Business Administration

PROFESSORS MASER (department head), LEMASTER.

ASSOCIATE PROFESSORS BOYD, CAMPBELL, CRAIG, NEWTON, PFANNER, SEATON.

ASSISTANT PROFESSORS BRODERS, COOLIDGE, DELLENBACK, GODDARD, GRAHAM, KELLEY, ULRICH.

INSTRUCTORS MACPHERSON, SNITZLER, WILLIAMS.

Business Education

PROFESSOR YERIAN (department head).

ASSOCIATE PROFESSORS LARSE, STUTZ.

ASSISTANT PROFESSORS CALLARMAN, WINGER.

Secretarial Science

PROFESSOR YERIAN (department head).

ASSOCIATE PROFESSORS STUTZ, FRICK (emeritus), LARSE.

ASSISTANT PROFESSORS CALLARMAN, JONES, ORNER, REEVES, WINGER.

General Statement

THE rapid and widespread industrialization of the United States, and of the Pacific Coast in particular, has created an insistent demand for college-trained men and women not only versed in the techniques of administration and management but also adequately educated in the basic technology and terminology of specific industrial operations and materials.

As a land-grant institution, Oregon State College is concerned with industry and the production, manufacture, and distribution of materials derived from land, forest, mine, and sea. Located on its campus are some of the outstanding technical schools in the West. Unique preparation to enter a field of administration and management in industry is provided in the School of Business and Technology through the combination of major work in business with minors offered by these technical schools.

The School of Business and Technology at Oregon State College offers major work in: General Business and Industry, Industrial Accounting and Cost Control, Industrial Finance, Production Management, Industrial Relations and

Personnel Management, and Industrial Marketing and Selling. The school also offers a major curriculum in Secretarial Science, and in conjunction with the School of Education prepares teachers of Business Education.

No graduate work is offered for majors in business and technology. Graduate students majoring in other fields may apply toward their minor requirements courses designated (g), pages 274-280.

The School of Business Administration at the University of Oregon offers major work, both undergraduate and graduate, in all fields of business where the interests of a student do not demand that technical training be taken in combination with business administration.

Business and Technology. Students majoring in business and technology combine any one of the major business curricula (pages 264-268) with a technical minor of 36 hours of which a maximum of 9 hours may be taken in required prerequisite or related courses (see TECHNICAL MINORS, pages 269-273). All students follow a common Lower-Division Curriculum (page 264).

Business Education. Students preparing to teach business education in secondary schools may follow a major curriculum in the School of Business and Technology (see Business Education curriculum, pages 267-268) and meet the requirements for a State Teacher's Certificate. State certification requirements are listed on pages 287-289. Advanced work in business education may be obtained by taking courses in the Department of Business Education for an M.A. or M.S. degree. (See course descriptions on pages 278-279.)

Secretarial Science. The secretarial science four-year curriculum (pages 268-269) is planned to meet the needs of students who wish to prepare for responsible secretarial positions or for such positions as office manager, assistant to public officials, and research assistants. Students who major in secretarial science may minor in some other field.

Baccalaureate Degrees. For the Bachelor of Arts degree students must complete 36 hours of arts and letters including two years of work (normally 24 hours) in a foreign language. For the Bachelor of Science degree students must complete 36 hours of either science or social science, or 45 hours in the two fields. (For full requirements for baccalaureate degrees, see pages 80-82.)

Facilities. The classrooms and laboratories of the School of Business and Technology are located in Commerce Hall. Special facilities include the latest office appliances and fixtures, standard typewriters, fluid, gelatin, and stencil duplicators, voice-recording machines, illuminated drawing boards, filing cabinets, adding machines, bookkeeping machines, and accounting machines. All appliances and equipment are kept in constant repair. Students are also taught how to maintain the appliances.

Curricula in Business and Technology

B.A., B.S. Degrees

LOWER-DIVISION CURRICULUM

	Term hours		
	F	W	S
Freshman Year			
Introduction to Business and Industry (BA 111, 112)	3	3	3
Survey of Modern Industry (BA 113)	3	3	3
Mathematics of Business and Industry (Mth 104, 105, 106)	3	3	3
Human Geography (HG 101)	3	3	3
Economic Geography (HG 102)	3	3	3
¹ Regional Geography, elective	3	3	3
History of American Civilization (1900 to present) (Hst 226)	3	3	3
American National Government (PS 201)	3	3	3
General Sociology (Soc 212)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
² Air, Military, or Naval Science (men)	2-3	2-3	2-3
³ Physical Education	1	1	1
	16-18	16-18	16-18

Sophomore Year			
Principles of Accounting (BA 211, 212, 213)	3	3	3
Principles of Economics (Ec 201, 202, 203)	3	3	3
General Psychology (Psy 207, 208)	3	3	3
Applied Psychology (Psy 209)	3	3	3
Business English (Eng 217)	3	3	3
Extempore Speaking (Sp 111)	3	3	3
Group Discussion (Sp 232)	3	3	3
⁴ Technical minor	3	3	3
² Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
	16-18	16-18	16-18

UPPER-DIVISION CURRICULA

GENERAL BUSINESS AND INDUSTRY

	Term hours		
	F	W	S
Junior Year			
Production (BA 311)	4	(4)	(4)
Finance (BA 312)	(4)	4	(4)
Marketing (BA 313)	(4)	(4)	4
Business Law (BA 411, 412, 413)	3	3	3
Business and Industrial Statistics (BA 431, 432)	3	3	3
Business Administration elective	3	3	3
Technical minor	3	3	3
Electives	3	3	3
	16	16	16
Senior Year			
Human Relations in Business and Industry (BA 497)	3	(3)	(3)
Government Relations in Business and Industry (BA 498)	(3)	3	(3)
Business and Industrial Policy (BA 499)	3	3	3
Business Administration electives	3	3	3
Technical minor	3	3	3
Technical minor	3	3	3
Electives	3	3	3
Electives	3	3	3
	18	18	18

¹HG 103 or HG 201 or HG 202 or HG 203, HG 204 or HG 211.

²Men taking Naval Science may defer Hst 226, PS 201, Soc 212 from freshman year and Eng 217, Sp 111, 232 from sophomore year.

³General Hygiene (PE 150), 2 term hours for women, 1 term hour for men, is taken one term in place of physical education.

⁴See pages 269-273.

INDUSTRIAL ACCOUNTING AND COST CONTROL

	Junior Year		
	Term hours		
	F	W	S
Production (BA 311)	4	(4)	(4)
Finance (BA 312)	(4)	4	(4)
Marketing (BA 313)	(4)	(4)	4
Business Law (BA 411, 412, 413)	3	3	3
Business and Industrial Statistics (BA 431, 432)	3	3	---
Advanced Accounting (BA 421, 422, 423)	3	3	3
Technical minor	3	3	3
Electives	---	---	3
	16	16	16

Senior Year			
Industrial Cost Accounting (BA 424, 425, 426)	3	3	3
Analysis of Financial Statements (BA 427)	3	---	---
Industrial Auditing (BA 428, 429)	---	3	3
Human Relations in Business and Industry (BA 497)	3	(3)	(3)
Government Relations in Business and Industry (BA 498)	(3)	3	(3)
Business and Industrial Policy (BA 499)	---	---	3
Technical minor	3	3	3
Technical minor	3	3	3
Electives	3	3	3
	18	18	18

Related Courses: Income Tax Procedure (BA 434)
 Office Organization and Management (SS 422)
 Money and Banking (Ec 413)
 Public Finance (Ec 418)
 Business Fluctuations (Ec 421)

INDUSTRIAL FINANCE

	Junior Year		
	Term hours		
	F	W	S
Production (BA 311)	4	(4)	(4)
Finance (BA 312)	(4)	4	(4)
Marketing (BA 313)	(4)	(4)	4
Business Law (BA 411, 412, 413)	3	3	3
Business and Industrial Statistics (BA 431, 432)	3	3	---
Related course	---	---	3
Technical minor	3	3	3
Electives	3	3	3
	16	16	16

Senior Year			
Income Tax Procedure (BA 434)	3	---	---
General Insurance (BA 435)	---	3	---
Investments (BA 436)	---	---	3
Industrial Finance (BA 437, 438)	3	3	---
Case Problems in Industrial Finance (BA 439)	---	---	3
Human Relations in Business and Industry (BA 497)	3	(3)	(3)
Government Relations in Business and Industry (BA 498)	(3)	3	(3)
Business and Industrial Policy (BA 499)	---	---	3
Technical minor	3	3	3
Technical minor	3	3	3
Electives	3	3	3
	18	18	18

Related Courses: Credits and Collections (BA 433)
 Analysis of Financial Statements (BA 427)
 Money and Banking (Ec 413)
 Public Finance (Ec 418)
 Business Combinations (Ec 420)
 Business Fluctuations (Ec 421)
 Office Organization and Management (SS 422)

PRODUCTION MANAGEMENT

	Term hours		
	F	W	S
Production (BA 311)	4	(4)	(4)
Finance (BA 312)	(4)	4	(4)
Marketing (BA 313)	(4)	(4)	4
Business Law (BA 411, 412, 413)	3	3	3
Business and Industrial Statistics (BA 431, 432)	3	3	---
Related course	---	---	3
Technical minor	3	3	3
Electives	3	3	3
	16	16	16

Senior Year

Production Management (BA 441, 442)	3	3	---
Case Problems in Production Management (BA 449)	---	---	3
Industrial Cost Accounting (BA 424, 425)	3	3	---
Human Relations in Business and Industry (BA 497)	3	(3)	(3)
Government Relations in Business and Industry (BA 498)	(3)	3	(3)
Business and Industrial Policy (BA 499)	---	---	3
Related course	---	---	3
Technical minor	3	3	3
Technical minor	3	3	3
Electives	3	3	3
	18	18	18

Related Courses: Industrial Purchasing (BA 461)
 Labor Problems (Ec 425)
 Collective Bargaining and Labor Legislation (Ec 426)
 Safety in Industry (IE 390)
 Methods and Motion Study (IE 391)
 Time Study (IE 392)

INDUSTRIAL RELATIONS AND PERSONNEL MANAGEMENT

	Term hours		
	F	W	S
Production (BA 311)	4	(4)	(4)
Finance (BA 312)	(4)	4	(4)
Marketing (BA 313)	(4)	(4)	4
Business Law (BA 411, 412, 413)	3	3	3
Business and Industrial Statistics (BA 431, 432)	3	3	---
Related course	---	---	3
Technical minor	3	3	3
Electives	3	3	3
	16	16	16

Senior Year

Personnel Management (BA 451, 452)	3	3	---
Case Problems in Personnel Management (BA 459)	---	---	3
Labor Problems (Ec 425)	---	4	---
Collective Bargaining and Labor Legislation (Ec 426)	---	---	4
Human Relations in Business and Industry (BA 497)	3	(3)	(3)
Government Relations in Business and Industry (BA 498)	(3)	3	(3)
Business and Industrial Policy (BA 499)	---	---	3
Related course	3	---	---
Technical minor	3	3	3
Technical minor	3	3	3
Electives	3	3	3
	18	19	19

Related Courses: Courses in Psychology
 Courses in Sociology
 Family Relationships (FL 422)
 Marriage (FL 222)
 Courses in Industrial Engineering
 Office Organization and Management (SS 422)

INDUSTRIAL MARKETING AND SELLING

	Term hours		
	F	W	S
Junior Year			
Production (BA 311)	4	(4)	(4)
Finance (BA 312)	(4)	4	(4)
Marketing (BA 313)	(4)	(4)	4
Business Law (BA 411, 412, 413)	3	3	3
Business and Industrial Statistics (BA 431, 432)	3	3	3
Related course			3
Technical minor	3	3	3
Electives	3	3	3
	16	16	16
Senior Year			
Industrial Purchasing (BA 461), Ind'l Traffic Management (BA 462, 463), or Advertising (BA 464), Salesmanship (BA 465), Sales Management (BA 466)	3	3	3
Industrial Marketing (BA 467, 468)	3	3	3
Case Problems in Industrial Marketing (BA 469)			3
Human Relations in Business and Industry (BA 497)	3	(3)	(3)
Government Relations in Business and Industry (BA 498)	(3)	3	(3)
Business and Industrial Policy (BA 499)			3
Technical minor	3	3	3
Technical minor	3	3	3
Electives	3	3	3
	18	18	18
Related Courses: Merchandising and Selling (SS 436) Credits and Collections (BA 433) General Insurance (BA 435) Office Organization and Management (SS 422)			

Curriculum in Business Education¹

B.A., B.S., Ed.B. Degrees

	Term hours		
	F	W	S
Freshman Year			
Typing (SS 121, 122, 123)	2	2	2
² Stenography (SS 111, 112, 113)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
Introduction to Business and Industry (BA 111, 112)	3	3	3
Vocabulary Building (Eng 211)			3
⁴ Group requirement in literature or science (men and women) or Air, Military, or Naval Science (men)	2-3	2-3	2-3
⁴ Physical Education	1	1	1
⁵ Electives	2	2	2
	16-17	16-17	16-17

¹All students following this curriculum will confer directly with the head of the Department of Business Education for complete counseling.

²Students who have had previous training in stenography and typing will be placed in classes commensurate with their abilities.

³As part of the requirement for junior standing (totaling 93 term hours), it is necessary to complete 9 term hours in each of two of the following three fields: Literature, Science, and Social Science. As the Social Science credits (Principles of Economics) are required in the sophomore year of the curriculum, it is necessary to choose between Literature and Science for the remaining 9 term hours. **NOTE:** In order for men taking Air, Military, or Naval Science to earn these remaining 9 term hours, it is recommended that they register for Science or Literature courses in place of Eng 211 in the freshman year and Eng 217 and Sp 111 in the sophomore year. These three last-named courses are deferred until later.

⁴General Hygiene (PE 150), 2 term hours for women, 1 term hour for men, is taken one term in place of physical education.

⁵The student should decide during the first year whether he desires the Bachelor of Science or the Bachelor of Arts degree. His choice of electives may be influenced by this decision.

The student should select before the end of the sophomore year one of the minors (excluding Business Administration) listed on pages 269-273. A minor must be completed before the student is eligible for Supervised Teaching during the senior year. A liberal number of elective hours, sufficient for the selection of a teaching minor, are available in the junior and senior years.

Students completing this curriculum will be prepared to enter both the teaching and secretarial fields.

	Term hours		
	F	W	S
Sophomore Year			
Applied Stenography (SS 211, 212, 213)	3	3	3
Principles of Accounting (BA 211, 212, 213)	3	3	3
Principles of Economics (Ec 201, 202, 203)	3	3	3
Business English (Eng 217)	3	.....	.....
General Psychology (Psy 207, 208) .....	.....	3	3
Social Science electives (men and women) <i>or</i> Air, Military, or Naval Science (men)	2-3	2-3	.....
Extempore Speaking (Sp 111) (men and women) <i>or</i> Air, Military, <i>or</i> Naval Science (men) .....	.....	.....	2-3
Physical Education	1	1	1
	15-16	15-16	15-16
Junior Year			
Office Procedure (SS 311, 312, 313)	4	4	4
Business Law (BA 411, 412, 413)	3	3	3
Secondary Schools in American Life (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
Methods and Materials (Ed 408c) .....	.....	.....	3
History of Oregon (Hst 377)	3	3	.....
¹ Electives	3	3	3
	16	16	15
Senior Year			
Merchandising and Selling (SS 436)	3	.....	.....
Office Organization and Management (SS 421, 422) .....	.....	3	3
Supervised Teaching (Ed 415)	6	(6)	(6)
Secretarial Problems (SS 411) .....	.....	3	.....
Secretarial Practice (SS 412)	(3)	(3)	3
Seminar (BED 407) .....	.....	3	.....
Research (BED 401) .....	.....	.....	3
Electives in science or social science	3	3	3
¹ Electives	6	6	3
	18	18	15

Curriculum in Secretarial Science

B.A., B.S., B.S.S. Degrees

	Term hours		
	F	W	S
Freshman Year			
Introduction to Business and Industry (BA 111, 112)	3	3	.....
Vocabulary Building (Eng 211) .....	.....	.....	3
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
Group requirement in science or language and literature	3	3	3
² Air, Military, or Naval Science (men)	2-3	2-3	2-3
¹ Physical Education	1	1	1
	17-18	17-18	17-18
Sophomore Year			
Applied Stenography (SS 211, 212, 213)	3	3	3
Principles of Economics (Ec 201, 202, 203)	3	3	3
Principles of Accounting (BA 211, 212, 213)	3	3	3
Business English (Eng 217)	3	.....	.....
History of American Civilization (1900 to present) (Hst 226) .....	.....	3	.....
American National Government (PS 201) .....	.....	.....	3
⁴ Social Science electives	3	3	3
² Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
	15-16	15-16	15-16

¹See footnote 5 on preceding page.

²Men taking Naval Science may defer Hst 226, PS 201, and Eng 217 to the junior year.

³General Hygiene (PE 150), 2 term hours for women, 1 term hour for men, is taken one term in place of physical education.

⁴Ninety of the hours taken for a baccalaureate degree must be in liberalizing courses.

	Junior Year		
	Term hours		
	F	W	S
Office Procedure (SS 311, 312, 313)	4	4	4
Production (BA 311)	4	(4)	(4)
Finance (BA 312)	(4)	4	(4)
Marketing (BA 313)	(4)	(4)	4
General Psychology (Psy 207, 208)	3	3	3
Applied Psychology (Psy 209)	3	3	3
¹ Electives	3	3	3
¹ Electives	3	3	3
	17	17	17
Senior Year			
Office Organization and Management (SS 421, 422)	3	3	3
Technical Reporting (SS 321, 322)	3	3	3
Merchandising and Selling (SS 436)	3	3	3
Secretarial Problems (SS 411)	3	3	3
² Secretarial Practice (SS 412)	(3)	(3)	3
Business Law (BA 411, 412, 413)	3	3	3
² Seminar (SS 407)	1	(1)	(1)
¹ Electives	3	3	3
¹ Electives	3	3	3
	16	18	15

Technical Minors

Agriculture:

- Agricultural Engineering
- Commercial Fisheries
- Dairy Products Industries
- Farm Crops
- Food Technology
- Horticulture
- Horticulture—Floriculture

Engineering and Industrial Arts:

- General Engineering
- Industrial Arts—Building Construction
- Industrial Arts—Metal Option
- Industrial Arts—Woodworking

Forestry

- Home Economics:
- Clothing and Textiles

Science:

- Industrial Chemistry
- Mining or Petroleum Geology
- Applied Physics

Technical fields in which minors are authorized are: Agriculture, Applied Physics, Engineering, Forestry, Home Economics, Industrial Chemistry, Mining or Petroleum Geology. In addition to the technical minors in these fields outlined below, similar technical minors within these authorized fields may be arranged where necessary to meet the objectives of individual students.

AGRICULTURAL ENGINEERING

PROFESSOR J. B. RODGERS, Adviser

	Term hours		
	F	W	S
Sophomore year:			
Elementary Analysis (Mth 101)	4	---	---
Abridged General Physics (Ph 211)	(3)	3	---
Forging and Welding (IE 250)	---	(2)	2
Junior year:			
Engineering Drawing (GE 121)	3	---	---
Farm Mechanics (AE 221)	---	3	---
Agricultural Engineering Survey (AE 111)	---	---	3
Senior year:			
Farm Motors and Tractors (AE 311)	3	---	---
Farm Buildings (AE 361)	---	3	---
Farm Implements (AE 231)	---	---	3
Automobile Mechanics (AE 313)	---	3	---
*Automobile Mechanics (AE 314)	---	---	3
*Soil Conservation Engineering (AE 471)	3	---	---
*Farm Electricity (AE 331)	---	3	---
*Pumps and Irrigation Equipment (AE 321)	---	---	3

¹Ninety of the hours taken for a baccalaureate degree must be in liberalizing courses.

²Offered each term.

* Of the four courses starred—AE 314, AE 471, AE 321, AE 331—the student selects two according to his objective.

APPLIED PHYSICS

PROFESSOR E. A. YUNKER, Adviser

	Term hours		
	F	W	S
Sophomore year:			
Elementary Analysis (Mth 101, 102, 103)	4	4	4
General Physics (Ph 201, 202, 203) or Engineering Physics (Ph 101, 102, 103)	4-3	4-3	4-3
Junior year:			
Introduction to Modern Physics (Ph 311, 312, 313)	3	3	3
Senior year:			
Electrical Measurements (Ph 331, 332, 333) or Electronics and Radio (Ph 337, 338, 339) or Fundamentals of Radio (Ph 334), Light (Geometric Optics) (Ph 465), Reading and Conference (Acous- tics) (Ph 405) or Photography (Ph 361, 362, 363)	3	3	3

CLOTHING AND TEXTILES

(For men and women)

PROFESSOR GERTRUDE STRICKLAND, Adviser

	Term hours		
	F	W	S
Sophomore year:			
Color and Composition (AA 160, 161)	3	3	3
Textiles (CT 250)	(3)	(3)	3
Junior year:			
Elementary Clothing (CT 111)	3	---	---
Clothing (Selection) (CT 211)	---	3	---
Related course	---	---	3
Senior year:			
Consumer Buying in Clothing and Textiles (CT 350)	3	(3)	(3)
Quantity Textile Purchasing (CT 351)	---	3	---
Textiles (CT 450)	3	---	---
Historic Textiles (CT 460)	---	---	3
The Clothing Buyer (CT 470)	---	---	3
Related course	---	3	---
Related Courses:			
Home Furnishing (CT 231, 331, 431)			
Flat Pattern and Draping (CT 310)			
Textile Design (CT 335)			
Textile Design (CT 435)			
Reading and Conference (CT 405)			

COMMERCIAL FISHERIES

PROFESSOR R. E. DIMICK, Adviser

	Term hours		
	F	W	S
Sophomore year:			
Biological Science Survey (GS 101, 102, 103)	4	4	4
Junior year:			
Economic Ichthyology (FG 274, 275, 276)	3	3	3
Senior year:			
Commercial Fisheries (FG 464, 465, 466)	3	3	3
Principles of Food Preservation (FT 250)	3	---	---
Nutrition (FN 225)	---	3	---
Preservation of Meats and Marine Products (FT 254)	---	---	3

DAIRY PRODUCTS INDUSTRIES

PROFESSOR G. H. WILSTER, Adviser

	Term hours		
	F	W	S
Sophomore year:			
General Chemistry (Ch 101, 102, 103)	3	3	3
Junior year:			
Dairy Husbandry (DH 121)	3	(3)	(3)
Testing Milk and Cream (DH 122)	---	1	---
Dairy Products Standards (DH 118)	---	---	1
Handling and Processing Milk (DH 210)	3	---	---
Milk Marketing (AEC 444)	---	3	---
General Bacteriology (Bac 204)	---	---	3
Senior year:			
Butter, Cheese, and Ice Cream Manufacturing (DH 417)	3	---	---
Dairy Products Laboratory (DH 315)	2	---	---
Related course	---	3	---
Related courses	---	3	3
Related Courses:			
Dairy Products Laboratory (DH 316, 317)			
Dairy Bacteriology (Bac 411)			
Dairy Bacteriology (Bac 412)			
Refrigeration and Cold Storage (ME 363)			

¹A related course in Clothing and Textiles may be substituted by those students who successfully pass a Clothing Placement Test.

Special sections for men are offered in Elementary Clothing, CT 111.

FARM CROPS

PROFESSOR D. D. HILL, Adviser

	Term hours		
	F	W	S
Sophomore year:			
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
Junior year:			
Elements of Agronomy I (FC 111)	3	.....	.....
Elements of Agronomy II (FC 211)	.....	3	.....
Soils (Sls 211, 212)	3	3	.....
Related course in farm crops or soils	.....	.....	3
Senior year:			
Seed Production (FC 414)	3	.....	.....
Cereal Production Lectures (FC 322)	.....	3	.....
Crop Inspection (FC 411)	.....	4	.....
Related course	.....	.....	3
Related Courses:			
Animal Nutrition I (AI 311)			
Weed Eradication (FC 317)			
Forage Crops (FC 324)			
Soil Fertility Lectures (Sls 424)			
Reading and Conference (FC 405)			

FOOD TECHNOLOGY

PROFESSORS E. H. WIEGAND, EARL M. LITWILLER, Advisers

	Term hours		
	F	W	S
Sophomore year:			
General Chemistry (Ch 101, 102, 103)	3	3	3
Junior year:			
General Bacteriology (Bac 204)	3	.....	.....
Principles of Food Preservation (FT 250)	3	.....	.....
Principles of Canning Fruits and Vegetables (FT 251)	.....	3	.....
Food Industries Survey (FT 240)	.....	.....	3
Senior year:			
Food Technology (FT 321, 322)	3	3	.....
Inspection of Processed Food (FT 371)	(3)	(3)	3
Frozen Foods (FT 412)	.....	3	.....
Related course	.....	.....	3
Related Courses:			
Elements of Horticulture (Hrt 111)			
Preservation of Meats and Marine Products (FT 254)			
Dehydration of Food Products (FT 331)			

FORESTRY

PROFESSOR W. F. McCULLOCH, Adviser

	Term hours		
	F	W	S
Sophomore year:			
Introduction to Forestry (F 213)	3	.....	.....
Forest Products (FP 210)	.....	3	(3)
Tree Identification (F 153)	(3)	.....	3
Junior year:			
Wood Utilization (FP 310)	3	.....	.....
Conservation of Natural Resources (F 360)	.....	3	.....
Mensuration: Scaling (F 226)	.....	.....	3
Senior year:			
Mensuration: Cruising (F 227)	3	.....	.....
Forest Economics (F 412)	.....	3	.....
Forest Management (F 426)	.....	.....	3
LOGGING OPTION ¹			
The Lumber Plant (FP 451)	3	.....	.....
Logging Methods (FE 392)	.....	3	.....
Forest Protection (F 231)	.....	.....	3
LUMBER MANUFACTURING AND MARKETING OPTION ¹			
The Lumber Plant (FP 451)	3	.....	.....
Lumber Manufacturing Problems (FP 452)	.....	3	.....
Lumber Merchandising (FP 453)	.....	.....	3

¹The student will select and complete one of the two options.

GENERAL ENGINEERING

PROFESSOR R. A. WANLESS, Adviser

	Term hours		
	F	W	S
Sophomore year:			
Elementary Analysis (Mth 101)	4	---	---
Abridged General Physics (Ph 211, 212)	---	3	3
Junior year:			
Engineering Fundamentals (GE 104, 105, 106)	3	3	3
Engineering Drawing (GE 121, 122)	3	3	---
Senior year:			
General Engineering (GE 201, 202, 203)	4	4	4
Related Courses:			
Structural Drafting (GE 211)			
Machine Drawing (GE 212)			
Plane Surveying (CE 226)			
Production Illustration (GE 114)			

HORTICULTURE

PROFESSOR HENRY HARTMAN, Adviser

	Term hours		
	F	W	S
Sophomore year:			
General Chemistry (Ch 101, 102)	3	3	---
Elements of Horticulture (Hrt 111)	---	---	3
Junior year:			
Basic Horticulture (Hrt 315)	3	---	---
Plant Propagation (Hrt 311)	---	3	---
Soils (Sls 211)	---	---	3
Senior year:			
Systematic Pomology (Hrt 433)	4	---	---
Fruit Handling and Distribution (Hrt 431)	---	4	---
Fruit and Nut Production (Hrt 331)	---	---	4
Systematic Vegetable Crops (Hrt 443)	2	---	---
Vegetable Production (Hrt 341)	---	3	---
Reading and Conference (Hrt 405)	---	---	3

HORTICULTURE—FLORICULTURE

PROFESSOR STANLEY E. WADSWORTH, Adviser

	Term hours		
	F	W	S
Sophomore year:			
Elements of Horticulture (Hrt 111)	3	(3)	(3)
General Floriculture (Hrt 151)	---	3	---
Flower Arrangement (Hrt 253)	---	---	3
Junior year:			
Commercial Floriculture (Hrt 351, 352, 353)	3	3	3
Senior year:			
Handling and Distribution of Florist Crops (Hrt 453)	3	---	---
Flower Shop Operation (Hrt 451)	3	---	---
Greenhouse Construction and Management (Hrt 313)	---	3	---
Plant Propagation (Hrt 311)	---	3	---
Herbaceous Plant Materials (Hrt 355)	---	---	3
Reading and Conference (Hrt 405)	---	---	3

INDUSTRIAL ARTS—BUILDING CONSTRUCTION

PROFESSOR G. B. COX, Adviser

	Term hours		
	F	W	S
Sophomore year:			
Engineering Drawing (GE 121)	3	---	---
House Planning and Architectural Drawing (AA 178, 180)	---	3	3
Junior year:			
Pattern Making (IE 111)	3	---	---
Methods in Woodworking (IE 112, 113)	---	3	3
Construction I (AA 220, 221, 222)	2	2	2
Senior year:			
Mill Work—Machine Woodwork (IE 311)	3	---	---
Carpentry and Building Construction (IE 333)	---	3	---
Farm Buildings (AE 361)	---	3	---
Building Cost Estimating (AE 465)	---	---	3
Related Courses:			
Elements of Interiors (AA 223)			
Home Furnishing (CT 231)			
Home-Ground Planning (LA 279)			

INDUSTRIAL ARTS—METAL OPTION

PROFESSOR MILTON C. SHEELY, Adviser

	Term hours		
	F	W	S
Sophomore year:			
Engineering Drawing (GE 121, 122)	3	3	3
Pattern Making (IE 111) .....	.....	.....	.....
Junior year:			
Foundry Practices (IE 141)	3	.....	.....
Forging and Welding (IE 152) .....	.....	3	.....
Machine Tool Practices (IE 163) .....	.....	.....	3
Senior year:			
Methods and Motion Study (IE 391)	3	.....	.....
Time Study (IE 392) .....	.....	3	.....
Safety in Industry (IE 390) .....	.....	.....	2
Related courses	3	3	3
Related Courses: Engineering Physics (Ph 101, 103) or General Physics (Ph 201, 203)			
Automobile Mechanics (AE 312, 313, 314)			
Casting Processes—Nonferrous (IE 343)			
Sheet Metal Work (IE 380)			

INDUSTRIAL ARTS—WOODWORKING

(Including Furniture Construction)

PROFESSOR G. B. COX, Adviser

	Term hours		
	F	W	S
Sophomore year:			
Engineering Drawing (GE 121, 122)	3	3	.....
Industrial Arts Drawing and Design (AA 281) .....	.....	.....	3
Junior year:			
Pattern Making (IE 111)	3	.....	.....
Methods in Woodworking (IE 112, 113) .....	.....	3	3
Senior year:			
Mill Work—Machine Woodwork (IE 311)	3	.....	.....
Wood Turning (IE 220) .....	.....	2	.....
Wood and Metal Finishing (IE 316) .....	.....	.....	3
Machine and Tool Maintenance (Wood Shop) (IE 225) .....	.....	.....	2
Furniture Design (IE 213)	2	.....	.....
Furniture Construction (IE 313, 314) .....	.....	2	2
Related Courses: Elements of Interiors (AA 223)			
Home Furnishing (CT 231)			
Textiles (CT 250)			

INDUSTRIAL CHEMISTRY

PROFESSORS J. S. WALTON and LEO FRIEDMAN, Advisers

	Term hours		
	F	W	S
Sophomore year:			
General Chemistry (Ch 101, 102, 103)	3	3	3
Junior year:			
Organic and Agricultural Biochemistry (Ch 251, 252)	5	3	.....
Agricultural Biochemistry (Ch 253) .....	.....	2	.....
Elementary Physical Chemistry (Ch 340) .....	.....	.....	3
Chemical and Mineral Industry Survey (ChE 111, 112, 113)	1	1	1
Elementary Analysis (Mth 101, 102)	4	4	.....
Senior year:			
Industrial Chemistry (ChE 321, 322, 323)	3	3	3

MINING OR PETROLEUM GEOLOGY

PROFESSOR I. S. ALLISON, Adviser

	Term hours		
	F	W	S
Sophomore year:			
Geology (G 201, 202, 203)	3	3	3
Geology Laboratory (G 204, 205, 206)	1	1	1
Junior year:			
Mineralogy and Rock Study (G 315, 316, 317)	4	4	4
Senior year:			
Mining Geology and Industrial Minerals (G 421, 422)	4	4	.....
Oil Geology (G 423) .....	.....	.....	4

Business Administration

COURSES in business and industrial administration are offered in the Department of Business Administration. The courses aim in the first two years to orient the student in the field and in the last two years to provide professional preparation for business and technology. Courses offered in the Department of Economics (pages 137-140) supplement the work of the Department of Business Administration.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- BA 111, 112. Introduction to Business and Industry.** 3 hours each term.
Survey of business organization, operation, and management intended to orient the student in the field of business and to help him determine a field of major concentration.
- BA 113. Survey of Modern Industry.** 3 hours.
Representative industries within the United States covering their development, structure, competitive conditions, basic processes, and technology. Orientation to help the student choose a minor in technology.
- BA 211, 212, 213. Principles of Accounting.** 3 hours each term.
FIRST TERM: Introduction to terminology, content, and form of financial statements for single proprietorships, partnerships, and corporations; recording of data for use in preparing profit and loss statements and balance sheets.
SECOND TERM: Detailed record-keeping procedures; internal control methods to protect cash resources; introduction to analysis and interpretation of financial statements. Prerequisite: BA 211.
THIRD TERM: Methods of recording and reporting incomes and expenses; introduction to functions and procedures of cost accounting for managerial use in controlling business operations; introduction to financial control through use of budgets. Prerequisite: BA 211, 212.

UPPER-DIVISION COURSES

- BA 311. Production.** 4 hours.
Operating techniques used in administration of manufacturing plants together with application to other areas of business management; organization, supervision problems, employee relations, wage payment, output standards, plant location, equipment layout, scientific management. Prerequisite: elementary economics.
- BA 312. Finance.** 4 hours.
Financial problems encountered in establishment and operation of business firms; forms of ownership organization, acquisition of capital, management of income; related financial institutions; financial adjustment to changing business conditions. Prerequisite: elementary economics, BA 211, 212.
- BA 313. Marketing.** 4 hours.
Survey of industrial and consumer markets and of activities and enterprises involved in distributing goods to those markets. Objective is to develop understanding of distribution processes, marketing problems and principles. Prerequisite: elementary economics.

- BA 405. Reading and Conference.** (g) Terms and hours to be arranged. Supervised individual work in some field of special application and interest. Subjects chosen must be approved by major professor. Prerequisite: senior or graduate standing.
- BA 411. Business Law.** 3 hours.
Basic rules of law for conduct of business generally, to create an awareness of proper legal practices, including the desirability of professional supervision; primary emphasis on requirements of formation, performance, and methods of discharge of contracts.
- BA 412. Business Law.** 3 hours.
Relationships between agents, persons for whom agents act, and persons with whom agents deal; legal relationships involved in partnership and corporate forms of business; law of promissory notes, bills of exchange, and checks. Prerequisite: BA 411.
- BA 413. Business Law.** 3 hours.
Primary features of real estate and land law, including deeds, wills, mortgages, titles, and landlord-tenant relationships; personal property law; nature of sales agreements and law of security arrangements; proper legal procedures, including preservation of evidence.
- BA 421, 422, 423. Advanced Accounting.** 3 hours each term.
Comprehensive review of basic accounting theory and critical study of conventional accounting procedures. Survey of more difficult problems encountered in accumulation and presentation of financial data; presentation and interpretation of balance sheets and other financial reports, measuring costs and revenues, problems in partnership accounting, installments, consignments, agency and branch accounting, consolidations, and fiduciary accounting. Prerequisite: BA 211, 212, 213.
- BA 424, 425, 426. Industrial Cost Accounting.** (g) 3 hours each term.
FIRST TERM: Theory and procedures in gathering cost data and their use in analyzing and controlling operating costs; specific order and process cost systems. Prerequisite: BA 211, 212, 213.
SECOND TERM: Technique of standard costs; analysis of variance; distribution costs; managerial reports; specialized cost problems. Prerequisite: BA 424.
THIRD TERM: Design and use of operating and financial budgets; establishment and review of industrial accounting systems through study of cases from industry. May be taken separately. Prerequisite: BA 211, 212, 213.
- BA 427. Analysis of Financial Statements.** 3 hours.
The preparation, analysis, and interpretation of balance sheets and operating reports for effective management and control of industrial and trading concerns. Prerequisite: BA 211, 212, 213.
- BA 428, 429. Industrial Auditing.** (g) 3 hours each term.
Personal standards and verification procedures for auditors of business enterprises; methods of surveying adequacy and effectiveness of accounting system and internal control; practice in application of auditing procedures and in preparation of working papers; certification of financial statement information. Prerequisite: BA 421, 422, 423.

- BA 431, 432. **Business and Industrial Statistics.** (g) 3 hours.
Statistical techniques for collecting and analyzing business data; statistical source materials; methods for dealing statistically with problems of inspection, quality control, personnel testing, financial analysis, and market research; development of facility in use of business data in reports; sharpening of critical faculties for appraisal of statistical "facts" and "proofs." Prerequisite: Mth 100 or 104, 105.
- BA 433. **Credits and Collections.** 3 hours.
Functions performed by a credit department are studied and related to other functions of the business enterprise; nature of consumer credit and mercantile credit, sources of credit information, evaluation of credit risks, and credit controls useful to business firms.
- BA 434. **Income Tax Procedure.** 3 hours.
Federal and state income tax laws, regulations, and court decisions applicable to individuals, partnerships, and corporations; differences between managerial and tax accounting and between federal and state tax requirements; computing taxable income and preparing official returns.
- BA 435. **General Insurance.** 3 hours.
Aims to familiarize students with the various insurance means at disposal of management for use in shifting, reducing, or eliminating risk; fire, casualty, compensation, fidelity and surety, marine, and other types of insurance.
- BA 436. **Investments.** (g) 3 hours.
Investment objectives and risks; investment program planning; corporate securities and securities markets; government bonds, real estate, savings institutions; interest income and stock yields; security analysis. Prerequisite: BA 312.
- BA 437, 438. **Industrial Finance.** (g) 3 hours each term.
Financial administration of an industrial enterprise; financial coordination of purchases, inventories, production, and sales; managing cash, receivables, inventories, investments, and working capital position; financial control of plant, equipment, leases, and industrial property. Prerequisite: BA 312.
- BA 439. **Case Problems in Industrial Finance.** 3 hours.
Problems of financial management are studied, using actual situations drawn from the current business scene. Written reports are prepared by the student for each case problem; emphasis on the analysis of the pertinent facts, weighing of alternative solutions. Prerequisite: BA 437, 438.
- BA 441, 442. **Production Management.** 3 hours each term.
Problems of production, factory organization, and factory management, from point of view of production manager. Prerequisite: BA 311.
- BA 449. **Case Problems in Production Management.** (g) 3 hours.
Designed primarily to enable student to formulate an over-all picture of interrelationship of major aspects of production. Intensive case study of actual cases drawn from industry. Prerequisite: BA 441, 442.
- BA 451, 452. **Personnel Management.** (g) 3 hours each term.
FIRST TERM: Survey of objectives, functions, and practices of personnel administration which contribute to effective achievement of aims of organizations.

SECOND TERM: Detailed consideration of techniques, uses, and limitations of such personnel activities as job analysis, job evaluation, evaluation of employees, employee services, employee publications, and suggestion systems. Prerequisite: BA 451.

BA 459. Case Problems in Personnel Management. 3 hours.

Case studies to help develop facility in using facts to diagnose causes of personnel problems and in working out plans for improving productivity of personnel. Opportunity is given to use knowledge and experience in situational thinking. Prerequisite: BA 451, 452.

BA 461. Industrial Purchasing. 3 hours.

Significant managerial problems raised by purchase and control of materials for industrial use as they affect control of quality of product, maintenance of operating efficiency, and quotation of competitive prices.

BA 462; 463. Industrial Traffic Management. (g) 3 hours each term.

FIRST TERM: Functions and procedures of traffic departments in industrial enterprises; use of tariffs; choice of agencies; control of transportation costs; government rate regulation procedures.

SECOND TERM: Activities and procedures peculiar to exporting and importing; obtaining transportation services; packing requirements; custom requirements; financing methods; insurance. May be taken separately.

BA 464. Advertising. 3 hours.

Advertising as a marketing function; organization of advertising agencies and advertising departments; preparation of advertisements: copy, illustration, and layout; use of media: newspapers, magazines, direct mail, radio and television.

BA 465. Salesmanship. 3 hours.

Principles and practice of salesmanship: pre-approach, gaining the interview, approach, demonstration, meeting objections, and the close; class work correlated with student's major interests in selling.

BA 466. Sales Management. 3 hours.

Sales manager in marketing process; his administrative and executive duties; analysis of market, recruiting, selecting, contracting, training, equipping, compensating, supervising, and evaluating salesmen.

BA 467, 468. Industrial Marketing. (g) 3 hours each term.

Management of marketing activities among enterprises serving industrial market; planning, organization, and control of various elements of marketing program; product planning and policies; market research; use of middlemen and agencies; selling methods; pricing and terms of sale. Prerequisite: BA 313.

BA 469. Case Problems in Industrial Marketing. 3 hours.

With the purpose of developing proficiency in solution of marketing problems representative cases are studied involving: choice of distribution channels, product and price policies, distribution cost analysis, and sales programs. Prerequisite: BA 467, 468.

BA 497. Human Relations in Business and Industry. (g) 3 hours.

Relationships among managerial, supervisory and other workers; actual cases used to help develop attitudes, frames of reference, and approaches which will be useful in solving human relations problems in business. Prerequisite: senior standing.

- BA 498. **Government Relations in Business and Industry.** (g) 3 hours. Statutory, administrative, and common law controls affecting modern business and their influence on budgetary considerations, business structure, and administrative policies; importance of constructive attitude and harmonious collaboration. Prerequisite: senior standing.
- BA 499. **Business and Industrial Policy.** 3 hours. Advanced integrative course in analysis of top-management decisions, executive responsibilities, and company objectives. Policy-making is studied through business histories, current business news, and field investigations of region. Prerequisite: senior standing.

GRADUATE SERVICE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

Business Education

PROFESSIONAL preparation for teachers of business subjects is provided in the Department of Business Education, which is a joint department in the School of Business and Technology and the School of Education. A student may major in either school. The student before registering must confer with the head of the Department of Business Education for discussion of a complete program.

Baccalaureate Degrees. The program for undergraduates for a baccalaureate degree is outlined in the curriculum on pages 267-268. Courses from business administration, education, and secretarial science form the major background. A liberal number of elective hours permits the selection of a teaching minor. The requirements for a State High-School Teacher's Certificate are listed on pages 287-289.

Advanced Degrees. Graduate study for advanced degrees with a major in business education is available through the School of Education for all those who complete the undergraduate curriculum (pages 267-268) or its equivalent. Thirty of the required 45 term hours for the Master of Science or the Master of Arts degree are taken in business education (including the thesis). Other master degree options are described on page 444. A choice of graduate program can be made following a conference with the head of the Department of Business Education.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

- BEd 401. **Research.** Terms and hours to be arranged.
- BEd 403. **Thesis.** Terms and hours to be arranged.
- BEd 405. **Reading and Conference.** Terms and hours to be arranged.
- BEd 407. **Seminar.** Terms and hours to be arranged.
- Ed 408c. **Methods and Materials.** (See Ed 408, page 303.)

GRADUATE COURSES

- BEd 501. **Research.** Terms and hours to be arranged.
- BEd 503. **Thesis.** Terms and hours to be arranged.

BEd 505. Reading and Conference. Terms and hours to be arranged.

BEd 507. Seminar. Terms and hours to be arranged.

MEASUREMENTS IN BUSINESS EDUCATION.

CURRENT TRENDS IN OFFICE PROCEDURE.

SUPERVISION AND ADMINISTRATION OF BUSINESS EDUCATION.

TEACHING SOCIO-BUSINESS SUBJECTS IN THE SECONDARY SCHOOL.

PRACTICUM IN BUSINESS EDUCATION—The planning and development of practical and creative projects, group or individual, in the field of business education. Students will be urged to use actual school situations as nucleus for the term's work and to arrive at the best possible solutions.

BEd 541. Current Practices in Typewriting. 3 hours fall.

Principles underlying development of typing skills; motivation, supplementary materials, and special devices. Prerequisite: Ed 408c or teaching experience in typing.

BEd 542. Current Practices in Shorthand. 3 hours winter.

Correct writing habits; correlation of sound and symbol response; word and sentence building and transcription technique. Prerequisite: Ed 408c or teaching experience in stenography.

BEd 543. Problems in Commercial Education. 3 hours spring.

Trends in high-school commercial curriculum; evaluation of methods and available research studies. Prerequisite: Ed 408c or teaching experience in commercial subjects.

Secretarial Science

THE major in secretarial science prepares young men and women for secretarial positions. It is often advantageous for the student to elect a minor in an industrial field in which he plans to work. In addition to the courses for students majoring in secretarial science, the department gives service work for students majoring in business and technology and in other major curricula of Oregon State College.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

SS 111, 112, 113. Stenography. 3 hours each term.

Theory of shorthand; practical applications in sentence dictation. SS 121, 122, 123 must be taken concurrently unless the student has had the equivalent. Students with 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; rhythmical drills, dictation exercises; writing paragraphs; punctuation and mechanical arrangement of business correspondence, legal forms, tabulating, manifolding, speed practice. Students with at least one year of typing are not permitted to take SS 121 for credit. Five periods laboratory work.

SS 131. Business Forms and Reports. 2 hours.

Planning and typing business papers, manuscripts, statistical tables, and reports. Speed typing is emphasized.

SS 211, 212, 213. Applied Stenography. 3 hours each term.

Advanced principles and phrases; dictation and transcripts covering vocabularies of representative businesses; legal forms; newspapers and magazine articles. Prerequisite: SS 113, 123 or equivalent. Three recitations; 3 one-hour laboratory periods.

UPPER-DIVISION COURSES

SS 311, 312, 313. Office Procedure. 4 hours each term.

The most efficient stenographic methods and office practice; filing; advanced dictation; transcripts; reports; modern office appliances. Prerequisite: SS 213 or equivalent. Two lectures; 3 two-hour laboratory periods.

SS 321, 322. Technical Reporting. 3 hours each term winter and spring.

Advanced stenographic training in specialized business fields.

SS 407. Seminar. 1 hour any term.**SS 411. Secretarial Problems.** 3 hours winter.

Duties and problems of the secretary in business and professions; relation to employer and fellow employees; office supervision. Prerequisite: SS 421 or equivalent.

SS 412. Secretarial Practice. 3 hours any term.

Practical office experience. Ninety hours laboratory work in campus offices. Prerequisite: senior standing.

SS 421, 422. Office Organization and Management. 3 hours fall and winter.

Scientific office management; organization; arrangement; operation; employment and training of office workers; efficiency problems; business ethics. Prerequisite: SS 313 or consent of instructor.

SS 436. Merchandising and Selling. (g) 3 hours fall.

Organization and operation of retail institutions; store location, store layout, buying and selling, operating activities, personnel and control.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) may be taken for graduate credit. For graduate courses in business education, see pages 278-279.

School of Education

Faculty

FRANKLIN ROYALTON ZERAN, Ph.D., Associate Dean of the School of Education.

CLYTIE MAY WORKINGER, Placement Secretary.

MARGARET LIEBER, Secretary, School of Education.

Education

PROFESSORS ZERAN (department head), BAKKUM, BERGSTROM, CLINTON, CRAMER, GOODE, JEWELL (emeritus), LANGTON, LASLETT, READ, SALSER (emeritus), SEEN, SHERBURNE.

ASSOCIATE PROFESSORS DIXON, MUNFORD, REICHART, STEVENS, WILLIAMSON.

ASSISTANT PROFESSORS BERNARD, GORDON, HAHN, MILLIKEN.

INSTRUCTORS BRUSH, O'DEA, VAN LOAN.

Agricultural Education

ASSISTANT PROFESSOR TEN PAS (acting department head).

PROFESSOR GIBSON (emeritus).

STATE SUPERVISOR AND TEACHER TRAINER MORGAN.

INSTRUCTOR JEAN.

Business Education

PROFESSOR YERIAN (department head).

ASSOCIATE PROFESSORS LARSE, STUTZ.

ASSISTANT PROFESSORS CALLARMAN, WINGER.

Home Economics Education

PROFESSOR DUBOIS (department head).

STATE SUPERVISOR AND TEACHER TRAINER KOHLHAGEN.

ASSOCIATE PROFESSOR MCQUESTEN.

INSTRUCTOR HOLLANDSWORTH.

Industrial Education

PROFESSOR COX (department head).

ASSOCIATE PROFESSORS MEYER, PAULSON.

ASSISTANT PROFESSOR HAHN.

Science Education

ASSOCIATE PROFESSORS WILLIAMSON (department head), MORRIS.

Supervising Teachers

- VIDA ABRAMS, Behnke-Walker, Commercial, Tillamook High School.
ROBERT ANDERSON, B.S., Industrial Arts, Leslie Junior High School, Salem.
HAROLD BABCOCK, B.S., Agriculture, Sandy High School.
CARMELITA BARQUIST, M.A., Biology, Salem High School.
ELEANOR BATEMAN, B.S., Home Economics, Philomath High School.
HOWARD BENNETT, B.S., Agriculture, Newberg High School.
BETHINE BIGEJ, B.S., Home Economics, Albany High School.
GEORGE BIRRELL, B.A., Chemistry, Salem High School.
CARL BLOOD, B.S., Industrial Arts, Eugene High School.
ANN BOENTJE, B.S., Mathematics, Salem High School.
ROBERT BUCHANAN, M.S., Biology, Albany High School.
MAURICE BULLARD, M.S., Industrial Arts, Corvallis High School.
KENNETH CARDON, B.S., Physical Education, Albany High School.
WALTER CARPENTER, B.S., Agriculture, Grants Pass High School.
LUCILLE CARTER, B.S., Home Economics, Oregon City High School.
GLADYS CHANDLER, B.S., Physics, Milwaukie High School.
VIVIAN CHANDLER, B.A., Biology, Salem High School.
LENO CHRISTENSEN, B.S., Agriculture, Madras High School.
CLAUDIA CLEVELAND, B.S., Commercial, Lebanon High School.
DOROTHY COATNEY, B.S., Home Economics, Junction City High School.
PAULINE COHEN, A.B., Commercial, Salem High School.
ELEANOR DALLAS, M.S., Home Economics, Corvallis High School.
RALPH DAMETZ, B.A., Industrial Arts, Parrish Junior High School, Salem.
MARION DAVIS, M.S., Industrial Arts, Salem High School.
DONALD DAWSON, B.S., Industrial Arts, Parrish Junior High School, Salem.
FRANCES DE VOS, B.S., Physical Education, Albany Junior High School.
WALTER DICKSON, B.S., Science, Leslie Junior High School, Salem.
PRESTON DOUGHTON, M.S., Commercial, Salem High School.
TOM DRYNAN, B.S., Physical Education, Albany High School.
RUTH EGGIMAN, B.S., General Science, Albany Junior High School.
L. J. EIGSTI, M.A., Industrial Arts, Woodrow Wilson Junior High School, Eugene.
EUGENE FOREMAN, B.S., Agriculture, Albany High School.
HOWARD FORREST, M.A., General Science, Corvallis High School.
ROY FOSTER, B.S., Industrial Arts, Parrish Junior High School, Salem.
ROBY GOFF, M.S., Industrial Arts, Corvallis High School.
E. J. GREINER, B.S., Industrial Arts, McMinnville High School.
VIRGINIA HARPER, B.S., Chemistry, Albany High School.
ROBERT HAWK, M.S., General Science, Lebanon High School.
ERNEST HEINBACH, B.S., Science, Newberg High School.
WENDELL HEINTZMAN, M.S., Commercial, Albany High School.
ELIZABETH HERINGER, B.S., Biology, Milwaukie High School.

- HOWARD HICKCOX, B.S., Science, Lebanon High School.
ELIZABETH HOGG, Behnke-Walker, Salem High School.
IRENE HOLLENBECK, M.S., Biology, Salem High School.
BERYL HOLT, B.A., Mathematics, Salem High School.
LEONARD HUDSON, B.S., Agriculture, Silverton High School.
DORMA LEE JOHNSON, B.S., Home Economics, Corvallis High School.
ALBERT JOHNSTON, M.S., Industrial Arts, Leslie Junior High School, Salem.
DONALD KABLER, B.S., Agriculture, Corvallis High School.
NELLIE KELLY, B.A., Mathematics, Albany High School.
HENRY LANDIS, B.S., Science, Parrish Junior High School, Salem.
MELVIN LARKIN, B.S., Physical Education, Albany Junior High School.
VERNA LARSEN, M.S., Commercial, Corvallis High School.
JAMES LUNN, B.A., Science, Albany High School.
PHILLIP MCGOVERN, M.S., Industrial Arts, Willamette High School, Eugene.
ODINE MICKELSON, B.S., Industrial Arts, Eugene High School.
DONALD C. MOORE, B.S., Industrial Arts, Eugene High School.
MADELINE MORGAN, B.S., Physical Education, Albany High School.
JOSE MORITZ, B.S., Mathematics, Corvallis High School.
FAY MORT, M.S., Science, Leslie Junior High School, Salem.
WILLIAM NEE, M.S., Industrial Arts, Woodrow Wilson Junior High School,
Eugene.
A. F. NEUMAN, B.S., Biology, Lebanon High School.
HARRIS OLSON, B.S., Physical Education, Corvallis High School.
VIOLETTE OLSTAD, B.S., Home Economics, Lebanon High School.
FRED OSBORNE, B.S., Physical Education, Corvallis High School.
CHARLES OWENS, B.S., Science, Parrish Junior High School, Salem.
IRENE PARENT, B.S., Physical Education, Albany High School.
RULON PARHAM, B.S., Mathematics, Lebanon High School.
BETTY P. PARRISH, B.S., Physical Education, Albany High School.
PAUL PATRICK, B.S., Agriculture, McMinnville High School.
MABEL PATTON, M.S., Mathematics, Corvallis High School.
JUNE PHILPOTT, M.S., Science, Salem High School.
GENEVIEVE PILUSO, M.A., Commercial, Lebanon High School.
MARTHA PINSON, B.A., Commercial, Salem High School.
DOROTHEA REED, B.S., Home Economics, West Linn High School.
LA RUE RICHARDS, B.S., Commercial, Salem High School.
NEIL SALING, B.S., Industrial Arts, Corvallis High School.
DAPHNE SCHAINCK, B.S., Physical Education, Corvallis High School.
DELBERT SCOTT, B.S., Physical Education, Corvallis High School.
FLOYD L. SIEGMUND, B.S., Industrial Arts, Salem High School.
PERRY SPELBRINK, B.S., Science, Corvallis High School.
LEE SPITZNOGLE, B.A., Commercial, Corvallis High School.
LEO STENBACK, B.S., Biology, Salem High School.

- KATHERINE STEVENS, M.A., Mathematics, Milwaukie High School.
 STANLEY STRONG, B.S., Mathematics, Corvallis High School.
 J. F. SWIGART, Ed.M., Industrial Arts, Leslie Junior High School, Salem.
 RAY TALBOT, B.S., Science, Hillsboro High School.
 RICHARD THAW, Ed.M., Science, Corvallis High School.
 JAMES THOMAS, B.S., Agriculture, Hillsboro High School.
 BRUCE THOMPSON, B.S., Industrial Arts, Salem High School.
 PHYLLIS TRUSTY, B.S., Home Economics, Cottage Grove High School.
 EMILLA TSCHANZ, B.S., Home Economics, Lebanon High School.
 ESTELLE VAN CLEAVE, B.S., Home Economics, Silverton High School.
 GEORGE VAN PELT, B.S., Physical Education, Lebanon High School.
 CLARA VOYEN, Behnke-Walker, Commercial, Albany High School.
 MARGARET WARREN, B.S., Home Economics, Albany High School.
 WALLY WEDIN, B.S., Agriculture, McLoughlin High School, Oregon City.
 CONSTANCE WEIMAN, B.A., General Science, Parrish Junior High School, Salem.
 RICHARD WILSON, B.S., Agriculture, Nyssa High School.
 ALICE WOOD, B.A., Science, Albany Junior High School.

General Statement

ALL professional preparation for teaching within the State System of Higher Education, except undergraduate 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. The School of Education operates on both the University of Oregon and the Oregon 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.

At Oregon State College students may prepare for teaching of agriculture, biological science, business education, general science, home economics, industrial arts, mathematics, physical education, physical science, and approved combinations of subjects, and for educational and vocational guidance.

At the University of Oregon are given general education courses, professional work in educational administration, and major curricula preparing for teaching of arts, biological science, business administration, general science, languages, literature, mathematics, music, physical education, physical science, social sciences, 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 should 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., B.S., or Ed.B. 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 teaching major and a teaching minor. Graduates of 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 other colleges except that not more than 9 hours of credit are allowed for supervised 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 full junior standing.

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. or Ed.B. degree 36 term hours of science or 36 term hours of social science, or 45 term hours in both, are required. One year of a laboratory science or mathematics, to be chosen by the student, is required for the B.S. or Ed.B. degree. Elementary Psychology (Psy 201, 202, 203) plus Laboratory (Psy 204, 205, 206) is *not accepted* in the School of Education as a substitute for science.

Candidates for a bachelor's degree in the School of Education, with the exception of the professional degree in Industrial Arts Education, must submit 36 term hours in education, of which at least 24 term hours must be in upper-division or graduate education courses. One teaching major and a teaching minor must also be submitted (see pages 290-297).

Either General Psychology (Psy 207, 208) or Elementary Psychology (Psy 201, 202, 203) is prerequisite to all upper-division education courses. These are the only psychology courses which may be counted as a part of the education major of 36 term hours.

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 Oregon State College through the Graduate School. For an M.A. or M.S. degree, the student must complete a graduate major in education and a graduate 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 complete a graduate major and a graduate minor in the field of education or a subject-matter field. For both the Ed.M. and Ed.D. degrees the candidate must submit a record of successful teaching experience. Reading knowledge of French, German, or other language may be required if it is regarded as essential to the student's program. The regulations governing graduate study are stated under GRADUATE SCHOOL 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 to Oregon State College. Supervised teaching cannot be done at the State College in fields in which the State College does not offer major work. Supervised student teachers observe teaching by expert instructors, work out lesson plans under the direction of the supervisors, and teach high-school classes under supervision. Credit for supervised teaching is granted only on the approval of the director of supervised teaching. *Arrangements to do student teaching during the senior year must be made with the director of supervised teaching during registration for winter term of the junior year. To be admitted to supervised teaching a student must have a grade-point average of 2.50 in his teaching major at the beginning of the term in which he is to do supervised teaching. He must also have a teaching minor.*

Professional Training in Guidance Work. Under the organization plan of the State System of Higher Education, training in the field of guidance is allocated to Oregon State College. Experience in fields of work other than teaching is desirable for all counselors and personnel workers.

Cooperative Elementary Teacher Education Program. Oregon State College has entered into a cooperative arrangement with the state colleges of education (located in Monmouth, Ashland, and La Grande) for providing preparation for elementary teaching, under a five-year plan ending July 1, 1956. Under this plan, students qualifying for junior standing, or equivalent preparation, in their first two years, may enroll on this campus in the junior year in a special curriculum for elementary teaching. This will be followed, upon recommendation of the dean of the School of Education, by a fourth year of concentrated professional preparation at any one of the colleges of education. During the fourth year the student will be registered at a college of education all three terms but will spend the spring term at Oregon State College doing supervised teaching (10 term hours) and course work (6 term hours), directed by the college of education. The student, on completion of the four-year program, will be awarded the Ed.B. degree from Oregon State College and the B.S. degree in Elementary Education from the college of education attended, and will be certificated for teaching in elementary schools.

This cooperative program provides opportunity for students already enrolled at Oregon State College to prepare for elementary teaching. The State Board of Higher Education maintains a full four-year program for the professional preparation of elementary teachers in the state colleges of education, and high school seniors who have decided to prepare for elementary teaching are normally advised to enroll in one of these colleges.

Students selecting this program should do so as early as possible. In any event, choice must be made by the end of the sophomore year if the program is to be completed in four years.

The first two years at Oregon State College should include the requirements for junior standing (see pages 80-81). This program applies only to students enrolled in the School of Education.

A similar program for preparation of emergency primary teachers is listed under the School of Home Economics (pages 385-386). The program does not lead to certification for teaching in secondary schools.

Requirements for secondary school certification are listed on pages 287-289.

Teacher Placement Service. A Placement Service is maintained by the School of Education for the placement of graduates of Oregon 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	\$5.00
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. Two kinds of certificates are issued: provisional and five-year secondary.

Provisional Certification. Provisional certification is granted upon completion of the requirements for a baccalaureate degree and either a 4- or 5-year teacher-education course in a standard college, university, or teachers college qualified to prepare teachers for the secondary school level. This program should include a broad general background that would normally require most of the time during lower-division years and which should be designed to develop:

1. Competency in written and spoken English, in physical and mental health, and in human relationships.
2. An appreciation of literature and the fine arts.
3. An understanding of the history and traditions of our culture including United States history, the history of western Europe, socio-economic problems, and the relationship of man to his environment.
4. An understanding of the biological or physical sciences (including mathematics). Competency in home economics may be accepted in lieu of biological or physical sciences.

* The required courses in education for a State Certificate are:

Secondary Education
 Educational Psychology
 General Methods (Principles of Teaching)
 Supervised Teaching
 Oregon School Law
 Oregon History

Provisional certificates are obtained on the following basis:

1. *Provisional Certificate A.* Completion of the requirements for the baccalaureate degree and a four-year teacher-education course in a standard college, university, or teachers college qualified to prepare teachers for the secondary school level.

* To do supervised teaching at Oregon State College, the student must, in addition, take Ed 408, Methods and Materials, in his major teaching field.

2. *Provisional Certificate B.* Completion of 9 term hours of approved study beyond the four-year teacher-education course and the bachelor's degree and one year of teaching in Oregon.
3. *Provisional Certificate C.* Completion of 18 term hours of approved study beyond the four-year teacher-education course and the bachelor's degree and one year of teaching in Oregon.
4. *Provisional Certificate D.* Completion of 27 term hours of approved study beyond the four-year teacher-education course and the bachelor's degree and one year of teaching in Oregon.
5. *Provisional Certificate E.* Completion of 36 term hours of approved study beyond the four-year teacher-education course and the bachelor's degree and one year of teaching in Oregon.
6. This schedule shows the minimum program of training based on advanced work that may be earned during summer session attendance or by extension work. Candidates may complete the work more rapidly, however, if they so desire.
7. Each provisional certificate is issued for one year only.

Progression from provisional to regular certification is as follows:

1. The candidate for a regular five-year certificate who has qualified for a provisional certificate upon completion of a four-year teacher-education course must complete the five-year teacher-education program as defined by the State Board of Education.
2. The candidate for a regular five-year certificate who has otherwise qualified for a provisional certificate upon completion of a five-year teacher-education course must have at least one year of successful teaching experience in Oregon on a provisional certificate.
3. Any holder of a provisional certificate who does not qualify for a regular certificate within five years following the granting of the first provisional certificate may be reinstated at the point in the program where he dropped out without penalty provided that the qualifications for the next step in the progression are met.

Regular Certification. The regular five-year secondary state certificate is granted on the completion of the following:

1. At least 32 term hours of education plus 2 term hours of Oregon history, of which 17 term hours of education, including 2 term hours of Oregon school law, and 2 term hours of Oregon history must be acquired prior to receiving the first provisional certificate. Teachers whose training is taken in institutions outside Oregon must present 17 term hours of approved courses in education exclusive of Oregon school law. Completion of the Oregon courses may be deferred for one year for such applicants.
A minimum of 9 term hours of education must be earned after the completion of the requirements for the baccalaureate degree.
The remaining 6 term hours of education may be taken as electives in either the undergraduate or graduate program.
2. Forty-five term hours of upper-division or graduate work beyond the completion of the requirements for the baccalaureate degree. This 45 term hours of work must include a minimum of 9 term hours of education.
3. One year of teaching on a provisional certificate in Oregon.

Ed 311, 312, 313, 408, and 415 must be taken in residence. They cannot be taken by correspondence.

According to the Secondary School Standards issued by the Oregon State Department of Education in 1948:

Teachers in approved secondary schools shall hold valid Oregon certificates to teach in the type of school in which they are employed.

A broad knowledge in the fields of English and literature, social studies, mathematics, natural science, and fine arts should be a fundamental part of the equipment of every secondary school teacher. It is, therefore, *recommended* that teachers employed in state-approved schools should have completed in a standard college or university the following minimum hours of work in each field:

ENGLISH (composition, literature, speech, dramatics) 24 term hours. (A maximum of 6 hours in library science may be applied toward fulfilling this requirement.)

SOCIAL STUDIES (history, political science, economics, sociology, geography, philosophy) 24 term hours. (A maximum of 6 hours in library science may be applied toward fulfilling this requirement.)

SCIENCE AND MATHEMATICS (to include 9 hours of biological science and either 8 hours of physical science and/or mathematics) 17 term hours.

ARTS AND CRAFTS (music, plastics, graphic, and industrial arts) 6 term hours. (Equivalent performance standards acquired outside college or university may be accepted if approved by 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.

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 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 ADDITION to the minimum number of hours in general education specified, new teachers employed in a state-approved school shall be assigned to teach only in those subject fields in which adequate preparation in a standard college or university has been completed. The teacher-training institutions of this state and the State Department of Education have agreed upon the minimum hours of college or university work that should be required of teachers in each subject field. Two or more years of successful experience in teaching those subjects may, upon the recommendation of the superintendent under whom the experience was obtained, be accepted in lieu of one-half the number of hours required for a teacher in that subject.

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 to be 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, and geography.

MATHEMATICS—15 term hours of college mathematics.

COMMERCE—Shorthand, 18 term hours which may include high school credits or business college course evaluated in terms of college hours or equivalent performance standards; typing, 6 term hours including credits from high school or business college evaluated in terms of college hours or equivalent performance standards; bookkeeping, business training, and commercial law, 24 term hours in accounting and business administration.

NATURAL SCIENCES—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 or in combined courses of botany and zoology; biology, 18 term hours in biology or in combined courses in botany and zoology; physics, 12 term hours; chemistry, 12 term hours.

HEALTH INSTRUCTION AND PHYSICAL EDUCATION—12 term hours each in physical education and health education.

INDUSTRIAL ARTS—24 term hours, exclusive of art and drawing courses.

HOMEMAKING—24 term hours.

AGRICULTURE—24 term hours.

Candidates for a bachelor's degree in the School of Education must submit a teaching major and a teaching minor. To insure 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.

The student's major teaching field must be a field in which Oregon State College offers supervised teaching, namely: agriculture, business education, general biology, general science, health education, home economics, human biology, industrial arts, mathematics, physical education, or physical science.

The student's teaching minor must include one of the fields listed in the teaching major field or in architecture, art, business administration, camp education, English, French, German, music, recreation, social science, Spanish, or speech.

Listed below are the courses which Oregon 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 pages 287-289). It is important to note, however, that they satisfy the *minimum* requirements only. *Students must 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 teaching major or minor requirements are of great help to teachers. Students should consult members of the faculty of the School of Education concerning such supplementary courses that would be of particular value in relation to their individual programs.

Science Education

*Biological Science

GENERAL BIOLOGY	Term hours	
	Teaching major	Teaching minor
General Zoology (Z 201, 202, 203)	9	9
General Botany (Bot 201, 202), Field Botany (Bot 203)	9	9
Natural History of Oregon I, II, III (Z 374, 375, 376)	10	10
Bacteriology (General or Principles)	3	3
Introduction to Economic Entomology (Ent 314)	4	4
Electives in field of biology (upper division)	9	....
	44	35

Desirable electives are: Biocology, Biogeography, Animal Ecology, Plant Ecology, Plant Physiology, Evolution, Genetics, Systematic Botany.

* Physical Science Survey is recommended to accompany a biological-science major.

	Term hours	
	Teaching major	Teaching minor
HEALTH EDUCATION		
Health Education must be accompanied by adequate science preparation. This is provided by the courses in Human Biology listed below.		
Introduction to Health Education (SEd 123)	3	3
Health Education (SEd 441, 442, 443)	9	9
School Health Problems (SEd 431, 432, 433)	9	9
Advanced Hygiene (PE 250)	3	3
Nutrition (FN 225)	3	3
Nine hours selected from the following with approval of adviser:		
Community Health Problems (Bac 425, 426), 6 hours	}	9
First Aid (PE 358), 2 hours		
Safety Education (Ed 358), 3 hours		
Health Education Seminar (Bac 407 or SEd 507), 3 hours		
Epidemiology (Bac 453), 3 hours		
Sanitation (Bac 321), 3 hours		
	36	27
HUMAN BIOLOGY		
Human Biology (Z 114, 115, 116)	9	
General Chemistry (Ch 101, 102, 103)	9	
Elementary Human Anatomy (Z 321, 322)	6	
Applied Human Anatomy (Z 323)	3	
Physiology (Z 331, 332)	6	
Applied Human Physiology (Z 336)	3	
General Bacteriology (Bac 204)	3	
Pathogenic Bacteriology (Bac 332, 333)	6	
Courses selected with approval of adviser	---	27
	45	27
General Science		
Biological Science Survey (GS 101, 102, 103)	12	12
Physical Science Survey (GS 104, 105, 106)	12	12
Natural History of Oregon I, II, III (Z 374, 375, 376)	10	---
Electives in biological or physical science	9	9
	43	33
Desirable electives are: Elementary Entomology, Principles of Bacteriology, Photography, Astronomy, Geology of Oregon, Field Geology, Ornithology, Evolution, Physical Geography.		
Mathematics		
Elementary Analysis (Mth 101, 102, 103) or equivalent	12	12
Differential and Integral Calculus (Mth 201, 202, 203) or equivalent	12	12
Electives in Mathematics (upper division)	12	---
	36	24
Desirable electives are: History of Elementary Mathematics (Mth 311); Foundations of Elementary Mathematics (Mth 410); Theory of Equations and Determinants (Mth 411); Higher Algebra (Mth 412); Advanced Geometry (Mth 415); Projective Geometry (Mth 416).		
Physical Science		
General Chemistry (Ch 101, 102, 103) or General Chemistry (Ch 204, 205), Qualitative Analysis (Ch 206)	14-15	14-15
Organic Chemistry (Ch 226, 227)	5-10	---
Quantitative Analysis (Ch 234)	5	---
General Physics (Ph 201, 202, 203)	12	12
Introduction to Modern Physics (Ph 311, 312, 313)	9	---
	45-51	26-27
Agriculture		
1. A B.S. in agriculture is required of all students majoring in Agricultural Education. (See page 208.)		
2. Institutional requirements may be found on pages 229-230.		
3. For year common to agriculture majors in their freshman year see page 210.		
4. The curriculum in Agricultural Education may be found on pages 213-214.		

The major in agriculture is for prospective teachers of general agriculture and is designed to serve the following purposes: (1) to provide high schools 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.

The following courses are considered essential for a major in agriculture and will serve as a basis for computing grade point in the major field:

- Agricultural Economics
 - Agricultural Resources (AEc 111)
 - Principles of Farm Management (AEc 211)
 - Farm Organization (AEc 312)
- Agricultural Education
 - Vocational Education in Agriculture (AEc 220)
- Agricultural Engineering
 - Agricultural Engineering Survey (AE 111)
 - Farm Mechanics (AE 221)
- Animal Industries
 - Introduction to Animal Husbandry (AH 121)
 - Dairy Husbandry (DH 121)
 - Poultry Production (PH 121)
 - Animal Nutrition I (AI 311) or Animal Nutrition II (AI 411)
 - Animal Breeding I (AI 315) or Plant Genetics I (FC 315)
- Plant Industries
 - Elements of Agronomy I (FC 111)
 - Elements of Agronomy II (FC 211)
 - Elements of Horticulture (Hrt 111)
 - Soils (Sls 211 and 212)

Business Education

	Term hours	
	Teaching major	Teaching minor
Stenography (SS 111, 112, 113)	9	
Typing (SS 121, 122, 123)	6	
Applied Stenography (SS 211, 212, 213)	9	
Principles of Accounting (BA 211, 212, 213)	9	
Office Procedure (SS 311)	4	
Business Law (BA 411)	3	
Merchandising and Selling (SS 436)	3	
Office Organization and Management (SS 421)	3	
	46	—

Students who have had one year or more of typing or stenography will receive advanced standing according to ability shown in placement tests provided by the Secretarial Science Department. However, electives in secretarial science or business administration must then be taken to complete the 46 term hours required for the teaching major.

***Home Economics**

	Term hours
	Teaching major Teaching minor
Foods (FN 211, 212, 213; or for students electing chemistry, FN 211, 220, 221)	9
Nutrition (FN 225)	3
Clothing (CT 111, 211, 212, 250)	12
Child Development (FL 311, 312)	6
Management in Family Living (HAd 340)	4
Marriage (FL 222)	2
Electives from at least two of the following groups totaling 9 hours:	
A. <i>Foods</i>	
Feeding the Family (FN 325), 2 hours	
Food Purchasing (FN 411), 3 hours	
Food Management (FN 412), 3 hours	
Food Demonstrations (FN 413), 3 hours	
Experimental Cookery (FN 435), 3 hours	
Quantity Cookery (IM 311), 3 hours	
Cafeteria Management (IM 320), 3 hours	
B. <i>Clothing</i>	
Home Furnishings (CT 231), 3 hours	
Flat Pattern and Draping (CT 310), 3 hours	
Costume Design (CT 311), 4 hours	
Tailoring (CT 312), 3 hours	
Clothing for Children (CT 320), 3 hours	
Home Furnishings (CT 331), 3 hours	9
Textile Design (CT 335), 3 hours	
Consumer Buying in Clothing and Textiles, (CT 350), 3 hours	
C. <i>Family Life and Home Administration</i>	
All courses in the Department of Family Life and Home Administration are open to those who have completed the courses listed previously. The following are particularly recommended:	
Household Equipment (HAd 330), 3 hours	
Organization and Use of House Space (HAd 335), 3 hours	
Parent Education (FL 423), 2 hours	
The Nursery School Child (FL 425), 3 hours	
Economics of the Family (HAd 441), 2 hours	
Buying Aids (HAd 442), 2 hours	
Home Management House (HAd 450), 5 hours	

45

Industrial Arts*Technical Subject Matter*

Methods in Woodworking (IE 112, 113)	6
Engineering Drawing (GE 111, 112, 113)	6
Industrial Arts Drawing and Design (AA 281, 282)	6
Wood Turning (IE 220) or Fiber Furniture Weaving (IE 326)..	2
Machine and Tool Maintenance (Wood Shop) (IE 225)	2
Millwork—Machine Woodwork (IE 311)	3
Furniture Construction (IE 313)	2
Wood and Metal Finishing (IE 316)	3
Carpentry and Building Construction (IE 333)	3
Electives in the general metals area	6
	39

Education and Professional Subjects

Methods and Materials (Ed 408e)	3
Supervised Teaching (in IA) (Ed 415)	6
Industrial Arts Organization (IEd 420)	3
Occupational Analysis (IEd 472)	3
Written and Graphic Teaching Aids (Ed 432)	3
Shop Planning and Organization (IE 411)	3
	21

See page 312 for statement of controlling objectives and an outline of the two types of programs available. The teaching major outlined above places primary emphasis on the woodworking

* To teach homemaking in vocational education in Oregon consult a staff member of the Department of Home Economics Education for the necessary requirements.

area of industrial arts. Students desiring a *different* emphasis, or help with individual problems, or those who wish to teach in states which demand additional technical preparation for certification, should refer to the professional curriculum for Industrial Arts Education (pages 299-300) and confer with the head of the Industrial Arts Department.

Physical Education

Term hours
Teaching major Teaching minor

MAJOR FOR MEN AND WOMEN

The major in physical education (See DIVISION OF PHYSICAL EDUCATION) includes required and elective courses for students preparing for physical education teaching and coaching and for related community and special positions.

MINOR FOR MEN

Introduction to Physical Education (PE 121, 122)	6
Technique of Physical Education (PE 174, 175, 176)	6
Technique of Physical Education (PE 274, 275, 276)	6
Coaching of Basketball (PE 346)	} Three courses selected from this group
Coaching of Football (PE 347)	
Coaching of Baseball (PE 348)	
Coaching of Track and Field (PE 349)	
Minimum hours for recommendation to coach one or more sports in connection with other teaching work	9

Minimum hours for recommendation to coach one or more sports
in connection with other teaching work

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; SEd 431, 432, 433; SEd 441, 442, 443; Bac 204, 205, 206; Bac 261; Bac 425, 426; FN 225; FL 225. Students interested in teaching physical education or biological science, or both, may include a minor in health education.

MINOR FOR WOMEN

Introduction to Physical Education (PE 121, 122)	6
Physical Education Technique (PE 343, 344, 345)	9
Sports Officiating (PE 354)	3
Electives approved by the department, chosen from the following:	
Introduction to Health Education (SEd 123), 3 hours	}
Recreation Leadership (PE 240), 3 hours	
Organization and Administration (PE 423), 3 hours	
Nature, Function, and Organization of Play (PE 435), 3 hours	
Camp Education (Ed 361), 3 hours	
.....	9
.....	27

HEALTH EDUCATION

See Teaching Major and Teaching Minor, page 291.

RECREATION

Community Recreation (Ed 426)	3
School and Community Club Work (Ed 425)	3
Recreation Leadership (PE 240)	3
Nature, Function, and Organization of Play (PE 435)	3
Sports Officiating (PE 354) or Physical Education Technique (Square Dance Technique) (PE 345)	3
Electives, approved by adviser, chosen from fields of physical education, social sciences, arts and crafts, music, and drama	12
.....	27

CAMP EDUCATION

Camp Education (Ed 361, 362, 363)	9
School and Community Club Work (Ed 425)	3
Recreation Leadership (PE 240)	3
Nature, Function, and Organization of Play (PE 435)	3
Electives approved by adviser chosen from: arts and crafts, music, dramatics, nature studies, geology, astronomy, industrial arts, design, photography, physical education, forest management, recreation	9
.....	27

Fields in Which Teaching Minors Only Are Offered

Supervised teaching is not offered in these fields.

	Term hours for teaching minor
Architecture*	
ARCHITECTURE AND CONSTRUCTION	
Graphics I (AA 211, 212, 213)	6
House Planning and Architectural Drawing (AA 178)	3
Construction I (AA 220, 221, 222)	6-9
Basic Design (AA 195)	6
Lower-Division Architectural Design (AA 297)	6-9
	27-33
ARCHITECTURE AND ALLIED ARTS	
House Planning and Architectural Drawing (AA 178, 179, 180)	9
Basic Design (AA 195)	6
Display Design (AA 295)	9
Survey of Visual Arts (History and Appreciation) (AA 116)	3
	27
Art	
DRAWING AND PAINTING	
Basic Design (AA 195)	6
Survey of Visual Arts (History and Appreciation) (AA 114, 115, 116)	9
Lower-Division Drawing (AA 291)	6
Lower-Division Painting (AA 290)	9
	30
ART CRAFTS	
Basic Design (AA 195)	6
Survey of Visual Arts (History and Appreciation) (AA 114, 115, 116)....	9
Nine hours selected from this group:	
Leathercraft (AA 254), 2 or 3 hours each term, 2 terms	}
Ceramics (AA 255), 2 or 3 hours	
Jewelry (AA 257), 3 hours	
Art Metalcraft (AA 258), 3 hours	
Art Craft (AA 259), 6 hours	
Electives in art	6
	30
Business Administration†	
Principles of Accounting (BA 211, 212, 213)	9
Production (BA 311)	4
Finance (BA 312)	4
Marketing (BA 313)	4
Business Law (BA 411, 412, 413)	9
	30
English	
Literature Survey (Eng 101, 102, 103) or, if approved, Introduction to Lit- erature (Eng 104, 105, 106)	9
Shakespeare (Eng 201, and either Eng 202 or 203)	6
American Literature (Eng 253, and either Eng 254 or 255)	6
English Composition for Teachers (Eng 324)	3
Secondary-School Library (Lib 381)	3
Literature for High-School Libraries (Lib 386)	3
Approved electives	6
	36
French	
RL 1, 2, 3 (first year), or equivalent, and the following courses:	
Second-Year French (RL 4, 5, 6)	12
French Literature (RL 311, 312, 313)	9
Second-Year French (RL 4, 5, 6) (b, conversational drill), Directed Read- ing in French (RL 211, 212, 213)	9
	30

* May be offered as a minor by Industrial Arts majors only.

† May not be offered as a teaching minor by Business Education teaching majors.

	Term hours for teaching minor
German	
GL 1, 2, 3 (first year), or equivalent, and the following courses:	
Second-Year German (GL 4, 5, 6)	12
German Literature (GL 311, 312, 313)	9
Second-Year German (GL 4, 5, 6), (b, conversational drill), Scientific Ger- man (GL 320, 321, 322)	9
	30
Journalism	
<i>Must be accompanied by another teaching minor.</i>	
Elementary Journalism (J 111, 112)	6
Copyediting (J 211)	3
Editorial Writing (J 223)	3
Special Feature Articles (J 312)	3
Public Information Methods (J 313)	3
¹ Approved electives	9
	27
Music	
VOCAL	
² Theory (Mus 111, 112, 113)	9
Introduction to Music Literature (Mus 121)	1
Individual Instruction (Mus 190) or Group Instruction—Voice (Mus 191) as directed	5
² Theory (Mus 211, 212, 213)	6
Choral Conducting (Mus 324, 325)	4
College Chorus (Mus 290)	3
	28
INSTRUMENTAL	
² Theory (Mus 111, 112, 113)	9
Introduction to Music Literature (Mus 121, 122)	2
Individual Instruction (Mus 190) or Group Instruction—Stringed In- struments (Mus 192, 193) as directed	5
² Theory (Mus 211, 212, 213)	6
Instrumental Conducting (Mus 321, 322)	4
Band Organization (Mus 334)	2
	28
Social Science	
The first two sequences are required.	
History of Western Civilization (Hst 201, 202, 203)	9
History of American Civilization (Hst 224, 225, 226)	9
Principles of Economics (Ec 201, 202, 203)	
American National Government (PS 201, 202), State and Local Governments (PS 203)	}
Elements of Sociology (Soc 201, 202, 203)	}
Geography (HG 101, 102, 103) or (HG 201, 202, 203) ...	} Two sequences selected from this group
	18
	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
	27

¹Suggested electives: Technical Writing (J 314), Journalism Projects (J 351, 352, 353), Creative Writing (Eng 218), English Composition for Teachers (Eng 324), Advertising (BA 464), Rudiments of Photography (Ph 161), Photography (Ph 361).

²Theory credit is applied on the music minor only when the three-term sequence is completed.

The minors in vocal and instrumental music prepare the student to teach music in the high school. Some knowledge of piano is necessary in a music minor and unless the student has had this training additional work in piano may be needed. If the student is competent in accompanying, this can be adjusted.

The subject for individual and group instruction (voice, piano, violin, or other) will be determined by the student with the guidance of his adviser in the department.

Additional study in the various upper-division service courses in music is recommended for those who wish to augment the minimum requirements of a minor.

Speech

Term hours
for
teaching
minor

GENERAL SPEECH

Extempore Speaking (Sp 111)	3
Voice and Diction (Sp 120)	3
Interpretation I, II (Sp 121, 122)	6
Speech Science (Sp 291)	3
Argumentation (Sp 220)	3
Speech Composition (Sp 221)	3
Community Drama (Sp 247)	3
Radio Speaking (Sp 334)	3
	<hr/>
	27

RADIO SPEECH

All students taking Radio Speech must be able to type.

Extempore Speaking (Sp 111)	3
Voice and Diction (Sp 120)	3
Interpretation I (Sp 121)	3
Radio Speaking (Sp 334, 335, 336)	9
Electives in Speech	9
	<hr/>
	27

DRAMATICS

Extempore Speaking (Sp 111)	3
Voice and Diction (Sp 120)	3
Interpretation I, II (Sp 121, 122)	6
Community Drama (Sp 247, 248, 249)	9
Electives in Speech	6
	<hr/>
	27

SPEECH CORRECTION

Extempore Speaking (Sp 111)	3
Voice and Diction (Sp 120)	3
Interpretation I (Sp 121)	3
Speech Science (Sp 291)	3
Speech Defects (Sp 392)	3
Speech Clinic (Sp 393)	3
Electives in Speech	9
	<hr/>
	27

FORENSICS

Extempore Speaking (Sp 111, 112)	6
Voice and Diction (Sp 120)	3
Speech Science (Sp 291)	3
Argumentation (Sp 220)	3
Speech Composition (Sp 221)	3
Squad or electives in Speech (Parliamentary Procedure, Sp 231, recommended)	9
	<hr/>
	27

Professional Curricula in Education

B.A., B.S., Ed.B., M.A., M.S., Ed.M., Ed.D. Degrees

STUDENTS' BASIC PROGRAM

THE following program of study shows the work that should be followed by students who are intending to become high-school teachers.

MAJORS <i>In which supervised teaching may be done</i>	MAJOR IN GUIDANCE AND PERSONNEL WORK <i>Including observation and supervised practice</i>	MINORS <i>In which observation, supervised teaching, and apprentice teaching may be done</i>	MINORS <i>In which observation is provided</i>
Science Education Biology Health Education Human Biology General Science Mathematics Physical Science Agriculture Business Education Home Economics Industrial Arts Physical Education	The major in Guidance and Personnel Work is given only at the graduate level. See GRADUATE STUDY on next page.	Science Education Biology Health Education Human Biology General Science Mathematics Physical Science Business Education Camp Education Physical Education Recreation	Art Business Administration English French German Journalism Music Social Science Spanish Speech

Freshman Year¹

	Term hours		
	F	W	S
<i>Required:</i>			
English Composition (Eng 111, 112, 113)	3	3	3
² Laboratory Science or Mathematics	3-5	3-5	3-5
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
<i>Electives:</i>			
³ Courses in teaching fields	3-5	3-5	3-5
Other electives	5-3	5-3	5-3
	17	17	17

Sophomore Year¹

<i>Required:</i>			
Psychology (Psy 207, 208 or Psy 201, 202, 203)	3	3	3
Literature	3	3	3
Extempore Speaking (Sp 111)	3	3	3
History of Oregon (Hst 377)	3	3	3
History of American Civilization (Hst 224, 225, 226)	3	3	3
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Physical Education	1	1	1
<i>Electives:</i>			
³ Courses in teaching fields	4-6	4-6	4-6
	16	19	19

Junior Year¹

<i>Required:</i>			
Secondary Education in American Life (Ed 311)	3	3	3
Educational Psychology (Ed 312)	3	3	3
Principles of Teaching (Ed 313)	3	3	3
Outlines of Economics (Ec 211 or 212)	3-4	3	3
General Sociology (Soc 212)	3	3	3
American National Government (PS 201)	3	3	3
Oregon School Law and Oregon System of Education (Ed 316)	2	2	2
<i>Recommended Electives:</i>			
³ Courses in teaching fields	6	6	6
Other electives	2-3	3-4	4
	17	15-16	16

¹See GENERAL NOTES, footnote on next page.

²Psychology plus laboratory is not acceptable as a substitute for a laboratory science.

³Consult advisers as early as possible. See GENERAL NOTES (footnote on next page).

	Senior Year ¹		
	F	W	S
Required:			
Methods and Materials (Ed 408)	3	(3)	(3)
Supervised Teaching (Ed 415)	3-9	(3-9)	(3-9)
Electives	4-10	4-16	4-16
	16	16	16

Fifth Year

See pages 287-289 for requirements for a State Teacher's Certificate. Fifth-year students desiring to meet certification requirements are not required to work for a master'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 Oregon State College, or for counseling, guidance, and personnel work in secondary schools or in colleges. The programs of graduate students are worked out on an individual basis, according to needs and objectives of the student and the regulations of the Graduate School.

Professional Curriculum in Industrial Arts Education²

B.S. Degree

	Freshman Year		
	F	W	S
Pattern Making (IE 111)	3		
Methods in Woodworking (IE 112, 113)		3	3
Foundry Practices (IE 240)	2		
Forging and Welding (IE 250)		2	
Machine Tool Practices (IE 260)			2
Engineering Drawing (GE 111, 112, 113)	2	2	2
Group requirement in Science	4	4	4
English Composition (Eng 111, 112, 113)	3	3	3
*Physical Education	1	1	1
Air, Military, or Naval Science	2-3	2-3	2-3
	17-18	17-18	17-18

Sophomore Year

	NORM		
	F	W	S
Industrial Arts Drawing and Design (AA 281, 282, 283)	3	3	3
Abridged General Physics (Ph 211, 212)		3	3
Extempore Speaking (Sp 111)	3		
General Psychology (Psy 207, 208)		3	3
Physical Education	1	1	1
Air, Military, or Naval Science	2-3	2-3	2-3
	9-10	12-13	12-13

¹GENERAL NOTES

- 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 teaching major and to one or two teaching minors. 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.
- In the freshman year General Hygiene (PE 150), 1 term hour for men, 2 term hours for women, is taken one term in place of physical education.
- 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 special methods courses. Summer session attendance may be used to reduce the time or the term load.

²All students following the professional curriculum for Industrial Arts Education will report directly to the head of the department for counseling on objectives, program planning, and occupational opportunities.

³General Hygiene (PE 150), 1 term hour, is taken one term in place of physical education.

	Term hours		
	F	W	S
WOOD INDUSTRIES OPTION			
Sophomore Year Norm	9-10	12-13	12-13
Wood Turning (IE 220)		2	.....
Machine and Tool Maintenance (Wood Shop) (IE 225)	2	.....	.....
Fiber Furniture Weaving (IE 326) or Pattern Making (IE 332)			2
House Planning and Architectural Drawing (AA 178, 179, 180)	3	3	3
Elective in Science Group	3	.....	.....
	17-18	17-18	17-18

METAL INDUSTRIES OPTION			
Sophomore Year Norm	9-10	12-13	12-13
Machine Tool Practices (IE 261)	2	.....	.....
Machine and Tool Maintenance (Machine Shop) (IE 265)		2	.....
Foundry Practices (IE 342) or Welding Processes and Applications (IE 354) .....		.....	2
Descriptive Geometry (GE 123)	3	.....	.....
Sheet-Metal Work (IE 380) .....	.....	3	.....
Metal Crafts (IE 387) .....	.....	.....	3
Elective in Science Group	3	.....	.....
	17-18	17-18	17-18

Junior Year

NORM

Wood and Metal Finishing (IE 316) .....	.....	.....	3
Extempore Speaking (Sp 112) or Stagecraft and Lighting (Sp 244)	3	.....	.....
Stagecraft and Lighting (Sp 244) or Parliamentary Procedure (Sp 231) .....	.....	3	.....
Secondary Schools in American Life (Ed 311)	3	.....	.....
Educational Psychology (Ed 312) .....	.....	3	.....
Principles of Teaching (Ed 313) .....	.....	.....	3
Methods and Materials (Ed 408e) or Oregon School Law and Oregon System of Education (Ed 316) .....	.....	.....	2-3
¹ History of Oregon (Hst 377) .....	.....	.....	3
Electives in Science or Social Science	3	3	.....
General electives	3	3	3-4
	12	12	15

WOOD INDUSTRIES OPTION

Junior Year Norm	12	12	15
Millwork—Machine Woodwork (IE 311)	3	.....	.....
Carpentry and Building Construction (IE 333) .....	.....	3	.....
² Technical electives	2	2	2
	17	17	17

METAL INDUSTRIES OPTION

Junior Year Norm	12	12	15
Mass Production Methods (IE 361, 362)	2	2	.....
² Technical electives	3	3	2
	17	17	17

Senior Year

Practical Electricity (IE 370)	3	.....	.....
Industrial Arts Organization (IED 420) .....	.....	3	.....
¹ Oregon School Law and Oregon System of Education (Ed 316) or Methods and Materials (Ed 408e)	2-3	.....	.....
Supervised Teaching (Ed 415e)	3	3	3
² Technical electives	2	5	8
Electives in Science or Social Science	3	3	3
General electives	4-3	3	3
	17	17	17

¹Students who are not candidates for the Oregon Credential, but who wish recommendations for teaching certificates based on a four-year curriculum (instead of the five-year certification requirement) will omit Oregon History, Oregon School Law, and IED 420. To complete graduation requirements and be eligible for certification and teaching recommendations it will be necessary to complete IED 472, IED 473, and IE 411 as substitutes for the three courses omitted.

²Technical electives must be related directly to the major option of the student and are selected with approval of major adviser.

Elementary Education Curriculum

Ed.B. Degree from Oregon State College

B.S. Degree from College of Education

	Term hours at Oregon State College		
	F	W	S
Freshman Year			
English Composition (Eng 111, 112, 113)	3	3	3
Biological Science Survey (GS 101, 102, 103)	4	4	4
¹ Air, Military, or Naval Science (men)	(2-3)	(2-3)	(2-3)
² Physical Education	1	1	1
³ Electives	8	8	8
	16	16	16
Sophomore Year			
Literature	3	3	3
General Psychology (Psy 207, 208)	3	3	3
Extempore Speaking (Sp 111)	4	4	4
History of American Civilization (Hst 224, 225, 226)	3	3	3
¹ Air, Military, or Naval Science (men)	(2-3)	(2-3)	(2-3)
Physical Education	1	1	1
Physical Science Survey (GS 104, 105, 106)	4	4	4
³ Electives	2	2	2
	16	16	16
Junior Year			
⁴ Secondary Education in American Life (Ed 311) (special section)	3	---	---
⁴ Principles of Teaching (Ed 313) (special section)	---	3	---
Educational Psychology (Ed 312)	---	---	3
Music Theory (Mus 111, 112)	3	3	---
Color and Composition (AA 160)	3	---	---
Basic Design (AA 195)	---	3	---
Introduction to Health Education (SEd 123)	---	---	3
Geography (HG 101)	---	---	3
History of Oregon (Hst 377)	---	---	3
³ Electives	7	7	5
	16	16	17
Senior Year			
	Term hours		Oregon
	College of		State
	Education		College ⁶
	F	W	S
Supervised Teaching at Elementary Level (Ed 415)	---	5	10
Educational Tests and Measurements (Ed 418)	---	---	3
Children's Literature (Eng 388)	3	---	---
School Organization (Ed 476)	3	---	---
Applied Mental Hygiene (Ed 460)	---	---	3
Audio-Visual Aids (Ed 435)	---	3	---
Physical Education in the Elementary Grades (Ed 344, 345, 346) ..	---	3	---
Primary Education (Ed 358)	4	---	---
Intermediate and Upper-Grade Education (Ed 359)	---	4	---
Elementary School Library (Ed 380)	2	---	---
Music III (Mus 283)	3	---	---
Art Structure III (A 311)	3	---	---
	18	15	16

¹Women will have these hours as electives.

²General Hygiene (PE 150), 1 term hour for men, 2 term hours for women, is taken one term in place of physical education.

³Including all requirements for junior standing (see pages 80-81). For men taking air, military, or naval science, electives are 6-5 each term in freshman year but none in sophomore year.

⁴May not be taken until Psy 207 and 208, or 201, 202, 203, are completed. If a student does not include psychology prior to his junior session year, it is doubtful whether he can complete the junior year program without summer session work, since Ed 311 and 313 may not be taken at the same time.

⁵Electives are to be selected from the following, in order of listing: (1) Hst 224, 225, 226 (unless taken in sophomore year as listed); (2) Ed 485; (3) Ed 460; (4) GS 104, 105, 106 (if not taken in sophomore year as listed); (5) GS 101, 102, 103 (if not taken in freshman year as listed); (6) HG 101, 102, 103.

⁶In spring term of senior year the student is in residence at Oregon State College but his work is directed by the College of Education. The student must register concurrently at both institutions for the spring term.

Education

INSTRUCTION given in education covers the principles and the technique of teaching at the secondary and college levels, special methods in teaching the various major subjects in which Oregon State College gives teacher training, the history and philosophy of education, guidance, counseling, and personnel work.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSE

Ed 101. Methods of Study. 3 hours.

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.

UPPER-DIVISION COURSES

See BACCALAUREATE DEGREES, page 285.

Ed 311. Secondary Schools in American Life. 3 hours.

Problems of the high school from the standpoint of the teacher; aims, functions, and characteristics. Prerequisite: Psy 207, 208, or Psy 201, 202, 203.

Ed 312. Educational Psychology. 3 hours.

Laws of learning and application to classroom; motivation; transfer of training; memory; forgetting; psychology of secondary school subjects. Prerequisite: Psy 207, 208, or Psy 201, 202, 203.

Ed 313. Principles of Teaching. 3 hours.

Different methods of presentation of subject-matter; values and weaknesses of each method; individual and group differences; extracurricular activity programs; measuring the results of teaching. Prerequisite: Ed 311, 312.

Ed 314. Educational Sociology. 3 hours.

Analysis of contributions of sociology to educational problems and practices. Prerequisite: Ed 311, 312, 313.

Ed 316. Oregon School Law and Oregon System of Education. 2 hours.

Oregon school system and laws on which it is based; problems of Oregon schools; plans for solution; course of study; trends in educational development. Prerequisite: junior standing.

Ed 341. Rural Education. 3 hours.

Utilizing rural, social, and economic environment to vitalize high-school instruction, and increase farm, home, and town-country efficiencies; continuation education. Prerequisite: upper-division standing.

Ed 358. Safety Education. 3 hours.

Background and knowledge of all phases of safety; home, fire, industrial, water, rural, school, and traffic safety; elementary, secondary, and adult.

Ed 361, 362, 363. Camp Education. 3 hours each.

Camp activities including handicrafts, camp crafts, nature, safety, waterfront, music, and dramatics with practical experience; counselor training including history, camp program, and problems; camp management, organization, and administration.

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, 2, or 3 hours any term.
Prerequisite: Ed 311, 312, 313, or consent of instructor.
- Ed 408. **Methods and Materials.** 3 hours.
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) agriculture, (b) biological science, (c) business, (d) home economics, (e) industrial arts, (f) mathematics, (g) physical science, (h) physical education, (i) health education,* (t) trade and industrial education. 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: (a) agriculture, (b) biological science, (c) business, (d) home economics, (e) industrial arts, (f) mathematics, (g) physical science, (h) physical education, (i) health education, (t) trade and industrial education. Arrangements to do supervised teaching must be made during registration for the winter term of the junior year. Prerequisite: Ed 311, 312, 313, 408 and consent of director of teacher training. *Student must have grade-point average of 2.50 in his teaching major at the beginning of the term in which he does supervised teaching.* He must also have a teaching minor.
- Ed 416. **Measurements in Secondary Education.** (G) 3 hours.
Use of standard tests and scales to measure achievement in secondary-school subjects; elements of statistical method. Prerequisite: senior standing.
- Ed 420. **Supervised Nursery School Experience.** (G) 8 hours.
Full participation in the program of the nursery school. Prerequisite: FL 425. Three six-hour laboratory periods; 1 two-hour seminar.
- Ed 425. **School and Community Club Work.** (G) 3 hours.
A cooperative effort to prepare for effective club work and community leadership. (Students may work in a chosen field under specialists, such as 4-H Club, Boy Scouts.) Prerequisite: senior or graduate standing or consent of instructor.
- Ed 426. **Community Recreation.** (G) 3 hours.
Aims to give an understanding of the developing philosophy of recreation, trends, problems in organization and administration of a recreation program in large, small, and rural communities. Prerequisite: senior or graduate standing or consent of instructor.
- Ed 431. **Selection and Use of Teaching Aids.** (G) 3 hours.
Film, slide, chart, and other visual materials; selection and use to best advantage; operation of projectors and other equipment. Prerequisite: senior standing or consent of instructor. Two lectures; 1 two-hour laboratory period.
- Ed 432. **Written and Graphic Teaching Aids.** (G) 3 hours.
Aids for more efficient teaching in large and diversified classes; diagrams, charts, illustrated instruction sheets, and blackboard illustrations. Prerequisite: senior standing or consent of instructor. One lecture; 1 four-hour laboratory period.

* SEd 442 fills requirement.

- Ed 440. **History of Education.** (G) 3 hours.
Growth and development of education; Plato, Aristotle, Renaissance educators, Comenius, Locke, Rousseau, Pestalozzi, Froebel, Herbart, Herbert Spencer, and Dewey. Prerequisite: Ed 311, 312, 313.
- Ed 460. **Psychology of Childhood.** (G) 3 hours.
Mental development; native responses; play, self-assertion, instinctive social attitudes; speech; emotions; simple, complex mental processes; mental organization. Prerequisite: senior standing.
- Ed 461. **Adolescence: Growth and Development of the Individual.** (G) 3 hours.
Processes through which normal human being reaches maturity, effective use of his bodily equipment and learning capacity, and satisfactory personal and social adjustments; recent studies. Prerequisite: senior standing.
- Ed 485. **Principles and Practices of Guidance Services.** (G) 3 hours.
Overview of guidance and personnel work. Attention given to vocational, educational, health, social, personality, recreational, and other aspects of individual development. Participation of teachers, counselors, administrators, parents, and community organizations in a program of guidance. For all teachers and administrators. Students specializing in guidance should begin with this course. Prerequisite: senior standing.
- Ed 486. **Occupational and Educational Information.** (G) 3 hours.
Materials available regarding occupations; interpretations of present trends; value and usefulness for high-school and college students. Prerequisite: senior standing.
- Ed 487. **Counseling Techniques.** (G) 3 hours.
Mental, achievement, trade, and other tests; administration of such tests; classifications; methods in educational and vocational counseling. Prerequisite: Ed 485.
- Ed 493. **Conference Leader Training.** (G) 3 hours.
Techniques of leading group meetings in which problems are thoughtfully and freely discussed; training conference leaders to pool experiences and ideas of the group for problem solving and developing teamwork. Prerequisite: consent of instructor.
- Ed 494. **Principles and Objectives of Vocational Education.** (G) 3 hours.
Basic principles and development of vocational education; review of history and legislation; analysis of objectives of vocational schools and vocational programs in relationship to the total program of education. Prerequisite: consent of instructor.
- Ed 495. **Organization and Administration of Vocational Education.** (G) 3 hours.
Federal vocational education acts; state boards for vocational education; local boards of education; analysis of laws, regulations, policies; problems and principles of vocational education as related to organization, administration, cooperating personnel, agencies, finances, budgets, and advisory committees. Prerequisite: consent of instructor.
- Ed 497. **Adult Education.** (G) 3 hours.
Development, methods, and results; public schools, extension instruction, industrial and commercial organizations, radio, and other agencies of adult learning. Prerequisite: senior standing.

- Ed 498. **Organization and Supervision for High-School Teachers.** (G)
3 hours.

Administrative organization, methods, and purposes of supervision as they involve the classroom teacher. Prerequisite: Ed 311, 312, 313.

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 staff members. Prerequisite: graduate standing in education. See also AEd 501, BEd 501, HEd 501, IEd 501, SEd 501.

Problems in Adult Education—Associate Professor Stevens.

Problems in Curriculum and Instruction—Professor Clinton.

Problems in Educational Psychology—Professor Laslett and Associate Professor Reichart.

Problems in Guidance—Professor Zeran.

Problems in History or Philosophy of Education—Associate Professor Reichart.

Problems in Measurements—Professor Clinton.

Problems in Secondary Education—Associate Professors Williamson and Stutz.

Problems in Higher Education—Professor Goode, Associate Professor Munford.

- 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 508. **Workshop.** Terms and hours to be arranged.

COUNSELOR TRAINING—Provides time for each student to concentrate on a special problem in guidance. Provides training and assistance to teachers interested in guidance services, counselors, deans, and administrative officers. Prerequisite: 9 hours in education and teaching experience.

CURRICULUM—Experience in planning curricula for specific situations. On an individual basis or (preferably) by a staff group working cooperatively in developing or revising plans and programs.

- Ed 510. **Problems of Secondary Education in American Life.** 3 hours.

Democracy as an ideology; survey of American school system; suggestions for improving secondary schools; survey of services to meet student needs; teacher relationships; relationship between secondary and higher education. Prerequisite: graduate standing in education.

- Ed 511. **Recent Educational Trends and Problems.** 3 hours.

Trends, problems, and developments in all fields of education with particular reference to high schools. Prerequisite: 24 hours of upper-division education including supervised teaching.

- Ed 512. **Research Procedures in Education.** 3 hours.

Methods, techniques, and tools for doing research work; meaning of scientific method; ways of locating and formulating problems; techniques for solving problems; necessary statistical tools; collection and interpretation of data; preparation of research reports.

- Ed 517. **Statistical Methods in Education.** 3 hours.
Elements of statistical method; methods of treating collective facts, average facts, and correlated facts, as applied to giving and scoring tests, finding costs, etc. Prerequisite: Ed 416.
- Ed 524. **Curriculum Construction.** 3 hours.
Building junior and senior high-school curricula; theories and policies since 1900; selecting and organizing subject matter; courses of study; curriculum organization. Prerequisite: 24 hours upper-division credit in education including supervised teaching.
- Ed 526. **Construction and Use of Objective Examinations.** 3 hours.
Principles and statistics involved in the selection of test items; types of examinations; validity; reliability; administering, scoring, grouping results. Prerequisite: graduate standing in education.
- Ed 527. **Tests and Their Social Uses.** 3 hours.
Application to cultural, moral, social, and educational problems; basic principles leading to improvement; adjustment of students in scholastic and personal activities. Prerequisite: graduate standing in education.
- Ed 535. **Psychological Aspects of Vocations.** 3 hours.
Psychological principles applied to: (1) choice of occupations, (2) adjusting or aiding others in adjusting, and (3) alteration of occupational conditions and demand to meet needs. Prerequisite: graduate standing in education.
- Ed 543. **History of American Education.** 3 hours.
Intellectual development of America with special reference to education. Prerequisite: graduate standing in education.
- Ed 546. **Philosophy of Education.** 3 hours.
Fundamental problems of education, with some attempt at their solution; meaning of philosophy; philosophy of education; value for teacher and administrator. Prerequisite: graduate standing in education.
- Ed 561. **Advanced Educational Psychology.** 3 hours.
Experimental material that seems most useful and relevant to educational psychology. Prerequisite: graduate standing in education.
- Ed 577. **Counselor Training: Group Procedures.** 3 hours.
Introduction to principles underlying behavior and methods for modifying individual's attitudes and actions by group procedures. Survey of group dynamics; evaluation of leader's role in group; process of attitudinal change and its results; approaches to group and play therapy; relation between individual and group counseling methods. Prerequisite: Ed 485, 487.
- Ed 580. **Laboratory Practice in Remedial Work.** 3 hours.
Demonstrates methods used in directing individual study. Includes remedial practice with beginning college students. Prerequisite: graduate standing or permission of instructor.
- Ed 581, 582. **Counselor Training.** 3 hours each.
Through cooperation of department stores and industries in Portland, students gain experience in both customer-contact and nonselling departments or move from job to job in industry to obtain both production-line experience and contact with top management; conferences, lectures, and discussions by executives, faculty members, leaders in labor relations, and others. Extramural or summer session. Prerequisite: Ed 485, 487.

- Ed 588. **Supervised Counseling Techniques.** 3 hours each term, two terms.
Provides actual counseling experience in counseling laboratory. Interviewing; administering, scoring, and interpreting psychological tests; writing case studies. Prerequisite: Ed 485, 487, Psy 474, 475, 476, and consent of instructor.
- Ed 589. **Organization and Administration of Guidance Services.** 3 hours.
Criteria for evaluating present personnel services, setting up guidance committees, selection of personnel, responsibilities and duties of staff, development of program of services, and in-service training program. Prerequisite: Ed 485, 487.
- Ed 594. **The College Student.** 3 hours.
Student as central factor in college and university teaching; hereditary background, physical environment, cultural environment, and group relationships as contributors to his maturation; learning as nurture; motivation and direction of college student's learning.
- Ed 595. **College and University Teaching.** 3 hours.
Aims, procedures, and evaluation in college teaching; professional relationships and interests; individual studies according to student's field. Prerequisite: graduate standing.
- Ed 596. **The American College and University.** 3 hours.
Functions and structures of American higher education; land-grant college movement; junior college; current problems and trends in their historical perspective.

Agricultural Education

THE Department of Agricultural Education is responsible for the training of teachers and supervisors of agriculture in high schools and other secondary schools, and in schools and classes for adult farmers and young men not enrolled in the regular day schools. Special consideration is given to the provisions of the federal laws for vocational education commonly known as the Smith-Hughes Act and the George-Barden Act. Included within the scope of this department are certain field activities including follow-up service for new teachers and involving the preparation of instructional material for use by agricultural instructors in cooperation with staff members of the School of Agriculture.

The Department of Agricultural Education is a joint department within the School of Agriculture and the School of Education.

Opportunities and Demand for Agricultural Teachers. The strong demand for teachers of vocational agriculture in Oregon, in states of the Pacific Region including Hawaii, and throughout the United States as a whole, is expected to continue for a number of years, if not indefinitely. The George-Barden Act approximately doubled the federal funds previously provided for vocational-agriculture education. Publications explaining the work and opportunities in teaching vocational agriculture are available on request.

Requirements for Teaching Agriculture. Teachers of agriculture need fundamental knowledge and a high level of practical ability in most of the departmental fields of the School of Agriculture. At the beginning of his college course the prospective teacher should confer with the head of the Depart-

ment 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 to this field of teaching. Attention of students interested in teaching vocational agriculture is directed to the curriculum on pages 213-214.

Requirements in Agriculture:

- (1) Graduation from a college of agriculture of standard rank.
- (2) 80 term hours, or equivalent, of special work in agriculture. Courses depend somewhat on previous training and experience and the recommendations of the head of the department. The suggested sequence and distribution of courses are given in the major curriculum on pages 213-214.

Requirements in Education and for Certification:

- (1) **Course requirements in Education:** Beginning teachers of agriculture should have a minimum of 18 term hours in education in the four-year curriculum including courses in methods and materials, and supervised teaching. (See courses listed in curriculum, pages 213-214.)
- (2) **Vocational Teaching Certificate:** The curriculum in agricultural education, pages 213-214, or its equivalent, is designed to fulfill the requirements for the vocational teaching certificate. The State Director of Vocational Education will issue this certificate to applicant after he has determined his qualifications for teaching vocational agriculture and after applicant has been placed in teaching position.
- (3) It is expected that persons who have been employed to teach vocational agriculture, after receiving the vocational certificate and completing the four-year curriculum, will continue systematic work in education and agriculture as needed through short summer courses and otherwise during the period of their employment in full-time teaching. Such work may carry college credit leading to a master's degree.

Graduate Study and Apprentice Teaching in Agricultural Education. For returning veterans and others who wish to continue their studies beyond the four-year curriculum in agricultural education and a bachelor's degree, a program of experience and graduate study leading to a master's degree will be developed to meet individual needs. A portion of such experience may be done for graduate credit in the form of apprentice teaching, whereby students of approved standing are placed in high-school centers and outstanding departments of agriculture under the general supervision of the Department of Agricultural Education and the immediate supervision of the local agriculture instructor, who serves also in the capacity of supervising teacher. Apprentice teachers may be employed in some instances as part-time or even full-time teachers of vocational agriculture and may be recognized as regular teachers of vocational agriculture in two-teacher departments.

DESCRIPTION OF COURSES*

LOWER-DIVISION COURSE

AEed 220. Vocational Education in Agriculture. 2 hours.

Principles and development of vocational education in agriculture; significance of national aims and objectives in vocational education.

UPPER-DIVISION COURSES

AEed 401. Research. Terms and hours to be arranged.

AEed 403. Thesis. Terms and hours to be arranged.

AEed 405. Reading and Conference. Terms and hours to be arranged.

AEed 407. Seminar. Hours to be arranged, two terms.

Ed 408. Methods and Materials. 3 hours.

Total of 6 hours may be taken. See Ed 408, page 303.

* See also courses in the Department of Education, especially Ed 341, page 302.

Ed 415. **Supervised Teaching.** 3 to 9 hours.

See Ed 415, page 303.

AEd 417. **The Agricultural Curriculum.** (G) 3 hours.

Determining course content and evaluating types of course organization with reference to the objectives to be attained in the field of agriculture. Prerequisite: Ed 313, 415.

AEd 418. **Adult Education in Agriculture.** (G) 3 hours.

Developing programs for young and adult farmer groups; supervision of classes for young farmers, for older farmers, and for farm veterans and special classes of veterans. Prerequisite: Ed 313, AEd 417.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

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.** Terms and hours to be arranged.

Vocational agriculture teachers in service may use this course to continue their professional improvement; conferences, follow-up instruction, supervision, correspondence, reports. Prerequisite: Ed 311, 312, 313.

AEd 533. **Rural Survey Methods.** 3 hours.

Technique of surveys; analyzing, interpreting, and using results in evaluating and formulating programs in agricultural education; field studies. Prerequisite: Ed 311, 312, 313, teaching experience.

AEd 541. **Community Programs of Agricultural Education.** 3 hours.

Developing the natural and human resources of a community through agricultural education. Prerequisite: Ed 415, AEd 417.

Business Education

PROFESSIONAL preparation for teachers of business subjects is provided in the Department of Business Education, which is a joint department in the School of Education and the School of Business and Technology. A student may major in either school. The student before registering must confer with the head of the Department of Business Education for discussion of a complete program.

Baccalaureate Degrees. The program for undergraduates for a baccalaureate degree is outlined in the curriculum on pages 267-268. Courses from business administration, education, and secretarial science form the major background. A liberal number of elective hours permits the selection of a teaching minor. The requirements for a State High-School Teacher's Certificate are listed on pages 287-289.

Advanced Degrees. Graduate study for an advanced degree with a major in Business Education is available through the School of Education for all those who complete the undergraduate curriculum (pages 267-268) or its equivalent.

Thirty of the required 45 term hours for the Master of Science or the Master of Arts degree are taken in Business Education (including the thesis). Other master degree options are described on page 444. A choice of graduate program can be made following a conference with the head of the Department of Business Education.

DESCRIPTION OF COURSES*

UPPER-DIVISION COURSES

- BEd 401. **Research.** Terms and hours to be arranged.
 BEd 403. **Thesis.** Terms and hours to be arranged.
 BEd 405. **Reading and Conference.** Terms and hours to be arranged.
 BEd 407. **Seminar.** Terms and hours to be arranged.
 Ed 408. **Methods and Materials.** (See Ed 408, page 303.)

GRADUATE COURSES

- BEd 501. **Research.** Terms and hours to be arranged.
 BEd 503. **Thesis.** Terms and hours to be arranged.
 BEd 505. **Reading and Conference.** Terms and hours to be arranged.
 BEd 507. **Seminar.** Terms and hours to be arranged.

MEASUREMENTS IN BUSINESS EDUCATION.

CURRENT TRENDS IN OFFICE PROCEDURE.

SUPERVISION AND ADMINISTRATION OF BUSINESS EDUCATION.

TEACHING SOCIO-BUSINESS SUBJECTS IN THE SECONDARY SCHOOL.

PRACTICUM IN BUSINESS EDUCATION—The planning and development of practical and creative projects, group or individual, in the field of business education. Students will be urged to use actual school situations as nucleus for the term's work and to arrive at the best possible solutions.

- BEd 541. **Current Practices in Typewriting.** 3 hours.
 Principles underlying the development of typing skills; motivation, supplementary materials, and special devices. Prerequisite: Ed 408c or teaching experience in typing.
- BEd 542. **Current Practices in Shorthand.** 3 hours.
 Correct writing habits; correlation of sound and symbol response; word and sentence building and transcription technique. Prerequisite: Ed 408c or experience in teaching stenography.
- BEd 543. **Problems in Commercial Education.** 3 hours.
 Trends in high school commercial curriculum; evaluation of methods and research studies. Prerequisite: Ed 408c or teaching experience in commercial subjects.

* See also courses in the Department of Education, pages 302-307.

Home Economics Education

PROFESSIONAL training for prospective teachers of home economics is provided by the Department of Home Economics Education which is a joint department within the School of Home Economics and the School of Education. A student in either school may meet qualifications for certification to teach homemaking. It is imperative, however, that every student, before attempting to register for teacher training courses, should receive permission for registering and guidance for selection of courses from the Department of Home Economics Education staff members. (For information regarding specific requirements for the State Teacher's Certificate see pages 287-289.)

Instruction in home-economics extension methods is offered for students preparing for home-demonstration, extension-specialist, or other work in the home-economics fields in which extension methods are commonly used. (For information on requirements see page 385.)

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 408. **Methods and Materials.** (See Ed 408, page 303.)
- Hed 413. **Home and Community Experiences.** (G) 2 hours.
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.
- Hed 420. **Field Work in Community Nutrition Programs.** (G) 3 hours.
Nutrition problems of high-school teacher in community; field work in co-operation with agencies interested in nutrition-health program. Prerequisite: FN 321, Ed 313. Two recitations; 1 laboratory period.
- Hed 422. **Organization and Administration of Homemaking Education.** (G) 3 hours.
Typical organizations of vocational and nonvocational homemaking departments with particular attention to equipment and management. Prerequisite: Ed 408d.
- Hed 440. **Adult Education in Home Economics.** (G) Hours to be arranged.
Problems in adult-education program authorized under Smith-Hughes Act; field work in promoting, organizing, observing, and teaching adult classes. Prerequisite: HEd 422.
- Hed 453. **Field Work in Home Economics Extension.** (G) Hours to be arranged.
Field practice in home demonstration work in selected counties under supervision of professor of extension methods and county extension agents.

* See also courses in the Department of Education, pages 302-307.

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.

HEd 554. **Community Programs in Homemaking.** 3 hours.

Planning, organizing, coordinating, directing, and appraising total community programs in family life education; emphasis on adult education. Prerequisite: HEd 440.

Industrial Education

JOINTLY with the Department of Industrial Engineering and Industrial Arts (School of Engineering) the Department of Industrial Education prepares 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 Engineering and Industrial Arts is responsible for the technical training, while the Department of Industrial Education (School of Education) is responsible for the professional curriculum and for the teacher-education courses and applied teaching methods.

Programs Available. Two intensities of training are open to those interested in industrial-arts education:

(1) The four-year professional program, leading to the degree of Bachelor of Science, 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 348-354.)

(2) The teaching major in industrial arts (pages 293-294) affords opportunity for approximately half the training in technical industrial-arts subject matter that is available to the student in the four-year professional 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.

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 field of supervision, administration, or teacher-education. Programs of study leading to the degree of 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.

COURSES FOR INDUSTRIAL ARTS STUDENTS*

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 408. **Methods and Materials.** (See Ed 408, page 303.)
- IEd 420. **Industrial Arts Organization.** (g) 3 hours.
Selection and organization of subject-matter for teaching industrial arts in diversified programs for smaller high schools; evaluation of jobs, projects, and class problems; survey of appropriate teaching aids; development of professional relationships. Prerequisite: Ed 408e and senior standing.
- IEd 470. **History of Manual and Industrial Education.** (G) 3 hours.
Historical development and present-day aims of industrial-arts and vocational-industrial education. Prerequisite: senior standing.
- IEd 472. **Occupational Analysis.** (G) 3 hours.
Analysis of an occupation, trade, or job into its component subdivisions, blocks, operation, and teaching units; occupational analysis in teaching procedure. Prerequisite: Ed 313, 408e, and technical background.
- IEd 473. **The General Shop and Its Problems.** (G) 2 hours.
The "general shop" type of organization; advantages and limitations; probable future; content, organization, and methods of presenting subject matter; class control. Prerequisite: Ed 313, 408e.
- IEd 475. **Project Analysis and the Contract Plan.** (G) 2 hours.
Projects for various types of shop teaching; history and development of the contract plan; technique of preparing contracts; suggestions for use in industrial-arts classes. Prerequisite: IEd 472 or equivalent.
- IEd 476. **Supervision of Industrial Arts.** (G) 2 hours.
Functions and techniques of the supervisor; supervision principles from the teacher's viewpoint; teacher-supervisor relationships. Problems of the supervisor in large and small school systems. Prerequisite: graduate standing and teaching experience in industrial arts.

GRADUATE COURSES

(For both Industrial Arts and Trade Education Students)
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.

* See also courses in the Department of Education, especially Ed 330, and courses in technical subject matter in the Department of Industrial Engineering and Industrial Arts, pages 348-354.

COURSES FOR TRADE AND INDUSTRIAL EDUCATION STUDENTS

UPPER-DIVISION COURSES

- IEd 381. Introduction to Industrial Education.** 2 hours.
Orientation in vocational education for beginning trade and industrial teacher; survey of purposes and operation of vocational education with special emphasis on trade and industrial aspects; guided practice in organizing materials, planning lessons, and developing suitable teaching techniques. Prerequisite: 3 years practical trade experience.
- IEd 382. Analysis and Course Construction.** 3 hours.
Techniques of course construction based on trade analysis; selection of type of jobs that require skills and knowledge discovered through analysis, arranged in sequence of difficulty within each division of the trade. Prerequisite: Ed 408t, IEd 381, or equivalent.
- IEd 383. Educational Psychology for Trade and Industrial Teachers.** 3 hours.
Psychology applied to acquisition of manipulative skills and related technical information. The learning process, factors in emotional control, development of attitudes, abilities and evaluations. Prerequisite: IEd 381 or experience as a vocational instructor.
- Ed 408. Methods and Materials.** (See Ed 408, page 303.)
- IEd 480. Shop Organization and Management.** (G) 3 hours.
Organizing and controlling shop instruction, handling supplies, maintaining equipment and tools, purchasing materials, keeping records, making inventories, and meeting other problems of setting up and operating vocational shop courses; shop plans and layout. Prerequisite: IEd 381, Ed 408t, IEd 382 or equivalent.
- IEd 481. Development and Use of Audio-Visual Aids.** (G) 3 hours.
Types of instructional aids and methods of evaluating them; practice in techniques of development, preparation, and construction; methods of using instructional aids; the operation of audio-visual equipment in vocational classes. Prerequisite: IEd 382 or teaching experience.
- IEd 482. Development, Organization, and Use of Instructional Materials.** (G) 2 hours.
Selection and effective use of instructional material in industrial classes. Sources, values, limitations, and classification of instruction sheets and reference materials. Techniques of developing and using instructional materials in shop and related classes. Prerequisite: IEd 382 or equivalent.
- IEd 483. Coordination of Diversified Occupations Programs.** (G) 2 hours.
Principles and practices of effective coordination applied specifically to the diversified occupation programs. The coordinator will study the problems involved in organizing, conducting, and reporting a diversified occupation program. Prerequisite: IEd 381 or coordination experience.
- IEd 484. Coordination of Trade and Industrial Classes.** (G) 2 hours.
Principles and practices of effective coordination between trade and industrial education and industry; problems of the coordinator in the unit trade, trade extension, and cooperative programs; relationships between coordinator, supervisor, and administrator; placement and follow-up problems. Prerequisite: IEd 483 or coordination experience.

- IEd 485. Supervision of Trade and Industrial Education. (G) 2 hours.**
Supervisory techniques applied to local-and-state-level programs. Analysis of supervisory needs for individual situations; planning supervisory programs to meet the needs. Prerequisite: IEd 382, IEd 484, or equivalent.
- IEd 486. Vocational Guidance for Trade and Industrial Teachers. (G) 2 hours.**
Principles and problems of guidance that will enable a vocational teacher to serve as an outpost of guidance counselor's office. He analyzes his particular occupation for data which, when organized and presented to students and parents, will assist in planning future of vocational-school graduate. Information covers number of workers in trade, working conditions, rates of compensation, special laws pertaining to occupation, opportunities for advancement, and necessary preparation for promotion and success in different phases of the occupation. Prerequisite: IEd 382 or equivalent.
- IEd 487. Industrial and Public Relations for Trade Industrial Teachers. (G) 3 hours.**
Designed to give industrial teachers information on the history and development of industrial, civic, and labor organizations, and to provide them with some of the techniques necessary to promote wholesome relationships with the community and outside groups. Prerequisite: Ed 408t or teaching experience.
- IEd 488. Educational Personnel Relations (Supervisory Development). (G) 2 hours.**
Designed to aid school administrators, supervisors, coordinators, and teachers in building and maintaining good personnel relations; methods of handling individual and group relations and problems. Prerequisite: IEd 484 or IEd 485 or equivalent.
- IEd 490. Shop Design and Layout for Trade and Industrial Teachers. (G) 2 hours.**
Shop planning and layout principles applied to vocational or trade school; planning, designing, and layout of vocational-type shops. Prerequisite: IEd 480 or equivalent.
- IEd 491. Testing for Trade and Industrial Teachers. (G) 3 hours.**
Designed to develop ability in selection and construction of tests, to measure effectiveness of trade teacher and advancement of pupils; to develop knowledge and appreciation of types of tests and correct techniques of construction and administration; possibilities and limitations; reliability and validity. Prerequisite: IEd 382, IEd 482, or equivalent.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit. See also page 313.

Physical Education

THE Division of Physical Education offers major work in physical education leading to baccalaureate degrees through the School of Education. The major provides professional preparation for physical education and coaching. It may be combined with health education, camp education, or recreation to meet needs in many public schools or communities. In addition to teaching and coaching, graduates are prepared for positions in YMCA or YWCA, city recreation, industrial recreation, camping, and various youth-serving organizations. The major provides a foundation for students preparing

to enter the field of physiotherapy and other closely related fields. The program is flexible so that varied needs may be met.

The Division of Physical Education outlines a suggested Student's Basic Program for a major in physical education. The requirements for a State High-School Teacher's Certificate are listed on pages 287-289.

Many opportunities exist for combining a physical-education major with courses in the schools of Science, Agriculture, Education, Engineering, and Home Economics. These schools offer work closely related to the offerings in health and physical education.

Faculty, facilities, and course offerings in physical education are included under DIVISION OF PHYSICAL EDUCATION.

Science Education

PROFESSIONAL preparation for prospective teachers of biological and physical science and mathematics is afforded by the Department of Science Education, which is a joint department within the School of Science and the School of Education. Students preparing to teach science in secondary schools may major in one of the sciences, or in general science, according to the degree of emphasis on subject matter or professional preparation. The combination of subjects to be taught and the scope of preparation desired influence the choice of major school.

The requirements for State High-School Teacher's Certificate are printed on pages 287-289. Approved teaching majors and minors in science are printed on pages 290-291; these are minimum requirements and may be supplemented by additional courses in the several fields. The teaching majors in general biology, general science, mathematics, and physical science provide electives that permit flexibility in selection of courses. The majors in health education and human biology are made up of required courses and may well be augmented by additional courses in biology and related fields. A wide range of health-education courses is available in the schools of Science, Education, Agriculture, Engineering, and Home Economics, and the Division of Physical Education. Both undergraduate and graduate majors in hygiene and sanitation are offered in the Department of Bacteriology and Hygiene.

DESCRIPTION OF COURSES*

LOWER-DIVISION COURSE

SEd 123. **Introduction to Health Education.** 3 hours spring.

Historical background and underlying philosophy of health education; study of statistical facts that indicate need for health education; survey of modern practices in, and organization for, health education; opportunities for professional work in field.

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 408. **Methods and Materials.** (See Ed 408, page 303.)

Biological science (b), mathematics (c), physical science (g).

* See also courses in the Department of Education, pages 302-307.

- SEd 431, 432, 433. **School Health Problems.** (G) 3 hours each term.
Maintenance of health of school children; communicable diseases; school sanitation; planning of school buildings; health of school child; hygiene of instruction. Prerequisite: upper-division standing and one year of upper-division biological science.
- SEd 441, 442, 443. **Health Education.** (G) 3 hours each term.
Philosophy and principles of health education; organization and administration; health instruction and its use in secondary schools and in adult health education. Prerequisite: upper-division standing and one year of upper-division biological science.
- SEd 481. **Alcohol Studies in School Curriculum.** (G) 3 hours.
Incorporation of scientific information about alcohol in school curriculum; physiological, psychological, sociological, and legal aspects of alcoholism. Prerequisite: 24 hours upper-division education.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

- 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.
- SEd 598. **Science Curriculum in Secondary Schools.** 3 hours.
Trends, problems, and procedures in junior-high and secondary-school science program. Prerequisite: 24 hours upper-division education including Ed 415.

School of Engineering and Industrial Arts

Faculty

GEORGE WALTER GLEESON, Ch.E., Dean of the School of Engineering and Industrial Arts.

THOMAS GEORGE MARSHALL, M.S., Personnel and Placement Officer.

JEAN OGLESBY, B.S., Secretary to the Dean.

General Engineering

PROFESSORS WANLESS (chairman), WILLEY.

ASSISTANT PROFESSORS HAITH, PARKINSON, RICHARDSON, ROOK.

INSTRUCTORS GRAY, LOCKWOOD, RICE.

Agricultural Engineering

PROFESSORS RODGERS (department head), SINNARD.

ASSOCIATE PROFESSORS CROPSEY, LUNDE.

ASSISTANT PROFESSORS KIRK, WOLFE.

Chemical Engineering

PROFESSOR WALTON (department head).

ASSOCIATE PROFESSOR SCHULEIN.

ASSISTANT PROFESSORS CHEN, CLAPP, KNUDSEN, ROSS.*

Civil Engineering

PROFESSORS MOCKMORE (department head), HOLCOMB, MERRYFIELD.

ASSOCIATE PROFESSORS COOPEY, KOFOID, WATERMAN.

ASSISTANT PROFESSORS CLAYTON, MCCLELLAN.

INSTRUCTORS HERRINGTON, LONSKI, McREARY, WATSON, WESTGARTH.

Electrical Engineering

PROFESSORS McMILLAN (department head), ALBERT, COCKERLINE, STARR.

ASSOCIATE PROFESSORS FEIKERT, NICHOLS, WITTKOPF.

ASSISTANT PROFESSORS BARCLAY, MAGNUSSON, MICHAEL, SHIRLEY, STONE.

INSTRUCTORS BALLARD, BURDIC, ENGLE, MOULTON, WARD.

GRADUATE ASSISTANTS HU, McLEOD, SMITH.†

* On leave of absence 1950-51.

† Fall term 1950.

Industrial Engineering and Industrial Arts

PROFESSORS COX (department head), ENGESSER, SHEELY.

ASSOCIATE PROFESSOR MEYER.

ASSISTANT PROFESSORS JOHNSON, LANGMO, ROBERTS, ROBLEY, SMITH, WILLIAMSON.

INSTRUCTORS CRABTREE, EPPERLY, FRAZIER, SODERLUND, WILSON.

GRADUATE ASSISTANTS ALLMAN, WOODWARD.

Mechanical Engineering

ASSOCIATE PROFESSOR POPOVICH (chairman).

PROFESSORS GRAF, HUGHES, MARTIN, PAUL, PHILLIPS (emeritus), RUFFNER, SLEGEL, THOMAS.

ASSOCIATE PROFESSORS HEATH, PAASCHE.

ASSISTANT PROFESSOR MILLER.

INSTRUCTORS BAILEY, CHRISTENSEN, JACKSON, OLSEN, PHILLIPS, STEIDEL.

GRADUATE ASSISTANTS HONEGGER, REIBER, SELLIKEN, WILLIAMSON.

Curricula in Engineering and Industrial Arts

B.A., B.S., M.A., M.S.,

A.E., Ch.E., C.E., E.E., M.E., Min.E., Ph.D. Degrees

*Agricultural Engineering
Chemical Engineering
Civil Engineering
Electrical Engineering*

*Industrial Engineering
Mechanical Engineering
Industrial Administration*

CURRICULA leading to baccalaureate and advanced degrees are offered in the School of Engineering as follows: in Agricultural Engineering, with options in Power and Machinery, Farm Structures, Soil and Water; in Chemical Engineering; in Civil Engineering with options in Structural Engineering, Highway Engineering, and Sanitary Engineering; in Electrical Engineering with options in Power, Communication, and Business; in Industrial Engineering; in Mechanical Engineering with a general option and options in Aeronautical Engineering, Automotive Engineering, Metallurgy, and Business; in Industrial Administration with options in Metal Industries, Tool Design, and Wood Industries.

Requirements for B.S. or B.A. Degree. In each of the four-year curricula offered in the School of Engineering the fulfillment of the 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 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, or 45 term hours of science and social science. 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 236 term hours may, on approval, receive both the Bachelor of Arts and the Bachelor of Science degrees.

Requirements for Advanced Degrees. In certain curricula outlined on the following pages suggested graduate programs are included leading to the degree of Master of Science or Master of Arts. Modifications of these programs are permitted. Programs for the degree of Doctor of Philosophy are in all cases worked out for each candidate. Requirements for professional engineer degrees and the general regulations governing advanced degrees are printed under GRADUATE SCHOOL.

Curricular Organization. The curricula offered in the Engineering School are organized into the following curricular groups:

- A. Agricultural Engineering and Chemical Engineering as four-year sequence curricula.
- B. Civil, Electrical, Industrial, and Mechanical Engineering including a common freshman curriculum and differentiated sophomore and upper-division curricula.
- C. Industrial Administration, which is not professional engineering but allied thereto.
- D. Technical Terminal, nonprofessional, nondegree program.

Engineering curricula are organized about four general fields of knowledge or training, and the sequence of courses in each curriculum establishes 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 curricula 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 are differentiated by the first year requirements. An undecided student who desires exploratory contact with group A subject matter should register at once in the appropriate department, 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. Curricular group C includes subject matter and course content sufficiently different from A or B to preclude transfer from C to A or B without appreciable loss of time. On the other hand, transfer may be made from A or B to C after one or two terms without serious loss of time. Students who elect curricular group C should register in this group at once. Curricular group D is offered to nondegree students who wish preparation for semiprofessional work such as "engineering aide," "junior engineer," etc. The outline of studies for such technical terminal programs will be by individual arrangement with the Division of General Engineering.

As one and one-half years of algebra and one year of geometry are required for entrance to the engineering curricula (industrial administration excepted), students who have not completed these requirements and desire a degree in engineering must spend more than four years for graduation. The program

for students entering the School with a deficiency in mathematics will include the mathematics that they lack, together with other freshman courses excepting those for which mathematics is prerequisite.

In the case of transfer students who transfer from institutions not accredited by the Engineering Council for Professional Development, each department of the School reserves the right to require an entrance examination, comprehensive to the level of transfer. The level of matriculation may be dictated by the results of such examination.

A. Agricultural and Chemical Engineering

AGRICULTURAL ENGINEERING

Freshman Year

	Term hours		
	F	W	S
Agricultural Engineering Problems (AE 101, 102, 103)	1	1	1
Engineering Drawing (GE 111, 112)	2	2	.....
House Planning and Architectural Drawing (AA 178) .....	.....	.....	3
Elementary Analysis (Mth 101, 102, 103)	4	4	4
Engineering Physics (Ph 101, 102, 103)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
Air, Military, or Naval Science	2-3	2-3	2-3
¹ Physical Education	1	1	1

16-17 16-17 17-18

Sophomore Year

Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
General Chemistry (Ch 201, 202, 203)	3	3	3
Mechanics (ME 212, 213, or CE 212, 213) .....	.....	3	3
Forging and Welding (IE 250)	2	.....	.....
² Machine Tool Practices (IE 260) .....	.....	2	.....
Plane Surveying (CE 226)	3	.....	.....
Farm Mechanics (AE 221) .....	.....	3	.....
Extempore Speaking (Sp 111) .....	.....	.....	3
Air, Military, or Naval Science	2-3	2-3	2-3
Physical Education	1	1	1

15-16 18-19 16-17

Junior Year

NORM

Strength of Materials (ME 314, 315, or CE 351, 352)	3	3	.....
Materials Testing Laboratory (ME 316) .....	.....	.....	3
Farm Motors and Tractors (AE 311)	3	.....	.....
Soils (Sls 211, 212)	3	3	.....
Industrial Electricity (EE 356)	3	.....	.....
Social Science or International Politics and National Power (SSc 441, 442, 443)	3	3	3
Air, Military, or Naval Science or electives	3	3	3
	18	12	9

SOIL AND WATER OPTION

Junior Year Norm	18	12	9
Structural Analysis (CE 382) .....	.....	4	.....
Reinforced Concrete (CE 383) .....	.....	.....	4
Plane Surveying (CE 222, 223) .....	.....	3	3
	18	19	16

POWER AND MACHINERY OPTION

Junior Year Norm	18	12	9
Automobile Mechanics (AE 313, 314) .....	.....	3	3
Steam, Air, and Gas Power (ME 346) .....	.....	.....	3
Mechanism (ME 312) .....	.....	3	.....
Fuels and Lubricants (ME 325) .....	.....	.....	3
	18	18	18

¹General Hygiene (PE 150), 1 term hour, is taken one term in place of physical education.

²Not taken by Naval Science students.

	Term hours		
	F	W	S
FARM STRUCTURES OPTION			
Junior Year Norm	18	12	9
Structural Analysis (CE 382) .....	.....	4	.....
Reinforced Concrete (CE 383) .....	.....	.....	4
Automobile Mechanics (AE 313) .....	.....	3	.....
Elective .....	.....	.....	3
	18	19	16
Senior Year			
NORM			
Farm Structures (AE 461, 462)	3	3	.....
Rural Electrification (AE 431) .....	.....	.....	3
Pumps and Irrigation Equipment (AE 321) .....	.....	.....	3
Contracts and Specifications (CE 427) .....	.....	.....	3
Business Law (BA 411)	3	.....	.....
Air, Military, or Naval Science or electives	3	3	3
	9	6	12
SOIL AND WATER OPTION			
Senior Year Norm	9	6	12
Soil Conservation Engineering (AE 471)	3	.....	.....
¹ Soil Conservation (Sls 413) .....	.....	3	.....
Power Farming Machinery (AE 491) .....	.....	3	.....
Automobile Mechanics (AE 313) .....	.....	.....	3
Fluid Mechanics (CE 311)	3	.....	.....
Hydraulics (CE 312) .....	.....	3	.....
Hydrology (CE 411)	3	.....	.....
² Reading and Conference (AE 405) .....	.....	.....	1
Seminar (AE 407) .....	.....	.....	1
Drainage and Irrigation Engineering (AE 472) .....	.....	3	.....
	18	18	17
POWER AND MACHINERY OPTION			
Senior Year Norm	9	6	12
Agricultural Machine Design (AE 481) .....	.....	3	.....
Power Farming Machinery (AE 491) .....	.....	3	.....
Soil Conservation Engineering (AE 471)	3	.....	.....
Fluid Mechanics (CE 341)	3	.....	.....
Reading and Conference (AE 405)	2	1	1
³ Seminar (AE 407)	1	1	1
⁴ Elective .....	.....	3	3
	18	17	17
FARM STRUCTURES OPTION			
Senior Year Norm	9	6	12
Farm Structures (AE 463) .....	.....	.....	3
Masonry and Foundations (CE 472) .....	.....	4	.....
Modern Construction Methods (CE 362) .....	.....	2	.....
Structural Design (CE 482) .....	.....	4	.....
Fluid Mechanics (CE 341)	3	.....	.....
² Reading and Conference (AE 405)	1	1	.....
² Seminar (AE 407)	1	1	.....
Elective	3	.....	.....
Building Cost Estimating (AE 465) .....	.....	.....	3
	17	18	18
CHEMICAL ENGINEERING			
Freshman Year			
Chemical and Mineral Industry (ChE 111, 112, 113)	1	1	1
General Chemistry (Ch 204, 205), Qualitative Analysis (Ch 206)	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	.....
⁴ Machine Tool Practices (IE 260) .....	.....	.....	2
Air, Military, or Naval Science	2-3	2-3	2-3
⁵ Physical Education	1	1	1
	17-18	17-18	17-18

¹Not taken by Naval Science students.

²Regular or R.O.T.C. only.

³Not taken by Naval Science students in spring term.

⁴Required for students not taking R.O.T.C.

⁵General Hygiene (PE 150), 1 term hour, is taken one term in place of physical education.

	Term hours		
	F	W	S
Sophomore Year			
Chemical Technology (ChE 211)	2		
Industrial Stoichiometry (ChE 212, 213)		2	2
Chemical Theory (Ch 241)	4		
Quantitative Analysis for Chemical Engineering Students (Ch 242)		4	
Commercial Methods of Analysis (Ch 243)			4
Engineering Physics (Ph 101, 102, 103)	3	3	3
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
*Technical Report Writing (Eng 227)		3	
Air, Military, or Naval Science	2-3	2-3	2-3
Physical Education	1	1	1
	16-17	17-19	16-17
Junior Year			
Industrial-Chemical Calculations (ChE 311)	3		
Chemical Engineering Thermodynamics (ChE 312)		3	
Elementary Unit Operations (ChE 313)			3
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 Testing Laboratory (ME 316)			3
Air, Military, or Naval Science or electives	3	3	3
	17	17	17
Senior Year			
Unit Operations (ChE 411, 412, 413)	3	3	3
Elements of the Process Industries (ChE 441, 442, 443)	2	2	2
Chemical Engineering Laboratory (ChE 414, 415, 416)	3	3	3
*Industrial Electricity (EE 354, 355)	3	3	
Chemical Plant Design (ChE 432)			3
Field Trip			0
Social Science or International Politics and National Power (SSc 441, 442, 443)	3	3	3
Air, Military, or Naval Science or electives	3	3	3
	17	14-17	17

B. Civil, Electrical, Industrial, and Mechanical Engineering

COMMON FRESHMAN YEAR

	Term hours		
	F	W	S
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 101, 102, 103)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
Air, Military, or Naval Science	2-3	2-3	2-3
*Physical Education	1	1	1
	17-18	17-18	17-18

CIVIL ENGINEERING

Sophomore Year

*Introduction to Civil Engineering (CE 201, 202, 203)	2	2	2
Plane Surveying (CE 221, 222, 223)	3	3	3
Mechanics (CE 212, 213)		3	3
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
General Chemistry (Ch 201, 202, 203)	3	3	3
Air, Military, or Naval Science	2-3	2-3	2-3
Physical Education	1	1	1
*Elective	3		
	18-19	18-19	18-19

¹Required for students not taking N.R.O.T.C.

²EE 355 not required for students taking N.R.O.T.C.

³General Hygiene (PE 150), 1 term hour, is taken one term in place of physical education.

⁴Naval Science students omit CE 202, CE 203, and elective.

	Term hours		
	F	W	S
Junior Year			
Fluid Mechanics (CE 311)	3		
Structural Analysis (CE 382)		4	
Reinforced Concrete (CE 383)			4
Strength of Materials (CE 351, 352)	3	3	
Hydraulics (CE 312)		3	
Hydraulic Machinery (CE 313)			3
Materials Testing Laboratory (ME 316)	3		
Industrial Electricity (EE 356)	3		
Curves and Earthwork (CE 332)			3
¹ Social Science or International Politics and National Power (SSc 441, 442, 443)	3	3	3
Air, Military, or Naval Science or electives	3	3	3
	18	16	16

Senior Year

NORM

Structural Engineering (CE 481)	4		
Structural Design (CE 482)		4	
Sanitary Engineering (CE 412)	3		
Estimating and Cost Analysis (CE 460)			3
Contracts and Specifications (CE 427)			3
Masonry and Foundations (CE 472)		4	
Hydrology (CE 411)	3		
Steam, Air, and Gas Power (ME 346)			3
Air, Military, or Naval Science or electives	3	3	3
	13	11	12

STRUCTURAL OPTION

Senior Year Norm	13	11	12
Indeterminate Structures (CE 485)	3		
Structural Analysis (CE 486)		3	
Building Design (CE 483)			4
Structural Materials Laboratory (ME 415)		3	
	16	17	16

HIGHWAY OPTION

Senior Year Norm	13	11	12
Highway Engineering (CE 421, 422)	4	3	
Highway Materials Laboratory (ME 414)		3	
Economics of Highway Transportation (CE 425)			3
	17	17	15

SANITARY OPTION

Senior Year Norm	13	11	12
Sanitary Engineering Laboratory (CE 413)		3	
Water Supply (CE 452)		3	
Sewage Disposal (CE 454)			3
Sanitary Bacteriology (Bac 261)	3		
Elective			1
	16	17	16

Graduate Year (M.A., M.S. degrees)

	Term hours
MAJOR IN STRUCTURAL ENGINEERING:	
Structural Stresses (CE 530)	2
Mechanical Methods of Stress Analysis (CE 531)	2
Bridge Design (CE 532)	3
Analysis and Design of Concrete Structures (CE 533)	3
Research (CE 501)	3
Thesis (CE 503)	9
Reading and Conference (CE 505)	5
Seminar (CE 507)	3
	30
Minor:	
Mathematics in Engineering and Physics (Mth 561, 562, 563)	9
Experimental Elasticity (ME 516, 517)	6
	15

¹American National Government (PS 201), General Sociology (Soc 212), Outlines of Economics (Ec 212).

MAJOR IN SANITARY ENGINEERING:

	Term hours
Sanitary Engineering Design (CE 540)	3
Stream Purification (CE 541)	3
Water and Sewage Treatment Processes (CE 542)	3
Treatment Plant Operation and Control (CE 543)	3
Research (CE 501)	3
Thesis (CE 503)	9
Reading and Conference (CE 505)	3
Seminar (CE 507)	3
	30

Minor:

Mathematics in Engineering and Physics (Mth 561, 562, 563)	9
Approved electives	6
	15

MAJOR IN HIGHWAY ENGINEERING:

Highway Administration and Finance (CE 550)	3
Municipal Engineering and City Planning (CE 551)	3
Transportation Engineering (CE 552)	3
Street and Highway Traffic Control (CE 553)	3
Research (CE 501)	3
Thesis (CE 503)	9
Reading and Conference (CE 505)	3
Seminar (CE 507)	3
	30

Minor:

Mathematics in Engineering and Physics (Mth 561, 562, 563)	9
Soil Mechanics (CE 519)	3
Approved elective	3
	15

MAJOR IN HYDRAULIC ENGINEERING:

Measurement in Water (CE 520)	3
Fluid Mechanics (CE 521)	3
Water-Power Engineering (CE 522)	3
River Control and Utilization (CE 523)	3
Research (CE 501)	3
Thesis (CE 503)	9
Reading and Conference (CE 505)	3
Seminar (CE 507)	3
	30

Minor:

Mathematics in Engineering and Physics (Mth 561, 562, 563)	9
Stream Purification (CE 541)	3
Soil Mechanics (CE 519)	3
	15

ELECTRICAL ENGINEERING

Sophomore Year

	Term hours		
	F	W	S
Introduction to Electrical Engineering (EE 201, 202, 203)	4	4	4
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
General Chemistry (Ch 201, 202, 203)	3	3	3
Plane Surveying (CE 226)	3	3	3
¹ American National Government (PS 201)	3	3	3
Social Science elective	3	3	3
² Machine Tool Practices (IE 260)	2	2	2
³ Extempore Speaking (Sp 111)	3	3	3
³ Principles of Accounting (BA 211)	3	3	3
Air, Military, or Naval Science	(2-3)	(2-3)	(2-3)
Physical Education	1	1	1
	17	18	18

¹Not required in Naval Science.

²Not required in Military Science.

³Not required in Military or Naval Science.

	Term hours		
	F	W	S
Junior Year			
Electric Circuits and Equipment (EE 311, 312, 313)	3	3	3
Electronics (EE 321, 322, 323)	3	3	3
Differential Equations (Mth 421, 422)	3	3	3
Electrical Engineering Analysis (EE 420)	3	3	3
Mechanics (ME 212, 213)	3	3	3
Fluid Mechanics (CE 341)	3	3	3
¹ Heat Power Engineering (ME 331, 332)	3	3	3
² Outlines of Economics (Ec 212)	3	3	3
² International Politics and National Power (SSc 441, 442, 443)	3	3	3
Air, Military, or Naval Science or electives	(3)	(3)	(3)
	18	18	18

	Term hours		
	F	W	S
Senior Year			
NORM			
Electrical Engineering Economy (EE 411, 412, 413)	3	3	3
Electrical Measurements and Analysis (EE 414, 415, 416)	3	3	3
Transmission Lines and Networks (EE 421, 422, 423)	3	3	3
Seminar (EE 407)	1	1	1
Air, Military, or Naval Science or electives	3	3	3
	13	13	13

	Term hours		
	F	W	S
POWER OPTION			
Senior Year Norm	13	13	13
Transformers and Rotating Electrical Machinery (EE 431, 432, 433)	3	3	3
	16	16	16

	Term hours		
	F	W	S
COMMUNICATION OPTION			
Senior Year Norm	13	13	13
Wire and Radio Communication (EE 461, 462, 463)	3	3	3
	16	16	16

	Term hours		
	F	W	S
BUSINESS OPTION			
Senior Year Norm	13	13	13
Personnel Management (BA 451)	3	4	3
Finance (BA 312)	4	3	3
Business Law (BA 411)	3	3	3
	16	17	16

Graduate Year (M.A., M.S. degrees)

MAJORS IN ELECTRICAL ENGINEERING:

Power Engineering, Communication Engineering (Wire and Radio),
Electronic Engineering, Control Engineering, Illumination Engineering,
other fields as approved.

	Term hours
Courses in major field (500 numbers and G courses) as approved	15-21
Thesis (EE 503)	6-12
Seminar (EE 507)	3
	30

<i>Minor:</i>	
Electives as approved	15

INDUSTRIAL ENGINEERING

	Term hours		
	F	W	S
Sophomore Year			
Foundry Practices (IE 240)	2	2	2
Forging and Welding (IE 250)	2	2	2
Machine Tool Practices (IE 260)	2	2	2
Introduction to Scientific Management (IE 290)	3	3	3
Mechanics (Statics) (ME 212)	3	3	3
Mechanics (Dynamics) (ME 213)	3	3	3
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
General Chemistry (Ch 201, 202, 203)	3	3	3
Outlines of Economics (Ec 212)	3	3	3
American National Government (PS 201)	3	3	3
Applied Psychology (Psy 209)	3	3	3
Physical Education	1	1	1
Air, Military, or Naval Science or electives	2-3	2-3	2-3
	18-19	18-19	18-19

¹Not required in Naval Science.

²Not required in Military Science.

	Term hours		
	F	W	S
Junior Year			
Methods and Motion Study (IE 391)	3		
Time Study (IE 392)		3	
Production Planning and Control (IE 393)			3
Pattern Making (IE 111)		3	
Machine Tool Practices (IE 261)	2		
Millwork—Machine Woodwork (IE 311)			3
Mass Production Methods (IE 361, 362)		2	2
Materials of Engineering (ME 216)	3		
Mechanism (ME 312)	3		
Strength of Materials (ME 314, 315)		3	3
Materials Testing Laboratory (ME 316)			3
Applied Statistics (Mth 341, 342)	3	3	
General electives	3	3	3
	17	17	17

Senior Year			
Welding Processes and Applications (IE 354)		2	
Safety in Industry (IE 390)			2
Industrial Supervision Principles (IE 490)			3
Production Planning and Control (IE 491)	3		
Tool Engineering (IE 464, 465)	3	3	
Steam, Air, and Gas Power (ME 346)			3
Machine Design (ME 411, 412)	3	3	
Machine Design (ME 413) or approved elective			3
Industrial Electricity (EE 356, 357)	3	3	
Principles of Accounting (BA 211a, 212a)	3	3	
Industrial Cost Accounting (BA 424a)			3
General electives	3	3	3
	18	17	17

MECHANICAL ENGINEERING

Sophomore Year

Descriptive Geometry (GE 123)	3		
Mechanics (Statics) (ME 212), Mechanics (Dynamics) (ME 213)	4	3	3
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
Foundry Practices (IE 240)	2		
Machine Tool Practices (IE 260)		2	
Forging and Welding (IE 250)			2
Plane Surveying (CE 226)	3		
Principles of Accounting (BA 211)		3	
General Chemistry (Ch 201, 202, 203)	3	3	3
Approved elective in Social Science			3
Air, Military or Naval Science or electives	2-3	2-3	2-3
Physical Education	1	1	1
	17-18	16-18	18-19

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	
Materials Laboratory (ME 317)			3
Fluid Mechanics (CE 341)	3		
Mechanism (ME 312)		3	
Approved elective in Social Science			3
Air, Military, or Naval Science, or approved elective	3	3	3
	15	15	15

GENERAL AND AUTOMOTIVE OPTIONS

Junior Year Norm	15	15	15
Fuels and Lubricants (ME 325)	3		
Hydraulic Machinery (CE 342)		3	
Elective			3
	18	18	18

¹Not required of Naval Science students. Those electing Aeronautical Option will substitute ME 241 for IE 240.

²Not required of Naval Science students.

	Term hours		
	F	W	S
AERONAUTICAL OPTION			
Junior Year Norm	15	15	15
Differential Equations (Mth 421)	3	.....	.....
Aerodynamics (ME 342) .....	.....	3	.....
Aeropropulsion (ME 343) .....	.....	.....	3
	18	18	18
BUSINESS OPTION			
Junior Year Norm	15	15	15
Methods and Motion Study (IE 391)	3	.....	.....
Principles of Accounting (BA 212a) .....	.....	3	.....
Industrial Cost Accounting (BA 424) .....	.....	.....	3
	18	18	18
METALLURGICAL OPTION			
Junior Year Norm	15	15	15
Metallurgy (Met 331, 332)	3	3	.....
Elementary Physical Chemistry (Ch 340) .....	.....	.....	3
	18	18	18
Senior Year			
NORM			
Machine Design (ME 411, 412)	3	3	.....
Industrial Engineering (ME 473) .....	.....	.....	3
Air, Military, or Naval Science, or electives	3	3	3
	6	6	6
GENERAL OPTION			
Senior Year Norm	6	6	6
Power Plant Engineering (ME 431, 432)	3	3	.....
Machine Design (ME 413) .....	.....	.....	3
Engineering Metallurgy (ME 416)	3	.....	.....
Mechanical Laboratory (ME 451, 452)	2	2	.....
Industrial Electricity (EE 351, 352, 353)	3	3	3
Electives .....	.....	3	2
	17	17	14
AERONAUTICAL OPTION			
Senior Year Norm	6	6	6
Airplane Design (ME 441, 442, 443)	3	3	3
Aeronautical Laboratory (ME 456, 457)	2	2	.....
Airplane Structural Analysis (ME 447, 448, 449)	3	3	3
Air Transportation (ME 471) .....	.....	.....	2
Electricity in Aeronautics (EE 358) .....	.....	3	.....
Airway Communication Systems (EE 359) .....	.....	.....	3
Elective	3	.....	.....
	17	17	17
AUTOMOTIVE OPTION			
Senior Year Norm	6	6	6
Automotive Engineering (ME 491, 492, 493)	3	3	3
Machine Design (ME 413) .....	.....	.....	3
Engineering Metallurgy (ME 416)	3	.....	.....
Mechanical Laboratory (ME 451, 452)	2	2	.....
Industrial Electricity (EE 351, 352, 353)	3	3	3
Elective .....	.....	.....	2
	17	14	17
BUSINESS OPTION			
Senior Year Norm	6	6	6
Engineering Metallurgy (ME 416)	3	.....	.....
Mechanical Laboratory (ME 451, 452)	2	2	.....
Industrial Electricity (EE 351, 352, 353)	3	3	3
Safety in Industry (IE 390) .....	.....	.....	2
Business Law (BA 411, 412, 413)	3	3	3
Salesmanship (BA 465) .....	.....	3	.....
Investments (BA 436) or Finance (BA 312) .....	.....	.....	3-4
	17	17	17-18

	METALLURGICAL OPTION		
	Term hours		
	F	W	S
Senior Year Norm	6	6	6
Physical Metallurgy (ME 481)	3	.....	.....
Mechanical Laboratory (ME 451, 452)	2	2	.....
Ferrous Metallography (ME 482), Nonferrous Metallography (ME 483).....	3	3	3
Industrial Electricity (EE 351, 352, 353)	3	3	3
Electives	3	3	2
	17	17	14

Graduate Year (M.A., M.S. degrees)

MAJORS IN MECHANICAL ENGINEERING:

General Mechanical Engineering, Automotive Engineering, Air Conditioning, Refrigeration, Gas Engineering, or Engineering Materials.		Term hours
Offerings in major field as approved by department head:		
Selected from 500-number and (G) courses		18
Thesis (ME 503)		6-12
Approved electives		6-0
		30
<i>Minor (suggested program):</i>		
Mathematics in Engineering and Physics (Mth 561, 562, 563)		9
Approved electives		6
		15

MAJOR IN AERONAUTICAL ENGINEERING:

Aerodynamics (ME 546, 547, 548)		9
Dynamics of Aircraft (ME 541, 542, 543) or Experimental Elasticity (ME 516, 517, 518)		9
Thesis (ME 503)		6-12
Approved electives		6-0
		30
<i>Minor (suggested program):</i>		
Mathematics in Engineering and Physics (Mth 561, 562, 563)		9
Approved electives		6
		15

C. Industrial Administration

Freshman Year

	NORM		
	Term hours		
	F	W	S
Pattern Making (IE 111)	3	.....	.....
Foundry Practices (IE 240)	2	.....	.....
Forging and Welding (IE 250) .....	.....	2	.....
Machine Tool Practices (IE 260) .....	.....	.....	2
Engineering Drawing (GE 111, 112, 113)	2	2	2
English Composition (Eng 111, 112, 113)	3	3	3
¹ Physical Education	1	1	1
Air, Military, or Naval Science or electives	2-3	2-3	2-3
	13-14	10-11	10-11

METAL INDUSTRIES OPTION

Freshman Year Norm	13-14	10-11	10-11
Intermediate Algebra (Mth 100)	4	.....	.....
Elementary Analysis (Mth 101) .....	.....	4	.....
Elements of Statistics (Mth 109) .....	.....	.....	4
Extempore Speaking (Sp 111) .....	.....	.....	3
Industrial Arts Drawing and Design (AA 281) .....	.....	3	.....
	17-18	17-18	17-18

TOOL DESIGN OPTION

Freshman Year Norm	13-14	10-11	10-11
Elementary Analysis (Mth 101, 102, 103)	4	4	4
Extempore Speaking (Sp 111) .....	.....	.....	3
Industrial Arts Drawing and Design (AA 281) .....	.....	3	.....
	17-18	17-18	17-18

¹General Hygiene (PE 150), 1 term hour, is taken one term in place of physical education.

	Term hours		
	F	W	S
WOOD INDUSTRIES OPTION			
Freshman Year Norm	13-14	10-11	10-11
Methods in Woodworking (IE 112, 113) .....	.....	3	3
Intermediate Algebra (Mth 100)	4	.....	.....
Elementary Analysis (Mth 101) .....	.....	4	.....
Elements of Statistics (Mth 109) .....	.....	.....	4
	17-18	17-18	17-18

Sophomore Year

NORM

Welding Processes and Applications (IE 354)	2	.....	.....
Descriptive General Chemistry (Ch 130) .....	.....	.....	3
Business English (Eng 217)	3	.....	.....
American National Government (PS 201) .....	.....	.....	3
Physical Education	1	1	1
Air, Military, or Naval Science or electives	2-3	2-3	2-3
	8-9	3-4	9-10

METAL INDUSTRIES OPTION

Sophomore Year Norm	8-9	3-4	9-10
Machine Tool Practices (IE 261)	2	.....	.....
Machine and Tool Maintenance (Machine Shop) (IE 265)	2	.....	.....
Welding Processes and Applications (IE 355) .....	.....	2	.....
Introduction to Scientific Management (IE 290) .....	.....	.....	3
Casting Quality Control (IE 345) .....	.....	2	.....
Mass Production Methods (IE 361, 362) .....	.....	2	2
Sheet-Metal Work (IE 380) .....	.....	3	.....
*Technical electives	2	2	3
Abridged General Physics (Ph 211, 212)	3	3	.....
	17-18	17-18	17-18

TOOL DESIGN OPTION

Sophomore Year Norm	8-9	3-4	9-10
Machine Tool Practices (IE 261)	2	.....	.....
Mass Production Methods (IE 361, 362) .....	.....	2	2
Mechanics (Statics) (ME 212) .....	.....	3	.....
Mechanics (Dynamics) (ME 213) .....	.....	.....	3
*Technical electives .....	.....	2	.....
Differential and Integral Calculus (Mth 201, 202)	4	4	.....
Engineering Physics (Ph 101, 102, 103)	3	3	3
	17-18	17-18	17-18

WOOD INDUSTRIES OPTION

Sophomore Year Norm	8-9	3-4	9-10
Machine and Tool Maintenance (Wood Shop) (IE 225)	2	.....	.....
Introduction to Scientific Management (IE 290) .....	.....	.....	3
House Planning and Architectural Drawing (AA 178, 179, 180)	3	3	3
Industrial Arts Drawing and Design (AA 281) .....	.....	3	.....
*Technical electives .....	.....	2	2
Abridged General Physics (Ph 211, 212)	3	3	.....
Extempore Speaking (Sp 111) .....	.....	3	.....
	16-17	17-18	17-18

Junior Year

NORM

Methods and Motion Study (IE 391)	3	.....	.....
Time Study (IE 392) .....	.....	3	.....
Production Planning and Control (IE 393) .....	.....	.....	3
Outlines of Economics (Ec 211)	4	.....	.....
Economic Development of the United States (Ec 215) .....	.....	4	.....
General electives	3	3	7
	10	10	10

METAL INDUSTRIES OPTION

Junior Year Norm	10	10	10
Production Machine Work (IE 363)	3	.....	.....
Materials of Engineering (ME 216) .....	.....	3	.....
Mechanism (ME 312) .....	.....	.....	3
Engineering Metallurgy (ME 416) .....	.....	.....	3
Business Law (BA 411, 412 or 413)	3	3	.....
*Technical electives	2	2	.....
	18	18	16

*Technical electives must be related directly to the major professional option of the student and will be selected with approval of major adviser.

	Term hours		
	F	W	S
TOOL DESIGN OPTION			
Junior Year Norm	10	10	10
Machine and Tool Maintenance (Machine Shop) (IE 265)	2	.....	.....
Production Machine Work (IE 363)	3	.....	.....
Materials of Engineering (ME 216) .....	.....	3	.....
Strength of Materials (ME 311) .....	.....	3	.....
Mechanism (ME 312) .....	.....	.....	3
Materials Testing Laboratory (ME 316) .....	.....	.....	3
¹ Technical electives	3	.....	2
	18	16	18
WOOD INDUSTRIES OPTION			
Junior Year Norm	10	10	10
Mill Work—Machine Woodwork (IE 311)	3	.....	.....
Wood and Metal Finishing (IE 316) .....	.....	.....	3
Carpentry and Building Construction (IE 333) .....	.....	3	.....
Business Law (BA 411, 412)	3	3	.....
¹ Technical electives .....	.....	2	4
	16	18	17
Senior Year			
NORM			
Safety in Industry (IE 390) .....	.....	.....	2
Industrial Supervision Principles (IE 490) .....	.....	.....	3
Principles of Accounting (BA 211, 212)	3	3	.....
Industrial Cost Accounting (BA 424) .....	.....	.....	3
Money and Banking (Ec 413)	4	.....	.....
Applied Psychology (Psy 209) .....	.....	.....	3
General electives	3	3	3
	10	6	14
METAL INDUSTRIES OPTION			
Senior Year Norm	10	6	14
Tool Engineering (IE 464, 465)	3	3	.....
Labor Problems (Ec 425) .....	.....	4	.....
¹ Technical electives	4	3	3
	17	16	17
TOOL DESIGN OPTION			
Senior Year Norm	10	6	14
Tool Engineering (IE 464, 465)	3	3	.....
Die Design (IE 469) .....	.....	.....	3
Machine Design (ME 411, 412)	3	3	.....
Business Law (BA 411) .....	.....	3	.....
¹ Technical elective .....	.....	2	.....
	16	17	17
WOOD INDUSTRIES OPTION			
Senior Year Norm	10	6	14
Labor Problems (Ec 425) .....	.....	4	.....
Technical electives	7	7	3
	17	17	17

General Engineering

ENGINEERING courses required in the common freshman year for civil, electrical, industrial, and mechanical engineering are grouped in the Department of General Engineering. Staff members from all departments of the school work as a committee to plan, coordinate, and unify instruction. Certain service courses that are available by election to all students of the College are administered and supervised by departments of the School of Engineering as indicated under the course descriptions.

¹Technical electives must be related directly to the major professional option of the student and will be selected with approval of major adviser.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- GE 101, 102, 103. **Engineering Problems.** 2 hours each term.
Lectures and elementary problems dealing with the general fields of civil, electrical, industrial, and mechanical engineering to train the student in engineering habits of work. One lecture; 2 two-hour computation periods.
- GE 104, 105, 106. **Engineering Fundamentals.** 3 hours each term.
Basic concepts and principles of physical science; elementary technical problems; algebraic composition; training in use of slide rule. One lecture; 2 three-hour computation periods.
- GE 111, 112, 113. **Engineering Drawing.** 2 hours each term.
Fundamental principles and the rules of composition of the graphic language of engineering. Three two-hour periods.
- GE 114. **Elementary Production Illustration.** 2 hours.
Study and application of special techniques of perspective drawing in making accurate pictorial drawings; now used in industry to supplement or replace regular engineering drawing. Prerequisite: GE 113. Two three-hour periods.
- GE 115. **Engineering Drawing.** 3 hours.
Fundamental principles and rules of composition of the graphic language of industry. For forestry students only. One lecture; 3 two-hour periods
- GE 116. **Lettering.** 1 hour.
Engineering and other descriptive styles of lettering; use of mechanical lettering devices. Two one-hour periods.
- GE 121, 122. **Engineering Drawing.** 3 hours each term.
Fundamentals of graphic composition with particular emphasis on reading and interpretation of line drawings, charts and diagrams. Two-term course for students in Business and Technology. One lecture; 3 two-hour periods.
- GE 123. **Descriptive Geometry.** 3 hours.
Theory and problems on the projection of points, lines, surfaces and solids; applications of graphical solution of engineering problems. Prerequisite: GE 111, 112. One lecture; 3 two-hour periods.
- GE 201, 202, 203. **General Engineering.** 4 hours each term.
Application of basic principles of science to general problems of engineering. For technical-terminal and nonprofessional degree students. One lecture; 1 recitation; 2 three-hour computation periods.
- GE 211. **Structural Drafting.** 3 hours.
Timber, steel, and concrete details; connections and marking systems; connections and truss details; plotting of earthwork cross sections and profiles. Three three-hour laboratory periods.
- GE 212. **Elementary Machine Drafting.** 3 hours.
Simple mechanisms; advanced working drawings; shop practices and requirements; reproduction methods. Three three-hour laboratory periods.

UPPER-DIVISION COURSE

- GE 444. **Technological Patents.** (g) 2 hours.
The various phases of the patent system with emphasis on factors pertinent to the development of technical processes and equipment. Administered under Department of Chemical Engineering.

Agricultural Engineering

THE curricula in agricultural engineering are planned to prepare young men for positions in the major fields of agricultural engineering: power and machinery, farm structures, and soil and water control and conservation. The curricula are planned also to give the student general training in agriculture since a sympathetic understanding of the problems of agriculture is essential to anyone going into agricultural engineering. The Department of Agricultural Engineering is a joint department within the School of Engineering and the School of Agriculture.

Equipment. Facilities are provided in the Agricultural Engineering Building for teaching and experimental work in the major fields. The farm-motors laboratory contains several makes and types of stationary gas engines, section-alized automobile and tractor motors and accessories, and a Prony brake for testing the power output of stationary engines. Modern equipment and demonstration material is loaned to the institution by leading manufacturers and distributors for study and operation by the student. The tractor and automobile laboratory is well equipped with modern tools and testing equipment. Tractors of both wheel and crawler types are loaned annually to the department for instruction purposes. Well-lighted drafting rooms with modern equipment are available to students studying farm structures. Various samples of building materials, models, and modern farm buildings are available for study and observation.

Courses in farm construction and general farm maintenance repairs are taught in laboratories equipped for the purpose. Farm water systems, centrifugal and turbine pumps for sprinkler irrigation pumping, and similar equipment are available for instruction purposes.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- AE 101, 102, 103. Agricultural Engineering Problems.** 1 hour each term. Lectures and problems dealing with major fields of agricultural engineering to train the student in engineering habits of work. One lecture; 1 two-hour computation period.
- AE 221. Farm Mechanics.** 3 hours any term. Use of hand and power tools for wood and metal working, arc and acetylene welding, construction of wood and metal farm appliances, concrete work, estimating costs and bill of materials. Prerequisite: IE 250 or equivalent. One lecture; 2 three-hour laboratory periods.

UPPER-DIVISION COURSES

- AE 311. Farm Motors and Tractors.** 3 hours any term. Farm motors and accessories; carburetors, magnetos, ignition, governing, cooling, lubricating systems; fuels and oils; testing, timing, trouble hunting. Two recitations; 1 three-hour laboratory period.
- AE 313. Automobile Mechanics.** 3 hours any term. Practical repairing and minor overhauling of automobiles, tractors, and trucks, with emphasis on preventive maintenance, lubrication, engine tune-up, brake adjusting, etc. Prerequisite: AE 311 or 312. One lecture; 2 three-hour laboratory periods.

- AE 314. Automobile Mechanics.** 3 hours spring.
Engine rebuilding; advanced electrical testing; repairing and rebuilding of electrical accessories; use of precision equipment of all types commonly found in up-to-date repair shops. Prerequisite: AE 313. Two recitations; 1 three-hour laboratory period.
- AE 321. Pumps and Irrigation Equipment.** 3 hours spring.
Operation and testing of pumps and sprinkler equipment. Prerequisite: CE 322 or equivalent. Two lectures; 1 three-hour laboratory period.
- 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 431. Rural Electrification.** (g) 3 hours spring.
Fundamentals of alternating currents, code and wiring, electric motors; principles of using electricity profitably on the farm. Prerequisite: EE 356 or equivalent. Two lectures; 1 three-hour laboratory period.
- AE 461, 462, 463. Farm Structures.** (g) 3 hours each term.
Farmstead building arrangements; functional and structural requirements of farm structures; principles of wood and masonry framing and construction; appraisals and cost construction estimates. Prerequisite: AA 178, ME 316, CE 213 or ME 213. One lecture; 2 three-hour laboratory periods.
- AE 465. Building Cost Estimating.** (g) 3 hours.
Complete and approximate estimates; general and detailed considerations in establishing unit prices; quantity surveying; overhead costs and profit estimates; specification interpretations; estimate of costs for separate contracts and subcontracts. Prerequisite: AA 220, 221, and upper-division standing.
- AE 471. Soil Conservation Engineering.** (g) 3 hours fall.
Engineering phases of soil-erosion control; design of dams, terraces, and gully-control structures; hydrology of small watersheds. Prerequisite: CE 226, 311, SIs 212. Two lectures; 1 three-hour laboratory period.
- AE 472. Drainage and Irrigation Engineering.** (g) 3 hours.
Design of farm drainage and irrigation systems; tile drains; open ditches; distribution systems; control structures; land leveling; construction methods. Prerequisite: AE 471.
- AE 481. Agricultural Machine Design.** (g) 3 hours winter.
Application of principles of mechanism, mechanics, and strength of materials to design of agricultural machinery. Prerequisite: ME 315 or CE 352. One recitation; 2 three-hour laboratory periods.
- AE 491. Power Farming Machinery.** (g) 3 hours winter.
Modern power farming equipment; design, operation, maintenance, and adjustment. Prerequisite: AE 311, ME 312. Two recitations; 1 three-hour laboratory period.

GRADUATE COURSES

Courses numbered 400-499 and designated (p) or (G)
may be taken for graduate credit.

- 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.

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 curriculum is equally applicable in preparation for research, design, control, operation, or technical sales. The student is given first 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 fields. 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**, page 320.

Equipment. The administrative offices for the department are located in Chemistry Hall, where modern laboratories and classrooms are provided for instruction and experimentation. Other offices, laboratories, and equipment are maintained in the Industrial Research and the Mines buildings. The laboratories contain the necessary apparatus for pilot-plant studies and for smaller scale investigations of problems and techniques encountered in industrial plants. The assaying and metallurgical laboratories are equipped to conduct experimental metallurgical operations and ore-dressing. The chemical engineering laboratory facilities provide for instruction in the unit operations and numerous manufacturing processes. A wide variety of instruments is available for securing engineering data, and the laboratories contain a complete stock of chemical reagents and chemical apparatus. Special laboratories are available for advanced research projects.

COURSES IN CHEMICAL ENGINEERING

LOWER-DIVISION COURSES

- ChE 111, 112, 113. **Chemical and Mineral Industry.** 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.
Fundamentals of chemical engineering; graphical analysis; instrumentation; control of process variables; applications in the solution of typical problems. Two lectures; one recitation.
- ChE 212, 213. **Industrial Stoichiometry.** 2 hours each term.
Quantitative interpretation and application of physical and chemical data to various industrial chemical processes. Two lectures; one recitation.
- Met 263. **Assaying.** 3 hours.
Commercial methods of wet and dry assay of ores, metallurgical products. Prerequisite: Ch 232 or equivalent. One recitation; 2 three-hour laboratory periods.

UPPER-DIVISION COURSES

- ChE 311. **Industrial-Chemical Calculations.** 3 hours.
Application of physical and chemical principles to industrial problems; introduction to chemical engineering thermodynamics. Three lectures; 1 two-hour computation period.
- ChE 312. **Chemical Engineering Thermodynamics.** 3 hours.
Principles and relationships of thermodynamics as applied to typical problems encountered in the field of chemical engineering. Prerequisite: Ch 440. Three lectures; 1 two-hour computation period.
- ChE 313. **Elementary Unit Operations.** 3 hours.
Introduction to unit operations of chemical engineering; flow of fluids and flow of heat. Three lectures; 1 two-hour computation period.
- ChE 321, 322, 323. **Industrial Chemistry.** 3 hours each term.
For nonchemical engineering majors. Treatment is quantitative but restricted to chemical engineering principles as applied to industrial chemical processes. Prerequisite: consent of instructor.
- Met 331, 332, 333. **Metallurgy.** 3 hours each term.
General operations and principles of extractive metallurgy; study of production of common, precious, and rare metals; metallurgical calculations. Prerequisite: Ch 206, Mth 103, or equivalents. Three lectures; 1 two-hour computation period.
- 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.

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. Prerequisite or parallel: ChE 411. One lecture; 1 four-hour laboratory period.

ChE 432. **Chemical Plant Design.** (g) 3 hours.

Problems in the design of a chemical plant and chemical-engineering equipment; design-room procedures emphasized. Reports required. Prerequisite or parallel: ChE 413. Two lectures; 1 two-hour computation period.

ChE 441, 442, 443. **Elements of Process Industries.** (g) 2 hours each term.

Inorganic and organic chemical technology; the development and economic aspects of commercial operations; kinetics. Two lectures; 1 recitation.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

ChE 501. **Research.** Terms and hour 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.

Classification of modern plastics; preparation, properties, and special fields of application; commercial processes of manufacture; fabrication. Prerequisite: Ch 430, 431, 432, or equivalent.

ChE 512. **Economic Balance.** 3 hours.

Solution of typical chemical engineering and applied chemistry problems from the standpoint of economic considerations; optimum conditions of design and operation.

ChE 513. **Petroleum Refining.** 3 hours.

Processes by which crude petroleum is converted into commercial products; special attention to application of fundamental operations of absorption, distillation, cracking, etc.

ChE 514. **Fluid Flow.** 2 hours.

Investigation of special phases of fluid flow, such as high pressure gas transmission systems, economics, and multiple parallel lines; special attention to recent literature. Prerequisite: ChE 413. One lecture; 1 two-hour recitation.

ChE 515. **Unit Processes.** 2 hours.

Advanced studies of typical processes such as hydrogenation, halogenation, alkylation, and nitration. Prerequisite: Ch 432, ChE 413. One lecture; 1 two-hour recitation.

ChE 521. **Diffusional Operations.** 3 hours.

Study of unit operations of evaporation, distillation, absorption, and extraction at an advanced level. Methods of solution of problems dealing with multicomponent mixtures are stressed. Prerequisite: ChE 413. Two lectures; 1 two-hour computation period.

ChE 522. **Heat Transmission.** 3 hours.

Mechanism of transference of heat energy; engineering applications. Two lectures; 1 two-hour computation period.

ChE 523. Process Laboratory. 3 hours.

Laboratory study of selected unit processes. Designed to emphasize the fundamentals of the subject. Prerequisite: organic chemistry.

ChE 531, 532, 533. Electrochemical Engineering. 3 hours each term.

A study of present-day electrochemical and electrometallurgical industrial practices with emphasis upon processes, efficiencies, operation, and cell or furnace design. Two lectures; 1 two-hour computation period.

COURSES IN MINING ENGINEERING

UPPER-DIVISION COURSES

MiE 331, 332. Mining. 3 hours fall and winter.

Theory and practice of prospecting; mine development, mining law, drilling, explosives, blasting, and mine support.

MiE 333. Mining. 3 hours spring.

Mining methods as applied to placer, open cut, and underground mining; mine exploration in general.

MiE 405. Reading and Conference. (g) Terms and hours to be arranged.**MiE 453. Mine Surveying.** (g) 3 hours spring.

Surveying problems in mining-engineering practice; determination of true meridian. Prerequisite: CE 226. One lecture; 2 three-hour laboratory periods.

MiE 471, 472. Fire Assaying. (g) 2 hours fall and winter.

Fire assaying of ores and metallurgical products; sampling; slag calculations; oxidation and reduction; special methods; principles of pyrometallurgy demonstrated by fire assaying. Prerequisite or parallel: Ch 204. One lecture; 2 three-hour laboratory periods.

MiE 482. Mineral Dressing. (g) 3 hours fall.

Principles of comminution, concentration, and related processes; methods of treatment and machinery used. Prerequisite or parallel: Met 263, G 312, or equivalents.

MiE 483. Mineral Dressing Laboratory. (g) 3 hours winter.

Quantitative experiments to demonstrate principles and teach practice of mineral dressing methods; procedures for ore testing; technical reports. Prerequisite: MiE 482. One lecture; 2 three-hour laboratory periods.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

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 four general fields of structures, hydraulics, sanitation, and highways. The curriculum is planned to prepare graduates for advancement to responsible positions.

Highway, structural, and sanitary engineering are offered as options in the civil-engineering curriculum 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 design, construction, operation, and maintenance work.

Equipment. The department is provided with quarters and equipment for performing its work adequately and thoroughly. The structural, soils, and sanitary laboratories, located on the ground floor of Apperson Hall, are equipped for the needs of both undergraduate and graduate instruction. Adjacent to the laboratories is a shop with modern equipment for making test specimens and models. A large room on the ground floor of the Industrial Arts Building houses the surveying instruments, and the middle third of the Engineering Laboratory is equipped with hydraulic equipment.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- CE 201, 202, 203. Introduction to Civil Engineering.** 2 hours each term. Fundamentals of graphic analysis, descriptive geometry, structural and topographic drafting, including field curves, in relation to the practice of structural, hydraulic, highway, and sanitary engineering. Two three-hour laboratory periods.
- CE 212. Mechanics (Statics).** 3 hours. Applied mechanics for engineering students. Prerequisite: differential calculus. One recitation; 2 two-hour computation periods.
- CE 213. Mechanics (Dynamics).** 3 hours. Continuation of CE 212. Principles and problems in kinetics; force as a factor causing motion; work, energy, friction, and impact. Prerequisite: CE 212. One recitation; 2 two-hour computation periods.
- CE 221. Plane Surveying.** 3 hours. Theory and use of engineer's transit, tape, and level; evaluation of effect of errors on observation; application of surveying methods to problems in construction and area surveys. Prerequisite: Mth 101. One recitation; 2 three-hour field periods.
- CE 222. Plane Surveying.** 3 hours. Surveying problems relating to construction and land surveying; special computation problems in map projections, control surveys, and earthwork; tests and adjustment of engineer's transit and level. Prerequisite: CE 221. One recitation; 2 three-hour field and computation periods.
- CE 223. Plane Surveying.** 3 hours. Control surveys; computation of statewide coordinates; topographic mapping; theory and use of stadia and plane table; field astronomy. Prerequisite: CE 222. One recitation; 1 six-hour field period.
- CE 224, 225. Surveying for Landscape Architecture Students.** 3 hours each term. Practical use of engineer's level, tape, and transit in planning and layout of projects in landscape architecture; principles of topographic mapping; use of engineer's transit and telescopic alidade in making stadia surveys; practical use of plane table; practical problems in making and using topographic data. One recitation; 2 three-hour laboratory periods.
- CE 226. Plane Surveying.** 3 hours. Theory and use of engineer's transit, tape, and level; application of surveying methods to problems in construction and area survey. Prerequisite: Mth 101. One recitation; 2 three-hour field periods.

UPPER-DIVISION COURSES

- CE 311. **Fluid Mechanics.** 3 hours.
Application of mechanics to compressible and incompressible fluids; laboratory measurements. Prerequisite: CE 212, Mth 203. Two recitations; 1 three-hour laboratory period.
- CE 312. **Hydraulics.** 3 hours.
Continuation of CE 311. Special hydraulic problems, including the laws of hydraulic similitude. Prerequisite: CE 311. One recitation; 2 two-hour laboratory periods.
- CE 313. **Hydraulic Machinery.** 3 hours.
Operation, characteristics, efficiency, theory, design, and installation of pumps and turbines; laboratory studies. Prerequisite: CE 311. Two recitations; 1 three-hour laboratory period.
- CE 320. **Elementary Photographic Surveying.** 3 hours.
Principles of modern photo-mapping methods and their practical applications. Three two-hour lecture-computation periods.
- CE 321. **Advanced Surveying.** 3 hours.
Precise leveling, triangulation, base-line measurement, stellar and solar observations, aerial mapping. Prerequisite: CE 223. One recitation; 2 three-hour field periods.
- CE 322. **Elementary Hydraulics.** 3 hours.
Principles underlying pressure and flow of water; laboratory measurements. For agricultural-engineering students. Prerequisite: Mth 103. Two recitations; 1 three-hour laboratory period.
- CE 331. **Navigation.** 3 hours.
Fundamental laws of navigation; longitude, latitude, spherical trigonometry; commercial flight routes; flight instruments. Two recitations; 1 three-hour laboratory period.
- CE 332. **Curves and Earthwork.** 3 hours.
Easement; parabolic curves as related to railroads, highways, and canals; surveys; complete survey of a transportation line; estimates of quantities. One recitation; 2 three-hour field periods.
- CE 341. **Fluid Mechanics.** 3 hours any term.
For students in electrical, mining, and mechanical engineering. Prerequisite: CE 212 or ME 212, Mth 203. Two recitations; 1 three-hour laboratory period.
- CE 342. **Hydraulic Machinery.** 3 hours.
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.
- CE 351, 352. **Strength of Materials.** 3 hours each term.
General principles of mechanics applied to the elements of engineering structures to determine their strength and fitness. Prerequisite: CE 212 or ME 212, Mth 203. One recitation; 2 two-hour laboratory periods.
- CE 362. **Modern Construction Methods.** 2 hours.
Modern methods of earth moving; economic haul for various types of equipment; use of explosives. Prerequisite: CE 351. One lecture; 30 hours laboratory arranged during the term.

CE 382. Structural Analysis. 4 hours.

Graphical and algebraic analysis of statically determinate structures. Prerequisite: CE 212 or ME 212. Two recitations; 2 two-hour laboratory periods.

CE 383. Reinforced Concrete. 4 hours.

Study and design of the elements of reinforced concrete including beams, slabs, girders, and columns. Prerequisite: CE 351, 382. Two recitations; 2 two-hour laboratory periods.

CE 401. Research. Terms and hours to be arranged.**CE 403. Thesis.** Terms and hours to be arranged.**CE 405. Reading and Conference.** Terms and hours to be arranged.**CE 407. Seminar.** 1 hour.**CE 411. Hydrology.** 3 hours fall.

Precipitation, storage, and run-off; field studies in standard methods of measurement. Two recitations; 1 three-hour laboratory period.

CE 412. Sanitary Engineering. (g) 3 hours.

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.

CE 413. Sanitary Engineering Laboratory. (g) 3 hours.

Laboratory practice in standard methods of water and sewage analysis. Prerequisite: senior standing. One recitation; 2 three-hour laboratory periods.

CE 421. Highway Engineering. (g) 4 hours.

Highway and street design; theory of structural design for rigid slab and flexible type pavement; subgrade stabilization; drainage design. Prerequisite: senior standing. Two recitations; 2 three-hour laboratory periods.

CE 422. Highway Engineering. (g) 3 hours.

Traffic surveys; methods of modern traffic control; safety; motor-vehicle laws; pedestrian control. Two recitations; 1 three-hour laboratory period.

CE 425. Economics of Highway Transportation. (g) 3 hours.

Highway economics; cost, benefit, and revenue factors; motor vehicle operation costs; economic theory of highway development and extensions. Two recitations; 1 three-hour laboratory period.

CE 427. Contracts and Specifications. (g) 3 hours.

General principles and laws of contracts as applied to engineering.

CE 433. Roads and Pavements. (g) 3 hours.

Fundamental principles of location, construction, and maintenance of roads; materials used in road and street building.

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.

CE 454. Sewage Disposal. (g) 3 hours.

Disposal and treatment of sewage; design and operation of sewage-treatment plants. Prerequisite: CE 311. Two recitations; 1 three-hour laboratory period.

- CE 460. **Estimating and Cost Analysis.** (g) 3 hours.
Quantity surveying; general and detailed considerations in establishing unit prices; subcontracts, overhead cost, and profits; estimates. Two recitations; 1 three-hour laboratory period.
- CE 471. **Soil Mechanics.** (g) 3 hours.
Evaluation and utilization of soil materials for engineering applications; highway subgrades and base courses; earth dam construction and foundations. Prerequisite: CE 311, 351, 352, ME 316. One lecture; 1 four-hour laboratory period.
- CE 472. **Masonry and Foundations.** (g) 4 hours.
Study and design of masonry foundations, walls, piers, dams, and arches. Prerequisite: CE 383. Two recitations; 2 three-hour laboratory periods.
- CE 481. **Structural Engineering.** (g) 4 hours.
Study and design of elements of riveted steel; design and detail of riveted-steel structures. Prerequisite: CE 351, 382. Two recitations; 2 three-hour laboratory periods.
- CE 482. **Structural Design.** (g) 4 hours.
Study and design of timber members in tension, compression, and flexure, with their connections; design and details of simple timber structures. Prerequisite: CE 351, 382. Two recitations; 2 three-hour laboratory periods.
- CE 483. **Building Design.** (g) 4 hours.
Study and design of building elements constructed of steel, reinforced concrete, timber, and miscellaneous building materials; fabrication and construction. Prerequisite: CE 472, 481. Two recitations; 2 three-hour laboratory periods.
- CE 485. **Indeterminate Structures.** (g) 3 hours.
Elastic deflections and methods of analysis of statically indeterminate stresses. Prerequisite: CE 382. Two recitations; 1 three-hour laboratory period.
- CE 486. **Structural Analysis.** (g) 3 hours.
Study and stress analysis of statically indeterminate structures such as continuous beams and rigid frames; methods of analysis. Prerequisite: CE 382. One recitation; 2 three-hour laboratory periods.

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.
- CE 519. **Soil Mechanics.** 3 hours.
Factors affecting settlement of building foundations; stability of earth dams and dikes; variations in shear strength of clays; principle of flow nets; trends in soil mechanics.
- CE 520. **Measurement of Water.** 3 hours.
Intensive study of reports on the measurement of flowing water by means of weirs, orifices, venturi meters, pitot tubes, current meters, bends, salt-velocity, and Parshall flumes.

- CE 521. **Fluid Mechanics.** 3 hours.
Dimensional analysis; principles of energy, continuity, and momentum; hydraulic jump and wave motion; hydrodynamics.
- CE 522. **Water-Power Engineering.** 3 hours.
Development of water power; storage and load; characteristics of modern turbines; selection of turbines; problems in design.
- CE 523. **River Control and Utilization.** 3 hours.
Study of the methods of controlling flood flow in streams; design of dikes, shore protection facilities, retarding and impounding basins; laws of similitude; use of hydraulic models.
- CE 530. **Structural Stresses.** 2 hours.
Stress analysis of space frames and continuous frames; use of elastic equations and distributed moments.
- CE 531. **Mechanical Methods of Stress Analysis.** 2 hours.
Theory and use of Beggs Deformeter, wire models, Gottschalk Continostat and Photoelastic Polariscope as applied to the solution of stresses in continuous frames.
- CE 532. **Bridge Design.** 3 hours.
Problems in location, economic selection, and design of steel bridges.
- CE 533. **Analysis and Design of Concrete Structures.** 3 hours.
Problems in analysis and design of elastic concrete structures. Prerequisite: CE 483, 485.
- CE 540. **Sanitary Engineering Design.** 3 hours.
Measurements, computations, and estimates of storm and sanitary sewers. Flow networks investigations. Design and estimates of water and sewage treatment plants.
- CE 541. **Stream Purification.** 3 hours.
A study of stream pollution, oxygen sag, reaeration, and their effects.
- CE 542. **Water and Sewage Treatment Processes.** 3 hours.
Critical review of recent and current researches in the field of water and sewage treatment.
- CE 543. **Treatment Plant Operation and Control.** 3 hours.
Field analysis of water and sewage treatment plant operations and methods of control.
- CE 550. **Highway Administration and Finance.** 3 hours.
Development of highway systems; organization of state and national highways; principles of highway finance; federal aid; technical functions of various highway units.
- CE 551. **Municipal Engineering and City Planning.** 3 hours.
Modern city streets, boulevards, and transportation systems; drainage and sanitation; water supply; lighting.
- CE 552. **Transportation Engineering.** 3 hours.
Study of related engineering factors pertaining to movement of freight by rail, water, air, and highways.
- CE 553. **Street and Highway Traffic Control.** 3 hours.
Study of various factors affecting operation of streets and highways from standpoint of efficiency and safety.

Electrical Engineering

THE curricula in electrical engineering are designed to train the student in the fundamental principles and in those collateral subjects needed by a well-trained engineer. Both electrical theory and application are presented by means of lectures, recitations, computations, laboratory courses, and inspection trips.

The undergraduate curricula emphasize the fundamentals of electrical engineering and related subjects in science and engineering. Specialized courses have been kept to a relatively small number in the undergraduate years. Three options are offered in the senior year: Power, Communication, and Business. The student selects the program in which his interests lie. The Power Option deals with the generation, transmission, distribution, and utilization of electric energy. The Communication Option is for students interested in wire communication, radio, and related work such as television and radar. The Business Option offers supplementary courses for those students whose interests lie in the fields of management and sales rather than in the more technical fields.

Facilities. The Electrical Engineering Department occupies Dearborn Hall which was designed to meet the needs of the departmental instruction and service courses. This building has a floor space of 56,500 square feet for classrooms, laboratories, offices, and other space requirements.

Laboratory equipment is available for demonstrating and verifying the fundamental electrical principles and theories and also for research. Laboratories are provided for experimental work in electric circuits, electric-power machinery, wire communications, radio, electromagnetic radiation, electronics, industrial electronics, electrical measurements, high voltage, illumination, servo-mechanisms, and standardization of instruments.

The machinery laboratory is equipped with alternating- and direct-current machinery, and transformers of various types. It is also equipped with power supply sources making available d-c and a-c power over a wide range of voltages and currents.

The communications laboratories are well provided with equipment and instruments for studying electroacoustics, wire and radio communication, and such related subjects as television and radar. Four laboratory units exist, electroacoustic laboratories, wire communication laboratories, radio laboratories, and an antenna laboratory on the roof of the building which is arranged for mounting antennas of various types. Each laboratory unit is provided with several research rooms. The facilities of Radio Station KOAC, including the 5,000-watt Western Electric transmitter, with directional antenna array, also are available for instructional and experimental purposes.

The circuits laboratory has adequate facilities for laboratory work in the basic electrical theory given during the sophomore year.

The high-voltage laboratory is equipped with apparatus for 60-cycle potentials up to 350,000 volts and impulse or "lightning" voltage waves of adjustable shape and magnitude. This laboratory is also provided with high-voltage, sphere gap voltmeters, surge-voltage records, high-voltage rectifiers, and other apparatus necessary for high-voltage testing and research.

A measurements laboratory is equipped for an advanced course in electrical measurements and the study of the electrical and magnetic characteristics of materials used in electric circuits and equipment.

The standardizing laboratory is provided with instruments for the precise measurement of potential, current, and power and for the standardization and calibration of electrical measuring instruments and meters.

There are two laboratories for experimental and research work in electronics. One is devoted to fundamental work and the other to the industrial aspects.

The control laboratory provides facilities for experimental work in control, automatic control, and servomechanisms.

The illumination measurements laboratory is designed for light measurements and experimental work with various kinds of lighting fixtures and light sources. The laboratory is constructed without windows which permits making measurements at any time without outside light interference.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

EE 201, 202, 203. Introduction to Electrical Engineering. 4 hours each term.

Fundamentals of magnetic and electric fields and associated circuits, and electric circuit theory. Prerequisite: GE 101, 102, 103, Ph 101, 102, 103, Mth 101, 102, 103, or equivalents. Two lectures; 2 two-hour recitations; 1 three-hour laboratory period.

UPPER-DIVISION COURSES

EE 311, 312, 313. Electric Circuits and Equipment. 3 hours each term.

Single and polyphase electric circuits; theory and characteristics of direct and alternating current machines and equipment. Prerequisite: EE 201, 202, 203 or equivalent. Two lectures; 1 three-hour laboratory period.

EE 321, 322, 323. Electronics. 3 hours each term.

Fundamental theory of electronics including thermionic emission, cold cathode emission, photoelectric emission, space charge, and discharges in gases; principles of vacuum, gas, and vapor tubes and their basic associated circuits. Prerequisite: EE 201, 202, 203 or equivalent. Two lectures; 1 three-hour laboratory period.

EE 351, 352, 353. Industrial Electricity. 3 hours each term.

Fundamentals of electric circuits and equipment emphasizing the application to industry. Prerequisite: junior standing. Two lectures; 1 three-hour laboratory period.

EE 354, 355. Industrial Electricity. 3 hours each term.

Direct and alternating current circuits and machines. Especially for chemical and metallurgical engineering students. Prerequisite: junior standing. Two lectures; 1 three-hour laboratory period.

EE 356. Industrial Electricity. 3 hours.

Abbreviated course covering direct and alternating current circuits and machines. For civil and industrial engineering students. Prerequisite: junior standing. Two lectures; 1 three-hour laboratory period.

EE 357. Industrial Electricity. 3 hours.

Distribution systems for industrial power and lighting, including equipment, safety appliances, and economic aspects. Prerequisite: EE 356. Two lectures; 1 three-hour laboratory period.

EE 358. Electricity in Aeronautics. 3 hours.

Fundamentals of electrical engineering as applied to aircraft and aerial navigation. Prerequisite: junior standing. Two lectures; 1 three-hour laboratory period.

- EE 359. **Airway Communication Systems.** 3 hours.
Systems of electrical communication used in air transportation. Prerequisite: junior standing. Two lectures; 1 three-hour laboratory period.
- 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.
- EE 411, 412, 413. **Electrical Engineering Economy.** (g) 3 hours each term.
Power and communication utility economy including plant investment; system of accounts; service tariffs; operation, regulation, and public relations problems. Prerequisite: EE 313, 323 or equivalent. Two lectures; 1 three-hour laboratory period.
- EE 414, 415, 416. **Electrical Measurements and Analysis.** (g) 3 hours each term.
Theory and techniques of d-c and a-c electrical measurements, including a study of measuring devices and measurements of electric, dielectric, and magnetic properties of materials encountered in electrical engineering. Prerequisite: EE 313, 323, or equivalent. Two lectures; 1 three-hour laboratory period.
- EE 420. **Electrical Engineering Analysis.** (g) 3 hours.
Electrical engineering problems, including the derivation and solution of differential equations for electrical and mechanical systems, applications of Fourier series and Bessel functions, and the reduction of experimental data to empirical equations. Prerequisite: differential equations. Two lectures; 1 two-hour recitation period.
- EE 421, 422, 423. **Transmission Lines and Networks.** (g) 3 hours each term.
Generalized theory of transmission over circuits with distributed constants and with lumped constants for power and communication frequencies. Power limits of transmission lines, steady state and transient stability of transmission systems. Prerequisite: EE 313, 323, or equivalent. Two lectures; 1 three-hour laboratory period.
- EE 431, 432, 433. **Transformers and Rotating Electrical Machinery.** (g) 3 hours each term.
Theory, design features, and characteristics of transformers and rotating electrical machinery with special emphasis on a-c machinery. Prerequisite: EE 313, 323, or equivalent. Two lectures; 1 three-hour laboratory period.
- EE 450. **Electromagnetic Waves.** (g) 3 hours.
Basic equations, theorems, and laws of electromagnetic fields and their applications to problems involving wave reflection, antennas, radiation, wave guides, and propagation in the ionosphere. Prerequisite: senior standing in electrical engineering or physics or mathematics. Two lectures; 1 two-hour computation period.
- EE 461, 462, 463. **Wire and Radio Communication.** (g) 3 hours each term.
Fundamental theory of wire and radio communication equipment and systems, including electroacoustics, telegraphy, telephony, point-to-point radio and radio broadcast, and television. Prerequisite: EE 313, 323 or equivalent. Two lectures; 1 three-hour laboratory period.

EE 481, 482, 483. Radio Engineering Practices. 1 hour each term.

Engineering and operating practices employed in modern radio broadcasting. Radio Station KOAC is used; instruction is given by engineer-in-charge. Prerequisite: senior standing in electrical engineering or physics. One lecture; 1 two-hour laboratory period.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit. Courses at the graduate level are given when warranted by demand.

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.**EE 511, 512, 513. Electronics.** 3 hours each term.

Emission of electrons; their behavior in electric and magnetic fields; conduction through gases at various pressures; application of electronic principles to high-vacuum gas and vapor tubes; special electronic devices including microwave equipment. Two lectures; 1 three-hour laboratory period.

EE 521, 522, 523. High-Voltage Engineering. 2 hours each term.

Experimental investigation and study of dielectric phenomena in high-voltage engineering. One lecture; 1 three-hour laboratory period.

EE 525, 526, 527. Industrial Electronics. 2 hours each term.

Industrial applications of electronics; vacuum tubes such as kenotrons, mercury-arc rectifiers, ignitrons, thyratrons, and photo-tubes; these tubes and devices as power rectifiers, converters, and electrical controls; X-ray production and applications in industry; induction and dielectric heating. One lecture; 1 three-hour laboratory period.

EE 531. Materials in Electrical Engineering. 3 hours.

Properties of conductors, insulators and magnetic materials used in electrical engineering. Two lectures; 1 three-hour laboratory period.

EE 535. Tensor Analysis in Electrical Engineering. 3 hours.

Methods used in matrix algebra and tensor analysis with special attention to use in problems involving electric phenomena.

EE 537. Electric Transients. 3 hours.

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.

EE 541, 542, 543. Electric Power Systems. 3 hours each term.

Advanced study of electric power generation, transmission, distribution, and utilization. Two lectures; 1 three-hour laboratory period.

EE 544. Power System Stability. 3 hours.

Steady-state and transient stability of electric power systems; attainment of economic loading of long transmission circuits; influence of relay, circuit-breaker, and machine characteristics, and of series and shunt capacitors on system stability. Prerequisite: EE 421, 422, 423, or EE 431, 432, 433. Two lectures; 1 three-hour laboratory period.

EE 545. Electrical Problems. 3 hours.

Advanced problems in electrical engineering, unbalanced circuits, and equivalent networks.

- EE 554, 555, 556. Control Engineering.** 3 hours each term.
Study of manual, semiautomatic, and fully automatic control systems as used in industry; fundamental principles of control engineering; devices used to produce specific results. Two lectures; 1 three-hour laboratory period.
- EE 561, 562, 563. Wire Communication.** 3 hours each term.
Advanced engineering study of theory and application of electrical transmission of information and other signals over wire lines and networks. Two lectures; 1 three-hour laboratory period.
- EE 571, 572, 573. Radio Communication.** 3 hours each term.
Advanced engineering study of modern radio communication including facsimile and television in both broadcast and point-to-point service; design and testing of modern transmitters, receivers, antenna systems, and associated equipment; detailed study of radiation and propagation of electromagnetic waves including theory of wave guides. Two lectures; 1 three-hour laboratory period.
- EE 575. Engineering of Sound Systems.** 3 hours.
Electroacoustic equipment such as microphones, amplifiers, and loud speakers and their engineering application to sound amplification and distribution both in buildings and in the open. Two lectures; 1 three-hour laboratory period.
- EE 581, 582, 583. Illumination.** 2 hours each term.
Light sources and their application to exterior and interior illumination.
- EE 591, 592, 593. Electrical Transportation.** 2 hours each term.
Application of electricity to street and interurban transportation; traffic conditions; rolling stock; speed time curves.

Industrial Engineering and Industrial Arts

THE Department of Industrial Engineering and Industrial Arts provides technical and professional training for industrial engineering, industrial administration, production control, and other phases of scientific management so vital to business and industry if quality and productive ability are to be maintained in the face of increasing labor and materials costs. Both the managers and the artisans of industry, from skilled labor to the industrial designers and production managers, are dependent upon an integral and intimate knowledge of industrial processes, the skills, and the machine applications necessary to produce the articles they collectively will create. These are the specific concerns of the industrial engineer and the student in industrial administration.

The Department of Industrial Engineering and Industrial Arts provides instruction in the technical courses required for the preparation of industrial arts teachers (see curriculum for Industrial Arts Education, pages 299-300) and offers service courses in engineering shop work for students in mechanical, electrical, agricultural, and chemical engineering. Service courses and electives are available to others as the facilities will permit.

The Industrial Administration Curriculum (pages 329-331) is designed to meet the ever-increasing demand in industry for men with basic skills and technical knowledge, supplemented with studies in scientific management and in business administration. This program of studies includes those accepted principles and practices by which the manufacturing industries have evolved a

system of production control, giving optimum results to the community, the consumer, the worker, and the manufacturer. Correlation of the technical studies, manufacturing processes, and management principles is emphasized to the extent that graduates of this curriculum can progress to supervisory and junior executive positions. The options (Metal Industries, Wood Industries, Tool Design), and the electives enable the student to specialize in the particular phases of industry consistent with his interests and aptitudes. The program affords a rich opportunity to combine technical training and business applications in industrial maintenance and improvement of service occupations, such as technicians in industry, production managers, tool designers, and time-study men.

The Industrial Engineering Curriculum (pages 326-327) is designed to train students for the engineering, production, or technological-administrative departments of industry. Technical knowledge in the manufacturing processes is supplemented with studies in business and industry, economics, safety engineering, and scientific management. Particular emphasis is placed on engineering and industrial management as applied to operation analysis, labor problems, work simplification, plant layout, production planning and control. Students are prepared for those positions in industry which require primarily a combination of engineering and business judgment in the management of men, materials, machines, and processes. The goal of the professional industrial engineer is to produce a superior product at the minimum cost consistent with fair employer-employee relationships. After gaining satisfactory experience in engineering practice, graduates of this curriculum should be qualified for the highest executive positions in industry.

Facilities. The Department of Industrial Engineering and Industrial Arts is housed in three buildings with a combined floor space of approximately forty 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 equipped along modern 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, and the School of Science contribute toward the enrichment of curricular opportunities.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

***IE 111. Pattern Making.** 3 hours.

Fundamentals of pattern making; relation of pattern making to drafting, design, foundry and machine-shop operation. One lecture; 6 one-hour laboratory periods. For business and technology students: 2 lectures; 1 four-hour laboratory period.

***IE 112, 113. Methods in Woodworking.** 3 hours each term.

Woodworking, with special reference to tool techniques, applied design, and craftsmanship in group and individual projects. Prerequisite: IE 111 or approval of the department. One lecture; 6 laboratory hours.

* In courses designated by asterisks, in addition to the regularly scheduled meetings, the student attends three general lectures to be arranged during the term.

***IE 141. Foundry Practices. 3 hours.**

Constitution, properties, and design limitations of casting in gray iron, malleable iron, and steel; methods used in the production of castings. One lecture; 2 three-hour laboratory periods. For business and technology students: 2 lectures; 1 four-hour laboratory period.

***IE 152. Forging and Welding. 3 hours.**

Forging, forming, and heat-treating of steel, followed by gas and electric-arc welding, flame cutting, brazing, and resistance welding operations. Attention is given throughout the course to care of equipment and to organization and use of instructional materials. One lecture; 2 three-hour laboratory periods. For business and technology students: 2 lectures; 1 four-hour laboratory period.

***IE 163. Machine Tool Practices. 3 hours.**

Use of basic machine tools on prescribed projects representative of industrial operations. One lecture; 2 three-hour laboratory periods. For business and technology students: 2 lectures; 1 four-hour laboratory period.

IE 213. Furniture Design. 2 hours.

Study of types and periods of furniture; application of design and construction principles of furniture and cabinet drawing. Prerequisite: GE 112, AA 295 or equivalent. One lecture; 5 laboratory hours.

IE 220. Wood Turning. 2 hours.

Tool processes and lathe technique; designing, turning, and finishing of individual projects of merit. Prerequisite: IE 111 or IE 112 or equivalent. One lecture; 5 laboratory hours.

IE 225. Machine and Tool Maintenance (Wood Shop). 2 hours.

Methods of care and maintenance of woodworking tools, machines, and supplementary equipment. Prerequisite: IE 111 or IE 112 or equivalent. Two lectures; 4 laboratory hours.

***IE 240. Foundry Practices. 2 hours any term.**

Introductory course covering constitution, properties, and design limitations of castings in iron and steel; fundamental methods in the production of castings. One lecture; 1 four-hour laboratory period.

IE 250. Forging and Welding. 2 hours any term.

Forging, forming and heat-treating of steel, followed by gas and electric-arc welding, flame cutting, brazing, and resistance welding operations. Attention is given throughout the course to practical applications of these processes in engineering construction and industrial fabrication. One lecture; 1 four-hour laboratory period.

***IE 260, 261. Machine Tool Practices. 2 hours each term.**

Basic and advanced operations of machine tools on prescribed projects illustrative of industrial operations. Correlation of engineering and manufacturing problems and processes. One lecture; 1 four-hour laboratory period.

IE 265. Machine and Tool Maintenance (Machine Shop). 2 hours.

Maintenance and repair problems for mechanical equipment. Methods and procedures in tool and cutter sharpening. Prerequisite: IE 163 or 260. Two lectures; 4 laboratory hours.

* In courses designated by asterisks, in addition to the regularly scheduled meetings, the student attends three general lectures to be arranged during the term.

- IE 290. Introduction to Scientific Management.** 3 hours.
History, development, and scope of scientific management. Laws of scientific management as applied to manufacturing.

UPPER-DIVISION COURSES

- IE 311. Mill Work—Machine Woodwork.** 3 hours.
A production course in machine woodworking. Prerequisite: IE 111 or 112 or equivalent. One lecture; 2 three-hour laboratory periods.
- IE 313, 314. Furniture Construction.** 2 hours each term.
The designing and construction of furniture and cabinet work, according to the needs and ability of the individual student. Prerequisite: IE 311 or approval of department. One lecture; 5 laboratory hours.
- IE 315. Upholstering and Seat Weaving.** 2 hours.
Typical upholstering processes including construction of frames and foundations with and without springs; seat and panel weaving. Prerequisite: IE 112 or equivalent. One lecture; 5 laboratory hours.
- IE 316. Wood and Metal Finishing.** 3 hours.
Materials and processes for the application of modern finishes to both old and new work on both wood and metal surfaces; brush and spray application of finishing materials. Prerequisite: IE 112 or equivalent. One lecture; 6 laboratory hours.
- IE 321. Wood Turning.** 1 hour.
Continuation of IE 220. Emphasis on more intricate cuts and turning processes, special chucking devices, and fancy turning. Prerequisite: IE 220. One three-hour laboratory period.
- IE 326. Fiber Furniture Weaving.** 2 hours.
The construction of frames and the weaving of art-fiber furniture, with suggestions for the use of this material in public-school teaching. Prerequisite: IE 112 or equivalent. One lecture; 5 laboratory hours.
- IE 332. Pattern Making.** 2 hours.
Continuation of IE 111, with emphasis on problems in making of patterns for more complicated machine parts and on factors influencing production costs of these parts. One lecture; 5 laboratory hours.
- IE 333. Carpentry and Building Construction.** 3 hours.
Application of carpentry fundamentals including actual construction in miniature from architect's plans, all with particular reference to the "Building Boy Builders" program as a core project in secondary education. Laboratory work also includes framing of rafters and selected architectural sections with full-size lumber. Prerequisite: IE 112. One lecture; 6 laboratory hours.
- IE 342. Foundry Practices.** 2 hours.
Equipment for school and home workshops; processes and projects suited to public-school applications in industrial-arts classes. Prerequisite: IE 141 or 240. One lecture; 1 four-hour laboratory period.
- IE 343. Casting Processes: Nonferrous.** 2 hours.
Study of fundamental processes in the casting of aluminum and copper-base alloys, with emphasis on quality control. Prerequisite: IE 141 or 240. One lecture; 1 four-hour laboratory period.

- IE 345. Casting Quality Control.** 2 hours.
Foundry raw materials; control of foundry sands; gating and risering theory; pattern design; ferrous melting and refining units; production of alloy cast irons; casting inspection; analysis of defects. Prerequisite: IE 141 or 240. Two lectures; 1 four-hour laboratory period.
- IE 346. Magnesium-Aluminum Foundry Practices.** 2 hours.
Study of aluminum and magnesium alloys and methods of fabrication; Dural and its age-hardening characteristics; practices in sand casting and permanent-mold casting of Al-Cu and Al-Mg alloys; study of die casting, welding, extruding, forging, and machining; magnesium foundry practices and methods of fabrication of light metals. Prerequisite: IE 141 or 240. One lecture; 1 four-hour laboratory period.
- IE 349. Ceramic Technology.** 3 hours.
Ceramic industry and processes used, with particular reference to Oregon resources. Silicate group; raw materials for ceramic bodies, body preparation, forming and drying; firing, glazes, properties, and tests; industrial applications. Prerequisite: Ch 203 and junior standing. Two lectures; 1 four-hour laboratory period.
- IE 353. Ornamental Iron Work.** 2 hours.
Craftsmanship in wrought-iron work; designing and making of wrought-iron furnishings, lamps, light fixtures, etc. Prerequisite: IE 152 or 250. One lecture; 5 laboratory hours.
- IE 354, 355, 356. Welding Processes and Applications.** 2 hours each term.
A study of welding processes and techniques applied to ferrous and non-ferrous metals. Selection of processes for typical production welding jobs; design and use of production welding devices—jigs, fixtures, forming, and handling equipment; welded product design and construction, including the engineering and economic problems involved. Prerequisite: IE 152 or 250. Two lectures; 1 two-hour laboratory period.
- IE 361, 362. Mass Production Methods.** 2 hours each term.
Use and application of machine tools in mass production; the functions of jigs, fixtures, and dies in quantity production. Group problems and projects. Prerequisite: IE 261. One lecture; 1 four-hour laboratory period.
- IE 363. Production Machine Work.** 3 hours.
The selection, set-up, operation, and maintenance of production machines in relation to quantity production. Applications through construction of group problems and projects. Prerequisite: IE 362. One lecture; 6 laboratory hours.
- IE 369. Jigs, Fixtures, and Die Design.** 2 hours.
Design and application of jigs, fixtures, and dies; sequence of operation analysis, dimensional control in machining operations; economics of tool engineering. Prerequisite: IE 362. One lecture; 5 laboratory hours.
- IE 370. Practical Electricity.** 3 hours.
Basic instruction in practical electricity, covering principles of electrical circuits and controls, with applications in fields of light and power wiring, stagecraft and lighting, communications. Intended primarily for prospective teachers. Prerequisite: junior standing. One lecture; 6 laboratory hours.

- IE 380. **Sheet-Metal Work.** 3 hours.
Projects in sheet-metal work and pattern drafting involving the fundamental machine and hand-tool operations. Prerequisite: GE 112. One lecture; 6 laboratory hours.
- IE 387. **Metal Crafts.** 3 hours.
Diversified metal crafts; metal spinning, and craft work in iron, copper, and Britannia metal. Prerequisite: AA 295, IE 343, or 353, or 380. One lecture; 2 three-hour laboratory periods.
- IE 390. **Safety in Industry.** 2 hours.
History of industrial safety; safety legislation, organizations, services, and training; accident costs and causes; methods of safe practice, safety and health standards and records. Prerequisite: junior standing.
- IE 391. **Methods and Motion Study.** 3 hours.
Theory and application of methods study; types of methods studies; operation and analysis sheets; principles of motion practice; micromotion studies; standardization and process charts. Prerequisite: junior standing. One lecture; 2 three-hour laboratory periods.
- IE 392. **Time Study.** 3 hours.
Theory and application of time-study techniques; job analysis and standardization; construction of standard data and formula application; synthetic determination of time standards; wage payment systems and merit rating. Prerequisite: junior standing and consent of instructor. One lecture; 2 three-hour laboratory periods.
- IE 393. **Production Planning and Control.** 3 hours.
Departmental organization and types of production control technique; codification and symbolization; forecasting, materials control, routing, scheduling, dispatching, and inspecting. Prerequisite: junior standing. One lecture; 2 three-hour laboratory periods.
- IE 394. **Materials Handling.** 3 hours.
Selection of materials-handling equipment, its application, coordination; effect of materials handling on plant layout in industrial situations. Prerequisite: junior standing in engineering.
- IE 405. **Reading and Conference.** Terms and hours to be arranged.
- IE 407. **Seminar.** 2 hours.
Prerequisite: senior standing.
- IE 411. **Shop Planning and Organization.** (G) 3 hours.
Planning and organizing the physical plant for different types of school shops. Prerequisite: Ed 408e and IEd 420 or equivalent. One lecture; 2 three-hour laboratory periods.
- IE 425. **Recreational Handicrafts.** (G) 3 hours.
Materials, projects, and procedures in developing a recreational handicraft program in secondary schools, on an extracurricular or curricular basis, and in evening adult classes; laboratory applications. Prerequisite: Ed 408e and courses in wood- and metal-work equivalent to IE 220, 313, and 343, 353 or 380. One lecture; 2 three-hour laboratory periods.
- IE 464, 465. **Tool Engineering.** 3 hours each term.
Fundamentals of tool engineering and tool design applied to machine tools, production tools, jigs, fixtures, and dies; the correlation of functional tool design with engineering and shop practices. Prerequisite: IE 362. One lecture; 6 drafting hours.

IE 469. Die Design. 3 hours.

Die design and construction for sheet metal, plastics, die-casting, forging, and extrusion. Analysis of operation sequences, dimensional control, and quality control; economics of tool engineering. Prerequisite: IE 464. One lecture; 6 laboratory hours.

IE 487. Metalcraft Problems. (G) 3 hours.

Utilization of semiprecious metals in school and home shop work; advanced skills in metal spinning, and craft work in copper, brass, and Britannia metal; processes applied to projects of practical value and artistic merit. Prerequisite: Ed 408e, AA 281, 282, 283 and IE 343, 353, or 387. One lecture; 2 three-hour laboratory periods.

IE 490. Industrial Supervision Principles. (G) 3 hours.

Basic company, supervisor, and operator objectives and responsibilities, and their relationship to one another; solutions of case problems compared with fundamentals established by industrial leaders. Prerequisite: IE 391, 392, 393, or consent of instructor.

IE 491, 492. Production Planning and Control. (G) 3 hours each term.

Quantitative analysis and economic optimum selection of machines, equipment, and labor; quantitative control in inverse relationships, least-cost combinations in purchasing quantities and in seasonal production. Prerequisite: calculus and IE 391, 392, 393.

GRADUATE COURSES

Courses numbered 400-499 and designated (*φ*) or (*G*) may be taken for graduate credit. Graduate courses in Industrial Education are listed on pages 313-315.

IE 501. Research. Terms and hours to be arranged.**IE 503. Thesis. Terms and hours to be arranged.****IE 505. Reading and Conference. Terms and hours to be arranged.****IE 507. Seminar. Terms and hours to be arranged.****IE 591. Operation Analysis. 3 hours.**

Current operation analysis techniques; application of methods and cost studies to advanced problems. Prerequisite: IE 391, 392.

IE 592. Timing Techniques. 3 hours.

Modern time-study methods; critical study of allowances, skill levels, and other advanced problems. Prerequisite: IE 391, 392.

IE 594. Plant Layout. 3 hours.

Application of principles governing selection of a plant site; development of plant layout; selection and planning of building for economic production. Prerequisite: IE 392, 394, 490.

Mechanical Engineering

THE curricula in mechanical engineering are 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.

Facilities. 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 in the Aeronautical Laboratory at the Corvallis Airport.

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 is provided with the necessary facilities for testing. The college heating plant, consisting of four 5,000-square-foot boilers and necessary auxiliaries, is also provided with testing facilities.

Equipment is available 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 a gas engine, several gasoline engines, six full Diesel engines connected to generators, automotive-type Diesels with dynamometers, all fully equipped for testing, three 100-horsepower electric dynamometers, 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 liquid cooled; two complete airplanes, a Luscombe and an F-51; and numerous wing panels, tail surfaces, instruments, and miscellaneous airplane parts. A Packard test cell for engine tests and two small smoke tunnels for the study of air flow also are 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, boiler feedwater analysis, photoelasticity, oils, fuels, and the microscopic examination, radiography, spectrum analysis, and heat treatment of metals. The equipment is modern and well arranged for the work of instruction and research.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

ME 212. Mechanics (Statics). 3 hours.

Forces and force systems with reference to the equilibrium of rigid bodies; numerous problems. Prerequisite: differential calculus. Two recitations; 1 two-hour period.

ME 213. Mechanics (Dynamics). 3 hours.

Continuation of ME 212. Principles and problems in kinetics; numerous problems. Prerequisite: ME 212. Two recitations; 1 two-hour period.

ME 216. Materials of Engineering. 3 hours.

Production, mechanical properties, and their control as applied to materials of machine and building construction. Corrosion resistance and other service requirements. Service course for nonmajors.

ME 241. Introduction to Aeronautics. 2 hours.

Brief descriptive survey of principles of flight, engine and propeller operations; navigation and meteorology; governmental aeronautical aids and regulations. Prerequisite: sophomore standing.

UPPER-DIVISION COURSES

- ME 311. Strength of Materials.** 3 hours.
General principles of mechanics applied to the elements of engineering structures to determine their strength and fitness. Service course for nonmajors. Prerequisite: ME 212. Two recitations; 1 two-hour computation period.
- ME 312. Mechanism.** 3 hours.
Mechanical movements; velocity ratios; transmission of motion by link works; gearing, cams, and belting. Two recitations; 2 two-hour laboratory periods.
- ME 314, 315. Strength of Materials.** 3 hours each term.
Similar to ME 311 with addition of stresses in curved beams, impact stresses, eccentric loading, and theories of failure. Prerequisite: ME 212. Two recitations; 1 two-hour laboratory period.
- ME 316. Materials Testing Laboratory.** 3 hours any term.
Materials of engineering construction; testing methods and specifications adopted by the American Society for Testing Materials, etc.; preparation of reports. Service course for nonmajors. One lecture; 1 three-hour laboratory period.
- ME 317. Materials Laboratory.** 3 hours winter or spring.
Similar to ME 316 but with additional emphasis on mechanical properties and structure of nonmetallic materials. Prerequisite: ME 314. Two recitations; 1 three-hour laboratory period.
- ME 321, 322, 323. Heat Engineering.** 4 hours each term.
Combustion and boilers; thermodynamic processes involved in the transformation of heat energy into work. Prerequisite: Mth 202, Ph 103, Ch 103. Three recitations; 1 three-hour computation or laboratory period.
- ME 325. Fuels and Lubricants.** 3 hours.
Preparation and processing of and tests upon solid and liquid fuels; production of motor fuels and lubricants; tests on bearings and lubricants. Prerequisite: junior standing. Two lectures; 1 three-hour laboratory period.
- ME 331, 332. Heat Power Engineering.** 3 hours each term.
Brief descriptive survey of the heat power plant and principal auxiliaries; physical properties and laws of gases and their application to power equipment. Prerequisite: Mth 202, Ph 103. Service course for electrical engineering students. Two recitations; 1 three-hour computation or laboratory period.
- ME 342. Aerodynamics.** 3 hours.
Elementary aerodynamic theory and phenomena; characteristics of airfoils and airfoil combinations; factors affecting stability, control, and performance. Prerequisite: junior standing.
- ME 343. Aeropropulsion.** 3 hours.
Screw propeller theories; selection of engines, propellers, and power-plant accessories for specific airplanes; power-plant installation. Prerequisite: ME 342. Two recitations; 1 three-hour laboratory period.
- ME 346. Steam, Air, and Gas Power.** 3 hours.
Elementary thermodynamics; properties of steam; fuels and their combustion; boilers; auxiliaries. Prerequisite: GE 101, 102, Mth 202. Service course for agricultural and civil engineering students. Two recitations; 1 three-hour computation or laboratory period.

- ME 347. **Heat Engines.** 3 hours.
Construction, operation, and performance of internal-combustion engines with emphasis on Diesel types; fuels, combustion, and lubrication as applied to internal-combustion engines; boilers and auxiliaries. Prerequisite: elementary physics and chemistry. Service course for forest engineering students. Two recitations; 1 three-hour laboratory period.
- ME 351, 352, 353. **Mechanical Laboratory.** 2 hours each term.
Basic sequence in machine testing. Proper application of instruments; tests of common machines and interpretation of results; preparation of engineering reports. Must parallel ME 321, 322, 323. One recitation; 1 three-hour laboratory period.
- ME 363. **Refrigeration and Cold Storage.** 3 hours.
Principles and practice of refrigeration and cold storage. For students in dairy manufacturing, horticulture, food industries, etc. Prerequisite: algebra and elementary physics. Two recitations; 1 three-hour computation or laboratory period.
- 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.
- 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. Prerequisite: ME 315. One recitation; 2 three-hour drafting periods.
- ME 414. **Highway Materials Laboratory.** (g) 3 hours.
For students specializing in highway engineering. Road and paving materials and binders tested and their properties determined; sheet-asphalt mixtures and bituminous mortars; types of roads and pavements analyzed for density, composition, and grading. One lecture; 1 four-hour laboratory period.
- ME 415. **Structural Materials Laboratory.** (g) 3 hours.
Plain and reinforced concrete beams and columns; reinforcing; concrete mixtures; unsymmetrical loads; riveted and welded joints; thermal conductivity; stresses in structures by strain gage. Prerequisite: ME 316. One lecture; 1 four-hour laboratory period.
- ME 416. **Engineering Metallurgy.** (G) 3 hours.
Survey of metallurgy and properties of ferrous products and nonferrous alloys from utilization standpoint; metallographic and other inspection techniques; principles of heat treatment and of machining and forming operations. Prerequisite: ME 216 and 316, or 317. Two recitations; 1 two-hour laboratory period.
- ME 431, 432. **Power-Plant Engineering.** (g) 3 hours each term.
Performance of steam and internal-combustion engine power plants from design standpoint; heat transfer; selection of equipment. Prerequisite: ME 323. Two recitations; 1 three-hour computation period.
- ME 441, 442, 443. **Airplane Design.** (g) 3 hours each term.
Design of airplanes for specific duties. Prerequisite: ME 343. One recitation; 2 three-hour laboratory periods.

- ME 447, 448, 449. **Airplane Structural Analysis.** (G) 3 hours each term.
Theory and practice of analyzing stresses in structural components of modern airplanes. Prerequisite: ME 315, 342.
- ME 451, 452. **Mechanical Laboratory.** (g) 2 hours each term.
Testing of steam turbines, refrigeration equipment, fans, a two-stage air compressor, a complete boiler plant, and internal-combustion engines; reports. Prerequisite: ME 353. One four-hour laboratory period.
- ME 453. **Mechanical Laboratory.** (g) 2 hours.
Special problems selected on basis of interest of student and equipment available. Prerequisite: ME 452. Periods arranged according to project.
- ME 456, 457, 458. **Aeronautical Laboratory.** (g) 2 hours each term.
Visual studies of flow about wings, fuselages, and other bodies; calibration of instruments; aerodynamic and structural tests; wind tunnel testing. Special studies in aircraft engine construction, operation, and testing. Prerequisite: ME 342, 353. One four-hour laboratory period.
- ME 471. **Air Transportation.** (G) 2 hours.
Effect of design fundamentals, government and international regulations, length of trip, and operational factors on economics of air transportation. Prerequisite: senior standing in aeronautical subjects.
- ME 473. **Industrial Engineering.** (G) 3 hours.
Especially arranged for mechanical engineering students. Various industrial organization systems and their methods of operation.
- ME 481. **Physical Metallurgy.** (g) 3 hours.
Constitution diagrams; homogeneous and heterogeneous equilibria; properties of metals and alloys as related to structures. Prerequisite: Ch 340. Two lectures; 1 one-hour computation period.
- ME 482. **Ferrous Metallography.** (g) 3 hours.
Internal structure, constitution, heat treatment, physical and mechanical properties of various irons and steels; preparation of metallographic specimens and development of microscopic structures; use of metallurgical microscope; photomicrography. Prerequisite: ME 481. Two lectures; 1 three-hour laboratory period.
- ME 483. **Nonferrous Metallography.** (g) 3 hours.
Internal structure, constitution, heat treatment, physical and mechanical properties of copper, aluminum, magnesium, lead, and special nonferrous alloys; preparation of metallographic specimens; use of metallurgical microscope; photomicrography. Prerequisite: ME 481. Two lectures; 1 three-hour laboratory period.
- ME 491, 492, 493. **Automotive Engineering.** (G) 3 hours each term.
Correlation of fuel and lubricant characteristics with engine performance; fuel induction systems, interpretation of exhaust gas analyses, and power-plant testing; automobile body and chassis engineering; tractive resistance; fleet operation, maintenance, and economics. Prerequisite: ME 323. Two lectures; 1 three-hour laboratory period.

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.
- ME 511, 512, 513. **Engineering Materials.** 3 hours each term.
Critical study of specifications and testing techniques. Metals; ceramic materials; plastics; electrical insulating materials, rubber, and fabrics. Any term may be taken independently. Prerequisite: ME 316. One lecture; 2 two-hour seminar periods.
- ME 516, 517, 518. **Experimental Elasticity.** 3 hours each term.
Mathematical theory of elasticity; experimental solution of problems in elasticity by means of photoelastic method; use of various types of strain gages, and mathematical analysis.
- ME 521. **Mechanical Vibrations.** 3 hours.
Vibration as applied to mechanical engineering. General theory of systems having one or more degrees of freedom; application to internal combustion engines, airplanes, vehicles, rotating machinery; vibration isolation and absorption; vibration measuring instruments and balancing machines. Prerequisite: ME 213, 312, 315, 353. Two lectures; 1 three-hour laboratory period.
- ME 531. **Applied Thermodynamics.** 3 hours.
Actual equations of state, corrected gas laws, chemical equilibrium in combustion reactions, and actual flame temperatures; specific heats, vapor pressure, and properties of real mixtures; flow of compressible fluids applied to solution of engineering thermodynamics problems. Prerequisite: ME 323 or equivalent.
- ME 534. **Gas Turbines and Jet Engines.** 3 hours.
Gas turbines as applied to power generation, process industries, and aircraft; study of various cycles and component equipment, including compressors, combustion chambers, gas turbines, heat exchangers, jets and ducts; properties of gases, fuels, and high-temperature materials. Prerequisite: ME 316, 323, 325, or equivalent. Two lectures; 1 three-hour laboratory period.
- ME 541, 542, 543. **Dynamics of Aircraft.** 3 hours each term.
Static and dynamic stability of airplanes, vibration of elastic structures, theory of flutter of wings and control surfaces.
- ME 546, 547, 548. **Aerodynamics.** 3 hours each term.
Theories of flow of perfect, viscous, and compressible fluids; theory of wings of finite and infinite spans.
- ME 561. **Heating and Air Conditioning.** 3 hours.
Modern methods of heating, ventilating, and air conditioning; computing radiating surface; effective methods of ventilation; general design, construction, and operation of plants. Prerequisite: ME 323. Two recitations; 1 three-hour computation or laboratory period.
- ME 562. **Refrigeration.** 3 hours.
Thermodynamics of refrigeration; systems in use and principal characteristics of each; fundamentals of design; principal applications. Prerequisite: ME 323. Two recitations; 1 three-hour laboratory period.
- ME 563. **Gas Technology.** 3 hours.
Manufactured and natural gas production, transmission, and distribution; industrial applications; problems of the industry including some reference to rate making and regulation. Prerequisite: ME 323, 452, or equivalent.

ME 576. Industrial Instrumentation. 3 hours.

Analysis of apparatus for measurement and control of pressure, temperature, speed, process duration, dimensional tolerances, fluid flow, liquid level, moisture content, gas composition, and solution concentration. Prerequisite: ME 432, 452, or equivalent. Two recitations; 1 three-hour laboratory period.

ME 581. Metallography and Pyrometry. 3 hours.

Alloy systems, microstructure, thermal analysis, photomicrography, X-ray diffraction; techniques and application to industrial problems and research. Prerequisite: ME 416 or equivalent. One lecture; 1 four-hour laboratory period.

ME 582. Metallography. 3 hours.

Alloy equilibrium diagrams; difficult specimens; high-power photomicrography; correlation of properties of metals with microstructure; dilatometry; structure and treatment of special steels; metal radiography. Prerequisite: ME 581. One lecture; 1 four-hour laboratory period.

ME 583. Industrial Radiology. 3 hours.

Radiographic inspection of castings, welds, and other metallic as well as nonmetallic engineering materials; X-ray diffraction applications; generating equipment, films, and protection; other nondestructive tests, including magnaflux, brittle lacquers, and similar methods. Prerequisite: ME 317, 416, EE 353 or equivalent.

School of Forestry

Faculty

PAUL MILLARD DUNN, M.S.F., Dean of the School of Forestry; Professor of Forest Management.

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

CLARA HOMYER, Secretary to the Dean.

Forest Engineering

PROFESSOR PATTERSON (department head).

ASSOCIATE PROFESSOR DAVIES.

INSTRUCTOR O'LEARY.

Forest Management

PROFESSORS McCULLOCH (department head), BARNES.

ASSOCIATE PROFESSORS NETTLETON, ROBINSON.

ASSISTANT PROFESSORS DILWORTH, KENISTON, KNORR, RANDALL, YODER.

INSTRUCTOR WHEELER.

Forest Products

PROFESSOR GRANTHAM (department head).

ASSOCIATE PROFESSORS ESPENAS, MACDONALD.

ASSISTANT PROFESSORS GRAHAM, SNODGRASS, WEST.

Forest Extension

FARM FORESTRY SPECIALIST ROSS.

FARM WOODLOT PRODUCTS MARKETING SPECIALIST GOODMONSON.

General Statement

OREGON has an interest in forestry greater than any other state in the Union. Within the state an area of 28,000,000 acres, because of peculiarities of soil, topography, and climate, appears to be permanently classified as forest land. Oregon has the largest amount of standing timber possessed by any state and it produces more lumber annually than any other. The Oregon State School of Forestry is obligated to train men to manage these great properties for continuous maximum production and economical and efficient distribution of the products.

Curricula. In the freshman year all students in forestry pursue substantially the same studies, following which they may elect one of the three majors. Because the forestry curricula require specialized training, students entering from junior colleges or similar institutions should not expect to complete the

requirements for graduation in less than three years. Except for the course in general forestry, credit will be accepted for forestry courses only from accredited forestry schools. The three majors offered by the school are:

(1) **FOREST ENGINEERING.** The logging engineer is the product of the Pacific Northwest. The Department of Forest Engineering was organized in response to the request of farsighted men in the industry, who realized the peculiar engineering requirements of their business. The four-year curriculum in forest engineering was prepared in consultation with some of the ablest timbermen in the state. 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, and in making logging plans.

(2) **FOREST MANAGEMENT.** In forest management the school has a dual responsibility: to the public agencies in educating men to be of service in helping to manage the national and state forests and other publicly owned forest lands; and to the forest industry in educating men to aid in solving the forestry problems that confront private forest management in the Northwest. Elective courses most commonly selected by students majoring in forest management are fish and game management, range management, recreation, entomology, science, industrial forest management, and pathology.

(3) **FOREST PRODUCTS.** The forest products industries of the Pacific Coast are growing in extent and diversification. The school's program in forest products, therefore, has been broadened in scope to train men for these expanding industries. Following two years of basic work in fundamental sciences and forestry, the forest products student studies the properties and processing of wood as a guide to its more efficient and profitable utilization. During his last two years, the student may elect one of two options:

The *production* option offers training for men interested in production, processing, and sales in the many wood industries and emphasizes the design, organization, and management of plants, manufacturing processes, and scientific merchandising.

The *technology* option provides extended training in basic sciences pointing toward product development and improvement, quality control in the woodworking industries, research, and teaching.

Baccalaureate Degrees (B.S., B.F.). For the bachelor's degree the student is required to complete 204 term hours of collegiate work. Every student before graduation must have completed at least 9 term hours in each of three groups in liberal arts and sciences. For the Bachelor of Science degree the student must present 36 term hours of science. He must complete at least 9 upper-division term hours in any one of several elective groups. Other courses may be substituted for electives, if such courses contribute to a specific student objective, and if approved by the dean of Forestry. Elective courses, however, must be taken at Oregon State College; transfer credits in lieu of electives are not acceptable unless from an accredited forestry school. The student should arrange his elective program in consultation with his staff adviser. The School of Forestry requires a minimum of 80 professional hours and at least six months of practical field work satisfactory to the faculty of the school.

Advanced Degrees. The degrees of Master of Science and Master of Forestry are offered to graduates of Oregon State College, or other accredited colleges, who have met the requirements for graduate study.

The program for the Master of Science degree is designed to develop the student for research work in his particular field. The minor of 15 term hours is selected in some field of basic science outside the School of Forestry. For the Master of Forestry degree the minor may be selected in a department either within or without the School of Forestry. This program is intended for students desiring advanced training in technical applications in the field or plant.

The thesis in the Master of Science program should be based on scientific research. For the Master of Forestry the thesis should be an original study applying professional knowledge to a specific objective.

To complete requirements for either of these degrees, in the forest management or forest products department, the student must have had at least six months of satisfactory employment in forestry or associated fields.

Forest engineering is a highly specific, localized field of instruction. Graduate students who do not have experience in the Pacific Northwest are handicapped in fulfilling the duties expected of a forest engineer in the region. For this reason, one year of forest engineering experience in this region is prerequisite to the granting of a master's degree in forest engineering.

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 and who present a satisfactory thesis. 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 SCHOOL*.

Scholarships and fellowships available in forestry and forest products are described under *SCHOLARSHIPS AND FELLOWSHIPS*, page 99.

Field Instruction. Actual field work, essential in preparing men for work in forest management and engineering, is made possible by the proximity of many large timbered areas easily accessible from Oregon State College in addition to the college-owned timber areas. Men preparing for work in forest products profit by numerous field trips to nearby lumber, plywood, pulp and paper, and other wood-processing plants and thus are kept abreast of current industry practices and development. In addition to the scheduled laboratory and field classes, occasional unscheduled trips are made under the supervision of the school staff.

Summer Employment. The principal operations of the lumber industry of the United States are in the Pacific Northwest. The United States Forest Service, the State Forestry Department, and forest industries all employ forestry students during vacation periods. Students expecting to engage in forestry work are thus enabled to obtain valuable field experience at reasonable pay without traveling long distances.

Buildings and Equipment. The Forestry Building (1917), three stories high, 80 by 136 feet, constructed of brick, contains laboratories well equipped with appropriate instruments and apparatus. Lumber-manufacturing concerns have supplied the school with wood products made from various species of Oregon trees. Many publications dealing with general forestry, logging, or utilization are provided. The Industrial Research Building (1947), two stories, 60 by 300 feet, devoted to forest products and chemical engineering research, contains equipment for investigations in lumber seasoning, wood preservation, plywood and gluing, fiberboard production, and the chemical utilization of wood. A circular sawmill, located in the school forest, is available for instruction in lumber manufacture and associated activities.

Forest Products Research. By special act of the legislature in 1941 the State of Oregon inaugurated a research program in utilization of forest products and associated it with the School of Forestry. Cooperative arrangements have been made for the full use of college facilities and staff. Full-scale experimentation in all phases of physical and chemical use of forest products is carried on under the guidance of the Oregon Forest Products Laboratory; the dean of the school is the director of the laboratory. Considerable opportunity is given for the training of graduate students specializing in the many industrial problems relating to forest products utilization.

Lands. The McDonald Forest, 6,564 acres of second-growth Douglas-fir lying within seven miles of the campus, was established in 1929 through the generosity of the late Mrs. Mary J. L. McDonald of San Francisco. This area is devoted to experimental work in reforestation and also serves as a laboratory for classes in surveying, mapping, timber estimating, logging-road location, forest protection, and tree and shrub identification. The whole forest is under intensive management with a full-time forester in charge. The George W. Peavy Arboretum of 181 acres is devoted to arboreta and experimental plantings. The Arboretum contains a large forest-tree nursery managed by the State Forestry Department. Here the student has an opportunity to do actual nursery work. In 1947, the Federal Government gave Oregon State College title to 6,200 acres of Camp Adair Military Reservation for the use of the schools of Agriculture and Forestry. This area contains approximately 4,000 acres of timberland, located just north of the McDonald Forest.

The school also supervises an area of 160 acres of logged and second-growth fir within 10 miles of the campus, presented by the Spaulding Logging Company, and a tract of 2,400 acres of cut-over forest land in Columbia County, given to the school in 1929 for research in reforestation by the Blodgett Timber Company. The Elliot State Forest, an area of 75,000 acres in Coos and Douglas counties, is also available for use by the School of Forestry.

Curricula in Forestry

B.S., B.F. Degrees

*Forest Engineering
Forest Management*

*Forest Products
Production Option
Technology Option*

COMMON FRESHMAN YEAR

	Term hours		
	F	W	S
¹ General Botany (Bot 201, 202)	3	3	...
² Geology (G 203) .....	...	...	3
General Forestry (F 111) .....	...	...	2
Forest Orientation (F 110)	2	...	...
Tree Identification (F 153) .....	...	...	3
Forest Engineering (FE 123) .....	...	...	3
³ Elementary Analysis (Mth 101, 102)	4	4	...
English Composition (Eng 111, 112, 113)	3	3	3
Engineering Drawing (GE 115) .....	...	3	...
Air, Military, or Naval Science	2-3	2-3	2-3
Physical Education, General Hygiene	1	1	1
	15-16	16-17	17-18

¹Forest engineering majors substitute speech for Bot 202.

²Forest engineering majors take Ch 130.

³Forest products and forest engineering majors add Mth 103.

FOREST ENGINEERING

	Term hours		
	F	W	S
Mensuration (F 224)	3	5	---
Engineering Physics (Ph 101, 102, 103)	3	3	3
Forest Engineering (FE 223)	---	---	4
American National Government (PS 201), State and Local Government (PS 203)	3	3	---
Forest Products (FP 210)	---	3	---
Forest Protection (F 231)	---	---	3
Outlines of Economics (Ec 212)	3	---	---
Wood Utilization (FP 310)	---	---	3
Technical Report Writing (Eng 227)	3	---	---
Air, Military, or Naval Science	2-3	2-3	2-3
Physical Education	1	1	1
	15-16	17-18	16-17

Junior Year

Literature	---	---	3
Forest Valuation (F 321)	---	---	3
Forest Engineering (FE 323)	---	---	4
Logging Methods and Equipment (FE 360)	---	4	---
Logging Roads (FE 381)	---	3	---
Silviculture: Forest Practices (F 342)	4	---	---
Timber Mechanics (FP 321)	4	---	---
Principles of Accounting (BA 211, 212)	3	3	---
Geology	---	3	---
Seminar (FE 307)	---	1	---
Mensuration: Timber Growth (F 323)	---	---	5
Heat Engines (ME 347)	3	---	---
Electives	3	3	2
	17	17	17

Senior Year

Logging Plans (FE 461)	5	---	---
Logging Transportation (FE 462)	---	5	---
Logging Costs (FE 463)	---	---	5
Business Law (BA 411)	3	---	---
Forest Economics (F 412)	---	3	---
Aerial Photo-Interpretation in Forestry (F 420)	---	---	3
Forest Administration (F 415)	---	---	3
Seminar (FE 407)	1	---	---
Fire Control (F 431)	---	3	---
Literature	---	3	3
Timber Management (F 425)	5	---	---
Electives	3	3	3
	17	17	17

FOREST MANAGEMENT

	Term hours		
	F	W	S
Mensuration (F 224)	---	---	5
Abridged General Physics (Ph 211, 212)	3	3	---
Forest Engineering (FE 223)	4	---	---
American National Government (PS 201), State and Local Government (PS 203)	---	3	3
Forest Products (FP 210)	---	---	3
Forest Protection (F 231)	---	3	---
General Chemistry (Ch 101, 102)	3	3	---
Outlines of Economics (Ec 212)	3	---	---
Technical Report Writing (Eng 227)	---	3	---
Extempore Speaking (Sp 111)	3	---	---
Soils for Forestry Students (Sls 214)	---	---	3
Air, Military, or Naval Science	2-3	2-3	2-3
Physical Education	1	1	1
	19-20	18-19	17-18

	Term hours		
	F	W	S
Junior Year			
Wood Utilization (FP 310)	3	---	---
Mensuration: Timber Growth (F 323)	---	5	---
Logging Methods (FE 392)	3	---	---
Silviculture: Forest Ecology (F 341)	4	---	---
Silviculture: Forest Practices (F 342)	---	---	4
Silviculture: Forestation (F 343)	---	4	---
Range Management (AH 341)	3	---	---
Forest Engineering (FE 323)	---	4	---
Forest Valuation (F 321)	---	---	3
Seminar (F 307)	---	1	---
Literature	---	---	3
Forest Land Use (F 311)	---	---	3
Electives	4	3	4
	17	17	17

Senior Year			
Public Administration (PS 431)	---	---	3
Forest Engineering (FE 423)	4	---	---
Forest Management (F 424)	---	3	---
Timber Management (F 425)	---	5	---
Dendrology (F 453)	---	---	3
Forest Administration (F 415)	---	3	---
Aerial Photo-Interpretation in Forestry (F 420)	3	---	---
Forest Economics (F 412)	---	3	---
Fire Control (F 431)	3	---	---
Literature	3	---	3
Seminar (F 407)	1	---	---
Electives	3	3	8
	17	17	17

FOREST PRODUCTS

	Term hours		
	F	W	S
Sophomore Year			
Mensuration (F 224)	5	---	---
Engineering Physics (Ph 101, 102, 103)	3	3	3
Forest Engineering (FE 223)	---	---	4
American National Government (PS 201), State and Local Government (PS 203)	3	3	---
Outlines of Economics (Ec 212)	---	3	---
Forest Products (FP 210)	---	3	---
General Chemistry (Ch 201, 202, 203)	3	3	3
Technical Report Writing (Eng 227)	---	---	3
Air, Military, or Naval Science	2-3	2-3	2-3
Physical Education	1	1	1
	17-18	18-19	16-17

PRODUCTION OPTION

Junior Year			
Wood Identification (FP 311)	3	---	---
Wood Properties (FP 314)	---	3	---
Timber Mechanics (FP 321, 322)	---	4	4
Silviculture: Forest Practices (F 342)	4	---	---
Logging Methods (FE 392)	3	---	---
Principles of Accounting (BA 211, 212)	3	3	---
Production (BA 311)	---	4	---
Finance (BA 312)	---	---	4
Extempore Speaking (Sp 111)	---	---	3
Literature	---	---	3
Seminar (FP 307)	---	---	1
Electives	3	3	3
	16	17	18

	Senior Year		
	F	W	S
Wood Preservation (FP 431)	---	---	3
Lumber Seasoning (FP 441)	---	3	---
The Lumber Plant (FP 451)	3	---	---
Lumber Manufacturing Problems (FP 452)	---	3	---
Lumber Merchandising (FP 453)	---	---	3
Ply and Laminated Products (FP 461)	3	---	---
Forest Management (F 426)	3	---	---
Forest Administration (F 415)	---	3	---
Heat Engines (ME 347)	3	---	---
Literature	---	3	3
Seminar (FP 407)	---	---	1
Electives	6	6	6
	18	18	16

TECHNOLOGY OPTION

Junior Year

Wood Identification (FP 311)	3	---	---
Wood Properties (FP 314)	---	3	---
Timber Mechanics (FP 321, 322)	---	4	4
Forest Pathology (Bot 315)	---	3	---
Insects Injurious to Forest Products (Ent 324)	3	---	---
Organic Chemistry (Ch 226, 227)	5	5	---
Quantitative Analysis (Ch 234)	---	---	5
Extempore Speaking (Sp 111)	---	---	3
Literature	---	---	---
Seminar (FP 307)	3	---	---
Electives	4	3	4
	18	18	17

Senior Year

Wood Anatomy (FP 416)	---	3	---
Wood Preservation (FP 431)	---	---	3
Lumber Seasoning (FP 441)	---	3	---
The Lumber Plant (FP 451)	3	---	---
Lumber Manufacturing Problems (FP 452)	---	3	---
Ply and Laminated Products (FP 461)	3	---	---
Forest Administration (F 415)	---	---	3
Wood Chemistry (Ch 470)	3	---	---
Chemical Analysis of Wood and Related Products (Ch 471)	---	3	---
Literature	3	---	3
Seminar (FP 407)	---	---	1
Electives	5	6	7
	17	18	17

Forest Engineering

COURSES in forest engineering are designed to prepare men to deal with the woods problems peculiar to the lumber industry of the Pacific Northwest. Emphasis is placed on the preparation of logging plans and the transportation of timber from the woods to the mills.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

FE 123. Forest Engineering. 3 hours.

Measurement of distance, direction, and elevation. Prerequisite: Mth 101. Two lectures; 1 four-hour laboratory period.

FE 223. Forest Engineering. 4 hours.

Topographic surveying; direct and indirect leveling; computing and plotting of field data. Prerequisite: FE 123, engineering drawing. Two lectures; 1 two-hour laboratory period; 1 four-hour field period.

UPPER-DIVISION COURSES

- FE 307. Seminar. 1 hour spring.
- FE 323. Forest Engineering. 4 hours.
Public land surveys; stadia; plane table; polar and solar observation; triangulation; drafting of field data. Prerequisite: FE 223. Two lectures; 1 two-hour laboratory period; 1 four-hour field period.
- FE 360. Logging Methods and Equipment. 4 hours winter.
A basic course in logging methods and equipment with particular application to the Pacific Northwest. Prerequisite: Mth 103, F 224, FE 223. Three lectures; 1 four-hour field period.
- FE 370. Field Work. 1 to 6 hours.
Practical field work between the sophomore and junior years or the junior and senior years; report based on an approved outline. (See Section 18, Academic Regulations pamphlet.)
- FE 381. Logging Roads. 3 hours winter.
Road location; bridges, culverts, construction problems. Prerequisite: Ph 103, FP 321. Two lectures; 1 four-hour laboratory period.
- FE 392. Logging Methods. 3 hours.
Relation between logging and forest production; felling and bucking; skidding, loading, hauling; relative merits of various methods. Prerequisite: FE 223, F 224. Two lectures; 1 four-hour field period.
- FE 401. Research. Terms and hours to be arranged.
- FE 403. Thesis. Terms and hours to be arranged.
- FE 405. Reading and Conference. Terms and hours to be arranged.
- FE 407. Seminar. 1 hour.
- FE 423. Forest Engineering. (g) 4 hours.
Basic logging plans and route surveys. Prerequisite: FE 323, FE 392. Two lectures; 1 two-hour laboratory period; 1 four-hour field period.
- FE 451. Industrial Forestry. (g) 3 hours.
The principles and methods employed in the operation of industrial forest properties in the Northwest. Prerequisite: F 426 or equivalent.
- FE 461. Logging Plans. (g) 5 hours.
Basic logging plans; analysis of timbered areas for development of logging operations; preliminary transportation plans. Prerequisite: FE 323, FE 360. One lecture; 1 three-hour laboratory period; 1 eight-hour field period.
- FE 462. Logging Transportation. (g) 5 hours.
Working plans from data obtained in FE 461; development of transportation systems. Prerequisite: FE 461. One lecture; 1 three-hour laboratory period; 1 eight-hour field period.
- FE 463. Logging Costs. (g) 5 hours.
Management control; economic theory of location and construction; costs of surveys, construction, operation, and maintenance. Prerequisite: FE 462. One lecture; 1 three-hour laboratory period; 1 eight-hour field period.

GRADUATE COURSES

Courses numbered 400-499 and designated (P) or (G) may be taken for graduate credit.

- FE 501. **Research.** Terms and hours to be arranged.
- FE 503. **Thesis.** Terms and hours to be arranged.
- FE 505. **Reading and Conference.** Terms and hours to be arranged.
- FE 507. **Seminar.** Terms and hours to be arranged.
Subject matter as required by graduate programs.
- FE 523. **Forest Engineering.** 3 hours.
Advanced logging plans and route surveys. Not open to forest engineering majors. Prerequisite: FE 423 or equivalent, graduate standing. Two lectures; 1 four-hour field period.
- FE 560. **Logging Methods.** 4 hours.
Studies of current developments in logging methods and equipment. Prerequisite: FE 360 or equivalent, graduate standing. Three lectures; 1 four-hour field period.
- FE 561, 562, 563. **Logging Engineering.** 5 hours each term.
Advanced study of logging plans and timber transportation systems. Prerequisite: FE 463 or equivalent, graduate standing. One lecture; 1 three-hour laboratory period; 1 eight-hour field period.
- FE 581. **Timber Bridge Design.** 3 hours.
Problems in location, design, and construction of timber bridges in logging transportation systems. Prerequisite: FE 381 or equivalent, graduate standing. One lecture; 2 three-hour laboratory periods.

Forest Management

THE courses in forest management afford a basic training for the practice of forestry, particularly in the Pacific Northwest. Emphasis is placed upon the scientific and administrative measures which are necessary to produce the greatest values from all forest resources.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- F 110. **Forest Orientation.** 2 hours fall.
Survey of vocational opportunities and requirements in forest engineering, forest products, and forest management; orientation of the student to the profession. One lecture; 1 recitation.
- F 111. **General Forestry.** 2 hours winter or spring.
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. Restricted to forestry students.
- F 153. **Tree Identification.** 3 hours fall or spring.
Principal Pacific Coast timber trees; range, occurrence, size, growth, form; climate, soil, moisture requirements, value; wildlife uses. One lecture; 2 two-hour laboratory periods.
- F 213. **Introduction to Forestry.** 3 hours fall.
Operation of various forest agencies in the United States. Not open to forestry students.

F 224. Mensuration. 5 hours.

Measurement of standing and felled timber and timber products. Prerequisite: FE 123. Restricted to forestry students. Three lectures; 2 three-hour field periods.

F 226. Mensuration: Scaling. 3 hours.

Log scaling and grading. Not open to forestry majors. Two lectures; 1 four-hour field period.

F 227. Mensuration: Cruising. 3 hours.

Measurement of standing timber. Not open to forestry majors. Two lectures; 1 four-hour field period.

F 231. Forest Protection. 3 hours.

Survey of the major causes of forest damage and their application in forest management. Recognition of major inimical factors, methods of salvage, preventive measures, control of damage. Two lectures; 1 three-hour field period.

UPPER-DIVISION COURSES

F 307. Seminar. 1 hour.**F 311. Forest Land Use. 3 hours.**

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.

F 321. Forest Valuation. 3 hours.

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. Two lectures; 1 three-hour laboratory period.

F 323. Mensuration: Timber Growth. 5 hours.

Growth of even-aged stands; growth of many-aged stands; growth of individual trees. Prerequisite: F 224. Three lectures; 2 three-hour field periods.

F 341. Silviculture: Forest Ecology. 4 hours fall.

Influence of environmental factors on the development, distribution, and succession of forest vegetation. Prerequisite: F 231. Three lectures; 1 three-hour field period.

F 342. Silviculture: Forest Practices. 4 hours fall (FE, FP majors); spring (F majors).

Treatment of stands to insure perpetuation of forest resources. Prerequisite: F 231 (and F 341 for forest management majors). Three lectures; 1 three-hour field period.

F 343. Silviculture: Forestation. 4 hours winter.

Forest land examination and classification; reproduction surveys; planting plans; establishment and maintenance of plantations; nursery practice. Prerequisite: F 341. Three lectures; 1 three-hour field period.

F 344. Farm Forestry. 3 hours winter.

Relation of forest resources and forestry to agriculture, with emphasis on techniques of farm-woodland management and utilization of farm-forest products. Designed especially for agriculture students. Two lectures; 1 three-hour laboratory period.

- F 360. **Conservation of Natural Resources.** 3 hours winter.
Nature, extent, and importance of organic resources of United States and methods of conserving them; forest, forage, recreation, wildlife, soil, water aspects.
- F 361. **Park Forestry.** 3 hours.
Trees and their treatment for park and recreational purposes. Two lectures; 1 three-hour laboratory period.
- F 370. **Field Work.** 1 to 6 hours.
Practical field work between the sophomore and junior years or the junior and senior years carried on with private concerns or public agencies; report based on an approved outline. (See Section 18 of Academic Regulations pamphlet.)
- 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 fall, winter, or spring.
- F 412. **Forest Economics.** (g) 3 hours.
Application of economic principles to forestry; socio-economic usefulness of forests; economics of forest production.
- F 415. **Forest Administration.** (g) 3 hours.
Administrative organization and personnel work of public and private forest agencies. Prerequisite: F 307, FE 307, FP 307.
- F 417, 418. **Regional Forestry.** 2 hours fall and winter.
Survey of the field of forest management. Of special interest to those who plan to enter the Federal or State Forest Service.
- F 420. **Aerial Photo-Interpretation in Forestry.** 3 hours.
Techniques and principles of forest photo-interpretation; forest type mapping; volume estimation from aerial photographs. Prerequisite: F 323. Two lectures; 1 three-hour field period.
- F 421. **Forest Recreation.** (g) 3 hours.
Forest recreation, its importance and nature; planning forest use for recreational purposes in relation to other forest uses. Elective for all but recreation minors. Two lectures; 1 three-hour laboratory period.
- F 424. **Forest Management.** (g) 3 hours.
Principles of forest management applied to integrated use of all forest resources. Prerequisite: F 341, 342, 343.
- F 425. **Timber Management.** (g) 5 hours.
Principles and practices in the regulation of forest properties for sustained yield; timber inventories and management plans. Prerequisite: F 224, 323, 424. Four lectures; 1 three-hour laboratory period.
- F 426. **Forest Management.** 3 hours fall or spring.
A comprehensive course in the general principles of forest management for students majoring in other fields. Prerequisite: F 213, 226, 227 for business and technology students; F 224 for forestry students. Two lectures; 1 three-hour laboratory period.

- F 431. **Fire Control.** (g) 3 hours.
Scientific basis for fire control. Fire-control planning and administration. Prerequisite: F 231. Two lectures; 1 three-hour field period.
- F 441. **Forest Influences.** (G) 3 hours.
Influence of forests on climate, water supply, and soil, with applications to watershed management and erosion control. Prerequisite: F 341.
- F 453. **Dendrology.** 3 hours fall or spring.
Classification and identification of forest trees of the United States; silvical characteristics and distribution; life history and requirements. Prerequisite: F 153. One lecture; 2 three-hour laboratory periods.

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.
Subject matter as required by graduate programs.
- F 511. **Economics of Private Forestry.** 3 hours fall.
Economic and financial problems of private forestry, including insurance, forest credit, cost analysis, and practical problems in forest finance. Prerequisite: F 412 or equivalent.
- F 512. **Socio-economic Problems in Forestry.** 3 hours winter.
Forest ownership, taxation, regulation, public aid, cooperatives, and resource planning. Prerequisite: F 412 or equivalent.
- F 513. **Economics of Forest Utilization.** 3 hours spring.
Factors affecting costs and returns in forest industries. Prerequisite: F 412 or equivalent.
- F 515. **Forest Administration.** 3 hours fall.
Organization, administration, operating problems of public and private forestry agencies. Prerequisite: F 415 or equivalent.
- F 520. **Aerial Photo Mensuration.** 3 hours.
Advanced methods in use of aerial photographs in forest inventory; photo-mensurational techniques in preparation of stand and tree volume tables; planning large scale photo-mensurational projects. Prerequisite: F 224, F 323, F 420, or equivalents. One lecture; 2 three-hour laboratory periods.
- F 521, 522, 523. **Forest Management.** 3 hours each term.
Managing even-aged and many-aged stands for timber production. Prerequisite: F 425 or equivalent. Two lectures; 1 three-hour laboratory period.
- F 531. **Fire Control.** 3 hours.
Forest-fire plans, their preparation and execution. Prerequisite: graduate standing and consent of instructor. Two lectures; 1 three-hour laboratory period.
- F 541, 542, 543. **Silviculture.** 3 hours each term.
Advanced approach in treatment of stands; research methods. Prerequisite: graduate standing and consent of instructor. Two lectures; 1 three-hour laboratory period.

Forest Products

COURSES in forest products are designed to meet the needs of those who plan a career in the field of wood utilization. In meeting student objectives it is often desirable to build a study program in cooperation with courses offered in chemistry, physics, and engineering. Special emphasis is given to the practical aspects of the existing and expanding manufacturing techniques in the Pacific Northwest.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSE

- FP 210. Forest Products.** 3 hours winter or spring.
Survey of wood-using industries; economic importance; species used; manufacturing processes and products; byproducts and waste utilization.

UPPER-DIVISION COURSES

- FP 307. Seminar.** 1 hour spring.
- FP 310. Wood Utilization.** 3 hours fall or spring.
Mechanical and physical properties; basis for lumber grades; lumber seasoning; wood treating and finishing. Abbreviated course for students not majoring in forest products. Prerequisite: F 111, 153, or 213, FP 210.
- FP 311. Wood Identification.** 3 hours fall.
Identification of commercial woods with a hand lens; brief introduction to their microscopic structure. Prerequisite: F 153, Bot 201. One lecture; 2 three-hour laboratory periods.
- FP 314. Wood Properties.** 3 hours winter.
Physical and chemical properties of wood; relation to uses. Prerequisite: FP 311. Two lectures; 1 two-hour laboratory period.
- FP 321. Timber Mechanics.** 4 hours.
Graphic and analytic statics applied to simple structures and structural elements of wood; stress, strain, strength and elastic characteristics of wood; design and selection of structural elements. Prerequisite: Mth 102, FP 310 or 311. Two lectures; 2 three-hour laboratory periods.
- FP 322. Timber Mechanics.** 4 hours.
Development, scope, and procedures of timber testing; factors affecting the strength of wood; gathering and analysis of mechanical properties data; timber fastenings and fabrication; design problems. Prerequisite: FP 321. Two lectures; 2 three-hour laboratory periods.
- FP 370. Field Work.** 1 to 6 hours.
Practical work in the mill or industrial plant between sophomore and junior years or junior and senior years, carried on with private concerns or public agencies; report based on an approved outline. (See Section 18 of Academic Regulations pamphlet.)
- FP 401. Research.** Terms and hours to be arranged.
- FP 403. Thesis.** Terms and hours to be arranged.
- FP 405. Reading and Conference.** Terms and hours to be arranged.
- FP 407. Seminar.** 1 hour fall, winter, or spring.

- FP 416. **Wood Anatomy.** (g) 3 hours winter.
Minute anatomy of wood; microscopic identification of tree species. Prerequisite: FP 311. One lecture; 2 three-hour laboratory periods.
- FP 431. **Wood Preservation.** (g) 3 hours spring.
Agencies of wood deterioration; principal preservatives; preparation of wood for treatment; wood preserving processes; properties of treated wood; treating plants and equipment; economic aspects of wood preservation. Prerequisite: FP 314. Two lectures; 1 three-hour laboratory period.
- FP 441. **Lumber Seasoning.** (g) 3 hours.
Technical aspects of the drying of wood; air seasoning practices; types, operation, and maintenance of lumber dry kilns; field trips, problems, and laboratory work. Prerequisite: FP 310 or 314. Two lectures; 1 three-hour laboratory period.
- FP 451. **The Lumber Plant.** (g) 3 hours fall.
Survey of physical plants and facilities of the several types of lumber manufacturing plants; equipment selection, operation, and maintenance and power requirements. Prerequisite: FP 310 or consent of instructor. Two lectures; 1 three-hour laboratory period.
- FP 452. **Lumber Manufacturing Problems.** (g) 3 hours winter.
Manufacturing problems in the lumber industry including grades, values and types of products; problems of production methods, costs, waste utilization and administration. Prerequisite: FP 451. Two lectures; 1 three-hour laboratory period.
- FP 453. **Lumber Merchandising.** (g) 3 hours spring.
Trade practices and customs of the lumber industry. Lumber wholesaling and retailing with major emphasis on retail distribution. Prerequisite: FP 452.
- FP 461. **Ply and Laminated Products.** (g) 3 hours fall.
Factors affecting gluing of wood; production and properties of glues, veneers, ply and laminated products, and modified wood; gluing techniques and commercial practices; equipment used; field trips. Prerequisite: senior standing in forest products. Two lectures; 1 three-hour laboratory period.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

- FP 501. **Research.** Terms and hours to be arranged.
- FP 503. **Thesis.** Terms and hours to be arranged.
- FP 505. **Reading and Conference.** Terms and hours to be arranged.
- FP 507. **Seminar.** Terms and hours to be arranged.
Subject matter as required by graduate program.
- FP 515. **Wood Anatomy.** Terms and hours to be arranged.
Specific knowledge and techniques required for specialization in various fields of forest products; laboratory training in sectioning, staining, and preparation of slides of woody material for microscopic studies related to advanced wood anatomy. Prerequisite: FP 416 or equivalent.
- FP 522. **Physical Properties of Wood.** 3 hours.
Advanced specialized, analytical, and experimental investigations of the mechanical or other physical properties of wood; studies of the relation of physical properties to specific uses. Prerequisite: FP 314, 322.

FP 531. Wood Preservation. 3 hours.

Advanced work in wood preservation designed to meet needs of individual students, with special attention to theoretical considerations and factors that control efficiency of treating processes. Prerequisite: FP 431 or equivalent.

FP 541. Lumber Seasoning. 3 hours.

Analysis of special problems relating to the drying of wood, their academic and commercial aspects; design of drying schedules; individualized laboratory instruction. Prerequisite: FP 441.

FP 551, 552, 553. Lumber Industry Problems. 3 hours each term.

Sawmill planning; production control; waste utilization; management, personnel, marketing, and merchandising problems related to lumber industry. Prerequisite: FP 452.

FP 561. Ply and Laminated Products. 3 hours.

Investigations of special gluing problems; testing adhesives used in ply and laminated construction; relation of physical properties of wood to bonding problems; extensive study of technical literature. Prerequisite: FP 461 or equivalent.

School of Home Economics

Faculty

VERA BRANDON, Ph.D., Acting Dean of the School of Home Economics.

C. JEANETTE DESHAZER, B.S., Secretary and Assistant to the Dean.

Clothing, Textiles, and Related Arts

PROFESSORS STRICKLAND (department head), FRITCHOFF (emeritus), GATTON.

ASSOCIATE PROFESSORS DIEDESCH, EDABURN, PATTERSON.

ASSISTANT PROFESSORS LEDBETTER, MOSER, L. B. SMITH.

INSTRUCTORS GRANT, JAMES, WALKER, WELLS.

Family Life and Home Administration

PROFESSORS PRENTISS (department head), BRANDON, MILAM (emeritus), READ (director of nursery schools).

ASSOCIATE PROFESSORS KIRKENDALL, VAN HORN, WIGGENHORN.

ASSISTANT PROFESSORS PHINNEY* (director of home management houses), BRASHEAR.

INSTRUCTORS CLARK, KURTZ, LUDWIG, N. A. SMITH, STATON.

GRADUATE ASSISTANT BENJAMIN.

Foods and Nutrition

PROFESSORS FINCKE (department head), STORVICK, WILLIAMS (emeritus).

ASSOCIATE PROFESSORS HADJIMARKOS, OVERMAN.

ASSISTANT PROFESSORS CHARLEY, GARRISON, HAWTHORNE, HUNTER, PETERSEN.

INSTRUCTORS MORGAN, WARE, WARREN, WEISER.

RESEARCH ASSISTANT LOUHI.

Home Economics Education

PROFESSOR DUBOIS (department head).

STATE SUPERVISOR AND TEACHER-TRAINER KOHLHAGEN.

ASSOCIATE PROFESSOR McQUESTEN.

INSTRUCTOR HOLLANDSWORTH.

Home Economics Research

PROFESSORS STORVICK (Chairman, Administrative Committee), WILSON (emeritus).

ASSOCIATE PROFESSORS EDABURN, OVERMAN, PATTERSON.

RESEARCH ASSISTANTS DUBÉ, EDWARDS, WOO, WU.

* On sabbatical leave 1950-51.

Institution Management

ASSISTANT PROFESSORS MULHERN (acting department head, assistant director of dormitories), CLEAVELAND (manager of Memorial Union dining service).

Home Economics Extension

PROFESSORS SAGER (state leader of home economics extension), CLINTON* (state agent, home economics extension), MACK (state agent, home economics extension), KOLSHORN (nutrition specialist), LANE (clothing specialist).

ASSOCIATE PROFESSORS CARTER (home furnishing specialist), FREEMAN (rural sociology specialist), MINDEN (home management specialist), SCALES (clothing specialist), TRINDLE (state agent, home economics extension), TULLER (rural housing specialist).

ASSISTANT PROFESSORS CAMPBELL (housing specialist), MALLALIEU (recreation specialist).

General Statement

UNDERGRADUATE and graduate work is offered in the School of Home Economics leading to degrees of Bachelor of Arts, Bachelor of Science, Master of Arts, Master of Science, Master of Home Economics, and Doctor of Philosophy.

The School of Home Economics seeks to serve, directly or indirectly, every Oregon home. The school contributes directly to the life of the commonwealth; students are prepared for the responsibilities of homemaking and parenthood, for teaching, administration and management, and for other work in home economics and allied fields. The true homemaker should have a well-rounded personality, with intelligent interests, disciplined judgment, and discriminating tastes. She is thus enabled to deal with the problems of the changing modern home with its complex social and civic relationships. Hence the home economics curricula must be both liberal and technical, including education in the sciences, the arts, and the economics of the household.

Through research and extension, closely coordinated with the resident teaching, effort is constantly directed toward the solution of home problems.

Undergraduate Curricula. Education in homemaking is fundamental in all the work of the school. In order to provide for differing backgrounds and interests of students, three curricula are offered for baccalaureate degrees as follows:

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, social work, and other earning fields related to home economics. Page 380.

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 home economics teaching, home economics extension, hospital dietetics, institutional management, nutrition, nursery school teaching, or commercial fields of home economics. Page 381.

In both Curriculum A and Curriculum B, courses in the arts and sciences supplement the home economics courses.

CURRICULUM C is planned for students who enter the School of Home Economics after 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. Page 382.

* On sabbatical leave spring-summer 1950-51.

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.

Cooperative Curriculum in Primary Education. Under the cooperative program for providing preparation for teaching in elementary schools (see page 286), a four-year curriculum is offered jointly by the School of Home Economics with the three state Colleges of Education (located at Ashland, Monmouth, and La Grande). A student completing the cooperative curriculum receives a degree from Oregon State College and from the College of Education in which the fourth undergraduate year is spent. The cooperative program provides opportunity for students already enrolled at Oregon State College to prepare for kindergarten and primary teaching. The State Board of Higher Education maintains a full four-year program for the professional preparation of elementary teachers in the state Colleges of Education, and high school seniors who have decided to prepare for elementary teaching are normally advised to enroll in one of these colleges. The cooperative curriculum in primary education is printed on pages 385-386.

One-Year and Two-Year Curricula. Students who plan to spend only a year or two in college find it desirable to select courses that will be of the greatest practical use in homemaking or whatever other occupation may be followed. 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 courses preparing for advanced study. (See pages 386-387.)

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 listed in the 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 required hours of science and 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.

Advanced Degrees. Through the Graduate School, all departments of the School of Home Economics offer graduate work leading to the master's degree (M.A., M.S., M.H.Ec.). The fields include clothing, textiles, and related arts; foods and nutrition; home management, child development, family relationships, and related fields; and institution management. The degree of Master of Home Economics may also be completed with a major in general home economics. The degree of Doctor of Philosophy is offered in the fields of foods and nutrition and family life and home administration. The regulations and procedures governing graduate study are printed under GRADUATE SCHOOL.

Home Economics Research. The School of Home Economics cooperates with the Agricultural Experiment Station of Oregon State College and with the Bureau of Human Nutrition and Home Economics of the United States Department of Agriculture in conducting research on home problems. In addi-

tion to the cooperative research the School of Home Economics conducts investigations financed by special state appropriations and by foundation grants. In foods and nutrition, studies are under way on the culinary value of fats; factors affecting the palatability of foods; fish cookery; human requirements of vitamins; and the relation of nutrition to teeth. Studies are also under way on problems of housing. In clothing, textiles, and related arts two studies are under way: the design and construction of functional work dresses; and the design and construction of household textiles made from Oregon linen.

Training in methods of research is included in graduate courses offered in the several departments of the School of Home Economics.

Home Economics Extension. The School of Home Economics cooperates with the Federal Cooperative Extension Service of Oregon State College in an effort to improve all phases of home and family life. Special courses in home economics extension are offered in the Department of Home Economics Education to prepare home economics students for county extension work.

Members of the home economics faculty prepare correspondence courses in home economics subjects that form a part of the program of the divisions of General Extension.

Facilities. Facilities for all phases of home economics work are provided in the Home Economics Building, the home management houses, the nursery schools, and the dormitory housing and dining service. Food laboratories, a nutrition laboratory, and animal laboratories are maintained, together with facilities for instruction in family meal service. Seven laboratories are equipped for instruction in clothing selection and construction, textiles, home furnishings, and crafts. The dormitory dining-room facilities afford opportunity for training in food service for large groups. 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. Orchard Street Nursery School and Park Terrace Nursery School and the two home-management houses, Kent and Withycombe, are located on the campus.

The supervised teaching is carried on in high schools of the state. 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 Oregon State College.

Undergraduate Curricula in Home Economics

B.A., B.S. Degrees

Curriculum A¹

This curriculum includes one-third specified courses in home economics, one-third specified courses in arts and sciences, and one-third electives. The electives may be chosen on an approved basis according to student's interest and may include minors chosen from the lists below (see MINORS IN ARTS AND SCIENCES) or programs preparing for earning fields (see SUGGESTED ELECTIVE COMBINATIONS).

	Term hours		
	F	W	S
Freshman Year			
Color and Composition (AA 160, 161)	3	3	(3)
*Physical or Biological Science	3-4	3-4	3-4
Introduction to Home Economics (HAd 101)	1		
Introduction to Music Literature (Mus 121)	1	(1)	(1)
English Composition (Eng 111, 112, 113)	3	3	3
Nutrition (FN 225)	(3)	(3)	3
Foods (FN 211)	3	(3)	(3)
Textiles (CT 250)	(3)	3	(3)
Clothing (Selection) (CT 211)	(3)	(3)	3
*Elementary Clothing (CT 111)	(3)	(3)	3
*Physical Education	1	2	1
	15-16	14-15	16-17
Sophomore Year			
Foods (FN 212, 213)	3	3	(3)
*Clothing (Construction) (CT 212)	(3)	(3)	3
House Planning and Architectural Drawing (AA 178)	(3)	(3)	3
Marriage (FL 222)	(2)	(2)	2
*Elementary Psychology (Psy 201, 202, 203)	3	3	3
Literature	3	3	(3)
History of Western Civilization (Hst 201, 202, 203)	3	3	3
Physical Education	1	1	1
Electives	3	3	(3)
	16	16	15
Junior Year			
Outlines of Economics (Ec 212)	3	(3)	(3)
General Sociology (Soc 212)	(3)	3	(3)
Home Furnishing (CT 331)	3	(3)	(3)
Management in Family Living (HAd 340)	(4)	4	(4)
Child Development (FL 311, 312)	3	3	(3)
Physiology (Z 331, 332)	3	3	3
Feeding the Family (FN 325)			2
Costume Design (CT 311) or Consumer Buying in Clothing and Textiles (CT 350) or Flat Pattern and Draping (CT 310) or Clothing for Children (CT 320), or Textile Design (CT 335)	(3)	(3)	3
Literature	(3)	(3)	3
*Electives	4	4	7
	16	17	15
Senior Year			
The Nursery School Child (FL 425)	3	(3)	(3)
Home Management House (HAd 450)	(5)	5	(5)
Political Science	(3)	3	(3)
Food Purchasing (FN 411), or Food Management (FN 412), or Food Demonstrations (FN 413), or Home Food Preservation (FN 331)	3	(3)	(3)
Electives	12	8	16
	18	16	16

¹See SUGGESTED ELECTIVE COMBINATIONS on pages 382-385. This is the curriculum followed by students in Home Economics in Social Work; see suggested program on pages 383-384.

²Psychology plus laboratory is not acceptable as a substitute for a laboratory science; if 9 hours instead of 12 hours of science are taken in the freshman year, the student must include 3 hours of science or social science in her electives during later years.

³CT 111 open to students who have little or no training and/or who have not qualified satisfactorily in the Clothing Placement Test.

⁴General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education.

⁵Students not placing sufficiently high in the placement test should take CT 111 as prerequisite to CT 212.

⁶Or Psy 207, 208.

Curriculum B

This curriculum includes specified courses in home economics and in the arts and sciences. About one-fourth of the curriculum is elective; the student may choose electives on any approved pattern, or may include minors chosen from the lists below (see MINORS IN ARTS AND SCIENCES), or may choose a program preparing for an earning field (see SUGGESTED ELECTIVE COMBINATIONS).

	Term hours		
	F	W	S
Freshman Year			
Color and Composition (AA 160, 161)	3	3	(3)
General Chemistry (Ch 101, 102, 103)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
¹ Introduction to Music Literature (Mus 121)	1	(1)	(1)
Introduction to Home Economics (HAD 101)	1	.....	.....
Nutrition (FN 225)	(3)	(3)	3
Foods (FN 211)	3	(3)	(3)
Textiles (CT 250)	(3)	3	(3)
Clothing (Selection) (CT 211) .....	.....	.....	3
² Physical Education	1	2	1
³ Elementary Clothing (CT 111) .....	.....	.....	3
	15	14	16
Sophomore Year			
Foods (FN 221, 222) .....	.....	3	3
⁴ Clothing (Construction) (CT 212)	(3)	(3)	3
Organic Chemistry (Ch 221)	4	.....	.....
Elements of Biochemistry (Ch 250) .....	.....	4	.....
Physiology (Z 331, 332)	3	3	.....
Literature	3	(3)	(3)
⁵ General Psychology (Psy 207, 208)	3	3	(3)
History of Western Civilization (Hst 201, 202, 203)	3	3	3
House Planning and Architectural Drawing (AA 178)	(3)	(3)	3
Marriage (FL 222)	(2)	(2)	2
Physical Education	1	1	1
	17	17	15
Junior Year			
Any two subjects in this grouping: Costume Design (CT 311) or Flat Pattern and Draping (CT 310), or Clothing for Children (CT 320), or Textile Design (CT 335), or Consumer Buying in Clothing and Textiles (CT 350), or Tailoring (CT 312)	3-4	3-4	(3-4)
Home Furnishing (CT 331)	(3)	3	(3)
General Bacteriology (Bac 204)	(3)	(3)	3
Management in Family Living (HAD 340)	4	(4)	(4)
Nutrition (FN 321)	4	(4)	(4)
General Sociology (Soc 212)	(3)	(3)	3
Child Development (FL 311, 312)	3	3	(3)
Extempore Speaking (Sp 111) or Elementary Journalism (J 111)	(3)	(3)	3
Outlines of Economics (Ec 212)	3	(3)	(3)
Literature	(3)	3	3
Electives .....	.....	4	4
	17-18	16-17	16
Senior Year			
The Nursery School Child (FL 425)	3	(3)	(3)
Home Management House (HAD 450)	(5)	5	(5)
Political Science	(3)	(3)	3
Upper-division foods course (Home Food Preservation, FN 331; Food Purchasing, FN 411; Food Management, FN 412; Food Demonstrations, FN 413; Experimental Cookery, FN 435, or Quantity Cookery, IM 311)	(3)	(3)	3
¹ Electives	14	12	10
	17	17	16

¹Mus 122, 123 are recommended electives.

²General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education.

³CT 111 open to students who have little or no training and/or who have not qualified satisfactorily in the Clothing Placement Test.

⁴A student not placing sufficiently high in the placement test should take CT 111 as prerequisite to CT 212.

⁵Or Psy 201, 202, 203.

Curriculum C¹

A minimum of 45 term hours in home economics is required. See statement on page 81 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 take 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.

The following courses are required for this curriculum. This pattern is suggested:

	Term hours—		
	F	W	S
Junior Year			
Marriage (FL 222)	(2)	(2)	2
Nutrition (FN 225)	3	(3)	(3)
Foods (FN 211 and either 212, 213, or 221, 222)	3	3	3
*Textiles (CT 250), Clothing (CT 211, 212)	3	3	3
Home Furnishing (CT 331 or 231)	(3)	3	(3)
Outlines of Economics (Ec 212)	(3)	3	(3)
*General Psychology (Psy 207, 208)	3	3	(3)
Color and Composition (AA 160)	3	.....	.....
Electives	1	1	8
	16	16	16
Senior Year			
Electives in Home Economics courses (upper division)	3	.....	3
Management in Family Living (HAD 340)	4	(4)	(4)
Child Development (FL 311, 312)	3	3	(3)
Feeding the Family (FN 325) .....	.....	.....	5
Home Management House (HAD 450)	(5)	(5)	5
General Sociology (Soc 212)	(3)	3	(3)
Political Science	(3)	3	(3)
The Nursery School Child (FL 425)	(3)	(3)	3
Electives	7	7	3
	17	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.

HOME ECONOMICS IN BUSINESS

CLOTHING, TEXTILES, AND RELATED ARTS

For students interested in commercial work in the field of clothing, textiles, and related arts the following courses are suggested:

	Term hours
French	12
Organic Chemistry	4
Survey of Visual Arts (History and Appreciation) (AA 114, 115, 116)	6
Lower-Division Drawing	6
Flat Pattern and Draping (CT 310)	3
Clothing for Children (CT 320)	3
Consumer Buying in Clothing and Textiles (CT 350)	3
Costume Design (CT 411)	3
Commercial Clothing (CT 412)	3
Home Furnishing (CT 431)	3
Textile Design (CT 435)	3
Textiles (CT 450)	3
Quantity Textile Purchasing (CT 351)	3
The Clothing Buyer (CT 470)	3
Home Furnishing Laboratory (CT 332)	3
Tailoring (CT 312)	4
Flat Pattern and Draping (CT 410)	3
Historic Textiles (CT 460)	3
Salesmanship (BA 465)	3
Educational Psychology (Ed 312)	3
Elementary Journalism (J 111)	3
Extempore Speaking (Sp 111)	3
Radio Speaking (Sp 334)	3

¹See SUGGESTED ELECTIVE COMBINATIONS, pages 382-385.

²CT 111 open to students who have little or no training and/or who have not qualified satisfactorily in the Clothing Placement Test.

³Or Psy 201, 202, 203.

FOODS AND NUTRITION

For students preparing for commercial positions such as food demonstrators or as food writers for newspapers, magazines, or radio the following courses are suggested:

	Term hours
Food Purchasing (FN 411)	3
Food Management (FN 412)	3
Food Demonstrations (FN 413)	3
Bacteriology (Bac 201 or 204)	3
Home Food Preservation (FN 331)	3
Extempore Speaking (Sp 111)	3
Voice and Diction (Sp 120)	3
Interpretation I (Sp 121)	3
Radio Speaking (Sp 334, 335, 336)	9
Elementary Journalism (J 111)	3
Technical Writing (J 314)	3
Household Equipment (HAD 330)	3
Organization and Use of House Space (HAD 335)	3
Educational Psychology (Ed 312)	3
Economics of the Family (HAD 441)	2

For students in Curriculum B preparing for commercial positions in test kitchens the following courses are suggested:

Food Purchasing (FN 411)	3
Food Management (FN 412)	3
Food Demonstrations (FN 413)	3
Home Food Preservation (FN 331)	3
Experimental Cookery (FN 435)	3
Household Equipment (HAD 330)	3

HOUSING AND EQUIPMENT*

For students interested in commercial work with utility and equipment companies, in home-planning institutes, and consultant services, the following courses are suggested:

Household Equipment (HAD 330)	3
Organization and Use of House Space (HAD 335)	3
Economics of the Family (HAD 441)	2
Management Problems in Home-Community Relations (HAD 445)	2
Family Housing (HAD 439)	3
Buying Aids (HAD 442)	2
House Planning in Relation to Function (HAD 435)	3
Functional Design of Dwellings (HAD 436)	3
Household Utilities (AE 435)	3
Rural House Planning (AE 451)	3
House Planning and Architectural Drawing (AA 179)	2-3
House Planning and Architectural Drawing (AA 180)	2-3
Food Management (FN 412)	3

CHILD DEVELOPMENT AND NURSERY SCHOOL

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 suggested for students in this field:

	Term hours
Child Development (FL 413)	3
Clothing for Children (CT 320)	3
Elements of Cultural Anthropology (Soc 215)	3
Curriculum Enrichment for Young Children (FL 428)	2
Economics of the Family (HAD 441)	2
Family Relationships (FL 422)	2
Selected Topics in Child Development (FL 481)	3
First Aid (PE 358)	3
Food Management (FN 412) or Quantity Cookery (IM 311)	3
Individual Differences (Psy 471, 472, 473)	9
Nursery School Administration (FL 429)	2
Psychological Tests and Testing (Psy 474, 475)	6
Social Psychology (Soc 474) or Social Problems (Soc 411, 412)	3-6
Statistical Methods (Mth 445, 446, 447, Ed 517)	3-9
Studies in Child Development and Family Relationships (FL 511)	3
Nursery School Procedure (FL 426) or Supervised Nursery School Experience (Ed 420)	3-8
Parent Education (FL 423)	2

Desirable electives: Child Nutrition (FN 421), Organization and Use of House Space (HAD 335), House Planning in Relation to Function (HAD 435), Management Problems in Home-Community Relations (HAD 445), Speech Defects (Sp 392), Sociology of the Family (Soc 312).

* Students preparing to work in this field should consult with staff members teaching housing courses for guidance in planning their programs as this is a new field of emphasis and courses recommended may be in several schools outside of Home Economics.

HOME ECONOMICS IN SOCIAL WORK

For students in Curriculum A preparing to enter Home Economics in Social Work, the following modifications in program are authorized:

Freshman Year: For required Science sequence take Z 114, 115, 116; defer FN 211 to

sophomore year and FN 225 to junior year; omit AA 161; add Soc 201, 202, 203.

Sophomore Year: Omit AA 178; take Psy 207, 208 instead of Psy 201, 202, 203; add

Ec 201, 202, 203 in place of electives.

Junior Year: Omit Ec 212, Soc 212, Z 331, 332, CT 311; add FL 413, HAd 445,

PS 203, Soc 312, Soc 364; take CT 231 instead of CT 331.

Senior Year: Omit FN 411; add Psy 471, 472, 473, Soc 474, 475, FL 422, HAd 439,

441, 442.

Electives depending on field of interest:

	Term hours
Food Purchasing (FN 411)	3
Parent Education (FL 423)	2
Selected Topics in Child Development (FL 481)	3
Consumer Buying in Clothing and Textiles (CT 350)	3
Social Problems (Soc 411, 412)	3-6
Principles of Accounting (BA 211)	3
Public Finance (Ec 418)	4
Labor Problems (Ec 425)	4
Collective Bargaining and Labor Legislation (Ec 426)	4
Elementary Journalism (J 111)	3
Public Information Methods (J 313)	3
Speech	3
History of Great Religions (R 462)	3
Municipal Government (PS 415)	3
Public Administration (PS 431, 432, 433)	3-9
Mental Hygiene (Psy 411)	3
Psychological Tests and Testing (Psy 474, 475, 476)	9
History of American Civilization (Hst 224, 225, 226)	9
Community Health Problems (Bac 425, 426)	6
Community Recreation (Ed 426)	3

Those who expect to make social work a career or to advance in the profession will need professional training in a school of social work. Because of the unmet demands for trained social workers throughout the country, many social-work positions are open to students immediately upon graduation from college. Students should familiarize themselves with the requirements formulated by the American Association of Schools of Social Work.

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 287-289 for requirements). These requirements for certification are not requirements for graduation in home economics. To teach homemaking in vocational education in Oregon, Curriculum A or B, including Sp 111 and CT 312, is required.

	Term hours		
	F	W	S
Secondary Schools in American Life (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 3	2 or 3	2 or 3
History of Oregon (Hst 377)	3 or 3	3 or 3	3 or 3
Methods and Materials (Ed 408d)	3 or 3	3 or 3	3 or 3
Supervised Teaching (Ed 415) (hours to be arranged)	---	3	or 3
Organization and Administration of Homemaking Education (HEd 422)	---	3	or 3
Adult Education in Home Economics (HEd 440)	3 or 3	3 or 3	3 or 3

INSTITUTION MANAGEMENT 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 205)	---	3	---
Principles of Accounting (BA 211)	3	---	---
Educational Psychology (Ed 312)	3	---	---
Methods of Teaching Nutrition (HEd 405)	---	3	---
Quantity Cookery (IM 311)	3	---	---
Physiological Chemistry (Ch 330, 331)	---	2	3
Nutrition in Disease (FN 420)	---	---	3
Institutional Organization and Administration (IM 430)	2	---	---
Institutional Equipment and Marketing (IM 440)	---	3	---
Institution Experience (IM 450)	---	---	4

Students in institution management and dietetics will be excused from taking one of group requirements in upper-division clothing.

Suggested electives: Food Purchasing (FN 411), Food Management (FN 412), Food Demonstrations (FN 413), Experimental Cookery (FN 435), Child Nutrition (FN 421), Readings in Nutrition (FN 481), Personnel Management (BA 451).

HOME ECONOMICS EXTENSION

For students preparing for positions in the field of home-economics extension as county home demonstration agents, 4-H Club agents, or similar types of work, either Curriculum A or B is required including HED 453, Field Work in Home Economics Extension. 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 home economics with training in journalism, speech and dramatics, economics, sociology, and other subjects, supplemented by work in extension methods, should materially assist in meeting the need for better training on the part of extension workers. The following sequences are suggested:

	Term hours		
	F	W	S
Junior Year			
Organization and Use of House Space (HAd 335)	3	3	(3)
Elementary Journalism (J 111)	3	(3)	(3)
Sociology of Rural Life (Soc 364)	3	.....	.....
Adult Education in Home Economics (HEd 440) .....	.....	.....	3
Radio Speaking (Sp 334)	3	(3)	(3)

Senior Year			
Field Work in Home Economics Extension (HEd 453) .....	.....	9	(9)
Home Furnishing (CT 431)	3	(3)	(3)
Home-Ground Planning (LA 279) .....	.....	3	.....
Educational Psychology (Ed 312)	3	.....	.....
House Planning in Relation to Function (HAd 435) .....	.....	.....	3
Home Food Preservation (FN 331)	3	.....	.....

Additional electives: Economics of the Family (HAd 441), Management Problems in Home-Community Relations (HAd 445), Family Housing (HAd 439), Recreation Leadership (PE 240), Child Nutrition (FN 421), Parent Education (FL 423), Food Demonstrations (FN 413), Field Work in Community Nutrition Programs (HEd 420).

Cooperative Curriculum in Primary Education

B.S. Degree from Oregon State College

B.S. Degree in Elementary Education from College of Education

	Term hours at Oregon State College		
	F	W	S
Freshman Year			
English Composition (Eng 111, 112, 113)	3	3	3
Physical Science Survey (GS 104, 105, 106) or Biological Science Survey (GS 101, 102, 103)	4	4	4
Color and Composition (AA 160, 161)	3	3	.....
Clothing Selection (CT 211) .....	.....	.....	3
Nutrition (FN 225)	3	.....	.....
Introduction to Home Economics (HAd 101)	1	.....	.....
Foods (FN 211) .....	.....	.....	3
Textiles (CT 250) .....	.....	3	.....
Elementary Clothing (CT 111) .....	.....	.....	3
Physical Education	1	.....	1
General Hygiene (PE 150) .....	.....	2	.....
	15	15	17
Sophomore Year			
History of Western Civilization (Hst 201, 202, 203)	3	3	3
General Psychology (Psy 207, 208)	3	3	.....
General Sociology (Soc 212) .....	.....	.....	3
Physiology (Z 331, 332)	3	3	.....
Literature	3	3	.....
Foods (FN 212, 213)	3	3	.....
House Planning and Architectural Drawing (AA 178) .....	.....	.....	3
Clothing Construction (CT 212) .....	.....	.....	3
Marriage (FL 222) .....	.....	.....	2
Physical Education	1	1	1
	16	16	15

	Term hours at Oregon State College		
	F	W	S
Junior Year			
Child Development (FL 311, 312)	3	3	---
Nursery School (FL 425)	---	3	---
Home Management (HAd 340)	---	4	---
Feeding the Family (FN 325)	2	---	---
Home Furnishing (CT 331)	3	---	---
Secondary Education (Ed 311)	3	---	---
Educational Psychology (Ed 312)	---	---	3
Home Management House (HAd 450)	---	---	5
Human Geography (HG 101)	3	---	---
American National Government (PS 201)	---	---	3
Health Education (SEd 123)	---	3	---
Music Theory (Mus 111, 112)	3	3	---
History of Oregon (Hst 377)	---	---	3
Elective in upper-division home economics	---	---	2
	17	16	16

	Term hours at College of Education		
	F	W	S
Senior Year			
Children's Literature (Eng 388)	3	---	---
School Organization (Ed 476)	3	---	---
Supervised Teaching (Ed 415)	---	5	10
Educational Tests and Measurements (Ed 418)	---	---	3
Applied Mental Hygiene (Ed 460)	---	---	3
Audio-Visual Aids (Ed 435)	---	3	---
Physical Education in Elementary Grades (Ed 344, 345, 346)	---	3	---
Primary Education (Ed 358)	4	---	---
Intermediate and Upper-Grade Education (Ed 359)	---	4	---
Elementary School Library (Ed 380)	2	---	---
Music III (Mus 283)	3	---	---
Art Structure III (A 311)	3	---	---
	18	15	16

One-Year and Two-Year Curricula

ONE YEAR OF HOME ECONOMICS

Students who plan to spend only one year in college should usually take the following home-economics and allied courses:

	Term hours		
	F	W	S
Introduction to Home Economics (HAd 101)	1	---	---
Nutrition (FN 225)	(3)	3	(3)
Food Preparation (FN 218, 219)	---	3	3
Clothing Selection (CT 217)	3	(3)	(3)
Clothing Construction (CT 218, 219)	(3)	3	3
Marriage (FL 222)	2	---	---
Child Care (FL 225)	(3)	(3)	3
Home Furnishing (CT 231)	3	(3)	(3)
Home Management (HAd 239)	(3)	(3)	3
English Composition (Eng 111)	3	(3)	(3)
Extempore Speaking (Sp 111)	(3)	(3)	3
Literature or Directed Recreational Reading (Eng 131)	2	(2)	(2)
Mental Hygiene (Psy 111)	(3)	3	(3)
¹ Physical Education	2	1	1
² Elective	---	3	---
	16	16	16

¹General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education.

²Suggested elective: PS 231.

TWO YEARS OF HOME ECONOMICS

Students who plan to spend not more than two years in college should usually take the following home economics and allied courses:

	First Year		
	Term hours		
	F	W	S
Introduction to Home Economics (HAD 101)	1	.....	.....
Color and Composition (AA 160)	3	(3)	(3)
¹ Elementary Clothing (CT 111)	(3)	3	(3)
Textiles (CT 250)	(3)	(3)	3
Marriage (FL 222)	(2)	(2)	2
Foods (FN 211)	3	(3)	(3)
Nutrition (FN 225)	(3)	(3)	3
² Biological or Physical Science	3	3	3
³ Physical Education	1	2	1
Electives	5	8	4
	16	16	16
Second Year			
Foods (FN 212, 213)	3	3	(3)
Clothing (CT 211, 212)	3	3	(3)
Home Furnishing (CT 231)	3	.....	.....
Home Management (HAD 239) .....	.....	.....	3
Child Care (FL 225) .....	.....	(3)	3
English Composition (Eng 111), Speech, Literature	3	3	3
Literature or History or Political Science or Sociology	3	3	3
Physical Education	1	1	1
Electives .....	.....	3	3
	16	16	16

For students planning to become dietitians' assistants or to work in school lunchrooms, the following courses are suggested in addition to the above: Typing (SS 121, 122, 123); Principles of Accounting (BA 211); Outlines of Economics (Ec 212); Feeding the Family (FN 325); Elementary Bacteriology (Bac 201).

In summer school following the two years, the following courses might be taken: Cafeteria Management (IM 320); Quantity Cookery (IM 311).

Minors in Arts and Sciences

Suggested minors in Arts and Letters, Social Sciences, and Sciences are outlined below. Each minor totals approximately 27 term hours, including 9 hours of upper-division work. Courses starred are courses prescribed in the curriculum which may count as part of a minor.

ART

	Term hours		
	F	W	S
*Color and Composition (AA 160, 161)	3	3	.....
*House Planning and Architectural Drawing (AA 178) .....	.....	.....	3
House Planning and Architectural Drawing (AA 179, 180), Elements of Interiors (AA 223); or Lower-Division Painting (AA 290), Drawing (AA 291), Composition (AA 292)	3	3	3
*Home Furnishing (CT 331, 431), Textile Design (CT 335, 435), Historic Textiles (CT 460), Organization and Use of House Space (HAD 335), or Costume Design (CT 311, 411), Commercial Clothing (CT 412), Historic Textiles (CT 460)	3	3	3

BACTERIOLOGY

General Bacteriology (Bac 204, 205, 206)	3	3	3
Electives in Bacteriology	3	3	3
Upper-division Bacteriology	3	3	3

BIOLOGY

General Zoology (Z 201, 202, 203)	3	3	3
General Botany (Bot 201, 202)	3	3	.....
Field Botany (Bot 203) .....	.....	.....	3
Natural History of Oregon I, II, III (Z 374, 375, 376)	3	3	4

¹CT 111 open to students who have little or no training and/or who have not qualified satisfactorily in the Clothing Placement Test.

²Psychology plus laboratory is not acceptable as a substitute for a laboratory science.

³General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education.

	Term hours		
	F	W	S
BOTANY			
General Botany (Bot 201, 202)	3	3	---
Field Botany (Bot 203)	---	---	3
Principles of Plant Physiology (Bot 331)	4	---	(4)
Principles of Plant Ecology (Bot 341)	(4)	---	4
Principles of Plant Pathology (Bot 351)	(4)	---	4
Structure of Economic Plants (Bot 371)	---	4	---
Systematic Botany (Bot 321)	---	4	---
CHEMISTRY			
General Chemistry (Ch 101, 102, 103)	3	3	3
Organic Chemistry (Ch 221)	4	---	---
Quantitative Analysis (Ch 234)	---	---	5
Elements of Biochemistry (Ch 250)	---	4	---
Physiological Chemistry (Ch 330, 331)	---	2	3
Elementary Physical Chemistry (Ch 340)	3	---	---
ECONOMICS			
¹ Principles of Economics (Ec 201, 202, 203)	3	3	3
Economic Development of the United States (Ec 215)	---	4	---
Economics of Consumption (Ec 411)	---	---	3
Electives in Economics (6 hours upper division)	4	4	3
ENGLISH			
*Literature Survey (Eng 101, 102, 103) or Introduction to Literature (Eng 104, 105, 106)	3	3	3
Shakespeare (Eng 201, 202, 203), American Literature (Eng 253, 254, 255), Individual Authors (Eng 261, 262), Great Books (Eng 263), Continental European Literature (Eng 264, 265, 266), Contemporary Literature (Eng 271, 272, 273), Short Story (Eng 274), Bible as Literature (Eng 275)	3	3	3
Survey of Russian Culture (Eng 327, 328, 329), The Novel (Eng 376), English Composition for Teachers (Eng 324) (suggested for those who intend to teach English)	3	3	3
ENTOMOLOGY			
General Zoology (Z 200)	5	---	---
General Entomology (Ent 200)	---	5	---
Electives in Entomology	---	8	---
Introduction to Economic Entomology (Ent 314)	4	---	---
Upper-division courses in Entomology	---	3	3
FRENCH			
First-Year French (RL 1, 2, 3)	4	4	4
Second-Year French (RL 4, 5, 6)	3	3	3
French Literature (RL 311, 312, 313)	3	3	3
GEOGRAPHY			
Human Geography (HG 101)	3	---	---
Economic Geography (HG 102)	---	3	---
Geography of North America (HG 103)	---	---	3
Regional Geography (any two of HG 201, 202, 203, 204, 211)	3	3	---
Cartography (GS 261)	---	---	3
Physical Geography (GS 461, 462, 463)	3	3	3
GEOLOGY			
Geology (G 201, 202, 203)	3	3	3
Geology Laboratory (G 204, 205, 206)	1	1	1
Electives in Geology	3	3	---
Upper-division Geology	3	3	3
GERMAN			
First-Year German (GL 1, 2, 3)	4	4	4
Second-Year German (GL 4, 5, 6)	3	3	3
German Literature (GL 311, 312, 313)	3	3	3

¹Students who take a minor in Economics omit Ec 212 from required courses in junior year.

HISTORY

	Term hours		
	F	W	S
*History of Western Civilization (Hst 201, 202, 203)	3	3	3
History of the Far East (Hst 204), Modern Russia (Hst 206), England and the British Empire (Hst 207, 208), The World Since 1914 (Hst 209), History of American Civilization (Hst 224, 225, 226), Great Americans in Thought and Action (Hst 230, 231, 232)	3	3	3
Main Currents in American Thought (Hst 341, 342, 343) or Latin-American Civilization (Hst 360, 361) or History of Oregon (Hst 377)	3	3	3

JOURNALISM

Elementary Journalism (J 111, 112)	3	3	---
Copyediting (J 211)	---	---	3
Editorial Writing (J 223)	3	---	---
Public Information Methods (J 313)	---	3	---
Special Feature Articles (J 312)	---	---	3
Technical Writing (J 314)	---	3	or 3
Journalism Projects (J 351, 352, 353)	2	2	2

Creative Writing (Eng 218) and Advertising (BA 464), courses closely related to journalism, may be counted in the minor.

LANDSCAPE ARCHITECTURE

Home-Ground Planning (LA 279)	3	---	---
Lower-Division Landscape Design (LA 290)	2	2	2
Plant Materials (LA 326, 327, 328)	3	3	3
History and Literature of Landscape Architecture (LA 356, 357, 358)	2	2	2
Planting Plans (LA 392)	2	---	---

MATHEMATICS

Elementary Analysis (Mth 101, 102, 103)	4	4	4
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
Upper-division Mathematics	3	3	---

MUSIC

Theory (Mus 111, 112, 113)	3	3	3
Introduction to Music Literature (Mus 121, 122, 123) or Accompanying and Sight Reading (Mus 180)	1	1	1
Individual Instruction (Mus 190) or Group Instruction—Voice (Mus 191)—	2	2	2
Upper-division Music	3	3	3

PHYSICS

General Physics (Ph 201, 202, 203)	4	4	4
Astronomy (Ph 204, 205)	3	3	---
Introduction to Modern Physics (Ph 311, 312, 313)	3	3	3

POLITICAL SCIENCE

American National Government (PS 201, 202)	3	3	---
State and Local Governments (PS 203) or European Governments (PS 204)	---	---	3
Current Affairs (PS 331)	---	---	2
Municipal Government (PS 415)	---	---	3
International Relations (PS 417)	3	---	---
Latin-American Relations (PS 418)	---	---	3
Pacific Area Relations (PS 419)	---	3	---
Public Administration (PS 431)	3	---	---

PSYCHOLOGY

*Elementary Psychology (Psy 201, 202, 203)	3	3	3
Mental Hygiene (Psy 411)	3	---	---
Individual Differences (Psy 471, 472, 473)	3	3	3
Electives in Psychology	---	3	3

	Term hours		
	F	W	S
RELIGION AND PHILOSOPHY			
The Sermon on the Mount (R 220)	2	---	---
The New Testament and Its Historical Background (R 211)	2	---	---
The Prophets and Their Message (R 225)	---	2	---
The Bible as Literature (Eng 275)	---	---	3
Introduction to Philosophy (Phi 201, 202, 203)	3	3	3
Principles of Religious Leadership (R 370)	---	---	2
Philosophy of Religion (R 461)	3	---	---
History of Great Religions (R 462)	---	3	---
Psychology of Religion (R 463)	---	---	3
Practical Life Philosophies (Phi 211, 212, 213) may be substituted for any of the lower-division courses.			
RUSSIAN			
First-Year Russian (SL 1, 2, 3)	4	4	4
Second-Year Russian (SL 4, 5, 6)	3	3	3
Survey of Russian Culture (Eng 327, 328, 329)	3	3	3
SOCIOLOGY			
Elements of Sociology (Soc 201, 202, 203)	3	3	3
Sociology of the Family (Soc 312)	---	3	---
Social Problems (Soc 411)	---	3	---
Sociology of Rural Life (Soc 364)	3	---	---
Sociology of Urban Life (Soc 465) or Social Problems (Soc 412)	---	---	3
Psychological Tests and Testing (Psy 474)	3	---	---
Community Organization and Leadership (Soc 475)	3	---	---
SPANISH			
First-Year Spanish (RL 11, 12, 13)	4	4	4
Second-Year Spanish (RL 14, 15, 16)	3	3	3
Spanish Literature (RL 341, 342, 343)	3	3	3
SPEECH			
Extempore Speaking (Sp 111, 112, 113)	3	3	3
Voice and Diction (Sp 120)	3	---	---
Interpretation I (Sp 121)	---	3	---
Elective in Speech	---	---	3
Upper-division Speech	3	3	3
ZOOLOGY			
General Zoology (Z 201, 202, 203)	3	3	3
*Physiology (Z 331, 332)	3	3	---
Electives in Zoology	3	3	3
Upper-division course in Zoology	---	---	3

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, 331, 311 or 310 or 320 or 350.

Curriculum B: CT 211, 212, 250, 331; any two in this group: 311, 312 or 310 or 320 or 350 or 335.

Curriculum C: CT 211, 212, 250, 231, or 331.

ELECTIVE

Curriculum A: CT 310, 312, 320, 335, 350, 411, 412, 431, 435, 450, 460.

Curriculum B: CT 310, 320, 335, 350, 411, 412, 431, 435, 450, 460.

Curriculum C: CT 235, 310, 311, 312, 320, 335, 411, 412, 431, 435, 450.

For students in education, secretarial science, etc.: CT 217, 218, 219, 231, 235, 250.

Students planning to register for clothing sequence 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.

¹Students taking a minor in Sociology omit Soc 212 from the required courses in the junior year.

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. Three two-hour laboratory periods.
MEN'S SECTION: selection and construction of butcher's apron and a shirt, or its equivalent.
- CT 211. **Clothing (Selection).** 3 hours any term.
Artistic and economic factors in the selection of adult clothing; wardrobe needs of college girl. Prerequisite: AA 160. Two lectures; 1 two-hour laboratory period. Men may be included in this course.
- *CT 212. **Clothing (Construction).** 3 hours any term.
Pattern study; commercial patterns and their adaptation; fitting and construction principles applied to cotton and wool garments. Prerequisite: CT 111 (or its equivalent), CT 211. Three two-hour laboratory periods.
- CT 217. **Clothing Selection.** 3 hours any term.
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. **Clothing Construction.** 3 hours any term.
Elective for those of other schools. Principles of selection and construction applied in the planning and making of cotton and wool garments. Three two-hour laboratory periods.
- CT 219. **Clothing Construction.** 3 hours fall or spring.
Continuation of CT 218. Planning and construction of silk garment and children's clothing. Prerequisite: CT 218. Three two-hour laboratory periods.
- CT 231. **Home Furnishing.** 3 hours any term.
Elective for other than home economics students. Aims to develop appreciation of beauty and suitability in home furnishings; materials and processes involved. Three two-hour laboratory periods.
- CT 235. **Textile Design and Weaving.** 3 hours fall or spring.
For students in other schools. Decorative art involving a consideration of line, form, and color as applied to problems in weaving, block printing, stenciling, etc. Three two-hour laboratory periods.
- CT 250. **Textiles.** 3 hours any term.
Properties, uses, selection and care of textile fibers and fabrics. No prerequisite, but chemistry is desirable. Two lectures; 1 two-hour laboratory period.

UPPER-DIVISION COURSES

- CT 310. **Flat Pattern and Draping.** 3 hours any term.
Principles of flat pattern and draping with practical application of principles to the construction of afternoon and evening garments. Prerequisite: CT 212, 250. Three two-hour laboratory periods. Professor Strickland; Associate Professor Edaburn.

* A home project in clothing construction is required of all students who have completed CT 111 before enrolling for CT 212.

- CT 311. **Costume Design.** 3 hours any term.
Art principles applied in selection and design of appropriate costumes; historic costume and relation to modern dress. Prerequisite: CT 212, 250, AA 161. One lecture; 2 two-hour laboratory periods. Associate Professor Diedesch.
- CT 312. **Tailoring.** 4 hours any term.
Principles of tailoring; independence, initiative, originality in designing, planning, and constructing coat and skirt or suit. Prerequisite: CT 310 or 311. Two four-hour laboratory periods. Assistant Professor Ledbetter.
- CT 320. **Clothing for Children.** 3 hours any term.
Selection and construction of clothing for children from the standpoint of health, beauty, and cost. Prerequisite: CT 212, 250. Three two-hour laboratory periods. Assistant Professor Ledbetter.
- CT 331. **Home Furnishing.** 3 hours any term.
Furnishing a small home from standpoint of comfort, beauty, and economy; influence of historic design. Prerequisite: CT 212, 250, AA 161, 178. One recitation; 2 two-hour laboratory periods. Associate Professor Patterson.
- CT 332. **Home Furnishing Laboratory.** 3 hours.
Principles of drapery and slip-cover construction; finishing furniture and interior woodwork; estimating yardage and costs of fabrics; simple upholstering techniques. Student furnishes own tools, furniture, and fabrics. Prerequisite: CT 212 or consent of instructor. Three two-hour workshop periods.
- CT 335. **Textile Design.** 3 hours any term.
Line, form, and color as applied to the design of woven and printed textiles; weaving and various printing techniques appropriate to contemporary printed fabrics. Prerequisite: CT 212, 250, AA 161. Three two-hour laboratory periods. Associate Professor Patterson.
- CT 350. **Consumer Buying in Clothing and Textiles.** 3 hours any term.
An analysis of problems as well as aids in purchasing clothing and textiles from consumer's point of view. Prerequisite: CT 212, 250, Ec 211. Associate Professor Diedesch.
- CT 351. **Quantity Textile Purchasing.** 3 hours.
Construction, purchasing, and care of fabrics in quantity; writing up specifications. Prerequisite: CT 250. Professor Gatton, Miss Grant.
- 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 410. **Flat Pattern and Draping.** (G) 3 hours.
Principles of flat pattern designing and of draping in different textures; practical application to afternoon and evening garments. Each student makes a dress form. Prerequisite: CT 310 (CT 311 recommended). Three two-hour laboratory periods.
- CT 411. **Costume Design.** (G) 3 hours.
Designing clothing and accessories for women; creative work. Prerequisite: CT 312. One lecture; 2 two-hour laboratory periods. Associate Professor Diedesch.

- CT 412. **Commercial Clothing.** (G) 3 hours.
Selecting, designing, and constructing garments for different types of figures; organization from trade standpoint; speed, economy, effectiveness, selling features. Prerequisite: CT 312. Three two-hour laboratory periods. Professor Strickland.
- CT 431. **Home Furnishing.** (G) 3 hours.
Consumer study of home furnishing, fabrics, furniture, rugs, china, silver and ceramics. Particular attention paid to contemporary designers and materials and to prices and manufacturers. Prerequisite: CT 331.
- CT 435. **Textile Design.** (G) 3 hours.
Advanced work in textile design for students who have had CT 335, CT 331, or their equivalent. Three two-hour laboratory periods. Associate Professor Patterson.
- CT 450. **Textiles.** (G) 3 hours.
Survey of the literature on recent research and new developments in the textile field. A research problem in the field of the student's special interest. Prerequisite: CT 350. Two lectures; 1 two-hour laboratory period. Professor Gatton.
- CT 460. **Historic Textiles.** (G) 3 hours.
Study of textiles from ancient times to present, from an appreciative and historical point of view. Prerequisite: CT 250 and senior standing. Professor Gatton.
- CT 470. **The Clothing Buyer.** 3 hours.
Methods and problems of buyers in buying ready-to-wear clothing and fabrics for the wholesale and retail markets; sources, style trends, types of merchandise, standards, and evaluation. Prerequisite: CT 250, 350. 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 Gatton and staff.

Family Life and Home Administration

IN THE Department of Family Life and Home Administration instruction is offered in general areas pertaining to family living—home management, economics of the family, problems of the consumer-buyer, household equipment, housing, child development, nursery school, and marriage and family relationships. Offices and classrooms are located in the Home Economics Building. Two home management houses and two nursery schools are located on the campus.

Men as well as women are welcomed in most of the courses in the Family Life and Home Administration Department.

REQUIRED

Curricula A and B: FL 222, 311, 312, 425; HAd 101, 340, 450.
Curriculum C: FL 222, 311, 312, 425; HAd 340, 450.

ELECTIVE

Curricula A, B, and C: FL 413, 422, 423, 426, 428, 429, 481; HAd 330, 335, 435, 436, 439, 441, 442, 445; Ed 420.
For nonmajors in Home Economics: FL 223, 225, 421; HAd 101, 239, 340, 441, 442, and any other courses for which prerequisites have been taken.

COURSES IN FAMILY LIFE**LOWER-DIVISION COURSES**

- FL 222. **Marriage.** 2 hours any term.
Mate selection; factors in a successful marriage; husband-wife relationships. Prerequisite: sophomore standing, or consent of instructor. Open to men and women.
- FL 223. **Family Relationships.** 2 hours.
Brief consideration of mate selection; husband-wife, parent-child relationships. For students not in home economics degree curricula. Open to men and women.
- FL 225. **Child Care.** 3 hours fall or spring.
Growth, development, and care of the infant and young child; observations in the nursery school. For students not in home economics degree curricula.

UPPER-DIVISION COURSES

- FL 311, 312. **Child Development.** 3 hours each term, fall and winter or winter and spring.
Growth and development of normal preschool children. Prerequisite: Psy 203 or 208, FL 222. Three recitations; 1 one-hour observation in the nursery school. Professors Brandon and Prentiss.
- FL 401. **Research.** Terms and hours to be arranged.
- FL 403. **Thesis.** Terms and hours to be arranged.
- FL 405. **Reading and Conference.** Terms and hours to be arranged.
- FL 407. **Seminar.** Terms and hours to be arranged.
- FL 413. **Child Development.** (G) 3 hours fall or spring.
Growth and development in middle and late childhood and early adolescence. Prerequisite: FL 312. Professor Brandon.
- Ed 420. **Supervised Nursery School Experience.** (G) 8 hours.
Full participation in the program of the nursery school. Prerequisite: FL 425. Three six-hour laboratory periods; 1 two-hour seminar. Professor Read, Mrs. Smith.
- FL 421. **Behavior of Young Children.** 2 hours.
Understanding developmental problems of young children; observation in nursery school. Open to men. Not open to home economics majors. Prerequisite: consent of instructor. Professor Read.
- FL 422. **Family Relationships.** (G) 2 hours winter.
Factors entering into adjustments within modern family group. Prerequisite: FL 312, HAd 340. Associate Professor Kirkendall.

- FL 423. **Parent Education.** (G) 2 hours winter.
Relationships of parents and children; resources for meeting problems with emphasis on discussion as a method. Prerequisite or parallel: FL 425. Professor Read.
- FL 425. **The Nursery School Child.** (G) 3 hours any term.
Developing insight into child behavior through participation in the nursery school program. Prerequisite: FL 312. Two recitations; 1 four-hour laboratory period. Professor Read, Associate Professor Wiggenhorn, Mrs. Ludwig, Mrs. Smith.
- FL 426. **Nursery School Procedure.** (G) 3 hours.
Additional participation in the nursery school. Prerequisite: FL 425. Two recitations; 6 hours of laboratory to be arranged. Professor Read, Mrs. Smith.
- FL 428. **Curriculum Enrichment for Young Children.** (G) 2 hours.
Methods of relating literature, art, music, and science activities to child interests; projects for nursery school. Prerequisite or parallel: FL 425. Associate Professor Wiggenhorn.
- FL 429. **Nursery School Administration.** (G) 2 hours spring.
Problems of equipping a nursery school, planning schedules, record keeping, personnel and community relations. Prerequisite: FL 425.
- FL 481. **Selected Topics in Child Development.** (G) 3 hours.
Reading and interpretation of current literature on child development. Prerequisite: FL 312. Professor Prentiss.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

- FL 501. **Research.** Terms and hours to be arranged.
- FL 503. **Thesis.** Terms and hours to be arranged.
- FL 505. **Reading and Conference.** Terms and hours to be arranged.
- FL 507. **Seminar.** Terms and hours to be arranged.
- FL 508. **Workshop.** Terms and hours to be arranged.
- FL 511. **Studies in Child Development and Family Relationships.** 3 hours winter.
Methods and techniques used in experimental investigations of child development and family relationships. Prerequisite: FL 312, and a course in statistics. Professor Brandon.

COURSES IN HOME ADMINISTRATION

LOWER-DIVISION COURSES

- HAd 101. **Introduction to Home Economics.** 1 hour fall.
Orientation of beginning students in the field of home economics.
- HAd 239. **Home Management.** 3 hours fall or spring.
Managing money, time, and energy in relation to goals of family living. For students not in home economics degree curricula. Two recitations; 1 two-hour laboratory period.

UPPER-DIVISION COURSES

- HAd 330. Household Equipment.** 3 hours spring.
Selection, operation, care, and arrangement of household equipment. Prerequisite: one term of foods. Two 2-hour periods; 1 hour to arrange. Assistant Professor Brashear.
- HAd 335. Organization and Use of House Space.** 3 hours.
Analysis of housing needs of families; optimum dimensions of activity areas; patterns for space units of family dwelling; evaluation of house plans in terms of family needs. Prerequisite: AA 178. Two lectures; 1 two-hour laboratory period. Mrs. Staton.
- HAd 340. Management in Family Living.** 4 hours any term.
Management in relation to goals, resources, practices and problems of family living under conditions of democratic government, industrial production, and market economy. Prerequisite: junior standing. Three recitations; 1 two-hour laboratory period. Associate Professor Van Horn.
- 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 435. House Planning in Relation to Function.** (G) 3 hours spring.
An advanced course concerned with the application of principles of functional design to various types of family dwellings and their surroundings. Prerequisite: HAd 335.
- HAd 436. Functional Design of Dwellings.** (G) Terms and hours to be arranged.
Problems in use of storage space; arrangement of equipment; floor plans for small dwellings; illustrative material for use in house planning classes. Prerequisite: HAd 435.
- HAd 439. Family Housing.** (G) 3 hours spring.
Social and economic aspects of housing in relation to family living. Prerequisite: Ec 211, Soc 212, senior or graduate standing. Associate Professor Van Horn.
- HAd 441. Economics of the Family.** (G) 2 hours.
Problems and practices of managing income, expenditures, savings, credit, and taxation in relation to standards and levels of living and to the national economy. Prerequisite: senior or graduate standing. Associate Professor Van Horn.
- HAd 442. Buying Aids.** (G) 2 hours.
Investigation and evaluation of information in relation to consumer needs and wants; role of information and persuasion in a market economy; sources of information. Prerequisite: senior or graduate standing. Associate Professor Van Horn.
- HAd 445. Management Problems in Home-Community Relations.** (G) 3 hours.
Managerial functions and problems arising from relations of the family to other institutions in society, particularly where change has been rapid or institutions only recently have assumed one-time home functions. Prerequisite: HAd 340, Soc 212. Associate Professor Van Horn.

HAd 450. Home Management House. 5 hours any term.

Experience in applying homemaking courses in a family-size group and in a family-type house. Prerequisite: FL 312, HAd 340, home project in foods, one-half term residence. Mrs. Staton, Mrs. Clark, Miss Kurtz.

GRADUATE COURSES

Courses numbered 400-499 and designated (D) 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.

Foods and Nutrition

THE Foods and Nutrition Department in its first nutrition course aims to teach the student the relation of nutrition to health and the ways of meeting the nutritive allowances by good food selection. In courses in food preparation, the applications of scientific principles are taught. The student is then able to plan meals which will be adequate nutritionally, attractive in taste and appearance, and economical of both money and time. Advanced courses lead to thorough preparation in the field of foods and nutrition not only for the home, but also for the professional fields of teaching, hospital dietetics, school lunch administration, public health nutrition, food demonstration, test kitchen work, research, etc. Service courses are offered for the non-major in home economics.

Laboratories are provided for instruction in food preparation and meal service, for dietetic and animal nutrition work, and for the chemical studies related to foods and nutrition.

DESCRIPTION OF COURSES

REQUIRED

Curriculum A: FN 211, 212, 213, 225, 325, and 411 or 412 or 413 or 331.

Curriculum B: FN 211 or 220, 221, 222, 225, 321, and 331 or 411 or 412 or 413 or 435 or IM 311.

Curriculum C: FN 211, 212, 213 or 220, 221, 222, and 225, and 325.

ELECTIVE

Curriculum A: FN 331, 411, 412, 413, HEd 420.

Curriculum B: FN 331, 411, 412, 413, 420, 421, 435, 481, HEd 420.

Curriculum C: FN 331, 411, 412, 413, HEd 420.

For students in education, pharmacy, etc.: FN 211, 212, 213, 218, 219, 225, 240, 250.

LOWER-DIVISION COURSES

FN 211. Foods. 3 hours any term.

Principles involved in the preparation of food; standards for judging food products; some experience in planning, preparing, and serving simple meals. Two recitations; 2 two-hour laboratory periods.

*FN 212, 213. Foods. 3 hours each term.

Continuation of FN 211. Prerequisite: FN 211. Prerequisite or parallel: one year of biological or physical science. FN 225 should parallel or precede FN 212. Two recitations; 2 two-hour laboratory periods.

* 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. This practice must be completed before an advanced course in foods may be taken.

- FN 218, 219. Food Preparation.** 3 hours each term.
For women students 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.
The application of chemical and physical principles in food preparation; menu planning and meal service. Prerequisite: Ch 101, 102, 103, FN 211, 225, and Ch 221 prerequisite or parallel. Two recitations; 2 two-hour laboratory periods.
- FN 225. Nutrition.** 3 hours any term.
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.
Open to men in all schools interested in food preparation, meal planning and serving. Aids men who are acting as managers of living groups or are preparing their own meals. 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 321. Nutrition.** 4 hours any term.
Application of principles of nutrition to individual and family group; projects in animal experimentation. Prerequisite: FN 225, Ch 250, 331. Z 332 may be taken parallel. Two lectures; 2 two-hour laboratory periods.
- FN 325. Feeding the Family.** 2 hours any term.
Feeding of infants and children through the period of growth, including prenatal period; planning family meals to meet the requirements of all members. Prerequisite: FN 213, 225.
- *FN 331. Home Food Preservation.** 3 hours fall.
Common home methods of preserving foods with special attention to freezing, canning, and dehydration. Prerequisite: FN 213 or 222, Bac 204. Six periods.
- 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. (g)** 3 hours any term.
Standards, grades, and qualities of food products; factors governing cost; food laws; ethics of buying and selling. Prerequisite: FN 213 or 222, Ec 212. Two lectures; 2 two-hour laboratory periods. Assistant Professor Hunter.

*Home practice in food preparation is required of all students who have completed FN 213 or 222 before taking advanced courses in foods.

- *FN 412. **Food Management.** (g) 3 hours winter or spring.
Advanced food preparation with emphasis on time, energy, and money management. Prerequisite: FN 213 or 222, 225. Six periods. Mrs. Ware.
- *FN 413. **Food Demonstrations.** (g) 3 hours spring.
Principles and techniques for commercial and classroom demonstration; practical experience with channels of publicity; demonstrations before classes and other audiences. Prerequisite: FN 213 or 222, Sp 111 or Ed 415, or equivalent. Six periods. Assistant Professor Petersen.
- FN 420. **Nutrition in Disease.** (G) 3 hours spring.
Dietary adjustments for abnormal conditions. For students who plan to become hospital dietitians or nutrition specialists or desire to broaden their training in nutrition. Prerequisite: FN 321. Two lectures; 1 two-hour laboratory period. Professor Storvick.
- HEd 420. **Field Work in Community Nutrition Programs.** (G) 3 hours.
Individual and group field projects in cooperation with agencies interested in nutrition-health programs. Prerequisite: FN 321 or 325, Ed 312. Assistant Professor Garrison.
- FN 421. **Child Nutrition.** (G) 3 hours.
Nutritional needs from prenatal life through childhood; maternal dietary requirements. Prerequisite: FN 321. Professor Fincke.
- *FN 435. **Experimental Cookery.** (G) 3 hours.
Development of experimental methods; application to investigations in cookery; skills involved; literature in field. Prerequisite: FN 222. Assistant Professor Charley.
- FN 481. **Readings in Nutrition.** (G) 3 hours.
Research studies in nutrition reviewed; interpretations and significance. Prerequisite: FN 321. 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 Fincke and staff.
- FN 522, 523. **Methods in Nutrition Research.** 3 hours each term. Students may register for one or two terms.
Introduction to methods and special techniques in nutrition research, emphasizing those methods used in human nutritional studies; blood studies; vitamin and/or mineral analyses; balance methods; special problems. Prerequisite: FN 321, Ch 233 or 234. Professor Storvick, Assistant Professor Hawthorne.
- FN 531, 532. **Food Preparation Investigation.** 3 or 5 hours each term.
Independent investigations. Prerequisite: FN 435. Offered alternate years. Associate Professor Overman.

* Home practice in food preparation is required of all students who have completed FN 213 or 222 before taking advanced courses in foods.

FN 541, 542. Food Economics. 3 hours each term.

Economic problems of food supply in relation to nutrition. Prerequisite: FN 411. Offered alternate years.

FN 551. Selected Topics in Nutrition. 3 hours spring.

Prerequisite: FN 481. Professor Fincke.

Home Economics Education

PROFESSIONAL training for prospective teachers of home economics is provided by the Department of Home Economics Education which is a joint department within the School of Home Economics and the School of Education. A student in either school may meet qualifications for certification to teach homemaking. Before attempting to register for teacher training courses, every student should receive permission for registering and guidance for selection of courses from the Home Economics Education Department staff members. (For information regarding specific requirements for the State Teacher's Certificate see pages 287-289.)

Instruction in home economics extension methods is offered for students preparing for home-demonstration, extension-specialist, or other work in the home-economics field in which extension methods are commonly used. (For information on requirements see page 385.)

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 408. Methods and Materials. (See Ed 408, page 303.) Professor DuBois.

HEd 413. Home and Community Experiences. (G) 2 hours.

Supervision of home and community experiences in homemaking instruction. Field work in home projects as well as community experiences through the Future Homemakers of America program. Prerequisite: Ed 408d. One recitation; 1 two-hour laboratory period. Miss Hollandsworth.

HEd 420. Field Work in Community Nutrition Programs. (G) 3 hours.

Individual and group projects in cooperation with agencies interested in nutrition-health programs; individual and group projects. Prerequisite: FN 321 or 325, Ed 312. Two recitations; 1 laboratory period. Assistant Professor Garrison.

HEd 422. Organization and Administration of Homemaking Education. (G) 3 hours.

Typical organizations of homemaking departments on both vocational and nonvocational basis with special attention to equipment and management. Prerequisite: Ed 408d. Associate Professor McQuesten.

HEd 440. Adult Education in Home Economics. (G) Hours to be arranged.

Problems in the adult-education program authorized under the vocational education program; field work in promoting, organizing, observing, and teaching adult classes. Prerequisite: HEd 422. Associate Professor McQuesten.

HEd 453. Field Work in Home Economics Extension. (G) Hours to be arranged.

Field practice in county extension work in selected counties under supervision of professor of extension methods and county extension agents. Prerequisite: EM 411, 412. Professors Clinton, Mack, and Sager.

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 DuBois.

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 DuBois.

HEd 554. Community Programs in Homemaking. 3 hours.

Planning, organizing, coordinating, directing, and appraising total community programs in family life education; emphasis on adult education. Prerequisite: HEd 440.

Institution Management

INSTITUTION Management is planned to provide background and training experience for those students who are interested in food service and housing in institutions. It is recommended that students who wish to enter this field plan to take an internship upon graduation either in a hospital, a commercial food service, or a college. The department has laboratories and facilities in large group housing and food service which are adequate and diversified for undergraduate and graduate work.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

IM 311. Quantity Cookery. 3 hours fall.

Use of standardized formulae and procedure; use of equipment; menu planning; preparation and service of foods in quantity. Prerequisite: FN 213 or 222. One lecture; 2 two-hour laboratory periods. Mrs. Young.

IM 320. Cafeteria Management. 3 hours.

For prospective teachers who will manage a school cafeteria. Menu study; cafeteria plans; accounting. At present offered alternate summer sessions only. Prerequisite: FN 213 or 222.

IM 401. Research. Terms and hours to be arranged. Assistant Professor Mulhern.

IM 403. Thesis. Terms and hours to be arranged. Assistant Professor Mulhern.

- IM 405. **Reading and Conference.** Terms and hours to be arranged. Assistant Professor Mulhern.
- IM 407. **Seminar.** Terms and hours to be arranged. Assistant Professor Mulhern.
- IM 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. Assistant Professor Mulhern.
- IM 440. **Institutional Equipment and Marketing.** (g) 3 hours. Equipment for different types of institutions; design, materials; construction, cost, and arrangement; food purchasing; production and distribution of food commodities; marketing costs; factors influencing prices; marketing of meats, vegetables, fruits, eggs. Prerequisite: HAd 340. Assistant Professor Cleaveland.
- IM 450. **Institution Experience.** (G) 4 hours spring. Practice work in halls of residence, Tea Room, and business offices of dormitories. Prerequisite: IM 311, 430, 440. One lecture; 3 two-hour laboratory periods. Assistant Professor Mulhern.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

- IM 501. **Research.** Terms and hours to be arranged.
- IM 503. **Thesis.** Terms and hours to be arranged.
- IM 505. **Reading and Conference.** Terms and hours to be arranged.
- IM 507. **Seminar.** Terms and hours to be arranged.

School of Pharmacy

Faculty

GEORGE EDWARD CROSSEN, Ph.D., Dean of the School of Pharmacy.

THELMA MAY PIMENTEL, Secretary to the Dean.

Pharmacy

PROFESSORS CROSSEN (department head), ZIEFLE (emeritus).

ASSISTANT PROFESSOR GRILL.

INSTRUCTORS HALLIGAN, SISSON.

Pharmaceutical Analysis

ASSOCIATE PROFESSOR FORSLUND.

INSTRUCTOR SEID.

Pharmacology and Pharmacognosy

ASSOCIATE PROFESSORS McCUTCHEON, SCIUCHETTI.

INSTRUCTOR ROEDER.

GRADUATE ASSISTANT WHITE.

General Statement

PHARMACY was first established as a separate department of Oregon State College in 1898 as a result of petition by the pharmacists of the state. The purpose of the department was to provide for a more thorough theoretical and practical training of the pharmacy apprentice than could be obtained in the average drug store, in which, up to that time, most of the training for the profession had been given. The department grew steadily from its inception, and in 1917 it was raised to the rank of school.

The school continued to develop, making it necessary that larger quarters and better facilities be placed at its disposal. As a consequence, the Pharmacy Building was erected and occupied by the school in 1924. This building affords all modern facilities for the work of the school, including special laboratories and lecture rooms, a model drug store, the pharmacy museum, and a library and reading room. The building also houses the laboratory of the Oregon Board of Pharmacy, in which drugs and drug products are subjected to analytical procedures for control purposes in order that the citizens of the state may be assured of receiving only those materials of highest quality.

Recognition of the School. The School of Pharmacy holds membership in the American Association of Colleges of Pharmacy, and is fully accredited and rated as a Class A college by the American Council on Pharmaceutical Education. Such recognition is accorded only to those pharmacy schools meeting high national standards for curriculum, facilities, faculty and staff, and constitutes a national endorsement of the educational program of the school.

Requirements for Pharmacy Licensure. Under the Oregon Pharmacy Law, the Oregon Board of Pharmacy is charged with the duty of examining candidates for pharmacy license. Certain requirements are set forth in the Law as prerequisites to such examination by the Board. Thus, in order to be eligible for license as PHARMACIST, the candidate must:

- (1) Be a citizen of the United States and at least twenty-one years of age.
- (2) Be a graduate of a school or college of pharmacy recognized by the Oregon Board of Pharmacy.
- (3) Have completed one year (not less than 2,400 hours) of practical experience in pharmacy, under the immediate supervision of a registered pharmacist. This experience must have been gained subsequent to the applicant's sixteenth birthday, and must have been in the nature of full-time employment.

Reciprocity. As the Oregon Board of Pharmacy is a member of the National Association of Boards of Pharmacy, pharmacists who are registered by this Board are privileged to reciprocate without further examination with all states except California, New York, and Florida.

Admission. Applicants for admission as freshmen, special, or graduate students in pharmacy must meet the general requirements for such admission as stated in the current catalog of the College.

Appropriate advanced standing is granted to those students transferring with acceptable records from other accredited institutions of collegiate rank. However, any applicant permitted to enter with advanced standing but having no previous training in an accredited school of pharmacy is required to be in residence in this school for a minimum of nine academic terms before becoming eligible for graduation, regardless of the previous academic status of the applicant.

Attendance Requirement. In order to be eligible for final examination for credit, students in pharmacy must attend at least seven-eighths of the classes of each course for which they have registered. Excessive absences incurred because of illness or other unavoidable circumstance may be cancelled by special arrangement with the instructor concerned and completion of all work missed during such absence.

Graduation Requirements. Completion of the prescribed curriculum and satisfaction of all College requirements are prerequisite to the granting of the bachelor's degree. All candidates for the baccalaureate degree must complete the work of the senior year in residence.

Advanced degrees are granted through and in accordance with the regulations of the Graduate School of the College.

Major Curricula

FIVE-YEAR curricula leading to degrees of Bachelor of Arts or Bachelor of Science, and graduate work leading to degrees of Master of Arts or Master of Science are offered by the School of Pharmacy.

Undergraduate Curricula. During the freshman and sophomore years all students pursue substantially the same prepharmacy curriculum. In the succeeding three years of professional training the student is permitted to diversify his study program by selection of certain professional and nonprofessional electives judged as being most valuable to him in preparation for the area of practice which he plans to enter.

PREPARATION FOR PRACTICAL PHARMACY: The student in this field studies pharmacy, chemistry, biology, accounting, business law, and related subjects, to prepare him not only to practice his profession with proficiency but also 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, the student is encouraged to elect such courses as will best equip him for these activities.

PREPARATION FOR SCIENTIFIC PHARMACY: Students wishing to enter positions demanding intensive preparation in scientific subjects, together with basic training in pharmacy and related subjects, may prepare for technical positions in industry or for entry upon graduate study toward an advanced degree. In addition, they will be fully prepared for registration as pharmacists.

PHARMACY PREMEDICAL¹: As Oregon State College is listed as an approved institution by the American Medical Association, a student by proper selection of electives can qualify for registration as pharmacist and for admission to a Class A medical school.

For admission to the study of dentistry the preliminary educational requirements are two years (ninety term hours) of preparation 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 premedical program as explained above is recommended. If a student is interested in any specific medical or dental school, he should study current catalogs and other requirements of that institution.

Graduate Work. Candidates for admission to study at the graduate level must hold a bachelor's degree in pharmacy from Oregon 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 Arts and Master of Science will be found under GRADUATE SCHOOL.

Five-Year Curriculum in Pharmacy

B.A., B.S. Degrees²

Effective July 1, 1951. Students enrolled prior to July 1, 1951 will progress and complete the requirements for a degree under the regulations effective at the time of their matriculation.

Freshman Year	Term hours		
	F	W	S
English Composition (Eng 111, 112, 113)	3	3	3
Extempore Speaking (Sp 111)	3	—	—
Intermediate Algebra (Mth 100)	—	4	—
Elementary Analysis (Mth 101)	—	—	4
Elements of Sociology (Soc 201, 202, 203)	3	3	3
Electives (United States History and/or Government)	3	3	3
Air or Military Science	2	2	2
³ Physical Education	1	1	1
	15	16	16

¹Programs are planned specifically to fit the needs of students who desire such combined training. Those who wish only to prepare for entry to a medical or dental school should register for the preprofessional program offered in the School of Science.

²The curriculum as outlined includes more than the necessary 36 term hours of science for a B.S. degree. If desired, the student may qualify for the B.A. degree by proper selection of elective courses in arts and letters and foreign language.

³General Hygiene (PE 150), 1 term hour for men, 2 term hours for women, is taken one term in place of physical education.

	Term hours		
	F	W	S
Sophomore Year			
Principles of Economics (Ec 201, 202, 203)	3	3	3
General Zoology (Z 201, 202, 203)	3	3	3
General Psychology (Psy 207, 208)	3	3	3
Applied Psychology (Psy 209)			3
General Chemistry (Ch 204, 205)	5	5	
Qualitative Analysis (Ch 206)			5
Air or Military Science	2	2	2
Physical Education	1	1	1
	17	17	17
Junior Year			
Introduction to Pharmacy (Phr 115, 116, 117)	2	2	2
Fundamentals of Pharmacy (Phr 213)	4		
Pharmaceutical Preparations (Phr 319, 320)		4	4
Elementary Botany (Bot 211)	3		
Pharmacognosy (PhP 232, 233)		3	3
Quantitative Analysis (Ch 234)	5		
Organic Chemistry (Ch 226, 227)		5	5
Electives	3	3	3
	17	17	17
Senior (Fourth) Year			
Inorganic Pharmaceuticals (Phr 311)	4		
Organic Medicinal Products (Phr 312, 313)		4	4
Pharmaceutical Preparations (Phr 321)	3		
History of Pharmacy (Phr 322)		3	
Prescription (Phr 323)			2
Pharmaceutical Qualitative Analysis (PhA 321)	3		
Pharmaceutical Quantitative Analysis (PhA 327)		4	
Elementary Physiology (Z 233)			5
General Bacteriology (Bac 204)	3		
Professional electives		3	3
Nonprofessional electives	3	3	3
	16	17	17
Senior (Fifth) Year			
Prescription Compounding (Phr 454)	4		
Prescription Compounding (Phr 455, 456)		3	3
Pharmacology (PhP 491, 492, 493)	3	3	3
First Aid (PE 358)	3		
Toxicology (PhA 441)		3	
Pharmacological Standardization (PhP 494)			3
Biological Products (PhP 495)	3		
Proprietary Specialty Products (Phr 451)		3	
Pharmacy Law (Phr 450)			3
Electives	2	3	3
	15	15	15

Pharmacy

IN THE Department of Pharmacy are offered elementary, basic, and advanced courses in theoretical pharmacy, pharmaceutical processes, and commercial pharmacy.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Phr 115, 116, 117. Introduction to Pharmacy. 2 hours each term.

General survey of field of pharmacy, with emphasis on professional literature and fundamental principles and practices.

Phr 213. Fundamentals of Pharmacy. 4 hours fall.

Weights and measures used in pharmacy; percentage and stock solutions; specific gravity; thermometers; etc. Prerequisite: Mth 10 or equivalent. Three lectures; 1 three-hour laboratory period.

UPPER-DIVISION COURSES

- Phr 311. **Inorganic Pharmaceuticals.** 4 hours fall.
Inorganic chemicals and their preparations used in medicine. Students make samples of chemicals; test for impurities. Prerequisite: Ch 206, Phr 320. Three lectures; 1 three-hour laboratory period.
- Phr 312, 313. **Organic Medicinal Products.** 4 hours winter and spring.
Organic chemicals and their preparations used in medicine; correlation between chemical constitution and physiological action. Prerequisite: Phr 311, 321, PhP 233, Ch 227. Three lectures; 1 three-hour laboratory period.
- Phr 319, 320. **Pharmaceutical Preparations.** 4 hours each term, winter and spring.
Preparations of U. S. Pharmacopoeia and National Formulary. Prerequisite: Phr 213, Ch 205 or 103. Three lectures; 1 three-hour laboratory period.
- Phr 321. **Pharmaceutical Preparations.** 3 hours fall.
Continuation of Phr 320. Prerequisite: Phr 320, PhP 233. Two lectures; 1 three-hour laboratory period.
- Phr 322. **History of Pharmacy.** 3 hours winter.
Evolution and development of profession from earliest times to present.
- Phr 323. **Prescription.** 2 hours spring.
The prescription as a document; methods of receiving, interpreting, compounding, and dispensing; ambiguities and incompatibilities. Prerequisite: Phr 311, 321, PhA 321, Ch 227.
- Phr 350, 351. **Manufacturing Pharmacy.** 3 hours winter and spring.
Problems involved in manufacturing drug and related products on industrial scale. Prerequisite: Phr 311, 321, PhA 321. One lecture; 2 three-hour laboratory periods.
- Phr 401. **Research.** Terms and hours to be arranged.
- Phr 403. **Thesis.** Terms and hours to be arranged.
- Phr 405. **Reading and Conference.** Terms and hours to be arranged.
- Phr 407. **Seminar.** One hour.
- Phr 447, 448, 449. **Drug-Store Practices.** 3 hours each term.
Establishing a store, arrangements, salesmanship, showcase and window trimming, inventory, narcotic and poison records, taking prescriptions over telephone, etc. Prerequisite: Phr 323. Two lectures; 1 three-hour laboratory period.
- Phr 450. **Pharmacy Law.** 3 hours spring.
Oregon Pharmacy Law; promulgations of Oregon Board of Pharmacy; Federal Food, Drug and Cosmetic Act; Harrison Narcotic Act; other laws.
- Phr 451. **Proprietary Specialty Products.** 3 hours winter.
Preparations of pharmaceutical manufacturers; composition and therapeutic use. Text, *New and Nonofficial Remedies*, supplemented by literature and reports. Prerequisite: Phr 313.

Phr 454. Prescription Compounding. 4 hours fall.

Theories of prescription compounding; management of prescription department. Prerequisite: Phr 323. Two lectures; 2 three-hour laboratory periods.

Phr 455, 456. Prescription Compounding. 3 hours winter and spring.

Supervised compounding of a wide variety of prescriptions selected from current files of practicing pharmacists. Prerequisite: Phr 454. One lecture; 2 three-hour laboratory periods.

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

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.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

PhA 321. Pharmaceutical Qualitative Analysis. 3 hours fall.

Composition and identification of natural products, alkaloids, synthetic drugs, and newer remedies. Prerequisite: Ch 206, 227, Phr 320, PhP 233. Two lectures; 1 three-hour laboratory period.

PhA 327. Pharmaceutical Quantitative Analysis. 4 hours winter.

Quantitative determination of purity of more common official and unofficial drugs. Prerequisite: Ch 227, 234, Phr 311, 321, PhA 321. Two lectures; 2 three-hour laboratory periods.

PhA 361, 362, 363. Advanced Drug Analysis. 3 hours each term.

Advanced quantitative methods, both chemical and physical. Students showing proficiency in this course may do special work in State Drug Laboratory. Prerequisite: PhA 327. One lecture; 2 three-hour laboratory periods.

PhA 441. Toxicology. 3 hours winter.

Detection of common inorganic and organic poisons; emphasis on alkaloids and synthetics. Prerequisite: PhP 233, PhA 321, Ch 227. Two lectures; 1 three-hour laboratory period.

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.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

PhP 231, 232, 233. **Pharmacognosy.** 3 hours each term.
Official botanical, animal, and synthetic drugs; macroscopic identification.

UPPER-DIVISION COURSES

PhP 354, 355. **Advanced Pharmacognosy.** 3 hours winter and spring.
Microscopy of vegetable and animal drugs; cultivation of drug plants. Prerequisite: PhP 233. One lecture; 2 three-hour laboratory periods.

PhP 454. **Commercial Poisons.** 3 hours spring.
Substances and materials used as commercial poisons; their composition, characteristics, and toxicities. Prerequisite: Ch 227, PhA 441.

PhP 491, 492, 493. **Pharmacology.** 3 hours each term.
Physiological action of drugs on human organism; toxicological aspects of poisonous drugs. Prerequisite: Phr 313, Z 233. Two lectures; 1 three-hour laboratory period.

PhP 494. **Pharmacological Standardization.** 3 hours spring.
Biological assaying; methods of U. S. P.; certain unofficial but well-recognized procedures. Prerequisite: PhP 492, Ch 227, Bac 204. One lecture; 2 three-hour laboratory periods.

PhP 495. **Biological Products.** 3 hours fall.
Official vaccines, serums, antitoxins, hormones, endocrine products, and other materials of biological origin. Prerequisite: Bac 204, Ch 227, Z 233.

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.

Air Science and Tactics

(Personnel detailed from United States Air Force)

PROFESSOR BEACH (Colonel, United States Air Force), Commandant.

ASSOCIATE PROFESSORS MORSE (Lieutenant Colonel), Executive Officer; CAMPION (Major), Unit Director, Basic; RYAN (Major), Assistant Unit Director, Administration; HILL (Major), Unit Director, Administration; BORGERSON (Captain), Unit Director, Communications; REILLEY (Captain), Assistant Unit Director, Communications.

INSTRUCTORS (Master Sergeants) HERDT, MORGAN, NATHANIEL, TIMMONS, SIMKINS, HOUSE, WILLIAMS.

General Statement

OREGON State College was one of the first colleges at which Air Force R.O.T.C. was offered following World War II. In September 1946 the program was initiated on the campus as one of the branches of R.O.T.C. supervised by the Army. On July 1, 1949, because of the need for a separate four-year program for United States Air Force students, the Air Force R.O.T.C. became self-supporting and was separated from the United States Army.

Requirements. Military instruction is required in the freshman and sophomore years of all physically qualified men students who are citizens of the United States between the ages of 14 and 22 years inclusive at the time of enrollment in the R.O.T.C. and who successfully complete such general survey and screening tests as may be prescribed.

Exemptions from military training are granted by the Registrar to the following persons:

Men who have served six months or more active duty in the Air Force, Army, Coast Guard, Marine Corps, or Navy.

Transfer students who have had no previous military training and who have sufficient hours of credit accepted at Oregon State College to be within three years of graduation.

Partial exemptions may be granted students who took accredited R.O.T.C. training in a high school, junior college, or military academy.

Objectives. The mission of the Air Force R.O.T.C. program is to produce, under a system of training based on appropriate Department of the Air Force programs of instruction, junior officers who have the qualities and attributes essential to their progressive development as officers in the Air Force of the United States. In general, the objectives of this mission are:

1. Qualifications of selected students for appointment as junior officers in the United States Air Force or U.S.A.F. Reserve.
2. Education that will benefit the students who do not complete the entire course and at a later date become members of the military service.
3. Education of all students in becoming better citizens and in playing their part in national security.

Basic Course. Requiring four hours a week, the first two years of military instruction constitute what is known as the Basic Course of the Air Force R.O.T.C. at Oregon State College. For each term 2 hours of academic credit

is allowed. Students assigned to Air Force R.O.T.C. pursue a course of general Air Force instruction. Students in the Basic Course receive no monetary allowances. Basic-course students are furnished a service-type uniform which includes such items as shirts, shoes, socks, necktie, rain coat, etc. The uniform is worn during one of the four hours of instruction per week and on other special occasions. The professor of air science and tactics may grant certificates of eligibility for entrance to a United States Air Force officer candidate school course to those especially qualified who:

1. Have completed the Basic Course.
2. Have completed 2 years of college studies.
3. Do not intend to pursue their college studies further.

Such certificates are valid for a period of two years only.

Basic R.O.T.C. band students are excused from drill with the squadrons in order to drill with the band.

Advanced Course. The third and fourth years of military instruction requiring five hours a week in addition to a summer camp constitute the Advanced Course of the Air Force R.O.T.C. The six-weeks summer camp is conducted at a regular Air Force Base and is attended by advanced air cadets between their first and second years of the Advanced Course.

Men who have served on active duty in one of the armed services over six months but less than twelve months must complete one year of basic R.O.T.C. to be eligible for acceptance in the Advanced Course. Those who have served on active duty twelve months or more need not take the Basic Course to be eligible for the Advanced Course.

Conditions for Enrollment in the Advanced Course. All students formally enrolled in the Advanced Course of the Senior Air Force R.O.T.C. must:

1. Be selected by the professor of air science and tactics and the President of Oregon State College.
2. Not have reached 27 years of age.
3. Successfully complete such survey and general screening tests as may be prescribed.
4. Have completed the Basic Course or received credit in lieu thereof for having had twelve months or more previous honorable active service in the Army, Navy, Marine Corps, Coast Guard, or Air Force.
5. Be a citizen of the United States.
6. Be physically qualified under standards prescribed by the Department of the Air Force. Due allowance will be made for those defects that are correctible before the student becomes eligible for appointment as a commissioned officer.
7. Be accepted by Oregon State College as a regularly enrolled student.
8. Execute a written agreement with the Government to complete the Advanced Course, contingent upon remaining in college, and to attend the Advanced Camp at the time specified.

Emoluments, Advanced Course. Students in the Advanced Course are paid at a daily rate of 90¢ per day for a total period not to exceed 570 days. Any emoluments are in addition to benefits received through the G.I. Bill of

Rights. Advanced students will be issued a complete officer-type uniform for wear during the Advanced Course, including the Summer Camp. Students attending camp will be messed and quartered, and will be paid at the rate prescribed for airmen of the 1st grade (\$75 per month). A travel allowance of 5¢ a mile is paid to and from camp.

Academic Credit, Advanced Course. Three hours of academic credit are allowed for each term of the Advanced Course plus 6 credit hours for work done while at the Advanced Summer Camp. With the basic work the student on graduation will have a total of 36 term hours of credit in air science, 24 hours of which will be upper division. This constitutes a major in air science and counts as a comajor with whatever other major he submits for a baccalaureate degree.

Minimum Nonmilitary Requirements for a Commission. For a commission a student must meet the following minimum requirements:

1. He must have attained the age of 21 years.
2. He must have successfully completed 4 years of education at the college level.
3. He must fulfill certain academic requirements:
 - a. U.S.A.F. Communication Officer: In addition to his major in air science, the student must have a comajor in one of the following departments:
 - Electrical or General Engineering
 - Electronic Physics
 - Other Engineering
 - b. U.S.A.F. General Administration Officer: In addition to his major in air science he must have a course of study leading to a baccalaureate degree. (Majors in branches of engineering, physics, or chemistry will not be assigned this course until quotas for the U.S.A.F. Communication course have been filled and a waiver is granted by the Signal Corps and Corps of Engineers R.O.T.C.)

Distinguished Graduates. Advanced Air Force R.O.T.C. students who have distinguished themselves both academically and in leadership, in military courses and campus activities, may be offered commissions for a career in the regular United States Air Force.

Flight Training. Students who desire United States Air Force Flight Training and who have successfully completed the Advanced Air Force R.O.T.C. program are eligible to participate in the United States Air Force Flight Training program as commissioned officers.

Specialized Training. Air Force R.O.T.C. students, at the beginning of the first year of the Advanced Course, are selected for specialization in Air Force Communications, or Air Force General Administration. Selection is based on the academic course pursued. After selection the student's primary effort is concentrated in the field for which selected and upon graduation he is awarded the Military Occupational Specialty appropriate to the specialized course pursued.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- AS 111, 112, 113. **First-Year Basic Course.** 2 hours each term.
Common course for freshmen. Leadership, drill and exercise of command; military organization and policy; evolution of warfare; maps and aerial photos; military psychology and personnel management; first aid and hygiene; geographical foundations of national power; military problems of the United States; military mobilization and demobilization.
- AS 211, 212, 213. **Second-Year Basic Courses.** 2 hours each term.
Leadership, drill and exercise of command; orientation; aerodynamics and propulsion; applied air power; meteorology; navigation.

UPPER-DIVISION COURSES

- AS 311, 312, 313. **First-Year Advanced Course.** 3 hours each term.
Leadership, drill and exercise of command; logistics; air operations; communications specialization.
- AS 314. **Advanced Summer Camp.** 6 hours.
For communications specialists. Prerequisite: AS 311, 312, 313.
- AS 321, 322, 323. **First-Year Advanced Course.** 3 hours each term.
Leadership, drill and exercise of command; supply; air, motor and commercial transportation; air operations; general administration specialization.
- AS 324. **Advanced Summer Camp.** 6 hours.
For general administration specialists. Prerequisite: AS 321, 322, 323.
- AS 411, 412, 413. **Second-Year Advanced Course.** 3 hours each term.
Leadership, drill and exercise of command; applied fields of officer orientation; communications specialization.
- AS 421, 422, 423. **Second-Year Advanced Course.** 3 hours each term.
Leadership, drill and exercise of command; military teaching methods; Air Force management; general administration specialization.

Military Science and Tactics

(Personnel detailed from United States Army)

PROFESSOR DEMUTH (Colonel, Artillery), Commandant.

ASSOCIATE PROFESSORS MOSBERGER (Colonel), Director of Artillery Unit; CAMPBELL (Major), Director of Engineer Unit; PACKMAN (Major), Director of Infantry Unit; PETERSON (Lieutenant Colonel), Director of Signal Corps Unit; HOGAN (Lieutenant Colonel), Director of Freshman Course.

ASSISTANT PROFESSORS BISSELL (Major), Infantry Unit; BUTHERUS (Major), Infantry Unit; SHAW (Major), Artillery Unit; PEARCE (Captain), Engineer Unit.

INSTRUCTORS BAILEY (Master Sergeant); BOGGS (Master Sergeant); GREEN (Master Sergeant); FORCE (Master Sergeant); KOEBRICK (Master Sergeant); KRONE (Master Sergeant); OLISZEWSKI (Master Sergeant); PETERSON (Master Sergeant); SMITH (Master Sergeant); WYNNE (Master Sergeant); CARLSON (Sergeant First Class); DIETZ (Sergeant First Class); WOJIECHOWSKIE (Sergeant First Class); CHELF (Sergeant).

General Statement

INSTRUCTION in military tactics was started at Oregon State College 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. History has shown that the average male between the ages of 18 and 60, at some time during his lifetime, regardless of the career for which he was trained and educated, has become a member of the military profession. The College has continued to agree to meet prescribed standards of training in order that its graduates might receive commissions as Reserve Officers in the Army of the United States who would be available as trained leaders, and that its nongraduates might receive training that would be of benefit to them in the event of a national emergency. During World Wars I and II, the number of nongraduates and 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. Civil colleges and universities, not essentially military, which grant degrees to students at an average age of not less than 21 years, and at which R.O.T.C. units are established, are classified as Senior Division R.O.T.C. institutions. The Senior Division R.O.T.C. program consists of two parts: (1) the *Basic Course*, and (2) the *Advanced Course*. Four branches of military training are offered at Oregon State College: Signal Corps, Infantry, Engineers, and Field Artillery. An excellent R.O.T.C. band affords instruction in band practice.

Requirements. Military instruction is required in the freshman and sophomore years of all physically qualified men students who are citizens of the United States between the ages of 14 and 22 years inclusive at the time of

enrollment in the R.O.T.C. and who successfully complete such general survey or screening tests as may be prescribed.

Exemptions from military training are granted by the Registrar to the following persons:

Men who have served six months or more active duty in the Air Force, Army, Coast Guard, Marine Corps, or Navy.

Transfer students who have had no previous military training and who have sufficient hours of credit accepted at Oregon State College to be within three years of graduation.

Partial exemptions may be granted students who took accredited R.O.T.C. training in a high school, junior college, or military academy.

Students eligible for the above exemptions may receive partial or complete credit (not hours) for the Basic Course. Such students, who are desirous of taking the Advanced Course, should contact the Department of Military Science and Tactics immediately upon enrollment.

R.O.T.C. and Its Relationship to Selective Service Acts. Enrollment in R.O.T.C. does not preclude registering under the Selective Service Act of 1948. All students enrolled and of age must register. Selected students enrolled in the R.O.T.C. within allotted quotas by the Department of the Army, who are not exempt from the draft because of prior military service may under certain conditions be exempted. A student within these quotas, in order to maintain exemption, must maintain a high standard of proficiency in his military courses and academic studies. For further information apply at R.O.T.C. Headquarters.

Objectives. The mission of the R.O.T.C. program is to produce, under a system of training based on appropriate Department of the Army programs of instruction, junior officers who have the qualities and attributes essential to their progressive development as officers in the Army of the United States. In general, the objectives of this mission are:

1. Qualification of selected students for appointment as junior officers in the Army of the United States.
2. Education that will benefit the students who do not complete the entire course and at a later date become members of the military service.
3. Education of all students in becoming better citizens and in their part to be played in national security.

Basic Course. The first two years of military instruction requiring four hours a week constitute what is known as the Basic Course of the R.O.T.C. at Oregon State College. For each term 2 hours of academic credit is allowed. Students in the Basic Course receive no monetary allowances. Basic-course students are furnished a service type uniform. The uniform is worn during one of the four hours of instruction per week and on other special occasions. The professor of military science and tactics may grant certificates of eligibility for entrance to an officer candidate school course to those especially qualified who:

1. Have completed the Basic Course.
2. Have completed 2 years of college studies.
3. Do not pursue their college studies to completion.

Such certificates are valid only for a period of two years.

Basic R.O.T.C. band students are excused from drill with the companies. They drill with the band.

Advanced Course. The third and fourth years of military instruction requiring five hours a week plus a summer camp constitute the Advanced Course of the R.O.T.C. Instruction is principally of a specialized type applicable to an Arm or Service. The summer camp consists of practical and theoretical military instruction of a specialized type and is of 6 weeks' duration. Students will attend the camp between the two years of the Advanced Course.

Conditions for Enrollment in the Advanced Course. All students formally enrolled in the Advanced Course of the Senior R.O.T.C. must:

1. Be selected by the professor of military science and tactics and the President of Oregon State College.
2. Not have reached 27 years of age.
3. Successfully complete such survey and general screening tests as may be prescribed.
4. Have completed the Basic Course or received credit in lieu thereof for having had twelve months or more previous honorable active service in the Army, Navy, Marine Corps, Coast Guard, or Air Force.
5. Be a citizen of the United States.
6. Be physically qualified under standards prescribed by the Department of the Army. Due allowance will be made for those defects that are correctible before the student becomes eligible for appointment as a commissioned officer.
7. Be accepted by the College as a regularly enrolled student.
8. Execute a written agreement with the United States to complete the Advanced Course, contingent upon remaining in school, and to attend the summer camp at the time specified.

Utilization of Graduates of Scientific and Technical Curricula. Though it is not practicable to maintain units of all the many branches at most colleges and universities, there will be students in scientific and technical courses whose services will be needed and who will wish to be commissioned in branches not represented by units on their campuses. The Department of the Army will make provisions for such advanced students to attend an R.O.T.C. camp of the appropriate branch and will tender them, if otherwise qualified, a commission in the appropriate branch within quota limitations.

Emoluments, Advanced Course. Students in the Advanced Course are paid at a daily rate equal to the value of the commuted ration (present value 90¢) for a total period not to exceed 570 days. Any emoluments are in addition to benefits received through the G. I. Bill of Rights. Students attending summer camp will be messed and quartered and will be paid at the rate prescribed for soldiers of the 7th grade (\$75 per month). A travel allowance from Oregon State College to camp and return to Oregon State College at the rate of 5¢ a mile will be authorized for students attending the summer camp.

Academic Credit, Advanced Course. Three hours of academic credit are allowed for each term of the Advanced Course plus 6 credit hours for work done while at the Advanced Summer Camp. With the basic work the student on graduation will have a total of 36 term hours of credit in military science, 24 hours of which will be upper division. This constitutes a major in military science and counts as a comajor with whatever other major he submits for a baccalaureate degree.

Minimum Nonmilitary Requirements for a Commission. For a reserve commission a student must meet the following minimum requirements:

1. He must have attained the age of 21 years.
2. Unless a veteran he must have successfully completed 4 years of education at the college level.
3. In addition to his major in military science, he must have a comajor as follows:
 - (a) For commission in the Engineer Corps, he must have a comajor in any academic course of instruction leading to an engineering, technical, or scientific degree.
 - (b) For commission in the Field Artillery or Infantry, he must have a comajor in any school or department at Oregon State College granting an academic degree.
 - (c) For commission in the Signal Corps, he must have a comajor in electrical, electronic or mechanical engineering, or physics.

Opportunities of R.O.T.C. Graduates for Regular Commission in U. S. Army. An R.O.T.C. student who possesses outstanding qualities of military leadership, high moral character, and definite aptitude for the military service; who distinguishes himself either academically or by demonstrated leadership through his accomplishments while participating in recognized campus activities; who has completed, or is scheduled to complete, the Advanced Course, Senior Division R.O.T.C., within one academic year, will be designated a "Distinguished Military Student." A distinguished military student who has completed the Advanced Course, Senior Division R.O.T.C., has been graduated by a college or university with a baccalaureate degree, and has maintained the standards required of a distinguished military student during the period between designation as a distinguished military student and the date of graduation with a degree, will be designated a "Distinguished Military Graduate."

A distinguished military student or distinguished military graduate may apply for appointment as a commissioned officer in the Regular Army.

Each candidate at time of appointment must:

1. Be a distinguished military graduate.
2. Be at least 21 years old.
3. Not have reached his 27th birthday. (This requirement may be waived under certain conditions.)
4. Be found to be physically qualified by meeting prescribed physical standards.
5. Have a record free of convictions by any type of military or civil court for other than minor traffic violations.
6. Not be nor have been a conscientious objector.
7. Not be nor have been a member of any foreign or domestic organization, association, movement, group, or combination of persons advocating subversive policy or seeking to alter the form of government of the United States by unconstitutional means.

In addition to those eligible for appointment listed above any student successfully completing requirements of the Advanced Course, Senior Division R.O.T.C. may, upon graduation, apply for a two-year "Competitive Tour." Upon completion of the tour with the Regular Army he may be tendered a commission in the Regular Army.

COURSES IN INFANTRY

LOWER-DIVISION COURSES

- MS 111, 112, 113. **First-Year Basic Course.** 2 hours each term.
Leadership, drill, exercise of command; military organization; fundamentals of drill; weapons and marksmanship; interior guard; map reading; geographical foundations of national power; evolution of warfare; military problems of the United States; military policy; first aid.
- MS 211, 212, 213. **Second-Year Basic Course.** 2 hours each term.
Leadership, drill, exercise of command; fundamentals of drill; organization; weapons; technique of fire; combat formations; field fortifications; scouting and patrolling; tactics of the rifle squad; tactics of weapons squad.

UPPER-DIVISION COURSES

- MS 311, 312, 313. **First-Year Advanced Course.** 3 hours each term.
Leadership, drill, exercise of command; organization; communications; weapons; gunnery; psychological warfare; combat intelligence; estimate of situation and combat orders; tactics of rifle and heavy weapon platoons, companies.
- MS 314. **Advanced Summer Camp.** 6 hours.
Practical and theoretical instruction of a specialized type. Prerequisite: MS 313.
- MS 411, 412, 413. **Second-Year Advanced Course.** 3 hours each term.
Leadership, drill, exercise of command; organization; communication; motors and transport; supply and evacuation; troop movement; new developments; command and staff; the military team; infantry battalion in attack and defense; military administration; military laws and boards; military teaching methods.

COURSES IN FIELD ARTILLERY

LOWER-DIVISION COURSES

- MS 121, 122, 123. **First-Year Basic Course.** 2 hours each term.
Leadership, drill, exercise of command; military organization; fundamentals of drill; weapons and marksmanship; interior guard; map reading; geographical foundations of national power; evolution of warfare; military problems of the United States; military policy; first aid.
- MS 221, 222, 223. **Second-Year Basic Course.** 2 hours each term.
Leadership, drill, exercise of command; fundamentals of drill; instruments; materiel; Field Artillery organization; motors and transport; Field Artillery mathematics; communications; service of the piece.

UPPER-DIVISION COURSES

- MS 321, 322, 323. **First-Year Advanced Course.** 3 hours each term.
Leadership, drill, exercise of command; psychological warfare; supply and evacuation; duties of the battery executive; communications; Field Artillery tactics; gunnery.
- MS 324. **Advanced Summer Camp.** 6 hours.
Prerequisite: MS 323.

- MS 421, 422, 423. **Second-Year Advanced Course.** 3 hours each term.
Leadership, drill, exercise of command; surveying; gunnery; combat intelligence; new developments; fire direction center; command and staff; Field Artillery tactics (advanced); military team; military administration; military laws and boards; military teaching methods; psychological warfare.

COURSES IN MILITARY ENGINEERING

LOWER-DIVISION COURSES

- MS 131, 132, 133. **First-Year Basic Course.** 2 hours each term.
Leadership, drill, exercise of command; military organization; fundamentals of drill; weapons and marksmanship; interior guard; map reading; geographical foundations of national power; evolution of warfare; military problems of the United States; military policy; first aid.
- MS 231, 232, 233. **Second-Year Basic Course.** 2 hours each term.
History and traditions of engineers; hand tools and rigging; explosives and demolitions; defense against chemicals; water supply; psychological warfare; camouflage; mines and booby traps; organization of the ground and field fortifications; engineer signal communications; characteristics of weapons; organization and tactics of small units; leadership, drill, exercise of command.

UPPER-DIVISION COURSES

- MS 331, 332, 333. **First-Year Advanced Course.** 3 hours each term.
Bridge design and classification; military roads and runways; vehicle operation and maintenance; water supply; psychological warfare; motor movements; organization of combat divisions; tactics of engineer units; engineer signal communications; organization of engineer units; engineer combat intelligence; engineer supply; leadership, drill, exercise of command.
- MS 334. **Advanced Summer Camp.** 6 hours.
Prerequisite: MS 333.
- MS 431, 432, 433. **Second-Year Advanced Course.** 3 hours each term.
Command and staff; river crossing operations; engineer support for air force; engineer support for communications zone; engineer support for type field army; psychological warfare; motor movements; construction, utilities, job management; military administration; military laws and boards; military teaching methods; leadership, drill, exercise of command.

COURSES IN SIGNAL CORPS

LOWER-DIVISION COURSES

- MS 151, 152, 153. **First-Year Basic Course.** 2 hours each term.
Leadership, drill, exercise of command; military organization; fundamentals of drill, weapons and marksmanship; interior guard; map reading; geographical foundations of national power; evolution of warfare; military problems of the United States; military policy; first aid.
- MS 251, 252, 253. **Second-Year Basic Course.** 2 hours each term.
Leadership, drill, exercise of command; fundamentals of drill; basic electricity and magnetism; motors and transportation; introduction to signal communications; organization and mission of the Signal Corps; organization and signal communications practices of infantry, armored, airborne divisions.

UPPER-DIVISION COURSES

- MS 351, 352, 353. **First-Year Advanced Course.** 3 hours each term.
Leadership, drill, exercise of command; communications security; signal orders; field wire communications fundamentals; field radio communications fundamentals; applied signal communications (division); message center and communications procedure; signal supply and repair; career guidance for Signal Corps officers; weapons and marksmanship.
- MS 354. **Advanced Summer Camp.** 6 hours.
Practical and theoretical instruction of a specialized type. Prerequisite: MS 353.
- MS 451, 452, 453. **Second-Year Advanced Course.** 3 hours each term.
Leadership, drill, exercise of command; military laws and boards; military teaching methods; psychological warfare; wire communications, materiel; radio communications, materiel; higher echelon signal communications and equipment; post signal operations and administrative practices; career guidance for Signal Corps officers; darkroom technique and photo practices; command and staff; combat intelligence.

Naval Science

(Personnel detailed from United States Navy)

PROFESSOR JENSEN (Captain), Commanding Officer.

ASSOCIATE PROFESSOR RIGAUD (Lieutenant Colonel, U.S.M.C.), Executive Officer.

ASSISTANT PROFESSORS MARSH (Lieutenant Colonel, U.S.M.C.); KUNHARDT (Lieutenant Commander); GIBSON (Lieutenant); WARD (Lieutenant).

INSTRUCTORS MILES (Master Sergeant, U.S.M.C.); QUINN (Chief Quartermaster); GRAHAM (Chief Gunner's Mate); NELSON (Chief Firecontrolman).

General Statement

UNDER the authority of a Federal Act on March 4, 1925, and amendments thereto, the Naval Reserve Officers' Training Corps was established as a college-training program for prospective naval officers. The first units were established in 1926, and during the succeeding fifteen years 27 units were activated at major colleges and universities throughout the nation. During 1945, 25 additional units were commissioned, bringing the total to 52 Naval R.O.T.C. units. A unit is the total student enrollment in the Corps at any one civil educational institution. Average enrollment in each unit is 270 students but is not limited to this number. Instruction given at an institution in accordance with programs prescribed by the Navy Department is conducted or supervised by a Department of Naval Science. Instruction in naval subjects is given by naval officers and men.

Oregon State College qualified for a Naval Reserve Officers' Training Corps unit under existing laws and regulations, and its unit was commissioned September 17, 1945.

Objectives. The mission of the Naval Reserve Officers' Training Corps at civil educational institutions is to develop the student morally, mentally, and physically, and to provide him with a basic knowledge of the naval profession, in order that he may become a capable junior officer in the U. S. Navy or Marine Corps, or be qualified for a commission in the Naval Reserve or Marine Corps Reserve on graduation. In general the objectives of the Department of Naval Science at a civil educational institution in carrying out the foregoing mission are:

1. To provide the student with a well-rounded course in basic naval subjects, which, in conjunction with a baccalaureate degree, will qualify him for a commission in the United States Naval Service.
2. To develop a knowledge of, and an interest in, naval customs and traditions.
3. By precept and example, to develop a capacity for leadership.
4. To supplement the academic work of the school year by summer training cruises.

The program is designed to operate within the established educational framework of Oregon State College. The general objective is to provide basic naval education together with a relatively broad general education. Curricula leading to first baccalaureate degrees in the various schools are integrated within the scope of the N.R.O.T.C. as an agency to increase naval officer strength.

Types of Students. The N.R.O.T.C. Unit is composed of two types of students:

Regular students: These students are appointed Midshipmen, U.S.N.R. They have their tuition, fees, and textbooks paid for by the Navy for a period not exceeding four years, are uniformed at Government expense, and receive retainer pay at the rate of \$600 per year. They obligate themselves to complete the prescribed Naval Science curriculum, to attend three summer cruises of from six to eight weeks, to accept a commission as Ensign, U.S.N., or Second Lieutenant, U.S.M.C., on graduation, and to serve on active duty for two years after receiving commissions, unless earlier released by the Navy Department. At the beginning of the third year after receiving commissions, they have the opportunity to apply for retention in the regular Navy or Marine Corps, and will be so retained if selected under the quotas then in force.

Students in this group are selected by means of a nation-wide examination, which is administered by state or regional selection boards. This examination is given each year, generally in December, for entry the following fall term. Information relative to later examinations may be obtained from the Commanding Officer of the N.R.O.T.C. Unit.

Contract students: These students are enrolled under the provisions of the prewar legislation, which remains in effect. They are uniformed at Government expense, and during their junior and senior years are paid one commuted ration a day (currently 90¢) while under instruction. They obligate themselves to complete the prescribed Naval Science curriculum, to make one summer cruise of approximately three weeks and to accept a commission on graduation as Ensign, U.S.N.R., or Second Lieutenant, U.S.M.C.R. The current Selective Service Act requirements, as applicable to N.R.O.T.C. students, will be fully explained by the Department of Naval Science on request.

Students in this group are selected by the Department of Naval Science at Oregon State College.

Requirements. *Every acceptable candidate*, whether applying as a regular or contract student, must:

1. Be a male citizen of the United States.
2. Be a regularly enrolled student in good standing at a college of which the N.R.O.T.C. Unit is a part.
3. Have attained his 17th birthday on or before July 1 of the year in which enrolled, but must not attain his 25th birthday before July 1 of the year in which he would normally receive his first baccalaureate degree and be commissioned.
4. Be unmarried and agree to remain unmarried until commissioned or otherwise separated from the N.R.O.T.C. program.
5. Agree, with the consent of his parent or legal guardian, to undergo whatever period of training may be necessary to complete all requirements of the N.R.O.T.C. curriculum.
6. Agree to participate in required summer training courses and cruises.
7. Agree to accept the appropriate commission in the Navy, Marine Corps, Naval Reserve, or Marine Corps Reserve, when offered.
8. Meet general physical requirements as follows: *Height*, minimum 5 feet 6 inches, maximum 6 feet 4 inches. *Vision*, 20/20 each eye; color perception normal. *Weight*, in proportion to height. *Teeth*, a minimum of 20 vital. Other physical requirements as prescribed by the Manual of the Medical Department for candidates for commissions.

9. Be morally qualified and possess potential officer qualities, as evidenced, for example, by appearance, scholarship, and extracurricular activities.

Every candidate for regular student and appointment as Midshipman, U.S.N.R., must, in addition to the requirements listed above, meet the following requirement: Agree, with the consent of his parent or legal guardian, to serve on active duty in the Navy or Marine Corps, after receiving commission, for a period of two years, unless sooner released by the Navy Department.

Status of Students. Students enrolled in the program will not be on active duty. They will be required to wear the uniform only for drills (one hour per week), on special occasions, and during the summer training cruises.

Academic Credit. Three hours of academic credit is granted each term for all naval science courses.

Curriculum. The program of study covers four years and fits into curricula leading to first baccalaureate degrees. It includes the following academic requirements:

1. Thirty-six term hours of Naval Science. Each N.R.O.T.C. student must be enrolled in at least one three-hour course in Naval Science each term until graduation.

2. One year of college physics, to be completed by the end of the sophomore year for regular students only. This course is a necessary background for the courses in naval engineering (NS 411, 412, 413).

3. Mathematics courses through trigonometry, to be completed by the end of the sophomore year. This requirement is a necessary background for the courses in navigation (NS 311, 312, 313).

4. Proficiency in written and oral expression. (One year of English is considered adequate.)

5. Two years of physical education. Each student must qualify as a swimmer and should be instructed in lifesaving and resuscitation.

Recommended electives are:

1. A sequence in mathematics, extending through calculus, and including spherical trigonometry.

2. A second year of physical science, such as advanced electricity and elementary electronics, for other than engineering students.

3. A year sequence in Personnel Management.

4. A year sequence in the Foundations of National Power, or a comparable sequence approved by the academic authorities.

5. Two years of a foreign language (modern Romance, Germanic, Slavic, or Oriental), or demonstration to the academic authorities by examination that he possesses a good reading knowledge and can make an acceptable translation of one of the languages.

Naval science (including summer cruise) pursued for four years in one of the undergraduate curricula constitutes a comajor with many of the majors offered in degree-granting divisions of schools. In addition, the Department of Naval Science offers a four-year curriculum with a major in naval science; in this curriculum the student may take considerable amounts of work in any of the schools but needs to complete a major only in naval science. See curriculum on next page.

Information. Any additional information desired can be obtained through the office of the Professor of Naval Science either in person or by letter.

Curriculum in Naval Science

B.A., B.S. Degrees

	Term hours		
	F	W	S
Freshman Year			
Naval Orientation (NS 111, 112, 113)	3	3	3
Elementary Analysis (Mth 101, 102, 103)	4	4	4
Engineering Physics (Ph 101, 102, 103)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
¹ Approved courses	3	3	3
Physical Education and General Hygiene	1	1	1
	17	17	17
Sophomore Year			
Naval Weapons (NS 211, 212, 213)	3	3	3
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
English literature electives	3	3	3
¹ Approved courses	6	6	6
Physical Education	1	1	1
	17	17	17
Junior Year			
² Navigation (NS 311, 312, 313)	3	3	3
¹ Approved courses	10	10	10
Electives	3	3	3
	16	16	16
CRUISE			
		Summer	
		Term hours	
³ Third-Year Cruise (First Period) (NS 331)		3	
³ Third-Year Cruise (Second Period) (NS 332)		3	
Senior Year			
² Naval Machinery (NS 411)	3		---
² Naval Diesel Engines and Ship Stability (NS 412)		3	---
² Naval Administration and Leadership (NS 413)			3
⁴ International Politics and National Power (SSc 441, 442, 443)	3	3	3
¹ Approved courses	7	7	7
Electives	3	3	3
	16	16	16

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

NS 111, 112, 113. Naval Orientation. 3 hours each term.

NS 211, 212, 213. Naval Weapons. 3 hours each term.

UPPER-DIVISION COURSES

NS 311, 312, 313. Navigation. 3 hours each term.

⁶NS 322. History of the Art of War. 3 hours.

¹Approved courses are selected on either of two plans: (1) liberal emphasis—courses providing a strong minor in Business and Technology, Science, or other suitable school; (2) technical emphasis—courses providing a strong minor in Engineering.

²Beginning with the winter term of junior year, Marine Corps students take the following courses in place of the naval science courses listed: History of the Art of War (NS 322), Concepts of Military Policy, Power, and Principles (NS 323), Analysis of American Battles (NS 421), American Battles and Amphibious Operations (NS 422), Amphibious Operations (NS 423).

³Credit hours earned on the third-year cruise count toward the 24 upper-division hours required for a naval science major. They will not satisfy elective requirements in any other curriculum.

⁴SSc 441, 442, 443 may be taken either in junior or senior year.

⁶Offered for candidates for U. S. Marine Corps or U. S. Marine Corps Reserve.

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- *NS 323. **Concepts of Military Policy, Power, and Principles.** 3 hours.
- NS 331, 332. **Third-Year Cruise.** 3 hours each period.
Cruise on board Navy combatant ships during summer between junior and senior years. Two periods covering 3 hours credit each. Junior Officer of the Watch standing. Practical application of training received in previous Naval R.O.T.C. courses; further instruction in naval subjects; gunnery, navigation, seamanship, and engineering experience and training.
- NS 411. **Naval Machinery.** 3 hours.
- NS 412. **Naval Diesel Engines and Ship Stability.** 3 hours.
- NS 413. **Naval Administration and Leadership.** 3 hours.
- *NS 421. **Analysis of American Battles.** 3 hours fall.
- *NS 422. **American Battles and Amphibious Operations.** 3 hours winter.
- *NS 423. **Amphibious Operations.** 3 hours spring.

* Offered for candidates for U. S. Marine Corps or U. S. Marine Corps Reserve.

Division of Physical Education

Faculty

CLAIR VAN NORMAN LANGTON, Dr.P.H., Ed.D., Director of the Division of Physical Education.

CECILE SMITH, Secretary to the Director.

Physical Education for Women

PROFESSOR SEEN (department head).

ASSOCIATE PROFESSORS MORRIS, THOMPSON.

ASSISTANT PROFESSORS P. GILL, HARRISON, HUPPRICH, MILLIKEN, SCULLY, WEIR.

INSTRUCTORS LUMPKIN, POLING, RYDER.

Physical Education for Men

PROFESSORS LANGTON (director of division), ALLMAN, ANDERSON, BERGSTROM, COLEMAN, KEENE, TAYLOR.

ASSOCIATE PROFESSORS ADRIAN, DIXON, RAABE (director of intramural sports), STEVENS (emeritus).

ASSISTANT PROFESSORS COX, DRILICA, FLOOD, SWAN.

INSTRUCTORS DAILEY, A. T. GILL, KOSKI, MOE, WILKINSON.

Intercollegiate Athletics

DIRECTOR R. S. KEENE, ASSISTANT DIRECTOR BAKER.

COACHES COLEMAN (baseball), C. ELLIOTT (assistant football), P. ELLIOTT (assistant football), FLOOD (swimming), GILL (basketball), MOE (assistant football), SWAN (track), TAYLOR (football), VALENTI (assistant basketball), YOUNCE (assistant football), WILKINSON (wrestling).

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 Oregon State College.

Major in Physical Education. In addition to its service functions, the Division of Physical Education offers major work in physical education leading to baccalaureate degrees through the School of Education. The major provides professional preparation for physical education teaching and coaching. It may be combined with health education, camp education, or recreation to meet needs in many public schools, recreation, physiotherapy, and youth organizations.

Minor in Physical Education. Students taking major work in other teaching fields may take a minor in physical education by completing at least

27 term hours in professional courses (see page 294). The minor in physical education may be combined with a major in secretarial science, science, mathematics, industrial arts, home economics, or other subject.

Major in Health Education. The health education major provides the professional preparation necessary for organizing, directing and conducting the school health program. A minimum of 36 hours in health education is required in addition to the human biology major courses. A health education major logically can be combined with a minor in physical education, general biology, or general science.

Minor in Health Education. A health education minor prepares the student for partial teaching assignments in health education in the high school. A minimum of 27 hours of specified subjects is required. A health education minor can be combined with a major in physical education, general biology, or general science.

Minor in Recreation. The minor in recreation prepares for leadership in the rapidly developing field of community recreation. A student should complete certain courses in sociology and psychology as background for this field. The study of community recreation includes emphasis on planning, organizing, and administering the program. (See page 294 for listing of courses.)

Minor in Camp Education. The camp education minor is directed toward professional leadership by offering basic training for camp counselors and through more advanced work with the problems of camp administration, direction, and advisement. (See page 294 for listing of courses.)

Intramural Sports. A comprehensive intramural sports program offers sports for all students of Oregon State College. This program brings to each participant the moral, social, physical, and educational values of athletic competition. Living organizations, clubs, individuals, classes, and institutional departments compete with friendly rivalry in many sports activities.

The department for women conducts a complete program of intramural sports for women and presents a corecreational program. The department for men carries on organized sports competition for men which is separate and apart from intercollegiate athletics.

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 and election to Parthenia are honor awards. The Varsity "O" Managers Association comprises the varsity team managers and the senior intramural sports manager. Professional physical education students belong to either the Men's Physical Education Club or the Women's Physical Education Club.

Student Health Service. A medical examination is required of all entering students. The Student Health Service advises with the Physical Education department 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, use of gymnasium suits and swimming

suits and towels, and laundry service. 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.

Required Courses. All undergraduate men and women are required to enroll in and complete physical activity courses during the freshman and sophomore years unless excused by the college physician or until the physical education requirement has been met. Freshman men take two of the following courses: PE 151, 152, 153; they take PE 150 (General Hygiene) one term. For sophomore men, PE 251, 252, 253 are required. Freshman women take two of the following courses: PE 114, 115, 116; they take PE 150 (General Hygiene) one term. For sophomore women, PE 214, 215, 216 are required. To attain junior standing students must 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 women, 1 term hour for men, for one term.

Sophomore Year

Physical Education, 1 term hour each term for three terms.

Only one of the courses listed above may be taken in any one term.

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.

A broad program of physical-fitness recreation is emphasized. It involves the prevention of disease, the correction of remedial defects, good nutrition, muscular strength, endurance, basic motor skills, mental health, and morale.

The physical-activity courses for students taking a major or minor in physical education (PE 124-126, 224-226 for women; PE 174-176, 225, 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 hours in addition to the regular physical-education requirement.

Professional students may select from the following recommended electives those which will increase preparation for professional positions. Nonprofessional students may enroll in these professional courses or others listed in catalog as interest dictates and when necessary prerequisites have been met.

RECOMMENDED ELECTIVES

Physical Education

- Techniques of Physical Education (men) (PE 175, 176, 275, 276), 8 hours.
- Coaching of Baseball (men) (PE 348), 3 hours.
- Coaching of Track and Field (men) (PE 349), 3 hours.
- Sports Officiating (men) (PE 354), 3 hours.
- *Principles of Physical Education (g) (PE 421), 3 hours.
- *Tests and Measurements in Physical Education (g) (PE 422), 3 hours.
- *Organization and Administration of Physical Education (g) (PE 423), 3 hours.

Recreation

- Recreational Leadership (PE 240), 3 hours.
- Camp Education (Ed 361, 362, 363), 9 hours.
- *School and Community Club Work (G) (Ed 425), 3 hours.
- *Community Recreation (G) (Ed 426), 3 hours.

* Courses designated (G) carry graduate credit and will satisfy graduate major requirements. Courses designated (g) carry credit toward a graduate minor.

Camp Education

See page 294.

Health Education

- First Aid (PE 358), 3 hours.
- Safety Education (Ed 358), 3 hours.
- *Community Health Problems (g) (Bac 425, 426), 6 hours.
- Epidemiology (Bac 453), 3 hours.
- *School Health Problems (G) (SEd 431, 432, 433), 9 hours.
- Nutrition (FN 225), 3 hours.
- Sanitation (Bac 321), 3 hours.

Many opportunities exist for combining with a physical-education major courses offered in the schools of Science, Agriculture, Education, Engineering, and Home Economics. These schools offer work closely related to the offerings in health and physical education.

Major in Physical Education

STUDENTS preparing for physical-education teaching and coaching or related fields pursue the basic program of required courses listed below.

STUDENT'S BASIC PROGRAM

	Freshman Year		
	Term hours		
	F	W	S
Human Biology (Z 114, 115, 116)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
¹ General Chemistry (Ch 101, 102, 103)	3	3	3
Introduction to Physical Education (PE 121, 122)	3	3	3
Introduction to Health Education (SEd 123)			3
Air, Military, or Naval Science (men)	2-3	2-3	2-3
Advanced Hygiene (PE 250)			3
² Technique of Physical Education (PE 174, 175, or 176) (men)	2	2	
Physical-Education Laboratory (PE 124, 125, 126) (women)	2	2	2
³ Electives (women)	2	2	
Sophomore Year			
Elementary Human Anatomy (Z 321, 322)	3	3	
Applied Human Anatomy (Z 323)			3
General Psychology (Psy 207, 208)	3	3	
Extempore Speaking (Sp 111)	3		
Literature	3	3	3
² Technique of Physical Education (men) (PE 225, 274, 275, or 276)	2	2	2
Physical-Education Laboratory (PE 224, 225, 226) (women)	2	2	2
Air, Military, or Naval Science (men)	2-3	2-3	2-3
American National Government (PS 201)			3
Outlines of Economics (Ec 212)			3
⁴ Recreational Leadership (PE 240) (women)		3	
⁴ Camp Education (Ed 361) (women)			3
⁴ Sports Officiating (PE 354) (women)		3	
⁵ Electives (men)		3	
⁵ Electives (women)	2		

* Courses designated (G) carry graduate credit and will satisfy graduate major requirements. Courses designated (g) carry credit toward a graduate minor.

¹ Nonteaching major students may take approved electives in lieu of these courses.

² Men students are required to complete (a) courses PE 174, 225, 274, and (b) any two of the following courses: PE 175, 176, 275, 276.

³ Elective courses permit the student to prepare for a variety of positions in physical education and closely related fields. See recommended electives on pages 428-429.

⁴ Required courses for women; other courses may be elected by men students.

	Term hours		
	F	W	S
Junior Year			
Physiology (Z 331, 332)	3	3	.....
Applied Human Physiology (Z 336) .....	.....	.....	3
¹ General Bacteriology (Bac 204)	3	.....	.....
Secondary Schools in American Life (Ed 311)	3	.....	.....
Educational Psychology (Ed 312) .....	.....	3	.....
Principles of Teaching (Ed 313) .....	.....	.....	3
Methods and Materials (in Physical Education) (Ed 408h) .....	.....	.....	3
Coaching of Basketball (PE 346) (men)	3	.....	.....
Coaching of Football (PE 347) (men) .....	.....	3	.....
Physical Education Technique (PE 343, 344, 345) (women)	3	3	3
General Sociology (Soc 212) .....	.....	3	.....
Nature, Function, and Organization of Play (PE 435) .....	.....	.....	3
Organization and Administration of Intramural Sports (PE 350) .....	.....	2	.....
² Electives	4	3	2-4
Senior Year			
¹ Health Education (SEd 441, 442, 443)	3	3	3
¹ Supervised Teaching (Ed 415)	3	(3)	(3)
¹ Oregon School Law and Oregon System of Education (Ed 316)	(2)	2	(2)
¹ History of Oregon (Hst 377)	(3)	(3)	3
Athletic Training and Conditioning (PE 361) .....	.....	3	.....
² Electives	7	7	8
Fifth Year			

The requirements for a State High-School Teacher's Certificate are listed on pages 287-289. Students who complete a physical-education major include courses in physical education during their fifth year with other courses according to their special objectives. Students who devote their fifth year to graduate work for a master's degree may major in education, science education, biology, hygiene, or other fields and include a graduate minor in physical education.

Description of Courses

SERVICE COURSES FOR WOMEN

LOWER-DIVISION COURSES

PE 114, 115, 116. Freshman Physical Education. 1 hour each term.

Student is permitted to elect courses offered in basketball, bowling, canoeing, relaxation, volleyball, baseball, field hockey, soccer, field ball; archery, badminton, tennis, swimming, fencing, golf, riding; dancing; tumbling; mechanics of posture. Three periods. Staff.

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.

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. Staff.

PE 250. Advanced Hygiene. 3 hours any term.

Personal health, exercise, weight control, prevention of infection, social hygiene, diet, stimulants, injurious popular remedies and fads, sunlight, air and ventilation, choosing a doctor, and life-extension problems. Professor Anderson.

¹Nonteaching major students may take approved electives in lieu of these courses.

²Men students are required to complete (a) courses PE 174, 225, 274, and (b) any two of the following courses: PE 175, 176, 275, 276.

³Elective courses permit the student to prepare for a variety of positions in physical education and closely related fields. See recommended electives on pages 428-429.

UPPER-DIVISION COURSES

- PE 314, 315, 316. **Junior Physical Education.** 1 hour each term.
Same activities as in PE 114, 115, 116. Three periods. Staff.
- PE 414, 415, 416. **Senior Physical Education.** 1 hour each term.
Same activities as in PE 114, 115, 116. Three periods. Staff.

SERVICE COURSES FOR MEN

LOWER-DIVISION COURSES

- PE 150. **General Hygiene.** 1 hour any term.
Principles and practices of health promotion; individual and physiological hygiene; disease prevention and control; community hygiene and public health.
- 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. Student uses open hours and intramural sports for practice. Three periods. Staff.
- PE 250. **Advanced Hygiene.** 3 hours any term.
Personal health, exercise, weight control, prevention of infection, social hygiene, diet, stimulants, injurious popular remedies and fads, sunlight, air and ventilation, choosing a doctor, and life-extension problems. Professor Anderson.
- PE 251, 252, 253. **Advanced Physical Education.** 1 hour each term.
Required of sophomores. Three periods. Staff.

UPPER-DIVISION COURSES

- PE 351, 352, 353. **Physical Activities.** 1 hour each term.
A continuation of PE 251, 252, 253. Required of juniors. Three periods. Staff.
- PE 451, 452, 453. **Physical Activities.** 1 hour each term.
A continuation of PE 351, 352, 353. Required of seniors. Three periods. Staff.

PROFESSIONAL COURSES

LOWER-DIVISION COURSES

- PE 121, 122. **Introduction to Physical Education.** 3 hours fall and winter.
Modern developments of physical education in relation to general education; aims and objectives; history of physical education; practical considerations, programs, physical plant, and personnel. Professors Bergstrom, Coleman, Seen.
- SEd 123. **Introduction to Health Education.** 3 hours spring.
Historical background and underlying philosophy of health education; study of statistical facts that indicate need for health education; survey of modern practice in, and organization for, health education; opportunity for professional work in field. Associate Professor Morris.
- PE 124, 125, 126. **Physical-Education Laboratory.** 2 hours each term.
Intensive instruction in all the various activities that go to make up the physical-education program. Six periods. Staff.

- PE 174, 175, 176. **Technique of Physical Education.** 2 hours each term. Laboratory courses in methods, technique, and skills of activities usually found in a physical-education program. Five periods. Staff.
- PE 224, 225, 226. **Physical-Education Laboratory.** 2 hours each term. A continuation of PE 124, 125, 126. Six periods. Staff.
- PE 240. **Recreation Leadership.** 3 hours fall or winter. Study and practice of games for family recreation, parties, picnics, clubs, and community centers. Assistant Professor Gill.
- PE 274, 275, 276. **Technique of Physical Education.** 2 hours each term. Laboratory courses in methods, technique, and skills of activities usually found in a physical-education program. Five periods. Staff.

UPPER-DIVISION COURSES

- Bac 321. **Sanitation.** 3 hours winter. Sanitation in home, school, city, with particular reference to control of communicable diseases and their relation to foods, rodents, swimming pools, eating establishments, insects, ventilation, industrial hygiene, etc. Prerequisite: one term of general bacteriology or equivalent. Professor Anderson.
- PE 343, 344, 345. **Physical-Education Technique.** 3 hours each term. Technique of teaching dancing and sports; problems of directed teaching. Prerequisite: skill and knowledge standard in activities as determined by department. Five periods. Staff.
- PE 346. **Coaching of Basketball.** 3 hours fall. Coaching and training of basketball teams beginning with fundamentals, passing, dribbling, and pivoting; psychology of the game; various methods of defense and offense. Two lectures; 1 two-hour laboratory period. Mr. A. T. Gill.
- PE 347. **Coaching of Football.** 3 hours winter. Football theory and practice, details of each position, training and managing, complete techniques of developing offensive and defensive tactics, comparison of various systems in American intercollegiate football. Two lectures; 1 two-hour laboratory period. Professor Taylor.
- PE 348. **Coaching of Baseball.** 3 hours spring. Technique of batting, pitching, baseball strategy, how to play various positions; promoting the game; making schedules; points of inside baseball; care and construction of field; management. Two lectures; 1 two-hour laboratory period. Professor Coleman.
- PE 349. **Coaching of Track and Field (Men).** 3 hours spring. How to train for track and field events; form and technique; conduct of meets; construction, use, and assembling of equipment; development of certain types of individuals for certain events. Two lectures; 1 two-hour laboratory period. Assistant Professor Swan.
- PE 350. **Organization and Administration of Intramural Sports.** 2 hours winter. Intramural program for high schools and colleges; aims and objectives; organizing a program; units of competition; program of sports; methods of competition; scoring plans; administrative problems. Professor Coleman, Assistant Professor Milliken.

PE 354. Sports Officiating. 3 hours winter.

A study and interpretation of rules, mechanics, and procedures of officiating in various competitive sports; enforcement of rules, use of signals, personal appearance and conduct, public relations, duties of officials, suggestions for coaches and administrators, code of ethics, and qualifications for national official's rating. Professor Coleman, Assistant Professor Milliken.

Ed 358. Safety Education. 3 hours.

Background and knowledge of all phases of safety; home, fire, industrial, water, rural, school, and traffic safety; elementary, secondary, and adult levels. Prerequisite: Ed 311, 312, 313. Associate Professor Dixon.

PE 358. First Aid. 3 hours.

Emergency treatment for various types of injuries; bandaging, splinting, control of bleeding, transportation, and artificial respiration. Leads to Red Cross Standard and Advanced and Instructor's Certificates. Open as a service course to all departments. Two lectures; 1 two-hour laboratory period. Professor Allman.

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. Prerequisite: Z 323. Professor Allman.

Ed 361, 362, 363. Camp Education. 3 hours each term.

Camp activities including handicrafts, camp crafts, nature, safety, waterfront, music, and dramatics, with practical experience; counselor training including history, camp program, and problems; camp management, organization, and administration. Professor Bergstrom, Assistant Professor Milliken.

PE 421. Principles of Physical Education. (g) 3 hours fall.

General philosophy and principles of physical education and their relation to general education. 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 construction. Professor Bergstrom.

PE 423. Organization and Administration. (g) 3 hours spring.

Administrative problems; organization of departments, organization of instructional and recreational programs, supervision of both teaching and physical plant and routine administration. Professors Bergstrom and Seen.

Ed 425. School and Community Club Work. (G) 3 hours.

A survey of youth serving organizations; organization and leadership of school and community clubs. Prerequisite: senior or graduate standing, or consent of instructor. Professor Seen.

Ed 426. Community Recreation. (G) 3 hours.

Aims to give an understanding of the developing philosophy of recreation, trends, problems in organizing and administration of a recreation program in large, small, and rural communities. Prerequisite: senior or graduate standing, or consent of instructor. Professor Seen.

- Bac 425, 426. **Community Health Problems.** (g) 3 hours each term.
Application of the principles of hygiene to sanitary, statistical, governmental, epidemiological, sociological problems. Prerequisite: junior or senior standing. Professor Anderson.
- SEd 431, 432, 433. **School Health Problems.** (G) 3 hours each term.
Maintenance of health of school children; communicable diseases; school sanitation; planning of school buildings; health of school child; hygiene of instruction. Prerequisite: upper-division standing and one year of upper-division biological science. Professor Langton.
- PE 435. **Nature, Function, and Organization of Play.** 3 hours spring.
Nature and function of play; adaptation of activities; program making. Playground instruction management and supervision. Assistant Professor Weir.
- SEd 441, 442, 443. **Health Education.** (G) 3 hours each term.
Philosophy and principles of health education; organization and administration; health instruction and its use in secondary schools and in adult health education. Prerequisite: upper-division standing and one year of upper-division biological science. Associate Professor Morris.
- Bac 453. **Epidemiology.** 3 hours spring.
Causes and behavior of communicable diseases in general population; factors influencing occurrence of epidemics; basic principles underlying control. Prerequisite: Bac 205 or equivalent. Professor Langton.

GRADUATE SERVICE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

Graduate School

HENRY P. HANSEN, Ph.D., Dean of the Graduate School.

IRVA TIDD, Secretary.

Graduate Council

HENRY P. HANSEN (chairman), G. H. BARNES, VERA H. BRANDON, P. M. BRANDT, R. COLBY, J. F. CRAMER, G. E. CROSSEN, S. H. GRAF, D. C. MOTE, E. A. YUNKER, F. R. ZERAN.

Graduate Committees

Agriculture: P. M. BRANDT (chairman), G. E. BLANCH, HENRY HARTMAN, E. H. WIEGAND.
Education: F. R. ZERAN (chairman), G. B. COX, MAY DuBOIS, R. R. REICHAUT, J. W. SHERBURNE, H. A. TEN PAS, S. E. WILLIAMSON.
Engineering and Industrial Arts: S. H. GRAF (chairman), G. W. GLEESON, F. O. McMILLAN, C. A. MOCKMORE.
Forestry: G. H. BARNES (chairman), J. B. GRANTHAM, H. R. PATTERSON.
General Studies: E. A. YUNKER (chairman), R. E. DIMICK, K. L. GORDON, H. R. PATTERSON, J. W. SHERBURNE, W. D. WILKINSON.
Graduate Minors in Nonmajor Fields: RALPH COLBY (chairman), G. A. BAKKUM, R. K. CAMPBELL, J. W. ELLISON, M. N. NELSON, J. A. PFANNER.
Home Economics: VERA H. BRANDON (chairman), MARGARET L. FINCKE (assistant chairman), MAY DuBOIS, DOROTHY GATTON, HELEN MULHERN, CLARA A. STORVICK.
Pharmacy: G. E. CROSSEN (chairman), R. S. McCUTCHEON.
Science: D. C. MOTE (chairman), W. B. BOLLEN, S. M. DIETZ, E. J. DORNFELD, E. C. GILBERT, W. E. MILNE, W. D. WILKINSON, S. E. WILLIAMSON, E. A. YUNKER.

Graduate Faculty

DEPARTMENTS OFFERING MAJORS FOR MASTER AND DOCTORAL DEGREES

Agricultural Economics: ASSOCIATE PROFESSOR BLANCH (acting head), PROFESSORS HOLLANDS, KUHLMAN, MUMFORD; ASSOCIATE PROFESSOR PLATH; ASSISTANT PROFESSORS KORZAN, VROOMAN.
Animal Husbandry: PROFESSORS MCKENZIE (chairman), BOGART, NELSON; ASSOCIATE PROFESSORS OLIVER, POULTON; ASSISTANT PROFESSOR JOHNSON.
Bacteriology and Hygiene: PROFESSORS SIMMONS (chairman), ANDERSON, BOLLEN, COPSON (emeritus), ELLIKER, LANGTON; ASSOCIATE PROFESSOR MORRIS; ASSISTANT PROFESSOR GERHARDT.
Botany: PROFESSORS DIETZ (chairman), GILKEY, MILBRATH, VAUGHAN; ASSOCIATE PROFESSORS BELKENGREN, HARDISON, PHINNEY, ROTH, SMITH, YOUNG; ASSISTANT PROFESSORS CHILCOTE, JONES.
Chemical Engineering: PROFESSORS WALTON (head), GLEESON (dean); ASSOCIATE PROFESSOR SCHULEIN; ASSISTANT PROFESSORS CHEN, CLAPP*, KNUDSEN.

* Starred names are members of the graduate faculty on a limited basis, authorized to teach a specialty.

- Chemistry:** PROFESSORS GILBERT (chairman), BUTTS, CALDWELL, CHELDELIN, CHRISTENSEN, FRIEDMAN, GILFILLAN (dean), HAAG, KURTH, MEHLIG (emeritus), PEASE; ASSOCIATE PROFESSORS LOGAN, SCOTT, WILLIAMS; ASSISTANT PROFESSORS BUBL, DECIUS, FREUND, HUSTON, MARVELL, NORRIS, REESE, REMMERT.
- Civil Engineering:** PROFESSORS MOCKMORE (head), HOLCOMB, MERRYFIELD, WANLESS; ASSOCIATE PROFESSOR WATERMAN.
- Dairy Husbandry:** PROFESSORS BRANDT (head), JONES, RICHARDSON, WILSTER; ASSOCIATE PROFESSOR WOLBERG.
- Education:** PROFESSORS ZERAN (associate dean), CLINTON, GOODE, LASLETT, WARRINGTON; ASSOCIATE PROFESSORS MUNFORD, PARKS, REICHAUT, REID; ASSISTANT PROFESSOR GORDON; INSTRUCTOR O'DEA.
- Electrical Engineering:** PROFESSORS McMILLAN (head), ALBERT, COCKERLINE, STARR; ASSOCIATE PROFESSORS FEIKERT, NICHOLS, WITTKOPF; ASSISTANT PROFESSORS BARCLAY, SHIRLEY, STONE; INSTRUCTORS ENGLE*, MOULTON.
- Entomology:** PROFESSORS MOTE (head), SCULLEN, THOMPSON; ASSOCIATE PROFESSORS CHAMBERLIN, MARTIN; ASSISTANT PROFESSOR CROWELL.
- Family Life and Home Administration:** PROFESSORS PRENTISS (head), BRANDON, READ; ASSOCIATE PROFESSORS KIRKENDALL, VAN HORN, WIGGENHORN; ASSISTANT PROFESSOR PHINNEY*.
- Farm Crops:** PROFESSORS HILL (head), FORE; ASSOCIATE PROFESSORS FINNELL, FOOTE, FREED, POULTON; ASSISTANT PROFESSOR COWAN; AGRONOMIST KELLER.
- Fish and Game Management:** PROFESSOR DIMICK (head); BIOLOGIST EINARSEN; ASSOCIATE PROFESSOR LONG; ASSISTANT PROFESSOR KUHN.
- Food Technology:** PROFESSORS WIEGAND (head), LITWILLER; ASSOCIATE PROFESSORS HARVEY, ONSDORFF, WORTHINGTON; ASSISTANT PROFESSOR NIVEN.
- Foods and Nutrition:** PROFESSORS FINCKE (head), KOLSHORN, STORVICK; ASSOCIATE PROFESSOR OVERMAN; ASSISTANT PROFESSORS CHARLEY, GARRISON, HAWTHORNE, HUNTER, PETERSEN.
- Geology:** PROFESSORS ALLISON (chairman), HODGE, WILKINSON; INSTRUCTORS BOYD, HINTZE.
- Horticulture:** PROFESSORS HARTMAN (head), DURUZ, FRAZIER, HANSEN; ASSOCIATE PROFESSORS APPLE, COMPTON, ROBERTS, ZIELINSKI.
- Mathematics:** PROFESSORS MILNE (head), CLARK, HOSTETTER, LONSETH, WILLIAMS; ASSOCIATE PROFESSORS EVES, KIRKHAM, LI, POOLE, SAUNDERS; ASSISTANT PROFESSORS ARNOLD, BREWER, MANNING, PRICE, STONE; INSTRUCTOR EHLERS.

* Starred names are members of the graduate faculty on a limited basis, authorized to teach a specialty.

Mechanical Engineering: ASSOCIATE PROFESSOR POPOVICH (chairman), PROFESSORS GRAF, HUGHES, MARTIN, PAUL, RUFFNER, SLEGEL, THOMAS; ASSOCIATE PROFESSORS HEATH, PAASCHE; INSTRUCTORS CHRISTENSEN, STEIDEL.

Physics: PROFESSORS YUNKER (chairman), BRADY, WENIGER; ASSOCIATE PROFESSORS DEMPSTER, GARMAN, MORGAN, VARNER, VINYARD; ASSISTANT PROFESSORS BOLINGER, NICODEMUS; INSTRUCTORS CHURCH*, DAY*, DECKER*.

Poultry Husbandry: PROFESSOR PARKER (head); ASSOCIATE PROFESSORS BERNIER, COONEY; ASSISTANT PROFESSOR HARPER.

Soils: PROFESSORS POWERS (head), RUZEK, STEPHENSON; ASSOCIATE PROFESSOR MARSH.

Zoology: PROFESSORS GORDON (chairman), ALLMAN, DORNFELD, KRUEGER, WULZEN (emeritus); ASSOCIATE PROFESSOR PRATT; ASSISTANT PROFESSORS HILLEMANN, STORM.

General Extension Division: PROFESSOR CRAMER (dean); ASSOCIATE PROFESSOR CAUGHLAN, MORRIS, STEVENS; ASSISTANT PROFESSOR BERNARD; INSTRUCTORS HOPSON, MCCORKLE.

Graduate School of Nuclear Engineering at Richland, Washington: ALKIRE, BUFP, BURGER, BURNS, CALLIS, DUVALL, FAULKNER, FRYAR, HARMON, HORNING, ISBIN, LACY, LARRICK, LEITZ, LIBBY, MOORE, PEARCE, ROESCH.

DEPARTMENTS OFFERING MAJORS FOR MASTER'S DEGREES ONLY

Agricultural Education: ASSISTANT PROFESSOR TEN PAS (acting head).

Agricultural Engineering: PROFESSORS RODGERS (head), SINNARD; ASSOCIATE PROFESSORS CROPEY, LUNDE; ASSISTANT PROFESSOR WOLFE*.

Business Education: PROFESSOR YERIAN (head); ASSOCIATE PROFESSORS LARSE, STUTZ; ASSISTANT PROFESSORS CALLARMAN, WINGER.

Clothing, Textiles, and Related Arts: PROFESSORS STRICKLAND (head), GATTON; ASSOCIATE PROFESSORS DIEDESCH, EDABURN, PATTERSON*; ASSISTANT PROFESSOR SMITH.

Forest Engineering: PROFESSOR PATTERSON (head); ASSOCIATE PROFESSOR DAVIES.

Forest Management: PROFESSORS McCULLOCH (head), DUNN (dean), BARNES; ASSOCIATE PROFESSORS NETTLETON, ROBINSON; ASSISTANT PROFESSORS DILWORTH, KENISTON, KNORR, YODER.

Forest Products: PROFESSORS GRANTHAM (head), PROCTOR; ASSOCIATE PROFESSORS ESPENAS, MACDONALD; ASSISTANT PROFESSORS GRAHAM, WEST.

General Science: PROFESSORS HANSEN (chairman), GILFILLAN (dean), JENSEN; ASSOCIATE PROFESSORS WILLIAMSON, HIGHSMITH.

* Starred names are members of the graduate faculty on a limited basis, authorized to teach a specialty.

Home Economics Education: PROFESSORS DuBois (head), CLINTON, MACK, SAGER (Home Economics Extension); ASSOCIATE PROFESSOR McQUESTEN; INSTRUCTOR HOLLANDSWORTH*.

Industrial Education, Industrial Engineering, and Industrial Arts: PROFESSORS COX (head), ENGESSER, SHEELY; ASSOCIATE PROFESSOR MEYER; ASSISTANT PROFESSORS HAHN, ROBLEY.

Institution Management: ASSISTANT PROFESSORS MULHERN (acting head), CLEVELAND*.

Pharmacy: PROFESSOR CROSSEN (dean); ASSOCIATE PROFESSORS FORSLUND, McCUTCHEON, SCIUCHETTI.

Science Education: ASSOCIATE PROFESSOR WILLIAMSON (head).

Veterinary Medicine: PROFESSORS SHAW (head), DICKINSON; ASSOCIATE PROFESSOR SCHNAUTZ.

DEPARTMENTS OFFERING COURSES APPLICABLE TOWARD GRADUATE MINORS ONLY

Business Administration: PROFESSORS MASER (head), LeMASTER; ASSOCIATE PROFESSORS BOYD, CAMPBELL, CRAIG, NEWTON, PFANNER; ASSISTANT PROFESSORS BROEDERS, COOLIDGE, GODDARD*.

Economics: PROFESSOR NELSON (head); ASSOCIATE PROFESSORS BOWEN*, RUBIN, VATTER.

Extension Methods: PROFESSOR BECK.

Physical Education: PROFESSORS LANGTON, SEEN (heads), BERGSTROM.

Political Science: PROFESSORS SWARTHOUT (head), SWYGARD.

Psychology: PROFESSOR SHERBURNE (acting head); ASSISTANT PROFESSOR HARRIS*.

Sociology: PROFESSORS BAKKUM (head), DANN; ASSOCIATE PROFESSORS PARKS, PLAMBECK.

COLLEGE CURRICULUM STUDIES

Sponsored by Curriculum Council (see page 448): PROFESSORS BARNES, DuBois, GOODE (secretary), ORDEMAN, SEEN, SHERBURNE (chairman), SLEGEL; ASSOCIATE PROFESSORS LARSE, PARKS, CURRICULUM CONSULTANTS: PROFESSOR GOODE, ASSOCIATE PROFESSOR MUNFORD.

General Statement

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

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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.

All study beyond the bachelor's degree at Oregon State College is conducted through the Graduate School. The formulation of departmental graduate programs and the working out and direction of the programs of individual students are responsibilities of the departments, under the general rules or requirements of the Graduate School. The graduate faculty includes all faculty members who have been authorized to conduct courses carrying graduate credit.

The Graduate School also administers the institutional program for the encouragement of research by members of the faculty, through the provision of necessary facilities and through grants-in-aid (see page 451).

Oregon State College granted its first advanced degree (A.M.) in 1876. In 1897 definite residence requirements for the master's degree were announced. In 1910 graduate study was placed under a standing committee of the faculty. In 1933 all graduate work in the State System of Higher Education was placed in an interinstitutional Graduate Division; graduate work at Oregon State College was placed under immediate charge of an associate dean and an institutional graduate council. The first degrees of Doctor of Philosophy were conferred by Oregon State College in 1935. In October 1946, the State Board of Higher Education returned to the institutions direct responsibility for their programs of graduate study, and assigned graduate work at Oregon State College to the Graduate School.

Advanced Degrees

OREGON State College offers graduate work leading to advanced degrees in the biological sciences, the physical sciences (including mathematics), and the professional and technical fields of agriculture, education, engineering, forestry, home economics, and pharmacy. The degrees granted, and the fields in which programs of study leading to the respective degrees are offered, are listed below:

Doctor of Philosophy: SCIENCE—bacteriology and hygiene, botany, chemistry, entomology, genetics, geology, mathematics, physics, zoology. AGRICULTURE—agricultural economics, animal husbandry, dairy husbandry, farm crops, fish and game management, food technology, genetics, horticulture, poultry husbandry, soils. ENGINEERING—chemical engineering, civil engineering, electrical engineering, mechanical engineering. HOME ECONOMICS—family life and home administration, foods and nutrition.

Doctor of Education: EDUCATION—education, guidance and personnel work.

Master of Arts (departmental): SCIENCE—bacteriology and hygiene, botany, chemistry, entomology, general science, genetics, geology, mathematics, physics, zoology. EDUCATION—education, guidance and personnel work, agricultural education, business education, home economics education, industrial arts education, science education. ENGINEERING—agricultural engineering, chemical engineering, civil engineering, electrical engineering, industrial engineering, mechanical engineering. HOME ECONOMICS—clothing, textiles, and related arts, family life and home administration, institution management.

Master of Arts in General Studies: see page 444.

Master of Science: SCIENCE—bacteriology and hygiene, botany, chemistry, entomology, general science, genetics, geology, mathematics, physics, zoology. AGRICULTURE—agricultural economics, agricultural engineering, animal husbandry, dairy husbandry, farm crops, fish and game management, food technology, genetics, horticulture, poultry husbandry, range management, soils, veterinary medicine. EDUCATION—agricultural education, business education, education, guidance and personnel work, home economics education, industrial arts education, science education. ENGINEERING—agricultural engineering, chemical engineering, civil engineering, electrical engineering, industrial engineering, mechanical engineering. FORESTRY—forest engineering, forest management, forest products. HOME ECONOMICS—clothing, textiles, and related arts, family life and home administration, foods and nutrition, institution management. PHARMACY—pharmacy, pharmaceutical analysis, pharmacology and pharmacognosy.

Master of Education: education, guidance and personnel work, business education, home economics education, science education.

Master of Forestry: forest engineering, forest management, forest products.

Master of Home Economics: clothing and textiles, family life and home administration, foods and nutrition, home economics education, institution management.

Engineer:

<i>Degree</i>	<i>Department</i>
Chemical Engineer (Ch.E.).....	Chemical Engineering
Civil Engineer (C.E.).....	Civil Engineering
Electrical Engineer (E.E.).....	Electrical Engineering
Forest Engineer (F.E.).....	{ Forest Engineering Forest Management Forest Products
Mechanical Engineer (M.E.).....	Mechanical Engineering
Mining Engineer (Min.E.).....	Chemical Engineering

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.

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 engineering degree; and (4) those wishing merely to take work beyond the requirements for the bachelor's degree. Students of the first three classes follow programs organized in conformity with the rules stated below. Students in the fourth class register for the courses they desire and for which they are prepared, with the understanding that the institution is under no implied obligation to accept credit earned as credit toward a degree. County extension and branch experiment station workers planning to enter under (1) are requested to write the graduate office for a registration procedure slightly modified from that described in the following pages.

Admission to the Graduate School. A student desiring to enter the Graduate School will send (or arrange to have sent) to the Office of the Registrar: (1) an admission blank completely filled out; (2) a transcript of all

his previous college or university work; (3) a letter indicating the special fields in which he is particularly interested or a statement that he does not wish to become a candidate for a degree; and (4) a small, fairly recent photograph. The Office of the Registrar will determine whether the general conditions for admission have been met. The major and minor departments indicated by the student will examine the material submitted to determine adequacy of scholastic background and to decide whether departmental facilities are adequate for the expressed aims of the student. The recommendations of the departments are reviewed by the graduate office. The student is then notified by the Registrar as to the action taken.

A graduate of a nonaccredited institution may be admitted provisionally as an unclassified student. He must take such standard diagnostic tests as may be required by the Graduate Council and additional qualifying examinations when demanded; he must complete at least one term of satisfactory work at Oregon State College, after which he may petition for full standing in the Graduate School and for graduate credit for courses that he has completed acceptably while registered as an unclassified student.

Reserving Credits. Graduate credit is not granted for undergraduate courses taken in excess of the requirements for a baccalaureate degree, but undergraduate students taking graduate courses in excess of baccalaureate requirements may have such credits reserved for possible future use under the following conditions:

- a. Only credits with A or B grades, earned within 45 hours of graduation, may be reserved for graduate credit.
- b. Request for reservation must be made early in the term in which the student completes baccalaureate requirements.
- c. A maximum of 21 hours may be reserved for graduate credit.
- d. Before more than 15 term hours of credit are earned, the student must select a graduate major and minor, pass qualifying examinations, be assigned a major professor, and formulate an approved graduate program.
- e. A minimum of two terms of residence in the Graduate School is required regardless of the number of credits reserved.

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 a 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 studies toward a degree will be expected to work out, in tentative form at least, a complete program 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 15 term hours (including course work and thesis). The maximum load is 16 term hours (17 term hours on petition). For assistants and fellows the maximum load is 12 term hours; for part-time assistants and fellows the maximum load 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 catalog by (G) or (g) following the course title. Courses designated (G) may form a part of either a major or minor; courses designated (g) may be taken toward a minor only.

Fees and Deposits. Graduate students do not pay the nonresident fee. Graduate students registered for seven term hours of work or more pay tuition and fees of \$40.00 a term. Students holding graduate or research assistantships or fellowships pay fees totaling \$17.50 per term. Graduate students registered for 6 term hours of work or less pay the regular part-time fee. Payment of the graduate fee entitles the student to all services maintained by Oregon State College for the benefit of students.

Graduate students must make a \$5.00 deposit once each year at the time of first registration. See page 86.

Master of Arts and Master of Science

Credit Requirement. For the departmental Master of Arts or Master of Science degree, 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. No correspondence credits may be included. Of the 45 term hours a maximum of 6 term hours may be earned under "in absentia" registration, but no thesis credit may be thus registered.

Residence Requirements. For all master degrees the residence requirement is one academic year. Work taken in summer sessions will count toward the satisfaction of the residence requirement. 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 to less than one academic year. A maximum of 15 term hours earned in graduate courses in the General Extension Division of the Oregon State System of Higher Education 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 the General Extension Division of the Oregon State System of Higher Education, may be transferred, provided that: (1) the work fits into a logical program for the degree; (2) the transfer is approved by the 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 on following page.)

Language Requirements. For the Master of Arts degree, the student must show, by examination or by adequate undergraduate courses (not less than two years), 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. A candidate for a master's degree who passes the regular reading-knowledge examination need not repeat such examination if he proceeds toward his doctorate within a reasonable time. For the Master of Science degree there is no foreign-language requirement, unless a language is needed in the individual student's program.

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) should be completed within a period of seven years, but work taken between seven and ten years before the program is completed may be validated under the supervision of the department, usually by assigned readings or examination, or both.

Qualifying Examinations. A student wishing to become a candidate for the master's degree is required to take qualifying examinations in his major and minor fields, designed to test his basic training and his ability to pursue studies at the graduate level in his areas. This examination may be oral or written or both, and must be taken during the first term of his graduate enrollment, preferably during New Student Week, but not later than one month after the beginning of the term. Off-campus General Extension Division students must select their degree-granting institution by the time they have earned 9 hours. If Oregon State College is chosen, they must take the qualifying examination before completing 15 hours.

In lieu of their own qualifying examination, departments may accept a satisfactory showing in the Graduate Record Examination or some other standard test. If satisfactory knowledge and ability are demonstrated, the student is considered a candidate for the master's degree, subject to the approval of the dean of the Graduate School.

A graduate of Oregon State College who has maintained a grade-point average in major and minor fields of at least 3.25 throughout his undergraduate work may be exempted from taking the qualifying examination, at the discretion of the department concerned.

Thesis. A copy of the thesis in final form must be presented to the Graduate Office for collating at least one week prior to the final examination. Copies of the thesis and abstract are then distributed to members of the examining committee. The original and the first carbon copy (Library copies) and three copies of the abstract are deposited unbound in the Graduate Office, and the second carbon copy and an abstract with the major department. The student must obtain on the thesis approval page the signatures of the major professor, the head of the major department, the chairman of the school graduate committee, and the dean of the Graduate School.

Full information concerning the prescribed style for theses may be obtained at the office of the Graduate School.

The credit allowed for the thesis, including the research and the preparation of the manuscript, varies from 6 to 12 term hours.

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 dean of the Graduate School, who is *ex officio* a member of all examining committees.

Other Master Degrees

Master of Arts (General Studies). In addition to the regular Master of Arts (departmental) degree, Oregon State College offers 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. (See page 448.)

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 9 term hours of course work. A committee may, on recommendation of the student's adviser, waive the foreign-language requirement.

Master of Education. The Master of Education is a professional degree, and satisfactory teaching experience is required. For the degree a minimum of 45 term hours in graduate courses must be completed; additional hours may be required depending on the needs and the undergraduate preparation of the candidate. Liberal provision is made for the earning of credits through the General Extension Division, but a minimum of 12 term hours of academic work (not thesis or field studies) must be earned on the Corvallis campus; this can be done in one summer session.

The candidate must qualify under one of the following plans: (a) He submits a thesis dealing with some applied or professional aspect of education. The thesis must meet all the standards for a master's thesis. For the thesis from 6 to 12 term hours of credit are allowed. (b) He completes a course in Research and Scientific Method, 3 term hours; he submits two acceptable papers on assigned or approved topics, 6 term hours. Two copies of each paper, prepared according to thesis form, will be deposited in the Graduate Office for transmission to the Library and one in the office of the School of Education. (c) He completes 48 term hours, but no thesis or field studies are required. Twenty-seven term hours in specific courses are required as follows: Research Procedures in Education, History of American Education, Philosophy of Education, Principles and Practices of Guidance Services, Curriculum Construction, Psychology of Childhood or Adolescence, Growth and Development of the Individual, Measurements in Secondary Education or Construction and Use of Objective Examinations, Problems of Secondary Education in American Life or Recent Educational Trends and Problems, Statistical Methods in Education or Advanced Educational Psychology. The remaining 21 hours are elective under direction of the adviser. In addition to the final oral examination, a written comprehensive examination is required in the candidate's major field.

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.

Master of Home Economics. The Master of Home Economics is a professional degree which may be of interest primarily to high-school teachers and extension personnel. A major is offered in general home economics and also in each of the departments of the School of Home Economics. A minor is required, to be selected from offerings in the School of Home Economics or from other schools and departments according to the student's needs.

A thesis is not required but at least one written report requiring reading, analysis, criticism, and organization of material shall be prepared and submitted to the Graduate Council and then filed with the department or departments concerned.

The general requirements, except for those relating to the thesis and written report, are the same as for the Master of Science degree.

Engineer

For the degrees of Chemical Engineer, Civil Engineer, Electrical Engineer, Forest Engineer, Mechanical Engineer, Metallurgical Engineer, and Mining Engineer, the candidate must hold a baccalaureate or master's degree in the corresponding field of engineering from Oregon 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.

Doctor of Education

For the degree of Doctor of Education, procedures and requirements in respect to residence, preliminary and final examinations, and thesis are similar to those for the Doctor of Philosophy degree.

The Ed.D. degree requires three years of graduate study and is granted primarily for attainments and proved ability. Successful teaching experience is essential. There is no rigid credit requirement, but the total number of term hours of graduate credit including thesis will approximate 135.

Along with the educational 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.

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 the policy of the institution not to accept as a candidate for the Ph.D. degree any student whose academic training, both undergraduate and graduate, has been exclusively at Oregon State College.

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 dean of the Graduate School, the student outlines a program devoting approximately sixty per cent of his time to the major, including thesis, and forty per cent to the minors.

Residence. For the doctor's degree, at least three years of full-time work beyond the bachelor's degree or two 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.

Qualifying Examinations. A student wishing to become a candidate for the doctor's degree must pass qualifying examinations in the fields of his major and minors. If he received his master's degree from Oregon State College not more than three years before beginning his doctoral work, he is not required to take the qualifying examination unless his major has been changed. He is required, however, to take qualifying examinations in additional minors.

Language Requirements. For the Doctor of Philosophy degree, a reading knowledge of French and German must be demonstrated by a formal examination 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 two terms before he takes the final examination. Advancement to candidacy is contingent on passing these preliminary 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.

Regulations concerning the doctoral dissertation are the same as those for the master's degree, page 443.

Final Examination. The final examination for the degree of Doctor of Philosophy may be written in part, but must include an oral examination, of at least two hours' duration. The oral examination is open to all members of the faculty and to advanced graduate students. 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, including at least one not directly connected with the major and minor departments. Additional members may be appointed by the major professor, with the approval of the graduate dean. Unanimous vote is necessary for approval of the thesis.

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.

Assistantships, Scholarships, and Fellowships

A VARYING number of graduate and research assistantships 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 School, and to become candidates for advanced degrees. Assistants and fellows pay fees amounting to \$17.50 per term, which admit them to all services maintained by the State College for the benefit of students. Application should be made before March 15. Application blanks are furnished, on request, by the Graduate School.

Graduate Assistantships. A graduate assistant renders services amounting to not more than 15 hours a week—reading papers, handling laboratory and quiz sections, etc. He is permitted to enroll for a maximum of 12 term hours of course work. A graduate assistant commonly completes the work for a master's degree in four terms. The stipend for a graduate assistant varies from \$700 to \$900. Reappointment may be made for one additional year.

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.

Teaching 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 teaching 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 12 term hours of course work. The stipend varies from \$1,000 to \$1,200.

Agricultural Experiment Station Graduate Research Assistantships and Fellowships. Appointees are usually required to devote the equivalent of one-half time on approved Experiment Station projects; they normally spend two years on the Master of Science degree. Appointment and stipend are based on training, ability, and experience. The stipend varies from \$1,000 to \$1,800 on a twelve-month basis.

State Scholarships. A limited number of scholarships covering tuition and laboratory and course fees are available to graduate students. 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 Oregon State College, on official blanks furnished by his office, and must be filed before April 1.

Other Scholarships and Fellowships. A number of scholarships are available for graduate students. These are described under SCHOLARSHIPS AND FELLOWSHIPS, pages 99-100.

General Studies

THE general-studies program at Oregon State College is supervised by a special committee of which Dr. E. A. Yunker is chairman. (See page 444.) In addition to courses chosen from the offerings of the several schools and departments, the following courses are available for the general-studies student.

DESCRIPTION OF COURSES

GRADUATE COURSES

- GSt 501. **Research in General Studies.** Terms and hours to be arranged.
 GSt 503. **Thesis.** Terms and hours to be arranged.
 GSt 505. **Reading and Conference.** Terms and hours to be arranged.

College Curriculum Studies

COLLEGE curriculum studies are a part of the effort of Oregon State College to improve its educational program. Certain studies are carried on under the sponsorship of the Curriculum Council, composed of members appointed by the President; in addition, each dean of a school or other division of instruction, ex officio, sits as a member of the council whenever matters affecting his school or division are under consideration.

The appointed members are responsible for initiating and promoting studies and projects designed to further the interests of Oregon State College as a whole; the ex officio members aid in relating studies and projects to the interests of the schools.

Studies or projects in curriculum development and improvement of teaching may be engaged in by individuals or faculty groups. Graduate students are encouraged to join these studies since the association of college teachers with students interested in curriculum and teaching is of mutual advantage.

Credit may be earned in the courses listed below. Whenever the nature of the work warrants, credit so earned may be applied toward a graduate major or minor in a department.

These courses are carried on under the immediate charge of coordinating committees of three or more members selected according to the nature of the studies and the personnel of the group. A representative of the Curriculum Council is ex officio chairman of each coordinating committee.

DESCRIPTION OF COURSES

GRADUATE COURSES

- CC 505. **Reading and Conference.** Terms and hours to be arranged.
 CC 506. **College Teaching Studies.** 3 hours any term.
 Reading, conference, and preparation of written reports related to, but distinct from, a teaching assignment at college level. No credit is given for the teaching itself. Open only to graduate students who have teaching assignments concurrent with the course. Prerequisite: Ed 594, 595, 596.
 CC 509. **College Curriculum Studies.** Terms and hours to be arranged.
 Joint study with staff assistance in any aspect of college curriculum, including problems of teaching, guidance, and coordination. Seminar or workshop procedures are used according to aims of group.

College and University Teaching

MOST persons who qualify for master's and doctor's degrees engage in college and university teaching as part of their professional work. The Graduate School prepares students for college and university teaching as well as for research. It offers a group of courses dealing with the philosophy, functions, and structure of higher education and problems of teaching, curriculum development, and student-faculty relationships. In all these courses, students have opportunity to delve into topics of special interest.

Maturity, background, and sincerity of purpose are the principal requisites. There are no course prerequisites in professional education. The program is not planned to fulfill requirements for a teaching credential in any state, although it may be supplemented with additional work to serve this purpose.

A minor in college and university teaching (15-18 term hours for a master's degree, 25-30 term hours for a doctor's degree) may be taken in conjunction with a subject-matter major. The core program, all of which is required for the teaching minor for a master's degree, consists of the following courses:

CC 506. College Teaching Studies. 3 hours.

..... 507. Seminar (Teaching Procedures). Terms and hours to be arranged.
(Registration may be in major department.)

Ed 594. The College Student. 3 hours.

Ed 595. College and University Teaching. 3 hours.

Ed 596. The American College and University. 3 hours.

For the doctoral candidates, additional electives are chosen in appropriate areas to form an integrated program in college teaching.

Actual teaching at the college level, usually in lower-division courses, is corequisite for CC 506.

Genetics

A PROGRAM for a major or minor in genetics is offered for the master's and doctor's degrees. Opportunity for specialization in pure and applied genetics is offered in the schools of Science and Agriculture. The course work is drawn from the biological departments of these schools. The genetics program is designed to acquaint the student in all the principal phases of genetics, and at the same time permit him to emphasize his research interests in this field. All graduate study in genetics is coordinated through a special committee nominated by the deans of Science and Agriculture and approved by the dean of the Graduate School. The seminar listed below serves an important purpose in unifying all genetic studies.

DESCRIPTION OF COURSE

GRADUATE COURSE

Gen 507. Seminar. Terms and hours to be arranged.

Graduate Work at Los Alamos and Richland

ARRANGEMENTS have been made whereby a very restricted number of students may complete theses for the Ph.D. degree at Los Alamos, New Mexico.

Oregon State College is one of five northwestern universities cooperating with the Graduate School of Nuclear Engineering of the General Electric Company at Richland, Washington. Credits toward the master and doctoral degrees may be earned at Richland. The minimum residence requirement at Corvallis is one term for a master's degree and two terms for a doctor's degree.

DESCRIPTION OF COURSES

The studies pursued at Richland vary for different students and fields but are subject to approval in each case by the Graduate Council. A plan is followed whereby the course number 509 is used, preceded by the appropriate departmental designation, followed by the name "Richland Studies" with the title of the particular study placed in parentheses.

GRADUATE COURSES

- Ch 509. Richland Studies. Terms and hours to be arranged.
- ChE 509. Richland Studies. Terms and hours to be arranged.
- EE 509. Richland Studies. Terms and hours to be arranged.
- ME 509. Richland Studies. Terms and hours to be arranged.
- Mth 509. Richland Studies. Terms and hours to be arranged.
- Ph 509. Richland Studies. Terms and hours to be arranged.

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. Of the 45 term hours of work required for the Master of Education degree, 33 hours may be earned in Portland. 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, except that in some instances arrangements may be made for a limited number of hours credit toward the Ed.D. degree. Graduate degrees earned at the Portland Center are awarded by Oregon State College or the University of Oregon according to major subject, in harmony with the allocation of curricula and degrees.

Research

ADVANCEMENT of human knowledge and technical and technological service to the commonwealth are recognized functions of institutions of higher learning. Research at Oregon State College is encouraged and assisted by several institutional agencies, including the General Research fund, the Agricultural Experiment Station, the Engineering Experiment Station, and the Oregon Forest Products Laboratory. Problems for the Government, for industry, or other sponsors, are undertaken on special contract.

General Research

GENERAL Research includes faculty research, especially of a fundamental nature, that does not fall into the organized and directed programs of other research agencies of Oregon State College. The Graduate Council (see page 435) prepares and submits annually a budget for the support of general research and is authorized to receive, examine, and act upon requests for grants-in-aid from the funds allowed. The school graduate committees are advisory bodies, assisting in the examination and evaluation of the projects for which funds are requested. Applications are received from individual staff members, or groups, of the rank of instructor or higher. Grants-in-aid are awarded for problems that give promise of results of general significance to learning. The grants will supply some apparatus, certain supplies, wages for some types of assistance, and if the project has advanced sufficiently, a part-time or full-time research assistantship or fellowship. Grants are not intended to provide data for theses leading to advanced degrees, or subject matter for a specific course, or information of restricted, though useful, nature for administrative functions. Each recipient of a grant is required to present a written progress report to the dean of the Graduate School during the last month of each term. Productive problems may receive assistance for several years.

Agricultural Experiment Station

FREDERICK EARL PRICE, B.S., Director of the Agricultural Experiment Station.
RALPH STEPHEN BESSE, M.S., Associate Director of the Agricultural Experiment Station.

ROBERT WESLEY HENDERSON, Ph.D., Assistant to the Director.

ROBERT M. ALEXANDER, M.A., Assistant to the Director.

GEORGE L. CROWE, Accountant, Agricultural Experiment Station.

JEROME C. R. LI, Ph.D., Biometrician.

Agricultural Chemistry

JOSEPH SHIREY BUTTS, Ph.D., Biochemist in Charge.

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

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

DELOSS EVERETT BULLIS, M.S., Chemist.

VIRGIL HAVEN FREED, M.S., Associate Chemist.

PAUL HENRY WESWIG, Ph.D., Associate Biochemist.

EDWARD CHARLES BUBL, Ph.D., Assistant Chemist.

†ROBERT ALLEN MAGEE, Assistant Chemist, Bureau of Plant Industry, Soils, and Agricultural Engineering, U. S. Department of Agriculture.
 LEMAR FRED REMMERT, Ph.D., Assistant Chemist.
 LEON C. TERRIERE, Ph.D., Assistant Chemist.
 SHENG CHUNG FANG, Ph.D., Research Assistant.
 HOWARD F. GRIFFIN, B.S., Research Assistant.
 DOROTHY DURST KREBS, M.S., Research Assistant.
 ALICE SCHMIDT LAWRENCE, B.A., Research Assistant.
 NANCY LEA LAWRENCE, M.S., Research Assistant.
 BARBARA STEARMAN, B.S., Research Assistant.
 DONNA F. WARD, B.S., Research Assistant.
 RUDOLPH KODRAS, M.S., Graduate Research Fellow.

Agricultural Economics

BURTON E. WOOD, Ph.D., Head of Department.
 HAROLD FULLER HOLLANDS, Ph.D., Agricultural Economist.
 GUSTAV WESLEY KUHLMAN, Ph.D., Agricultural Economist.
 DWIGHT CURTIS MUMFORD, M.S., Agricultural Economist.
 ERMINE LAWRENCE POTTER, M.S., Agricultural Economist Emeritus.
 GRANT E. BLANCH, Ph.D., Associate Agricultural Economist.
 C. VINTON PLATH, Ph.D., Associate Agricultural Economist.
 MANNING HENRY BECKER, M.S., Assistant Agricultural Economist.
 MELVIN J. CONKLIN, B.S., Assistant Agricultural Economist.
 GEORGE BALFOUR DAVIS, M.S., Assistant Agricultural Economist.
 CHARLES MEREL FISCHER, M.S., Assistant Agricultural Economist.
 EDGAR ANDREW HYER, Ph.D., Assistant Agricultural Economist.
 GERALD E. KORZAN, Ph.D., Assistant Agricultural Economist.
 GLEN T. NELSON, Ph.D., Assistant Agricultural Economist.
 CHARLES WILLIAM VROOMAN, Ph.D., Assistant Agricultural Economist.
 M. T. ROSENBLUM, B.S., Graduate Research Assistant.

Agricultural Engineering

JEFFERSON BELTON RODGERS, M.S., A.E., Agricultural Engineer in Charge.
 †JESSE E. HARMOND, B.S., Senior Agricultural Engineer, Division of Agricultural Engineering, Bureau of Plant Industry, Soils and Agricultural Engineering.
 HERBERT REEVES SINNARD, M.S., R.A., Agricultural Engineer (Farm Structures).
 MYRON GEORGE CROFSEY, M.S., Associate Agricultural Engineer.
 †LEONARD MARTIN KLEIN, B.S., Associate Agricultural Engineer, Division of Agricultural Engineering, Bureau of Plant Industry, Soils and Agricultural Engineering.
 RALPH NICHOLAS LUNDE, B.S., Associate Agricultural Engineer.
 †N. R. BRANDENBURG, B.S., Assistant Agricultural Engineer, Bureau of Plant Industry, Soils, and Agricultural Engineering.
 DALE EARL KIRK, B.S., Assistant Agricultural Engineer.
 GLEN ELLIS PAGE, M.S.M.E., Assistant Agricultural Engineer.
 *FRED MARION TILESTON, B.S., Assistant Agricultural Engineer; Assistant Irrigation Engineer, Soil Conservation Service.

† U. S. Government investigators stationed in Oregon.

* Employed by both State and Federal Government.

JOHN WILLIAM WOLFE, M.S., Assistant Agricultural Engineer.
 DAVID ROBERT LONG, B.S., Research Assistant.
 ROBERT E. DOUGHTY, B.S., Graduate Research Assistant.

Animal Husbandry

FREDERICK FRANCIS MCKENZIE, Ph.D., Animal Husbandman in Charge.
 RALPH BOGART, Ph.D., Animal Husbandman.
 ORAN MILTON NELSON, M.S., Animal Husbandman.
 ALFRED WEAVER OLIVER, M.S., Associate Animal Husbandman.
 CHARLES EDGAR POULTON, M.S., Associate in Range Management.
 JOE BONNER JOHNSON, M.S., Assistant Animal Husbandman.
 ALVIN CROPPER WARNICK, Ph.D., Assistant Animal Husbandman.
 RUTH GYSBERS, M.S., Research Assistant.
 JEROME J. DAHMEN, B.S., Graduate Research Assistant.
 GEORGE B. McLERoy, M.S., Graduate Research Fellow.
 JAMES EDMUND OLDFIELD, M.S., Graduate Research Fellow.
 SZU-HSIAO WU, M.S., Graduate Research Fellow.

Bacteriology

JOSEPH ELLSWORTH SIMMONS, M.S., Bacteriologist in Charge.
 WALTER BENO BOLLEN, Ph.D., Bacteriologist.
 PAUL R. ELLIKER, Ph.D., Bacteriologist.
 KUO C. LU, B.S., Graduate Research Assistant.
 DONALD DUANE MILLER, M.S., Graduate Research Fellow.
 RICHARD B. PARKER, B.S., Graduate Research Assistant.

Botany and Plant Pathology

SHERL MELVIN DIETZ, Ph.D., Plant Pathologist in Charge.
 CHARLES ELMER OWENS, Ph.D., Plant Pathologist Emeritus.
 EDWARD KEMP VAUGHAN, Ph.D., Plant Pathologist.
 HELEN MARGARET GILKEY, Ph.D., Botanist.
 †BLISS F. DANA, M.S., Plant Pathologist, Division of Fruit and Vegetable
 Crops and Diseases, Bureau of Plant Industry, Soils and Agricultural
 Engineering.
 *GODFREY RICHARD HOERNER, M.S., Plant Pathologist.
 *FRANK PADEN MCWHORTER, Ph.D., Plant Pathologist; Agent, Division of
 Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, Soils
 and Agricultural Engineering.
 JOHN A. MILBRATH, Ph.D., Plant Pathologist.
 †PAUL WILLIAM MILLER, Ph.D., Plant Pathologist, Division of Fruit and
 Vegetable Crops and Diseases, Bureau of Plant Industry, Soils and Agri-
 cultural Engineering.
 RICHARD O. BELKENGREN, Ph.D., Associate Botanist.
 †A. J. CULVER, M.S., Associate Plant Pathologist, Production and Marketing
 Administration.
 *JOHN ROBERT HARDISON, Ph.D., Associate Pathologist, Division of Forage
 Crops and Diseases, Bureau of Plant Industry, Soils and Agricultural
 Engineering.
 ROY A. YOUNG, Ph.D., Associate Plant Pathologist.

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 ARTHUR HOLLOMAN, JR., B.S., Research Assistant.
 CHESTER E. HORNER, B.A., Research Assistant.
 HAROLD J. JENSON, Ph.D., Research Assistant.
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 GEORGE L. BARNES, M.S., Graduate Research Fellow.
 NORMAN DALE DOBIE, B.S., Graduate Research Assistant.
 AUDUS WINZLE HELTON, M.S., Graduate Research Fellow.
 CLARK ALFRED PORTER, A.B., Graduate Research Assistant.
 DEWAYNE C. TORGESON, B.S., Graduate Research Assistant.
 PAUL H. WOOLEY, B.S., Graduate Research Assistant.

Dairy Husbandry

PHILIP MARTIN BRANDT, A.M., Dairy Husbandman in Charge.
 GUSTAV HANS WILSTER, Ph.D., Dairy Husbandman.
 IDWAL RALPH JONES, Ph.D., Dairy Husbandman.
 GEORGE ARTHUR RICHARDSON, Ph.D., Dairy Husbandman.
 FLOYD BYRON WOLBERG, M.S., Associate Dairy Husbandman.
 JUNIUS L. COVINGTON, B.S., Research Assistant.
 JOHN H. BYERS, M.S., Research Assistant.
 JAMES ORVILLE YOUNG, M.S., Research Assistant.
 PAUL CARSON BERGER, B.S., Graduate Research Assistant.
 SAM H. DALAL, B.S., Graduate Research Assistant.
 LEONARD MAURICE KAMM, B.S.A., Graduate Research Assistant.
 ROBERT E. STREIFF, B.S., Graduate Research Assistant.

Entomology

DON CARLOS MOTE, Ph.D., Entomologist in Charge.
 BENJAMIN GARRISON THOMPSON, Ph.D., Entomologist.
 *SIDNEY CARROLL JONES, M.S., Associate Entomologist; Agent, U. S. Bureau of Entomology and Plant Quarantine.
 *HERMAN AUSTIN SCULLEN, Ph.D., Apiculturist; Agent, U. S. Bureau of Entomology and Plant Quarantine.
 HAMBLIN HOWES CROWELL, Ph.D., Assistant Entomologist.
 HUGH ENGLE MORRISON, M.S., Assistant Entomologist.
 ROBERT G. ROSENSTIEL, Ph.D., Assistant Entomologist.
 ELVIS ARNIE DICKASON, M.S., Research Assistant.
 ROBERT W. LAUDERDALE, B.S., Research Assistant.
 SAMUEL K. KAMAKA, B.S., Graduate Research Assistant.

Farm Crops

DONALD DAVID HILL, Ph.D., Agronomist in Charge.
 †HARRY AUGUST SCHOTH, M.S., Senior Agronomist, Division of Forage Crops and Diseases, Bureau of Plant Industry, Soils and Agricultural Engineering.

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†KENNETH R. KELLER, Ph.D., Associate Agronomist, Division of Tobacco, Medicinal and Special Crops, Bureau of Plant Industry, Soils and Agricultural Engineering.

*ROBERT WESLEY HENDERSON, Ph.D., Associate Geneticist, Division of Rubber Plant Investigations, Bureau of Plant Industry, Soils and Agricultural Engineering.

*HENRY HARDY RAMPTON, M.S., Associate Agronomist, Division of Forage Crops and Diseases, Bureau of Plant Industry, Soils and Agricultural Engineering.

*LOUISA AMES KANIPE, B.S., Associate Seed Technologist; Associate Botanist, Production and Marketing Administration.

WILSON HOOVER FOOTE, Ph.D., Associate Agronomist.

VIRGIL HAVEN FREED, M.S., Associate Agronomist.

CHARLES EDGAR POULTON, M.S., Associate in Range Management.

CHARLES EDWIN ALLEN, B.S., Assistant Agronomist.

JOHN RITCHIE COWAN, M.S., Assistant Agronomist.

*DONALD WILLIAM FISHLER, B.S., Assistant Agronomist; Agent, Division of Cotton and Other Fiber Crops and Diseases, Bureau of Plant Industry, Soils and Agricultural Engineering.

WHEELER CALHOUN, JR., B.S., Research Assistant.

WILLY HENRY KOSAN, M.S., Research Assistant.

HAROLD SCHUDEL, M.S., Research Assistant.

Farm Service

DONALD EDWARD JEWELL, B.S., In Charge, Farm Service Department.

Fish and Game Management

ROLAND EUGENE DIMICK, M.S., Wildlife Conservationist in Charge.

†ARTHUR SKOGMAN EINARSEN, B.S., Biologist, United States Fish and Wildlife Service.

CARL ELDON BOND, M.S., Assistant Biologist.

LEE WALLACE KUHN, M.S., Assistant Biologist.

EUGENE PETER HAYDU, M.S., Research Assistant, Oyster Laboratory, Yaquina.

DOUGLAS K. HILLIARD, B.S., Graduate Research Assistant.

GERALD HARVEY WATSON, B.S., Graduate Research Assistant, Oyster Laboratory, Yaquina.

PHYLLIS RUTH WATT, B.S., Graduate Research Assistant.

Food Technology

ERNEST HERMAN WIEGAND, B.S.A., Food Technologist in Charge.

EARL MILO LITWILLER, Ph.D., Food Technologist.

EDWARD WINSLOW HARVEY, Ph.D., Associate Food Technologist, Seafoods Laboratory, Astoria.

OLIVER JACKSON WORTHINGTON, Ph.D., Associate Food Technologist.

HO-YA YANG, Ph.D., Associate Food Technologist.

EDWARD CHARLES BUBL, Ph.D., Assistant Food Technologist.

† U. S. Government investigators stationed in Oregon.

* Employed by both State and Federal Government.

WILLIAM F. FILZ, M.S., Assistant Food Technologist.
 THOMAS BLANEY NIVEN, Ph.D., Assistant Food Technologist.
 CLIFFORD ELROY SAMUELS, B.S., Assistant Food Technologist.
 RUSSELL O. SINNHUBER, M.S., Assistant Biochemist, Seafoods Laboratory,
 Astoria.
 †CURTIS WILDER, M.S., Assistant Food Technologist.
 KENNETH DUNCAN LAW, B.S., Research Assistant, Seafoods Laboratory,
 Astoria.
 RUTH MILLER, B.S., Research Assistant.
 MARGARET JO SCHWAB, Ed.M., Research Assistant.
 JAMES R. BROCK, B.S., Graduate Research Assistant.
 EDWARD N. HENNEY, B.S., Graduate Research Assistant.
 JAMES H. MOSER, B.S., Graduate Research Assistant.
 J. N. SHAW, B.S., Graduate Research Assistant.
 HUSAIN A. B. PARPIA, M.S., Graduate Research Fellow.

Home Economics

MAUD MATHES WILSON, A.M., Home Economist Emeritus.
 CLARA A. STORVICK, Ph.D., Home Economist (Nutrition).
 CLARA WILLIAMS EDABURN, M.S., Associate Home Economist (Clothing).
 ANDREA OVERMAN, Ph.D., Associate Home Economist (Foods).
 JOAN PATTERSON, M.A., Associate Home Economist (Textiles).
 RACHEL DUBÉ, M.S., Graduate Research Fellow.
 MEI-LING WU, M.S., Graduate Research Fellow.

Horticulture

HENRY HARTMAN, M.S., Horticulturist in Charge.
 WILLIAM ALLEN FRAZIER, Ph.D., Horticulturist (Vegetable Crops).
 ELMER HANSEN, Ph.D., Horticulturist (Pomology).
 E. J. KRAUS, Ph.D., Visiting Professor.
 †JOHN HOWE PAINTER, M.S., Horticulturist, Division of Fruit and Vegetable
 Crops and Diseases, Bureau of Plant Industry, Soils and Agricultural
 Engineering.
 †GEORGE FORDYCE WALDO, M.S., Horticulturist, Division of Fruit and Vegetable
 Crops and Diseases, Bureau of Plant Industry, Soils and Agricultural
 Engineering.
 SPENCER B. APPLE, M.S., Associate Horticulturist.
 OLIVER CECIL COMPTON, Ph.D., Associate Horticulturist.
 †ALFRED NATHAN ROBERTS, M.S., Associate Horticulturist.
 STANLEY ELLIOT WADSWORTH, B.S., Associate Horticulturist (Floriculture).
 QUENTIN BLISS ZIELINSKI, Ph.D., Associate Horticulturist.
 CARL ARTHUR BOLLER, M.S., Assistant Horticulturist.
 LAWRENCE THOMAS BLANEY, M.S., Research Assistant.
 LEWIS ANGLE HAMMERS, M.S., Research Assistant.
 RALPH GARREN, JR., B.S., Graduate Research Assistant.
 WALTER M. MELENTHIN, B.S., Graduate Research Assistant.
 LYSLE H. PARSONS, B.S., Graduate Research Assistant.

† U. S. Government investigators stationed in Oregon.

‡ On sabbatical leave.

Poultry Husbandry

JESSE ELMER PARKER, Ph.D., Poultry Husbandman in Charge.
 PAUL EMILE BERNIER, Ph.D., Associate Poultry Husbandman.
 WILBUR TARLETON COONEY, M.S., Associate Poultry Husbandman.
 JAMES ARTHUR HARPER, M.S., Assistant Poultry Husbandman.
 CHESTER ERVIN STOTTS, B.S., Graduate Research Fellow.

Publications and News Service

DELMER MORRISON GOODE, M.A., Director of Publications.
 FRED SHIDELER, M.S., Director of News Bureau.
 RALPH WILLIAM SALISBURY, B.S., Assistant to the Director of Publications.
 §SAMUEL HALL BAILEY, M.S., Experiment Station Editor.
 NORVILLE RAY GISH, B.S., Assistant Experiment Station Editor.

Soil Science

‡WILBUR LOUIS POWERS, Ph.D., Soil Scientist in Charge.
 CHARLES VLADIS RUZEK, M.S., Soil Scientist.
 ROSCOE ELMO STEPHENSON, Ph.D., Soil Scientist.
 *ALBERT SINCLAIR HUNTER, Ph.D., Associate Soil Scientist, Bureau of Plant Industry, Soils and Agricultural Engineering.
 ALBERT W. MARSH, Ph.D., Associate Soil Scientist.
 †RAY A. PENDLETON, Ph.D., Agronomist, Division of Sugar Plant Investigations, Bureau of Plant Industry, Soils and Agricultural Engineering.
 ELWOOD WESLEY DULL, B.S., Research Assistant.
 ALEXANDER POPE, M.S., Graduate Research Assistant.
 SHUI Ho SHIH, M.S., Graduate Research Assistant.

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., Veterinarian.
 JOHN OTTO SCHNAUTZ, A.B., D.V.M., Associate Veterinarian.
 †T. H. B. KEITH, D.V.M., Livestock Inspector, Bureau of Animal Industry.
 WILLIAM E. BABCOCK, B.S., D.V.M., Research Assistant.
 JESSE F. BONE, B.A., D.V.M., Research Assistant.
 JAMES F. SULLIVAN, D.V.M., Research Assistant.
 JOHN L. WEIBEL, B.S., D.V.M., Research Assistant.

BRANCH STATIONS

John Jacob Astor Branch Experiment Station, Astoria

HERBERT BADOLLET HOWELL, B.S., Superintendent.
 WILLIAM ELMER DENT, M.S., Assistant Superintendent.

Squaw Butte-Harney Cooperative Range and Livestock Branch Station

*WILLIAM ARTHUR SAWYER, B.S., Superintendent.
 †DON HYDER, M.S., Range Conservationist, Bureau of Land Management.

† U. S. Government investigators stationed in Oregon.
 * Employed by both State and Federal Government.
 ‡ On leave of absence.
 § On military leave.

†CLEE S. COOPER, M.S., Assistant Agronomist, Bureau of Land Management.
 FARRIS E. HUBBERT, JR., M.S., Research Assistant (Animal Husbandry).

Umatilla Branch Experiment Station, Hermiston

*CARL A. LARSON, Ph.D., Superintendent, Soil Scientist; Division of Soils, Fertilizers, and Irrigation, Bureau of Plant Industry, Soils and Agricultural Engineering.

‡DONALD HENRY SHERWOOD, B.S., Assistant Poultry Husbandman.

§DONALD S. BLACK, B.S., Research Assistant (Agronomy).

JAMES A. BURR, B.S., Research Assistant (Agronomy).

THOMAS P. DAVIDSON, B.S., Research Assistant (Horticulture).

ERICK R. KALBERG, M.S., Research Assistant (Poultry Husbandry).

Hood River Branch Experiment Station, Hood River

LEROY CHILDS, A.B., Superintendent, Entomologist.

GORDON GEORGE BROWN, B.S., Horticulturist.

†J. R. KIENHOLZ, Ph.D., Pathologist, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, Soils and Agricultural Engineering.

WILMER ABELE MEYLE, B.S., Research Assistant (Horticulture).

VERNON WILLIAM OLNEY, B.S., Research Assistant (Entomology)

Southern Oregon Branch Experiment Station, Medford

*ELLIOTT STANFORD DEGMAN, Ph.D., Superintendent and Pomologist, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, Soils and Agricultural Engineering.

FRANK CHARLES REIMER, M.S., Superintendent Emeritus.

LOUIS GUSTAV GENTNER, M.S., Entomologist.

HAROLD H. WHITE, M.S., Associate Agronomist.

†WILFRED TUTTLE FROST, A.B., Associate Hydraulic Engineer, Soil Conservation Service, U. S. Department of Agriculture; Irrigation Water Forecasting.

†R. A. WORK, B.S., Project Supervisor, Irrigation Water Forecasting; U. S. Department of Agriculture.

‡ROBERT TURNER BEAUMONT, B.S., Assistant Water Forecaster.

Sherman Branch Experiment Station, Moro

*GEORGE ADAMSON MITCHELL, B.S., Superintendent and Assistant Agronomist, Division of Dry Land Agriculture, Bureau of Plant Industry, Soils and Agricultural Engineering.

WILLIAM HALL, B.S., Research Assistant (Agronomy).

Pendleton Branch Experiment Station, Pendleton

*MERRILL MAHONRI OVESON, M.S., Superintendent, Soil Scientist; Agent, Division of Cereal Crops and Diseases and Division of Dry Land Agriculture, Bureau of Plant Industry, Soils and Agricultural Engineering.

†THEODORE R. HORNING, M.S., Soil Conservation Service.

*CARROLL H. RAMAGE, B.S., Research Assistant; Agent (Junior Soil Scientist) Division of Soils, Bureau of Plant Industry, Soils and Agricultural Engineering.

† U. S. Government investigators stationed in Oregon.

* Employed by both State and Federal Government.

‡ On leave of absence.

§ On military leave.

Eastern Oregon Branch Experiment Station, Union

HARRY GRANT AVERY, B.S., Superintendent.

CECIL DURWOOD PIERCE, B.S., Research Assistant (Animal Husbandry).

AGRICULTURAL EXPERIMENTAL AREAS

ALVIN EUGENE GROSS, M.S., Superintendent, Klamath Experimental Area, Klamath Falls.

ALFRED R. HALVORSON, Ph.D., Assistant Superintendent and Assistant Soil Scientist, Klamath Experimental Area.

JACK T. McDERMID, B.S., Superintendent, Red Soils Experimental Area, Oregon City.

ELBERT NEIL HOFFMAN, B.S., Superintendent, Malheur Experimental Area, Ontario.

HENRY JAMES O'REILLY, M.S., Superintendent, The Dalles Experimental Area, The Dalles.

HERBERT BADOLLET HOWELL, B.S., Superintendent, Northrup Creek Grazing Area, Birkenfeld.

MALCOLM JOHNSON, M.S., Project Leader, Deschutes Experimental Project, Redmond.

CARL A. LARSON, Ph.D., Superintendent, Milton-Freewater Experimental Area, Hermiston.

EARL E. BROWN, B.S., Research Assistant (Entomology), Milton-Freewater Experimental Area, Hermiston.

JOHN A. CURRIE, B.S., Research Assistant (Soils and Irrigation), Deschutes Experimental Project, Redmond.

THOMAS P. DAVIDSON, B.S., Research Assistant (Horticulture), Milton-Freewater Experimental Area, Hermiston.

FLOYD E. ELLERTSON, B.A., Research Assistant (Entomology), The Dalles Experimental Area, The Dalles.

JOHN A. YUNGEN, B.S., Research Assistant (Agronomy), Malheur Experimental Area, Ontario.

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 eight branch stations and eight experimental areas so located 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 Experiment Station workers engaged in the scientific investigation of problems presented by the different branches of agriculture. The Station includes the following departments: Agricultural Chemistry; Agricultural Economics; Agricultural Engineering; Animal Husbandry; Bacteriology; Botany and Plant Pathology; Dairy Husbandry; Entomology; Farm Crops; Fish and Game Management; Food Technology; Home Economics; Horticulture; Poultry Husbandry; Soils; and Veterinary Medicine.

Much of the research program of the Station is cooperative with the U. S. Department of Agriculture, and a number of federal scientists are located in Oregon working on problems of a regional nature.

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 Oregon 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 eight branch stations located at Astoria, Burns, Hermiston, Hood River, Medford, Moro, Union, and Pendleton and the eight experimental areas located at Birkenfeld, Klamath Falls, Milton-Freewater, Ontario, Oregon City, Redmond, Talent, and The Dalles conduct experiments on the major agricultural problems of their respective agricultural sections of the state.

The John Jacob Astor Branch Experiment Station at Astoria has as its major problems of investigation: dairying; improvement of forage crops; soil fertility; soil management for Coast conditions; and the drainage, improvement, and cultivation of tidelands.

The Umatilla Branch Experiment Station at Hermiston, conducted cooperatively with the United States Department of Agriculture, 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 orchard section.

The Sherman Branch Experiment Station at Moro, operated cooperatively with the United States Department of Agriculture, 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, and soil conservation.

The Southern Oregon Branch Experiment Station at Medford, conducted cooperatively with the United States Department of Agriculture, Bureau of Plant Industry, Soils, and Agricultural Engineering, is centering attention on problems of fruit production. Irrigation water forecasting activities of the Oregon cooperative snow surveys are located at this station. The station cooperates with the Soil Conservation Service and other agencies in this work.

The Eastern Oregon Branch Livestock Experiment Station at Union is conducting experiments in fattening, wintering, grazing, breeding, 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 Pendleton Branch Experiment Station is situated in the heart of an important wheat and pea production area. In cooperation with the Bureau of Plant Industry, Soils, and Agricultural Engineering of the U. S. Department of Agriculture it has concentrated on the development of improved wheat varieties and crop practices, including crop rotation, weed eradication, and coa-

trol of soil erosion. Recently an intensive project on erosion control has been initiated in cooperation with the Soil Conservation Service and the Bureau of Plant Industry, Soils, and Agricultural Engineering.

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 worn-out 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; 661 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 Bureau of Land Management, Department of the Interior.

The Klamath Experimental Area consists of two experimental tracts, one located southeast of Klamath Falls on mineral soil and the other located south of Klamath Falls on muck soil. In addition to research on reclamation of problem soils in this irrigated district this experimental area is engaged in research on production problems with potatoes, cereals, and forage crops in the Klamath Basin.

The Malheur Experimental Area research program is aimed at finding the best methods of crop production and the crops best suited to the areas of the Vale-Owyhee irrigation project. Major emphasis is given to studies of production and utilization of forage crops for livestock. The Bureau of Plant Industry, Soils and Agricultural Engineering of the U. S. Department of Agriculture, the Bureau of Reclamation of the U. S. Department of the Interior, and the Soil Conservation Service cooperate actively with the state in certain phases of the program.

The Red Soils Experimental Area is centering attention on rebuilding worn-out red hill soils, of which there are approximately 800,000 acres in the Willamette Valley. Utilization of grasses and legumes for seed production and forage has been emphasized in the station's soil-building program.

The Dalles Experimental Area is concerned with problems affecting the stone-fruit industry of that area. Principal fields of research are virus disease and insect control, and soil management and cultural practice improvement.

The Central Oregon Experimental Area located at Redmond conducts research on general farming problems in Crook, Deschutes, and Jefferson Counties. Current emphasis is on problems related to production of potatoes, alsike, and ladino clover seed, cereals, and hay. All research is conducted on privately owned land under cooperative agreements with the owners.

The Southern Oregon Agronomic Project at Talent is engaged in research on problems related to production of pasture and hay, grass and legume seed, and cereals in southern Oregon, including Josephine, Jackson, and Douglas counties.

The Milton-Freewater Area is seeking solutions for problems faced in the production of fruit and vegetables in the eastern part of Umatilla County. Special emphasis is placed at present on control of insect pests of fruit trees.

Engineering Experiment Station

Administrative Officers

- EDGAR W. SMITH, B.A., LL.D., President, Oregon State Board of Higher Education.
 CHARLES DAVID BYRNE, Ed.D., Chancellor, Oregon State System of Higher Education.
 AUGUST LEROY STRAND, Ph.D., President, Oregon State College.
 GEORGE WALTER GLEESON, Ch.E., Dean, School of Engineering.
 DELMER MORRISON GOODE, M.A., Director of Publications.
 SAMUEL HERMAN GRAF, M.E., M.S., Director.

Station Staff

- ARTHUR LEMUEL ALBERT, M.S., E.E., Communication Engineering.
 WALTER CLIFFORD BAKER, B.S., Air Conditioning.
 MARTIN PORTMAN COOPEY, B.S., Highway Engineering.
 PAUL MILLARD DUNN, M.S.F., Forestry.
 WILLIAM FREDERIC ENGESSER, B.S., Industrial Engineering.
 GRANT STEPHEN FEIKERT, M.S., E.E., Radio Engineering.
 GEORGE WALTER GLEESON, M.S., Ch.E., Chemical Engineering.
 GLENN WILLIS HOLCOMB, M.S., Structural Engineering.
 JOHN GRANVILLE JENSEN, Ph.D., Industrial Resources.
 CLAIR VAN NORMAN LANGTON, Dr.P.H., Ed.D., Public Health.
 FRED ORVILLE McMILLAN, M.S., Electrical Engineering.
 WALLACE HOPE MARTIN, M.E., M.S., Heat Engineering.
 FRED MERRYFIELD, M.S., Sanitary Engineering.
 CHARLES ARTHUR MOCKMORE, C.E., Ph.D., Civil and Hydraulic Engineering.
 WILLIAM HOWARD PAUL, M.S., Automotive Engineering.
 PHIMISTER BAYARD PROCTOR, Ph.D., Wood Products.
 BENJAMIN FRANKLIN RUFFNER, Aero.E., M.S., Aeronautical Engineering.
 MILTON CONWELL SHEELY, B.S., Shop Processes.
 LOUIS SLEGEL, Ph.D., Machine Design.
 EUGENE CARL STARR, E.E., Electrical Engineering.
 CHARLES EDWIN THOMAS, M.M.E., Engineering Materials.
 JESSE SEBURN WALTON, B.S., Chemical and Metallurgical Engineering.

Technical Counselors

- R. H. BALDOCK, State Highway Engineer, Salem.
 R. R. CLARK, Designing Engineer, Corps of Engineers, Portland District, Portland.
 R. W. COWLIN, Director, Pacific Northwest Forest and Range Experiment Station, United States Department of Agriculture, Forest Service, Portland.
 DAVID DON, Chief Engineer, Public Utilities Commission, Salem.
 CURTISS M. EVERTS, JR., State Sanitary Engineer, Portland.
 F. W. LIBBEY, Director, State Department of Geology and Mineral Industries, Portland.
 PAUL B. MCKEE, President, Portland Gas & Coke Company, Portland.

BEN S. MORROW, Engineer and General Manager, Department of Public Utilities and Bureau of Water Works, Portland.

JAMES H. POLHEMUS, President, Portland General Electric Co., Portland.

S. C. SCHWARZ, Chemical Engineer, Portland Gas & Coke Company, Portland.

C. K. STERRETT, Manager, Industries Department, Portland Chamber of Commerce.

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 research 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 investigative work of the station to the extent of funds allocated or contributed for this purpose. Much of the work of the station has been made possible by the assistance of industries and state and national associations. Many cooperative projects have been carried through in past years and such projects are always under way. Inquiries concerning cooperative projects are welcomed.

The dean of engineering, the director of the station, and the heads of the various major departments function as a council *ex officio*. The director acts as chairman of the council, technical adviser on investigations, 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 on 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.

Oregon Forest Products Laboratory

Staff

PAUL MILLARD DUNN, M.S., Director.

PHIMISTER BAYARD PROCTOR, Ph.D., Managing Director.

WILLIAM JENNINGS BAKER, M.S., Forest Products.

LEIF DEDRICK ESPENAS, M.F., Wood Seasoning.

ROBERT DOUGLAS GRAHAM, M.S., Wood Preservation.

ERVIN FREDERICK KURTH, Ph.D., Wood Chemistry.
 MORTIMER DEFORREST MACDONALD, M.S., Laminated Products.
 JOHN DARYL ROSS, M.S., Chemical Engineering.
 JOHN ROBERT STILLINGER, M.S., Forest Products.
 HUGH EDWARD WILCOX, M.S., Wood Fiber Products.
 MARION HORTON, Administrative Assistant.

Cooperating Departments and Divisions

Agricultural Engineering Department	Engineering Experiment Station
Agricultural Experiment Station	Forest Engineering Department
Botany Department	Forest Management Department
Chemical Engineering Department	Forest Products Department
Chemistry Department	Mechanical Engineering Department

BY SPECIAL Act, the 1941 Oregon Legislature authorized a program of research in the utilization of forest products to be carried on through the State Board of Forestry in cooperation with the School of Forestry. This Act was revised in 1945, establishing a forest products laboratory on the campus of Oregon State College under the directorship of the dean of the School of Forestry and authorizing cooperation with public agencies and private industries.

The law created an advisory committee to guide the policy of the program. The committee is composed of representatives of the following agencies: West Coast Lumbermen's Association, Willamette Valley Lumbermen's Association, Western Pine Association, Oregon Plywood Interests, Pacific Northwest Forest and Range Experiment Station, and the School of Forestry. The Governor of Oregon is chairman and the State Forester is secretary.

Summer Session

FRANKLIN ROYALTON ZERAN, Ph.D., Director of the Summer Session.

OREGON State College conducts an eight-week summer session which serves several groups of students: undergraduate and graduate students who wish to shorten time for completing degree requirements; mature students from all parts of the country who have the summer free for study and travel; junior-college graduates and transfer students who need to make some adjustment in their programs before entering advanced or professional training; recent high-school graduates who desire additional study before starting a regular curriculum; and others who find the campus of Oregon State College a pleasant and profitable place for summer studies in many fields.

Summer courses offered. In the summer of 1951 eight schools and divisions will participate. The Lower Division offers basic courses in arts and letters and in social sciences. The School of Science offers undergraduate and graduate work in all departments. The School of Business and Technology offers courses in business administration, secretarial science, and business education. All departments of the School of Home Economics offer undergraduate and graduate courses. The School of Engineering offers a limited number of engineering courses. The Department of Industrial Education offers courses in industrial engineering, industrial arts, and industrial arts education. The School of Education provides basic and advanced course work in teaching theory, with stress on the training of guidance, testing, and counseling specialists. Workshops, seminars, and short courses in health education, guidance, Northwest resources, and special types of subject matter supplement the regular courses. The Division of Physical Education offers both recreational and professional course work.

Credit and fees. Students may earn a total of up to twelve term hours of credit in the eight-week session. Under certain conditions an additional three credits of graduate work may be taken in a two-week post session in the School of Education. Full-time summer students pay a \$55.00 fee. Part-time students registering for not more than five hours pay fees at the rate of \$7.00 per term hour. There is no out-of-state fee. Ability to profit from the course work serves as the primary criterion of admission to summer classes. Candidates for degrees from Oregon State College must satisfy the regular requirements for admission. (See pages 78-79.)

Institute of Marine Biology. Sponsored by the State System of Higher Education, the Institute of Marine Biology supplements summer work of the departments of Botany and Zoology. Located near the entrance of Coos Bay in southwestern Oregon, the Institute grounds lie close to collecting areas which abound in marine life. Courses serve primarily advanced undergraduate and graduate students and include work in field botany, field zoology, algology, ichthyology, and invertebrate zoology.

Summer information. For the 1951 summer session calendar see pages 8-9. The summer-session bulletin and other special announcements may be obtained by writing the Director of the Summer Session, Oregon State College. For an announcement of studies in marine biology address the Director of the Institute of Marine Biology, School of Science, Oregon State College.

Extension

THROUGH extension services the benefits of all the Oregon state institutions of higher education are brought to the people of the state in their own communities. All divisions of the Oregon 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 are administered through 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

JOHN F. CRAMER, D.Ed., Dean and Director of General Extension.
VIRON A. MOORE, M.A., Assistant Director of General Extension.
ERRETT E. HUMMEL, D.Ed., Administrative Assistant.
DOROTHY D. SMITH, B.A., Eugene Office Manager.

Correspondence Study

HOWARD J. AKERS, M.A., Head of Correspondence Study.

State-Wide Extension Classes

VIRON A. MOORE, M.A., Head of State-Wide Classes.
ROBERT J. GRIDLEY, B.S., Field Representative.
VICTOR N. PHELPS, M.A., Field Representative.

Portland Extension Center

MARGARET M. SHARP, Director of Portland Extension Center.
JAMES C. CAUGHLAN, Ph.D., Director of Portland Summer Session.
LOUIS F. JUDKINS, B.J., Manager of Information Services.
CLARK P. SFURLOCK, M.A., Student Counselor.
HELEN R. WILDERMAN, B.A., Recorder.

Vanport Extension Center

STEPHEN E. EPLER, Ph.D., Director of Vanport Extension Center.
PHIL S. PUTNAM, Ed.D., Assistant Director of Vanport Extension Center.
JEAN P. BLACK, Ph.D., Librarian.
RICHARD B. HALLEY, M.A., Men's Adviser.
JOSEPH V. HOLLAND, M.A., Athletic Director.
LESLIE B. NEWHOUSE, B.S., Business Manager.

Radio Station KOAC

JAMES M. MORRIS, B.S., Program Manager, KOAC.
GLADYS D. CHAMBERS, M.A., Director of Women's Programs.
ELIZABETH E. DOTSON, B.S., Director of KOAC School of the Air.
JAMES S. NELSON, Production Manager.
ARNOLD EBERT, B.S., Director of Agricultural Program.

D. GLENN STARLIN, M.A., Production Director, University Radio Studios.
ROBERT C. HINZ, B.A., Announcer.
PHILIP KALAR, Mus.B., Director of Music.
DON S. SOMERVILLE, M.A., Specialist in Radio Education.

Visual Instruction

W. CURTIS REID, Ph.D., Head of Department of Visual Instruction.
CHARLES VAN HENKLE, A.B., Specialist in Visual Education.
JOHN F. SHRAWDER, B.S., Specialist in Visual Education.

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. Its work is organized into the following departments: at Eugene: Correspondence Study, State-Wide Extension Classes; at Corvallis: Visual Instruction, Radio Station KOAC; at Portland: Portland Extension Center, Vanport Extension Center.

Portland Extension Center. General extension in Portland is carried on through the Portland Extension Center. More than two hundred evening courses in thirty-five different departments and professional schools were offered during the academic year 1950-51. The work of these classes is of standard college or university grade. Resident credit at the University, the State College, or the state 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.

Vanport Extension Center. To meet congested conditions in institutions of the State System, the Board of Higher Education established the Vanport Extension Center in the summer of 1946. Designed to provide for the overflow from the institutions, Vanport Center offers freshman and sophomore courses in a wide variety of fields. Course work is closely integrated with campus instruction; all credits earned are transferable to the University of Oregon, Oregon State College, and the colleges of education.

State-Wide Extension Classes. Through its program of state-wide extension classes, the General Extension Division provides the people of the state of Oregon with opportunities for college instruction and educational growth in their home communities. Courses will be organized in any community which can furnish a suitable meeting place for a class and give assurance of an enrollment large enough to pay, through course fees, the cost of providing an instructor. The state-wide extension program includes both courses for college credit and noncredit courses. Through the Department of State-Wide Classes, the General Extension Division cooperates in the operation of local community-college programs at Bend and Baker.

Correspondence Study. Study at home under competent supervision is possible for any adult 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 for 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 of the General Extension Division provides glass and film slides, microscope slides, and motion-picture films suitable for educational use by schools, community clubs, and other organizations. A special catalog lists 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 the University of Oregon, Oregon State College, the Oregon colleges of education, and various departments of the Oregon state government. Studios are located at Eugene, Corvallis, and Salem. In addition, many other public agencies, organizations, and individuals contribute frequently to broadcasts from the station. The station, established in 1925, is operated in the interest of the Oregon public. The programs are free from commercialism. KOAC operates with 5,000 watts power on a frequency of 550 kilocycles by authority of the Federal Communications Commission. Announcements of radio programs are issued periodically, and will be furnished on request.

Federal Cooperative Extension Service

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FEDERAL Cooperative Extension performs one of the three major functions of Oregon State College, which are: resident teaching, research, and extension teaching. It extends the available information of Oregon State College, the United States Department of Agriculture, and other appropriate state and federal agencies to every portion of the state. A staff of men and women resident in the counties, cooperatively supported by Oregon State College, United States Department of Agriculture, and the counties, and a resident staff of subject-matter specialists in agriculture and home economics work on a project basis, all projects being approved by the appropriate administrative officers.

The work of the Extension Service is directed toward improvement of rural life. Its first objective is the rural home. Its program includes all forms of off-campus instruction and assistance in those phases of agriculture, home economics, and related subjects that can be practically adapted to the needs of the people of the state. Unique teaching methods have been developed through the years, important among which is organization for self-help to bring widespread application of the principles presented. Active cooperation with all other organized forces of betterment toward enrichment of the agricultural and home interests of Oregon characterizes the extension program. All counties of the state cooperate in the program, which therefore is available in every community.

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 Oregon 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 district 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; information; radio; and visual instruction.*

Agriculture—soils, irrigation, and drainage; soil conservation; horticulture; animal husbandry; dairying; poultry husbandry; farm crops; hop production; agricultural economics, including marketing and the collection and dissemination of statistical and outlook information; agricultural engineering; rodent eradication; land use planning; entomology; farm forestry; seed certification; and plant pathology.

Home Economics—nutrition; home management; clothing and textiles; home furnishings; community social organization; rural housing; rural sociology; and family relationships.

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 and home welfare, or to material agricultural development.

* Supported jointly with General Extension Division.

Summary of Enrollment—1949-50

ENROLLMENT BY CURRICULUM AND CLASS, REGULAR SESSION, 1949-50

Curriculum	Freshman year	Sophomore year	Junior year	Senior year	Graduate	Special	Sub-total	Total
<i>Liberal Arts and Sciences</i>								
<i>Lower Division</i>								
Arts and Letters	233	96	-----	-----	-----	2	-----	-----
Social Science	287	109	-----	-----	-----	1	-----	-----
Total, Lower Division	520	205	-----	-----	-----	3	728	-----
<i>School of Science</i>								
General Science	88	121	42	77	4	-----	-----	-----
Bacteriology	6	20	5	12	7	-----	-----	-----
Botany	1	6	3	5	21	-----	-----	-----
Chemistry	19	37	14	26	67	-----	-----	-----
Entomology	1	9	1	5	10	-----	-----	-----
Geology	16	28	17	33	7	-----	-----	-----
Mathematics	3	12	11	12	20	-----	-----	-----
Physics	10	23	8	26	29	-----	-----	-----
Zoology	1	9	3	5	28	-----	-----	-----
Total, School of Science	145	265	104	201	193	-----	908	-----
Total, Liberal Arts and Sciences, excluding duplicates	665	470	104	201	193	3	-----	1,636
<i>Professional Curricula</i>								
School of Agriculture	269	310	167	238	145	3	-----	-----
School of Business and Technology	260	367	162	334	2	1	-----	-----
School of Education	93	200	104	162	107	-----	-----	-----
School of Engineering	172	293	263	607	62	-----	-----	-----
School of Forestry	61	117	70	146	16	-----	-----	-----
School of Home Economics	177	160	73	125	32	1	-----	-----
School of Pharmacy	59	88	35	95	1	-----	-----	-----
Unclassified	-----	-----	-----	-----	44	-----	-----	-----
Totals (excluding duplicates)	1,756	2,005	978	1,958	602	8	-----	7,307
Auditors	-----	-----	-----	-----	-----	-----	-----	59
Total Students, Regular Session								7,366

DISTRIBUTION OF ENROLLMENT AS TO SEX AND RANK 1949-50

	Men	Women	Total
Total Graduate Students	520	82	602
Total Undergraduate Students	5,069	1,636	6,705
Total Auditors	9	50	59
Totals	5,598	1,768	7,366

ENROLLMENT IN SUMMER SESSION, 1949

	Men	Women	Total
Regular Students	1,184	400	1,584
Second Session	2	2	4
Auditors	4	10	14
4-H Club Short Course	646	1,186	1,832
Totals	1,836	1,598	3,434

ENROLLMENT IN GENERAL EXTENSION DIVISION
July 1, 1949—June 30, 1950

Classes	Under-graduate	Graduate	Total
Extension Classes:			
Portland Center	5,218	641	5,859
Vancouver Center	2,317	.....	2,317
State-Wide Classes (71 centers)	5,401	829	6,230
Total, Extension Classes	12,936	1,470	14,406
Correspondence Study:			
New Registrants	2,935	.....	2,935
Old Registrants	1,813	.....	1,813
Total, Correspondence Study	4,748	.....	4,748
Grand Total, General Extension Division	17,684	1,470	19,154

SUMMARY OF DEGREES GRANTED AT OREGON STATE COLLEGE 1949-50

<i>Advanced Degrees:</i>		
Doctors of Philosophy	17	.....
Doctors of Education	3	.....
Masters of Arts	3	.....
Masters of Science	126	.....
Masters of Education	18	.....
Masters of Forestry	3	.....
Total Advanced Degrees .....	.....	170
<i>Bachelors' Degrees:</i>		
Bachelors of Arts:		
Science	11	.....
Business and Technology	4	.....
Education	6	.....
Engineering	9	.....
Home Economics	2	.....
Bachelors of Science:		
Science	190	.....
Agriculture	310	.....
Business and Technology	315	.....
Education	137	.....
Agricultural Engineering	6	.....
Chemical Engineering	30	.....
Civil Engineering	89	.....
Electrical Engineering	144	.....
Mechanical Engineering	126	.....
Metallurgical Engineering	1	.....
Mining Engineering	5	.....
Industrial Engineering and Industrial Arts	126	.....
Forestry	105	.....
Home Economics	110	.....
Nursing Education	3	.....
Pharmacy	67	.....
Bachelor of Forestry	1
Total Bachelors' Degrees	1,798
Total Degrees Granted 1949-50	1,968

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