

Oregon State College
CATALOG
1944-45



Corvallis, Oregon

Oregon State System of Higher Education B U L L E T I N

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Office of the State Board of Higher Education
Eugene, Oregon

Oregon State System of Higher Education

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* Each dean and director in this list is interinstitutional in function, and the chancellor's principal adviser in his field. Academic deans and directors are responsible, jointly with the presidents of institutions where nonmajor work is offered, for keeping nonmajor course offerings in proper relation to the work of the major schools.

† JOHN FRANCIS CRAMER, Ed.D., will become Dean and Director of General Extension on July 1, 1944.

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Oregon State System of Higher Education

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

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

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

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

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



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

THE OREGON STATE SYSTEM

UNIVERSITY OF OREGON

OREGON STATE

LIBERAL ARTS AND SCIENCES

Lower Division (Junior Certificate)

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

College of Liberal Arts (B.A., B.S., M.A., M.S., Ph.D.)

Major curricula in General Arts and Letters, General Social Science, General Science, and in Anthropology, Biology, Chemistry, Classics, Economics, English (including options in Speech and Dramatic Arts and in Preliminary Training), Geology and Geography, Germanic Languages, History, Mathematics, Philosophy, Physics, Political Science, Psychology, Romance Languages, and Sociology. Premedical and Preparatory Nursing curricula.

Lower Division (Junior Certificate)

Freshman and sophomore work in Literature, Science, and Social Science) is the State College and the University.

School of Science (B.A., B.S., M.A.)

Major curricula in General Science, and Geology, Geology, Mathematics, Physics, Nursing curricula.

PROFESSIONAL AND TECHNICAL CURRICULA

School of Architecture and Allied Arts (B.A., B.S., B.Arch., B.L.A., M.A., M.S., M.Arch., M.F.A., M.L.A.)

Architectural Design, Interior Design, Landscape Architecture (with one year at State College), Drawing and Painting, Sculpture, Art Education, and General Art; Structural Design in Architecture, a joint curriculum with Engineering.

School of Business Administration (B.A., B.S., B.B.A., M.A., M.S., M.B.A.)

Accounting, Advertising and Selling, Finance, Foreign Trade, General Business, Industrial Management, Marketing and Merchandising; combined curriculum in Business Administration and Law.

School of Education (B.A., B.S., B.Ed., M.A., M.S., M.Ed., D.Ed., Ph.D.)

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

School of Journalism (B.A., B.S., B.J., M.A., M.S.)

Reporting, Editing, Advertising, Publishing, Typography and Fine Printing.

School of Law (B.A., B.S., LL.B., J.D.)

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

Medical School (Portland) (B.A., B.S., M.A., M.S., Ph.D., M.D.)

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

School of Music (B.A., B.S., B.M., M.A., M.S., M.M.)

Music History and Appreciation, Theory and Composition, Applied Music, Public-School Music.

School of Physical Education (B.A., B.S., B.P.E., M.A., M.S.)

Professional curriculum combining work in physical education, health education, and recreation. Preparation for coaching and for teaching of physical education and health education.

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

School of Agriculture (B.S., B.Agr.)

Animal Industries (Animal, Dairy, and Fish and Game Management, Fisheries Management; Plant Industries (Farm Crops and Maintenance, Food Industries (Food Processing and Agricultural Technology).

Division of Business and Industry

Business and Industry with major emphasis in Industrial Organization and Operation, Industrial Cost Control, Industrial Marketing and Management; Secretarial Science, including

School of Education (B.A., B.S., E.)

Major curricula preparing for teaching of Mathematics, Agriculture, Home Economics, and approved combinations of subjects. Training for part-time physical-education teachers. Education operates jointly at the University and the State College.

School of Engineering and Industrial Science

Ch.E., C.E., E.E., M.E., Met.E., Chemical Engineering, Civil Engineering (Highway options), Electrical Engineering (Power options), Mechanical Engineering (Automotive, Industrial, and Marine), Metallurgical Engineering, Mining Engineering, and Structural Design in Architecture and Allied Arts.

School of Forestry (B.S., B.F., M.S.)

Logging Engineering, Technical Forestry (Light Building Construction option).

School of Home Economics (B.A., B.S., M.A., M.S., M.H.E.)

Clothing, Textiles, and Related Arts; Food and Nutrition; Home Economics; Home Economics Education.

School of Pharmacy (B.A., B.S., M.A., M.S., M.P.)

Pharmacy, including Pharmaceutical Chemistry and preparation for certification as registered pharmacist.

In addition to the major professional curricula listed above, the University offers lower-division and service courses in Architecture and Physical Education.

GRADUATE STUDY AND RESEARCH

Graduate Division

All graduate instruction is administered by the interinstitutional Graduate Division.

General Research Council

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

Graduate Division

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

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

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

Graduate Division

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

Biological Sciences, Physical Sciences, Education, Engineering, Forestry, Home Economics, and Pharmacy.

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

M OF HIGHER EDUCATION

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



ATE COLLEGE

OREGON COLLEGES OF EDUCATION

General Arts and Sciences (Language and Literature) offered on essentially the same basis at both
M.S., Ph.D.)
and in Bacteriology, Botany, Chemistry, Entomology, and Zoology. Premedical and Preparatory

Lower Division (Junior Certificate)

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

M.S., Ph.D.)
and Poultry Husbandry, Dairy Manufacturing, and Agriculture Economics including Farm Crops, Soils, Horticulture, Landscape Construction; Agricultural Education; Agricultural Engineering.

B.A., B.S., B.S.S.)
emphasis on General Business and Industry, Industrial Finance, Industrial Accounting and Selling, Industrial Relations and Personnel Management, Stenography, Typewriting, Office Methods.

Ed.B., M.A., M.S., Ed.M., Ed.D.)
of Biological and Physical Sciences, Mathematical Arts, Commercial Education, and training for educational and vocational guidance. Education teaching and coaching. The School of Education and the State College.

ial Arts (B.A., B.S., B.I.A., M.A., M.S., Min.E.)

ing (General curriculum, Business and High-Power and Communications options), Industrial (General curriculum, Aeronautical option), Engineering, Industrial Arts Education, Industrial Architecture, a joint curriculum with Architecture

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

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

(A., M.S.)
Analysis, Pharmacology, and Pharmacognosy; and pharmacist.

Curricula listed above, the State College offers Architecture and Allied Arts, Journalism, Music, and

Degrees has been allocated to the State College in Sciences (including Mathematics), Agriculture, Education Economics, and Pharmacy.
above, following the name of each major school.

EXTENSION

General Extension Division

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

Correspondence Study
Portland Extension Center
Radio Station KOAC
State-Wide Extension Classes
Visual Instruction

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

Federal Cooperative Extension

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

Oregon State College and the War

IN RESEARCH, resident instruction, and extension all the facilities of Oregon State College have been brought into increasingly close relation to the military program, the industrial program, and the production and distribution program of a nation engaged in highly mechanized, total war.

More than sixty staff members are on leave in the armed forces or in related industrial work. Many staff members have been giving instruction to the 1,400 soldier students, selected by the Army for ability and aptitude and sent to Oregon State College during 1943-44 from all parts of the United States for training in the Army Specialized Training Program.

The course offerings of a land-grant institution like Oregon State College are readily adapted to the demands of wartime. While a few special courses have been added, the main effect of war demands has been a refocusing of all the work in terms of the wartime situation, particularly of the immediate needs of students preparing for military or civilian war services. The courses offered in 1944-45 will depend on the availability of faculty as well as on student demand. In general, however, the regular course offerings will be available subject only to such limitations as are imposed by changes in staff and student body.

Campus life during wartime reflects the relation of the College to the war effort. The soldier students have set a stiff pace. Among the civilian students the majority are women; the male contingent is made up in large part of men who are trying to get in at least part of a year of college before entering the armed forces; many of these are in the seventeen-year class. Student activities reflect the wartime interests of students.

Although most of the space in the college dormitories has been occupied by members of the college army training units, ample accommodations have been provided for civilian students in houses near the campus that in peacetime are occupied by men's living organizations; these houses have been operated under regular dormitory rates and regulations.

1944

June 1944

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July 1944

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August 1944

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September 1944

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October 1944

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November 1944

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December 1944

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31	---	---	---	---	---	---

ACADEMIC CALENDAR

Summer Quarter 1944

- June 19, *Monday*.....Registration, First Session
 June 20, *Tuesday*.....Classes begin
 July 28, *Friday*.....First Session ends
 July 29, *Saturday*.....Registration, Second Session
 July 31, *Monday*.....Classes begin, Second Session
 September 1, *Friday*.....Classes end, Second Session

Fall Term 1944-45

- September 15, *Friday*.....First faculty meeting, 4:00 p.m.
 September 18-23, *Monday to Saturday*..... Freshman Week
 September 23, *Saturday*.....Registration, returning students
 September 25, *Monday*.....Classes begin
 October 7, *Saturday*.....Last day for addition of new courses or new registrations
 October 27, *Friday*.....Charter Day
 November 30, *Thursday*.....Thanksgiving Day, holiday
 December 9, *Saturday*.....Classes end
 December 11-16, *Monday to Saturday*..... Final examinations
 December 16, *Saturday*.....Fall term ends

SEVENTY-SEVENTH YEAR

Winter Term 1944-45

January 2, *Tuesday*.....Registration
 January 3, *Wednesday*.....Classes begin
 January 16, *Tuesday*.....Last day for addition
 of new courses or new registrations
 March 17, *Saturday*.....Classes end
 March 19-24, *Monday to Saturday*.....
 Final examinations
 March 24, *Saturday*.....Winter term ends

Spring Term 1944-45

April 2, *Monday*.....Registration
 April 3, *Tuesday*.....Classes begin
 April 16, *Monday*.....Last day for addition of
 new courses or new registrations
 May 30, *Wednesday*.....Memorial Day, holiday
 June 9, *Saturday*.....Classes end
 June 10, *Sunday*.....Baccalaureate Service
 June 11, *Monday*.....76th Annual
 Commencement
 June 11-16, *Monday to Saturday*.....Final
 examinations

Summer Quarter 1945

June 18, *Monday*.....Registration, First Session
 June 19, *Tuesday*.....Classes begin
 July 27, *Friday*.....First Session ends
 July 28, *Saturday*.....Registration, Second
 Session
 July 30, *Monday*.....Classes begin, Second
 Session
 August 31, *Friday*.....Classes end, Second
 Session

1945

January 1945

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February 1945

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March 1945

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April 1945

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29	30	---	---	---	---	---

May 1945

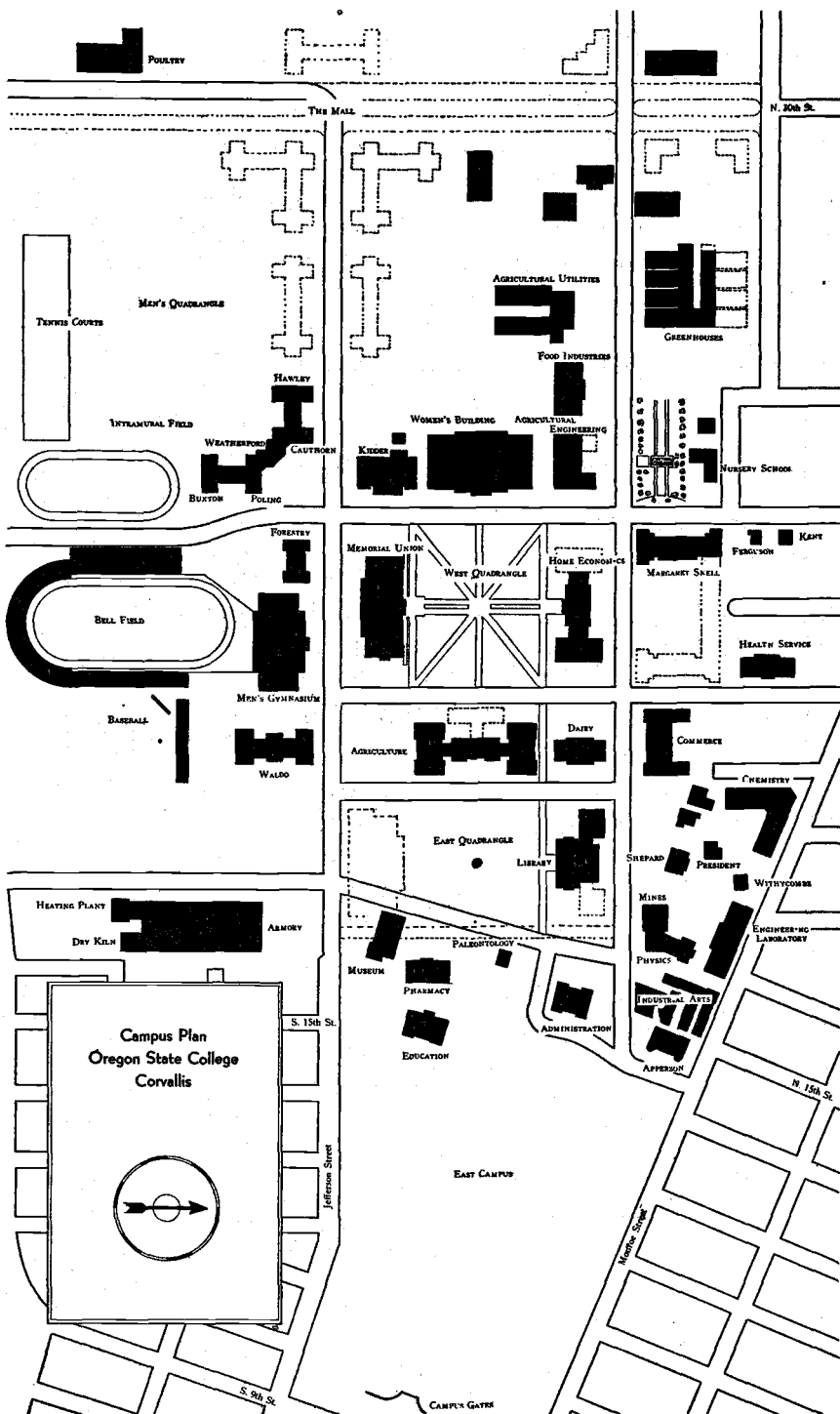
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20	21	22	23	24	25	26
27	28	29	30	31	---	---

June 1945

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Part I

State College Staff

Oregon State College

Officers of Administration

FREDERICK MAURICE HUNTER, Ed.D., LL.D.....	Chancellor
AUGUST LEROY STRAND, Ph.D.....	President
ERWIN BERTRAN LEMON, B.S.....	Dean of Administration; Registrar
<hr/>	
RICHARD HAROLD DEARBORN, A.B., E.E.....	Dean of Engineering and Industrial Arts
ULYSSES GRANT DUBACH, Ph.D.....	Dean of Men
PAUL MILLARD DUNN, M.S.F.....	Dean of Forestry
FRANCOIS ARCHIBALD GILFILLAN, Ph.D.....	Dean of Science
JAMES RALPH JEWELL, Ph.D., LL.D.....	Dean of Education
CLAIR VAN NORMAN LANGTON, Dr.P.H., Ed.D.....	Director of Physical Education
LUCY MAY LEWIS, A.B., B.L.S.....	Librarian
BUENA MARGASON MARIS, M.S.....	Dean of Women
CLIFFORD ELGES MASER, Ph.D.....	Head of Business and Industry
AVA BERTHA MILAM, M.A.....	Dean of Home Economics
DANIEL THOMAS ORDEMAN, Ph.D.....	Associate Registrar
CARL WALTER SALSER, Ed.M.....	Assistant Dean of Education
WILLIAM ALFRED SCHOENFELD, M.B.A.....	Dean and Director of Agriculture
MAHLON ELLWOOD SMITH, Ph.D.....	Dean of Lower Division; Dean of Lower Division and Service Departments; Director of Summer Sessions
LT. COL. GLEN MERRILL WEBSTER, B.S.....	Commandant
WILLIBALD WENIGER, Ph.D.....	Associate Dean of Graduate Division
ADOLPH ZIEFLE, M.S., Phar.D.....	Dean of Pharmacy

Service Divisions

OFFICE OF THE PRESIDENT

ERWIN BERTRAN LEMON, B.S.....	Dean of Administration
WILLIAM ARTHUR JENSEN, M.S.....	Executive Secretary Emeritus
HAZEL KELSEY WESTCOTT, B.S.....	Administrative Assistant
MARGARET McLOUGHLIN LANGAN.....	Secretary to the President

BUSINESS OFFICE

PAUL A. WALGREN, B.B.A.....	Acting Business Manager
*THEODORE PUTMAN CRAMER, B.S.....	Business Manager
EDWIN MONROE SMITH, B.S.D.....	Business Manager Emeritus
ARTHUR ALONZO BROOKS.....	Chief Requisition Clerk
MAE JOSEPHINE NUSBAUM.....	Salary Clerk
RUTH WAGNER.....	Cashier

* On leave for military or civilian war service.

DORMITORIES

MELISSA HUNTER, M.A. Director of Dormitories
 GEORGIA CHAPMAN BIBEE, B.S. Supervisor of Memorial Union Dining Service

STUDENT HEALTH SERVICE

DANIEL CLYDE REYNOLDS, B.S., M.D. Director of Health Service
 MURRAY BATES, M.A., M.D. Assistant Physician
 CHARLOTTE MELLER, B.S., M.D. Assistant Physician
 ERNA PLAGEMAN, R.N. General Supervisor
 MABEL DARELIUS, R.N. Nurse
 VALERA AMORT, R.N. Nurse
 MARGARET MCLAUGHLIN, R.N. Nurse
 HELEN LANDES, R.N. Nurse
 *DOROTHY FOSTER Nurse
 *ANNA MAE STEWART Nurse
 NELLE MARY GUNN X-Ray Technician
 EMMA PLAGEMAN Clerk
 *AUDREY DESHERBININ Clerk
 *HELEN HARPER Clerk

DIVISION OF INFORMATION

DELMER MORRISON GOODE, M.A. Editor of Publications
 EDWIN THOMAS REED, B.S., A.B., Litt.D. Emeritus Editor of Publications
 JOHN COLE BURTNER, B.S. In Charge of News Bureau
 FRED MERLE SHIDELER, M.S. Assistant in News Bureau
 ETHEL E ALLEN, B.S. Assistant Editor of Publications
 BETTY-SUE MCCREADY, M.S. Editorial Assistant, Office of Publications

LIBRARY

LUCY MAY LEWIS, A.B., B.L.S. Librarian
 LUCIA HALEY, A.B., B.L.S. Assistant Librarian
 BERTHA EMMA HERSE, B.S., B.L.S. Reference Librarian
 ELIZABETH PROPHET RITCHIE, A.B., B.L.S. Catalog Librarian
 ELZIE VANCE HERBERT Orders Librarian
 RUTH CAROLINE KRUEGER, M.A. Circulation Librarian
 KATHERINE WHIPPLE HUGHES, M.A. Science Reference Librarian
 HARRIET JANET WARNER, A.B. Assistant Reference Librarian
 MARIAN LUCILLE WABY, A.B., B.S. in L.S. Orders Assistant
 †DORA HIMMELSBACH COSTELLO, B.Ed., B.S. in L.S. Serials Assistant
 IRENE LOUISE CRAFT, M.A., M.S. in L.S. First Serials Assistant
 †WILLIAM ERNEST JORGENSEN, B.A. Engineering Librarian
 IDA CATHERINE HILBERS, M.A. Continuations Cataloger
 †LOREN GLENN STRAWN, M.A. Reference Assistant

* Resigned.

† On leave for military or civilian war service.

WILDA THOMPSON, B.A., B.A. in L.S.	Serials Assistant
LAVERNE MARIE PRUDEN GOMAN, B.A., B.A. in L.S.	Order Assistant
EDNA ELIZABETH VAN SYOC, B.A., B.S. in L.S.	Documents Cataloger
VIRGINIA ELIZABETH OLSEN, B.A., Cert. of Libr.	Circulation Assistant
NEDRA LUCILLE LeBLOND, B.A., B.S. in L.S.	Reference Assistant
ANNE AILEEN MURDOCK, B.S., B.S. in L.S.	Reserve Librarian
ALICE WALKER JONES, B.A.	Science Assistant
SUSAN MARIE WATT, M.A.	Reference Assistant
WANDA ZERILDA BROCKMAN, B.A.	Circulation Assistant
ELINOR JONES KINSLEY, B.S., B.A. in L.S.	Science Assistant
MARGARET MURIEL FIELD, M.A.	Engineering Librarian
LOIS CRISWELL, B.A.	Catalog Assistant
I MARIE SCHEIE, M.A.	Reclassification Cataloger
CARRIE HELEN THORY	Secretary

PHYSICAL PLANT

LOUIS NAPOLEON TRAVER	General Superintendent of Physical Plant
ERVIN EARL BARKLOW, B.S.	Superintendent of Campus Surveys, Roads and Walks, Sewer Maintenance, and Fire Protection
ARTHUR LEE PECK, B.S., B.A.	Superintendent of Campus
MARK CLYDE PHILLIPS, B.M.E.	Superintendent of Heating
HARRY RUTHERFORD	Supervisor of Building Repairs
DONALD BRUCE STUART	Superintendent of Light and Power
JOHN D WELLS	Chief, Campus Patrol
CHARLES GEORGE WILTSHIRE	Superintendent of Plumbing and Steam Fitting
CLARENCE EUGENE WOODWARD	Supervisor Janitorial
CECILE SMITH	Secretary to General Superintendent of Physical Plant

PRESS AND MANIFOLDING SERVICE

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

REGISTRAR'S OFFICE

ERWIN BERTRAN LEMON, B.S.	Registrar
DANIEL THOMAS ORDEMAN, Ph.D.	Associate Registrar
EVA BLACKWELL, B.S.	Assistant to the Registrar
BESS JACKSON MCCOY	Chief Clerk
	Examiner
BELVA DIXON, B.S.	Schedule Clerk
MARGARET SHUPE	Recorder
JEAN OGLESBY, B.S.	Secretary

STUDENT WELFARE, PERSONNEL, AND PLACEMENT

ULYSSES GRANT DUBACH, Ph.D. Dean of Men
 *BUENA MARGASON MARIS, M.S. Dean of Women
 CARL WALTER SALSER, Ed.M. Head of Personnel and Placement Service
 LORNA COLLAMORE JESSUP, B.S. Acting Dean of Women, Director of
 War-time Housing for Women
 ERNEST WILLIAM WARRINGTON, M.A. Director of Religious Education
 EDWARD CHRISTOPHER ALLWORTH, B.S., LL.D. Manager and Secretary,
 Memorial Union
 PERCY PHILIP LOCEY, M.A. General Manager of Student Activities
 MABEL WHITTENBERG WINSTON, M.A. Acting Assistant Dean of Women
 DAN WILLIAMS POLING, M.S. Assistant to the Dean of Men
 CLYTIE MAY WORKINGER Placement Secretary
 EMMA SERENA COE, B.A. Employment and Housing Secretary for Men
 EDITH MAE WILKINSON, B.S. Secretary to the Dean of Men
 GLADYS HULERY BULLIS Secretarial Assistant; In Charge of
 Employment for Women

ALUMNI OFFICE

*WARREN ALASKA REID, B.S.....Manager, Alumni Association
EUNICE ESTHER COURTRIGHT, B.S.....Acting Manager, Alumni Association

* On leave for military or civilian wartime service.

State College Staff*

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

A.B. (1905), Nebraska; A.M. (1919), Columbia; Ed.D. (1925), California; LL.D. (1930), Colorado College; LL.D. (1932), University of Colorado; LL.D. (1939), Nebraska. Chancellor, State System, since 1935.

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

B.S. (1885), Utah; B.S. in Didactics (1894), D.Sc. (1896), General Education Board, Utah; LL.D. (1921), Idaho; LL.D. (1938), Utah State; LL.D. (1943), Oregon State. Chancellor Emeritus, State System, since 1935.

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; Dean Emeritus of the School of Forestry; Professor Emeritus of Forestry.

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

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

B.S. (1932), M.S. (1932), Oregon State. At Oregon State since 1926.

RUSSEL MONROE ADAMS, M.S., Assistant State Supervisor, Emergency Farm Labor Service.

B.S. (1918), Washington State; M.S. (1930), Oregon State. At Oregon State since 1935.

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

B.S. in Ed. (1929), Kansas State Teachers College (Emporia); A.M. (1935), Kansas. At Oregon State since 1940.

WALTER MILO ADRIAN, 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 and Acting Head of Electrical Engineering.

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

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

B.S. (1916), Oregon State. At Oregon State since 1917.

LEONARD JOHN ALLEN, M.S., Assistant 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.

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

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

An INDEX of NAMES of members of the State College staff, of United States Department of Agriculture scientists at the State College, and of interinstitutional officers of administration, research, and extension of the Oregon State System of Higher Education, is printed on pages 399-403.

† On leave of absence for military or civilian war service.

- DELMAR ISAAC ALLMAN, Dr.P.H., Associate Professor of Hygiene.
B.S. (1928), Michigan State Normal College; M.S. (1931), Dr.P.H. (1936), Michigan.
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.
- ERMINIA ALONSO, Acting Instructor in Spanish.
At Oregon State since 1943.
- VALERA AMORT, R.N., Nurse and Laboratory Technician, Student Health
Service.
B.S. (1939), Portland; R.N. (1939), St. Vincent School of Nursing. At Oregon State
since 1941.
- DOROTHY LOUISE ANDERSON, B.S., Instructor in English.
B.S. (1932), Oregon State. At Oregon State since 1943.
- WILLIAM BALLANTYNE ANDERSON, Ph.D., Professor Emeritus of Physics.
B.S. (1901), M.S. (1903), Ph.D. (1906), Wisconsin. At Oregon State since 1914.
- CHESTER ABBO ARENTS, B.S., Instructor in Mechanical Engineering.
B.S. (in E.E.) (1932), Oregon State. At Oregon State since 1943.
- MILDRED MARGUERITE ARNOLD, M.S., Assistant Professor of Foods and Nu-
trition.
B.S. (1932), Bradley Polytechnic Institute; M.S. (1939), Chicago. At Oregon State
since 1939.
- MAUDE L ASHE, A.B., Instructor in Foods and Nutrition.
A.B. (1928), California. At Oregon State since 1943.
- WINFRED MCKENZIE ATWOOD, Ph.D., Professor of Plant Physiology.
A.B. (1907), A.M. (1910), Cornell College; M.S. (1911), Ph.D. (1913), Chicago. At
Oregon State since 1913.
- HARRY GRANT AVERY, B.S., Assistant Extension Economist, Marketing.
B.S. (1930), Oregon State. At Oregon State since 1921.
- FLORENCE S BAKKUM, M.A., Instructor in Mathematics.
B.A. (1916), Grinnell College; M.A. (1924), Cornell. At Oregon State since 1942.
- GLENN ALMER BAKKUM, Ph.D., Professor of Sociology; Chairman of
Department.
B.S. (1920), Iowa State; M.A. (1925), Columbia; Ph.D. (1928), Cornell. At Oregon
State since 1935.
- LAURIN BURTON BALDWIN, A.M., D.D., Assistant Professor Emeritus of
English.
A.B. (1895), A.M. (1897), Philomath; A.B. (1925), California; D.D. (1910), Hunt-
ington College. At Oregon State since 1906.
- FRANK LLEWELLYN BALLARD, B.S., Extension Agricultural Editor.
B.S. (1916), Oregon State. At Oregon State since 1917.
- ERVIN EARL BARKLOW, B.S., Superintendent of Campus Surveys, Roads and
Walks, Sewer Maintenance, and Fire Protection.
B.S. (1927), Oregon State. At Oregon State since 1939.
- ELIZABETH MARIA BARNES, B.L.I., Associate Professor of Speech.
B.L.I. (1925), Emerson College. At Oregon State since 1922.

GEORGE HECTOR BARNES, M.S.F., Associate Professor of Forestry.

B.S. (1924), Washington; M.S.F. (1929), California. At Oregon State since 1943.

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

B.S. (1925), M.B. (1927), M.D. (1928), M.A. (1937), Minnesota. At Oregon State since 1940.

*CHANDLER BAKER BEALL, Ph.D., Acting Instructor in French.

Diplôme (1921), Sorbonne; A.B. (1922), Ph.D. (1930), Johns Hopkins. At Oregon State 1943.

*PAULETTE BEALL, Acting Instructor in French.

Diplôme, Lycée, Cannes, France. At Oregon State 1943.

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

B.S. (1899), Oregon State; M.A. (1929), California. At Oregon State since 1905.

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

B.S. (1903), Oregon State; M.A. (1916), California. At Oregon State since 1908.

JAMES RALPH BECK, B.S., State Supervisor, Farm Labor Service.

B.S. (1920), Oregon State. At Oregon State since 1922.

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

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

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

B.S. (1928), Utah State; M.S. (1932), Kansas State. At Oregon State since 1937.

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

B.S.A. (1913), M.S. (1915), Missouri. At Oregon State since 1922.

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

B.S. (1925), Washington. At Oregon State since 1926.

THOMAS EDWARD BLACK, Captain, Corps of Engineers, B.S., Battalion Commander, AST Unit 3900.

B.S. (1937), Washington State. At Oregon State since 1942.

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

Ph.B. (1918), Chicago; M.A. (1924), Indiana; Ph.D. (1932), Minnesota. At Oregon State since 1924.

ROY LOGAN BOALS, B.S., Instructor in General Engineering.

B.S. (1943), Oregon State. At Oregon State since 1944.

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

B.S. (1921), M.S. (1922), Oregon State; Ph.D. (1924), Iowa State. At Oregon State since 1929.

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

B.S. (1906), Oregon State; M.S. (1930), Cornell. At Oregon State since 1909.

* Resigned, October 1943.

- EDOUARD JOANY BOURBOUSSON, Docteur en Droit International, Assistant 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.
- FLORENCE BOWDEN, B.A., Instructor in Cello, Violin, and Fretted Instruments; Conductor of Mandolin and Guitar Club.
B.A. (1915), Oregon. At Oregon State since 1911.
- 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., Associate Professor of Physics.
B.A. (1927), Reed College; M.A. (1928), Indiana; Ph.D. (1931), California. At Oregon State since 1937.
- JOHN CLAUDE BRALY, Curator of Oölogy.
At Oregon State since 1941.
- VERA HASKELL BRANDON, Ph.D., 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; In Charge, Division of Animal Industries; Head of Department of Dairy Husbandry; Dairy Husbandman, Agricultural Experiment Station.
B.S. (1910), A.M. (1913), Missouri. At Oregon State since 1914.
- THOMAS OTTO BRANDT, Ph.D., Acting Instructor in German.
Ph.D. (1933), Vienna. At Oregon State since 1943.
- *CLARENCE IVAN BRANTON, B.S., Assistant Agricultural Engineer, Agricultural Experiment Station.
B.S. (1933), Oregon State. At Oregon State since 1933.
- JEANETTE ALICE BRAUNS, M.S., Instructor in Physical Education for Women.
B.S. (1930), Battle Creek College; M.S. (1941), Oregon State. At Oregon State since 1930.
- LE ROY BREITHAUPT, B.S., Extension Agricultural Economist (Statistics, News, and Outlook).
B.S. (1910), Oregon State. At Oregon State since 1911.
- CAPTAIN EDWARD CARMACK BRETT, Adjutant General's Department, Classification Officer, AST Unit 3900.
A.B. (1936), Oklahoma. At Oregon State since 1943.
- LEWIS CLEMENCE BRITT, Ph.D., Associate Professor of Pharmacy.
Ph.C. (1925), B.S. (1926), Oregon State; M.S. (1929), Ph.D. (1937), Washington. At Oregon State 1926-28 and since 1930.
- WANDA ZERILDA BROCKMAN, B.A., Circulation Assistant, Library.
B.A. (1940), Reed College; Certificate in Librarianship (1942), California. At Oregon State since 1942.
- 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 ALBERT BRUNS, M.S., Instructor in Electrical Engineering.
B.S. (1942), M.S. (1943), Oregon State. At Oregon State since 1942.

* On leave for military or civilian war service.

- DELOSS EVERETT BULLIS, M.S., Associate Chemist, Agricultural Experiment Station.
B.S. (1917), M.S. (1929), Oregon State. At Oregon State since 1917.
- ELLWOOD J BURNS, Sergeant, Field Artillery, Instructor in Military Science and Tactics (Field Artillery Unit).
At Oregon State since 1942.
- JOHN COLE BURTNER, B.S., In Charge of News Bureau; Extension Editor; Professor of Journalism.
B.S. (1923), Oregon State. At Oregon State since 1924.
- *JOSEPH SHIREY BUTTS, Ph.D., Professor of Biochemistry.
B.S. (1926), Florida; M.S. (1928), Fordham; Ph.D. (1933), Southern California. At Oregon State since 1939.
- CHARLES NEWTON CAIN, Staff Sgt. Regimental Supply Sgt., AST Unit 3900.
At Oregon State since 1943.
- *WILLIAM ELMER CALDWELL, Ph.D., Associate Professor of Chemistry.
Met.E. (1924), Montana School of Mines; B.S. (1928), Ph.D. (1930), Wisconsin. At Oregon State since 1930.
- 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.
- EDWARD CLEVELAND CALLAWAY, M.S., Instructor in Chemistry.
B.S. (1909), M.S. (1911), M.S. (1931), Oregon State. At Oregon State since 1929.
- PAUL CARPENTER, B.S., Extension Agricultural Economist (Marketing).
B.S. (1932), Minnesota. At Oregon State since 1934.
- PHYLLIS MAY CARPENTER, M.A., Instructor in Foods and Nutrition.
B.A. (1937), Carleton College; M.A. (1943), Oregon State. At Oregon State since 1941.
- JAMES ANTHONY CARR, M.S., Instructor in Physical Education.
B.S. (1930), M.S. (1942), Oregon State. At Oregon State since 1942.
- LUCY ADA CASE, M.A., Associate Professor of Home Economics Extension; Extension Nutritionist.
A.B. (1911), Wisconsin; M.A. (1912), Columbia; B.S. (1924), Minnesota. At Oregon State since 1924.
- GERARD JOSEPH CAVANAGH, B.S., Instructor in Civil Engineering.
B.S. (in C.E.) (1940), Oregon State. At Oregon State since 1940.
- *WILLARD JOSEPH CHAMBERLIN, Ph.D., Associate Professor of Entomology.
B.S. (1915), M.S. (1921), Oregon State; Ph.D. (1930), Stanford. At Oregon State since 1916.
- GLADYS DAWSON CHAMBERS, M.A., Instructor in Psychology.
A.B. (1917), M.A. (1920), Indiana. At Oregon State since 1942.
- OTHNIEL ROBERT CHAMBERS, Ph.D., Professor of Psychology; In Charge of Department.
A.B. (1922), M.A. (1922), Indiana; Ph.D. (1926), Ohio State. At Oregon State since 1929.

* On leave for military or civilian war service.

- *MERWYN PIERCE CHAPMAN, D.V.M., Instructor and Research Assistant (Veterinary Medicine), Agricultural Experiment Station.
D.V.M. (1938), Kansas State. At Oregon State since 1940.
- VERNON HENDRUM CHELDELIN, Ph.D., Associate Professor of Chemistry.
B.A. (1937), Reed; M.S. (1939), Oregon State; Ph.D. (1941), Texas. At Oregon State since 1942.
- ORAS VERNON CHENOWETH, B.S., Assistant Specialist in Soils.
B.S. (1942), Oregon State. At Oregon State 1942 and since 1943.
- HERBERT ELLSWORTH CHILDS, Ph.D., Associate Professor of English.
A.B. (1926), Oberlin College; Ph.D. (1932), Washington. At Oregon State since 1935.
- BERT EINAR CHRISTENSEN, Ph.D., Professor of Chemistry.
B.S. (1927), Washington State; Ph.D. (1931), Washington. At Oregon State since 1931.
- CLARENCE LEWIS CHURCH, A.M., Acting Instructor in Physics.
A.B. (1927), Willamette; A.M. (1936), Southern California. At Oregon State since 1943.
- JOHN MYERS CLIFFORD, Extension Secretary.
At Oregon State 1918-20 and since 1933.
- 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.
- HAROLD COCKERLINE, B.S., Associate Professor of Electrical Engineering.
B.S. (in E.E.) (1912), Oregon. At Oregon State since 1921.
- RALPH COLBY, Ph.D., Associate Professor of English.
B.A. (1916), M.A. (1917), Minnesota; Ph.D. (1928), Illinois. At Oregon State since 1928.
- ELVIS LEROY COLE, First Sergeant, Infantry, Company A, First Sergeant AST Unit 3900.
At Oregon State since 1943.
- RALPH ORVAL COLEMAN, M.A., Professor of Physical Education; Director of Intramural Sports; Head Coach of Baseball.
B.S. (1918), Oregon State; M.A. (1929), Columbia. At Oregon State since 1919.
- HOWARD NOTSON COLMAN, B.A., B.S., Assistant Professor of Dairy Husbandry.
B.A., B.S. (1915), Nebraska. At Oregon State since 1920.
- *WILBUR TARLETON COONEY, B.S., Assistant Professor of Poultry Husbandry; Assistant Poultry Husbandman, Agricultural Experiment Station.
B.S. (1937), Oregon State. At Oregon State since 1937.
- MARTIN PORTMAN COOPEY, B.S., Instructor in Civil Engineering.
B.S. (1936), Oregon State. At Oregon State since 1941.
- GODFREY VERNON COPSON, M.S.; Professor of Bacteriology; Head of Department; Bacteriologist in Charge, Agricultural Experiment Station.
B.S. (1911), M.S. (1913), Oregon State. At Oregon State since 1915.
- ROBERT JOSEPH CORRUCINI, Ph.D., Instructor in Chemistry.
B.A. (1938), Reed; M.A. (1940), Oregon State; Ph.D. (1942), Illinois. At Oregon State since 1942.

* On leave for military or civilian war service.

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

At Oregon State since 1920.

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- FRANK LESLIE ROBINSON, M.Acct., Associate Professor Emeritus of Accounting.
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- REGINALD HEBER ROBINSON, M.S., Chemist (Insecticides and Fungicides), Agricultural Experiment Station.
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- ZELTA FEIKE RODENWOLD, M.S., Director of Women's Programs, Radio Station KOAC; Assistant Professor of Home Economics Extension.
B.S. (1919), Oregon State; M.S. (1929), Iowa State. At Oregon State 1919-26 and since 1930.

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- *JACK GLYNDON ROOF, Ph.D., Assistant Professor of Chemistry.
B.A. (1934), M.A. (1935), California at Los Angeles; Ph.D. (1938), Wisconsin. At Oregon State since 1938.
- DALE W ROPER, First Sergeant, Infantry, First Sergeant, Company F, AST Unit 3900.
At Oregon State since 1942.
- *ARNOLD SAMUEL ROSENWALD, B.S., D.V.M., Assistant Veterinarian.
B.S. (1930), California; D.V.M. (1936), Kansas State. At Oregon State since 1937.
- GERTRUDE ROSKIE, M.S., Assistant State Supervisor and Teacher Trainer in Home Economics Education.
B.S. (1929), South Dakota State; M.S. (1938), Colorado State. At Oregon State since 1941.
- *LEWIS FRANKLIN ROTH, Ph.D., Instructor in Botany.
B.A. (1936), Miami; Ph.D. (1940), Wisconsin. At Oregon State since 1940.
- BENJAMIN FRANKLIN RUFFNER, Aero.E., M.S., Professor of Aeronautical Engineering; Coordinator of CAA War Training Service.
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- *A'LEEN ELIZABETH RUNKLE, B.S., Instructor in Art.
B.S. (1934), Oregon State; Ecole Américaine des Beaux-Arts, Palais de Fontainebleau (1939). At Oregon State since 1939.
- CHARLES VLADIS RUZEK, M.S., Acting Head of Department; Professor of Soil Fertility; Soil Scientist (Fertility), Agricultural Experiment Station.
B.S.A. (1909), M.S. (1929), Wisconsin. At Oregon State since 1914.
- AZALEA LINFIELD SAGER, M.A., State Leader of Home Demonstration Agents; Professor of Extension Methods.
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- *NEIL EDMUND SALING, B.S., Supervising Teacher in Industrial Education.
B.S. (1930), Oregon State. At Oregon State since 1939.
- CARL WALTER SALSER, Ed.M., Professor of Education; Head of Department; Head of Placement; Assistant Dean of the School of Education.
A.B. (in Ed.) (1911), Kansas State Teachers (Emporia); Ed.M. (1926), Harvard. At Oregon State since 1929.
- ETHEL IDA SANBORN, Ph.D., Associate Professor of Botany; Associate Professor of Paleobotany.
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- JACK DILLARD SATHER, B.S., Research Assistant, Agricultural Experiment Station; Instructor in Farm Crops.
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JOE SCHUH, M.S., Assistant Entomologist, Agricultural Experiment Station.

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

B.S. (1922), Knox College; M.A. (1926), Wisconsin; Ed.D. (1937), New York. At Oregon State since 1935.

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

At Oregon State since 1916.

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.

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

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† On leave for military or civilian war service.

- JOSEPH ELLSWORTH SIMMONS, M.S., Professor of Bacteriology; Bacteriologist, Agricultural Experiment Station.
B.S. (1916), M.S. (1918), Wisconsin. At Oregon State since 1919.
- LOYD GEORGE SIMON, Sergeant, Medical Department, Instructor, Field Artillery, SC Unit 3942.
At Oregon State since 1943.
- ELLIS MARCUS SIMS, M.S., Associate Professor of Mechanical Engineering.
B.S. (in M.E.), 1937, M.S. (1937), Agricultural and Mechanical College of Texas. At Oregon State since 1943.
- *HERBERT REEVES SINNARD, M.S., R.A., Associate Professor of Agricultural Engineering; Associate Professor of Architecture; Associate Agricultural Engineer (Farm Structures), Agricultural Experiment Station.
B.S. (1927), M.S. (1929), Iowa State. At Oregon State 1929-32 and since 1934.
- *WILLIAM JAMES SKINNER, B.S., Instructor in Mechanical Engineering.
B.S. (1942), Lehigh. At Oregon State since 1942.
- CHARLES WESLEY SMITH, B.S., County Agent Leader.
B.S. (1921), Washington State. At Oregon State since 1927.
- CLIFFORD LOVEJOY SMITH, M.S., Assistant County Agent Leader.
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- EDWIN MONROE SMITH, B.S.D., Business Manager Emeritus.
B.S.D. (1891), Oregon College of Education. At Oregon State since 1915.
- FRANK HERSCHEL SMITH, Ph.D., Assistant Professor of Botany.
B.S. (1929), Arkansas; M.S. (1930), Washington State; Ph.D. (1932), Wisconsin. At Oregon State since 1936.
- MAHLON ELLWOOD SMITH, Ph.D., Dean of Lower Division; Dean of Lower Division and Service Departments; Director of Summer Sessions; Professor of English.
A.B. (1906), Syracuse; M.A. (1909), Ph.D. (1912), Harvard. At Oregon State since 1919.
- ROBERT WAYNE SMITH, Ph.D., Acting Instructor in History.
At Oregon State since 1943.
- *ANDREW SOBCZYK, Ph.D., Associate Professor of Mathematics.
B.A. (1935), M.A. (1936), Minnesota; Ph.D. (1939), Princeton. At Oregon State since 1939.
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- *EUGENE CARL STARR, B.S., E.E., Professor of Electrical Engineering.
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- BEATRICE ANNE HYLAND STAUSS, B.S., Acting Instructor in Mathematics.
B.S. (1942), Oregon State. At Oregon State since 1942.

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† On leave of absence.

- *ROBERT ADOLPH STEINER, M.B.A., Instructor in Economics and Business Administration.
B.B.A. (1933), M.B.A. (1936), Washington. At Oregon State since 1937.
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- *ROBERT HOWARD STERLING, B.S., Assistant Extension Specialist in Land Use Planning.
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- EDWARD ALMERON STEVENS, LL.B., Assistant Professor of Physical Education; Coach of Rowing.
LL.B. (1909), Cornell. At Oregon State since 1931.
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- ANNE MAE STEWART, R.N., Nurse, Student Health Service.
R.N. (1935), Hospital of the Good Shepherd (Syracuse, New York). At Oregon State since 1943.
- ALONZO L STINER, B.S., Head Coach of Football; Instructor in Physical Education.
B.S. (1927), Nebraska. At Oregon State since 1928.
- *ROY EDGAR STOUT, M.S., Research Assistant in Dairy Manufacturing.
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- *LOREN GLENN STRAWN, M.A., Reference Assistant, Library.
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- GERTRUDE STRICKLAND, B.S., Assistant Professor of Clothing, Textiles, and Related Arts.
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- DONALD BRUCE STUART, Superintendent of Light and Power.
At Oregon State since 1914.
- ERNST THEODORE STUHR, M.S., Associate Professor of Pharmacology and Pharmacognosy; In Charge of Department.
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- MARION DAWS THOMAS, B.S., Assistant Extension Economist.
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- BENJAMIN GARRISON THOMPSON, Ph.D., Associate 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.
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- WILDA THOMPSON, B.A., Serials Assistant, Library.
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- EDWARD FRITCHOFF TORGERSON, B.S., Associate Professor of Soils; Associate Soil Scientist (Soil Survey), Agricultural Experiment Station.
B.S. (1914), Illinois. At Oregon State since 1918.
- LOUIS NAPOLEON TRAVER, General Superintendent of Physical Plant.
At Oregon State since 1940.
- MAY VAN DEUSEN, M.S., Supervising Teacher in Home Economics Education.
B.S. (1934), Northwestern State (Alba, Oklahoma); M.S. (1938), Colorado State. At Oregon State since 1942.
- JOHN ALBERT VAN GROOS, M.S., Associate Professor Emeritus of Mathematics.
B.S. (1899), Oregon State; M.S. (1903), Yale. At Oregon State since 1919.
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B.A. (1923), Colorado College; M.A. (1932), Columbia. At Oregon State 1939-40, 1942, and since 1943.
- EDNA ELIZABETH VAN SYOC, B.A., B.S. in L.S., Documents Cataloger, Library.
B.A. (1934), Simpson College, Iowa; B.S. in L.S. (1939), Illinois. At Oregon State since 1943.
- WILLEM JOHAN VAN WAGTENDONK, Ph.D., Assistant Professor of Chemistry.
B.S. (1931), M.S. (1934), Ph.D. (1937), Rijksuniversiteit Utrecht. At Oregon State since 1941.
- *ANIBAL VARGAS-BARON, Ph.D., Acting Instructor in Spanish.
A.B. (1926), Asbury; M.A. (1929), Ph.D. (1943), Washington. At Oregon State 1943.

* Resigned, October 1943.

- WILLIAM ROY VARNER, E.E., Ph.D., Associate Professor of Physics; Acting Associate Professor of Electrical Engineering.
B.S. (1912), M.S. (1932), Ph.D. (1939), Oregon State; E.E. (1914), Westinghouse. At Oregon State 1929-33 and since 1934.
- EARNST VANCOURT VAUGHN, Ph.D., Professor of History; In Charge of Department.
B.L. (1900), M.A. (1904), Missouri; Ph.D. (1910), Pennsylvania. At Oregon State since 1924.
- ILA PUTMAN VENATOR, B.S., Supervising Teacher in Home Economics Education.
B.S. (1941), Oregon State. At Oregon State since 1943.
- EDWARD VIETTI, M.S., Assistant Professor of Secretarial Science.
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B.S. (in E.E.) (1924), M.S. (1928), Oregon State; Ph.D. (1938), Pennsylvania State. At Oregon State since 1938.
- LUISE HURLBRINK VINYARD, A.M., Acting Assistant Professor of Physics.
A.B. (1925), A.M. (1928), Pennsylvania State. At Oregon State since 1943.
- ESTHER VON LEHE, B.A., Instructor in Piano.
B.A. (1940), Oregon. At Oregon State since 1942.
- *GLENN VOORHIES, M.S., F.E., Associate Professor of Wood Products.
B.S. (1929), M.S. (1930), F.E. (1940), Oregon State. At Oregon State since 1936.
- MARIAN LUCILLE WABY, A.B., B.S. in L.S., Orders Assistant, Library.
A.B. (1934), California at Los Angeles; B.S. in L.S. (1935), Illinois. At Oregon State since 1935.
- CLYDE WALKER, M.S., Extension Agricultural Engineer.
B.S. (1924), M.S. (1930), Nebraska. At Oregon State since 1928.
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- ERNEST WILLIAM WARRINGTON, M.A., Professor of Philosophy; Professor of Religion; Head of Department.
A.B. (1905), Delaware; M.A. (1907), Princeton. At Oregon State 1921-26 and since 1928.
- IVAN FREDERIC WATERMAN, C.E., Associate Professor of Civil Engineering.
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- GLEN MERRILL WEBSTER, Lieutenant Colonel, Corps of Engineers, B. S., Professor of Military Science and Tactics; Commanding Officer, AST Unit 3900.
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KENNETH BASSETT WILLIAMS, B.S., Instructor in Civil Engineering.

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B.S. (1920), M.S. (1921), Ph.D. (1928), Iowa State. At Oregon State since 1929.

CHARLES GEORGE WILTSHIRE, Superintendent of Plumbing and Steam Fitting.

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LYNNE K WOOD, Ph.D., Instructor in Soils; Research Assistant, Agricultural Experiment Station.

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CLYTIE MAY WORKINGER, Placement Secretary.

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ROSALIND WULZEN, Ph.D., Sc.D., Associate Professor of Zoology.

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B.S. (1926), Oregon State. At Oregon State since 1927.

FRED HARRIS YOUNG, B.A., Instructor in Mathematics.

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*EDWIN ARTHUR YUNKER, Ph.D., Professor of Physics.

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SANFORD MYRON ZELLER, Ph.D., Professor of Plant Pathological Research and Plant Pathologist, Agricultural Experiment Station.

B.S. (1909), Greenville College; A.B. (1912), A.M. (1913), Washington; Ph.D. (1917), Washington University (St. Louis). At Oregon State since 1919.

ADOLPH ZIEFLE, M.S., Phar.D., Dean of the School of Pharmacy; Professor of Pharmacy.

Ph.C. (1904), B.S. (1907), M.S. (1919), Michigan; Phar.D. (1928), Pittsburgh. At Oregon State since 1914.

ASSOCIATES AND ASSISTANTS

HELEN HULAC ARNEY, B.S., Graduate Assistant in Household Administration.

ANNA MAY CARLSON, B.S., Williams-Waterman Assistant in Zoology.

ROBERT DIXON ENGLERT, B.S., Graduate Scholar in Chemistry.

MARY ELLEN HARPER, B.S., Graduate Assistant in Household Administration.

WALTER ERNEST JACKSON, B.A., Graduate and Research Assistant in Chemistry.

HILDEGARD LAMFROM, B.A., Graduate Assistant in Zoology.

RAYMOND LEROY PEDERSON, B.A., Graduate Scholar in Chemistry.

ARTHUR STANLEY RATHKEY, A.B., Graduate Assistant in Chemistry.

HERBERT PAUL SARETT, Ph.D., Research Associate in Biochemistry.

DONALD HOWARD SIMONSEN, B.A., Research Assistant in Chemistry.

JOHN FRANK THURLOW, B.S., Research and Graduate Assistant in Chemistry.

ARTHUR JOHN TOMISEK, B.S., Research Assistant in Chemistry.

RUTH CONSTANCE WOOSTER, M.A., Williams-Waterman Research Scholar in Chemistry.

LEONARD PETER ZILL, B.S., Graduate and Research Assistant in Chemistry.

* On leave for military or civilian war service.

Part II

General Information

Organization and Facilities

History

OREGON State College is the oldest state-supported institution of higher learning in Oregon and in 1943 celebrated the seventy-fifth anniversary of its establishment. Significant events by decades of the period from 1868 to the present are listed in the following outline.

BEGINNINGS

- 1851 Oregon territorial legislature "located and established" the territorial university at Corvallis (then known as Marysville).
- 1853 Three commissioners named by the legislature selected as the university site a location about where Margaret Snell Hall now stands and assembled brick, lumber, and other materials for erecting a university building.
- 1855 Legislature relocated the university at Jacksonville and ordered sold the materials assembled at Corvallis.
- 1856 Community academy established at Fifth and Madison streets, Corvallis.
- 1858 Corvallis Academy incorporated as Corvallis College.
- 1859 Oregon became a state, February 14, 1859.
- 1862 First Morrill Act, establishing the land-grant colleges, signed by President Lincoln, July 2, 1862.
- 1865 Rev. William A. Finley, A.M., first president of Corvallis College, October 1865.
- 1868 New academic calendar, providing for three terms of fourteen weeks each, adopted August 22, 1868.
- 1868-1878
- 1868 Oregon legislature "designated and adopted" Corvallis College as the "agricultural college of the State of Oregon" and the recipient of the land-grant funds, October 27, 1868. The legislature specified 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 requirements of the Act of Congress." The trustees of Corvallis College accepted the responsibility of conducting the institution according to the requirements of the federal law, October 31, 1868.
- 1869 Curriculum in agriculture established. The other curricula of the College included: the Classical Course (A.B. degree) and the Scientific Course (B.S. degree).
- 1870 First class graduated (three B.S. degrees).
Professor Joseph Emery elected Librarian.
Oregon legislature "permanently adopted" Corvallis College as "the agricultural college of Oregon" October 21, 1870.
Experimental farm of thirty-five acres, containing a dwelling house, barn, and orchard, purchased.
- 1871 First A.B. degree.
- 1872 First instruction in military science and tactics.
President Finley resigned, effective at time of Third Annual Commencement, 1872.
B. L. Arnold, A.M., second president, August 31, 1872. Professorships: Moral Philosophy and Physics, B. L. Arnold; Mathematics, Joseph Emery; Languages, B. J. Hawthorne.
- 1873 Report of the first agricultural research by the College, an analysis of "white soil" with suggested treatment and an analysis of "marl" from the Yaquina Bay district.
- 1874 First Biennial Report of the College issued by President Arnold, containing reports for each department (physical science, moral science, languages, mathematics, military).
- 1876 First A.M. degree.
- 1878-1888
- 1880 Professorship in commerce established May 24, 1880.
- 1883 Edgar Grimm, B.S., '80, first professor of agriculture, September 1883.
- 1885 Surrender of the College to the state and conveyance of the College farm to the "board of regents of the State agricultural college of Oregon" approved by the legislature, February 1885.
- 1887 Federal Hatch Act providing for the establishment of agricultural experiment stations approved March 2, 1887.

1888-1898

- 1888 First bulletin of Agricultural Experiment Station, October 1888.
- 1889 Farmers' Institutes held at Corvallis, Salem, Roseburg, and Hillsboro. Administration Building, the gift of citizens of Benton County, erected on the present campus.
- 1889 Grant Adelbert Covell, M.E., first professor of engineering.
Margaret Comstock Snell, M.D., first professor of home economics.
- 1890 Second Morrill Act passed by Congress.
Adelphian Library, nucleus of present collections, presented to the College.
- 1892 Death of President Arnold, January 1892. Professor John D. Letcher, C.E., placed in charge of the institution pending appointment of a president.
John M. Bloss, A.M., M.D., third president, June 1, 1892.
The Station Building (now the Paleontology Laboratory) was under construction.
- 1893 Cauthorn Hall (now Kidder) erected as a men's dormitory.
Legislature appropriated \$26,100 for new buildings.
Enrollment for twenty-fifth year after designation as state college: first year, 123; second year, 31; third year, 18; fourth year, 7; graduate, 5—total, 184. Teaching and research staff, 16. Books in Library, 1,950.
Degrees granted at the Twenty-fourth Annual Commencement: Bachelor of Science, 2; Bachelor of Literature, 1; Bachelor of Science in Agriculture, 6; Bachelor of Home Economics, 7; Bachelor of Mechanical Engineering, 3—total, 19.
- 1894 Farmers' Short Course, first in the West, January 10 to February 7, 1894.
Experiment station bulletins reached a total of 31, April 1894.
"Hayseed," forerunner of the Beaver, published by senior class.
Board of Regents December 1, 1894, congratulated citizens of Oregon "that the hard times, and consequent straightened circumstances of so many, have not had more effect in keeping worthy and energetic students out of the State Agricultural College."
New buildings constructed for agriculture, horticulture, mechanical arts, and photography.
A lieutenant of the United States Army detailed to the College to give instruction in military science and tactics.
- 1896 H. B. Miller, fourth president, July 28, 1896.
Professor Frederick Berchtold, A.M., at the College since 1884, named Dean of the College.
- 1897 Thomas M. Gatch, A.M., Ph.D., D.D., fifth president.
- 1898 Chair of pharmacy established on petition of druggists of state.
Mechanical Hall (now Apperson) erected.
- 1898-1908
- 1900 Armory and gymnasium (now Museum Building) erected.
United States Commissioner of Education defined subjects of instruction for land-grant institutions under the Morrill Acts, December 7, 1900.
Four-year curriculum in mining organized in Department of Chemistry.
- 1901 Self-sustaining Department of Music established.
Four-year Literary-Commerce curriculum organized.
First branch experiment station established at Union.
- 1902 New Agricultural Hall (later known as Science Hall and in 1940 remodeled as present Education Hall) erected.
- 1906 Federal Adams Act for further endowment of experiment stations, March 16, 1906.
Four-year curriculum in forestry established.
- 1907 Nelson Amendment to Second Morrill Act.
William Jasper Kerr, B.S., Sc.D., sixth president.
Waldo Hall completed.
Captain U. G. MacAlexander, commandant, 1907-09.
- 1908 Preparatory Department discontinued. Entrance requirements raised.
Two-semester calendar adopted.
Industrial Arts Building and Shepard Hall erected.
Schools of Agriculture (Arthur Burton Cordley, M.S., dean), Commerce (John Andrew Bexell, A.M., dean), Engineering and Mechanic Arts (Grant Adelbert Covell, M.E., dean), and Domestic Science and Art (Juliet Greer, A.B., dean) organized.
Ida Angeline Kidder appointed Librarian.
Summer school for teachers.
John C. Olmsted campus plan.
- 1908-1918
- 1909 Professorship of industrial pedagogy established.
State Board of Higher Curricula established.
First unit of Agriculture Hall erected.
Gamma Sigma Delta chapter established.
- 1910 The present Armory constructed.
Twenty-fifth anniversary of full state control of the College, dating from 1885, celebrated June 10-14, 1910.
Correspondence courses offered.
Committee on Advanced Degrees (precursor of Graduate Division).
- 1911 Student self-government, initiated by students, adopted December 1910.
Student loan fund established through liberality of Hon. R. A. Booth.

- Department of College Extension organized with Ralph Dorn Hetzel as director. Anna Zou Crane, A.B., M.D., first dean of women.
- 1912 Agricultural Engineering Building, Dairy Building, and Stock Judging Pavilion erected.
- 1913 Agriculture Hall completed.
First millage tax law passed.
School of Forestry and School of Mines established July 19, 1913.
Mines Building erected.
- 1914 Smith-Lever Law providing for extension work in agriculture and home economics passed by Congress May 8 and June 14, 1914.
Original unit of Home Economics Building erected.
- 1915 Men's Gymnasium erected.
- 1916 Student health service organized.
- 1917 Forestry Building completed, September 1917.
First home management house opened.
Reserve Officers' Training Corps established. Oregon State College designated a "Distinguished Institution" for its R.O.T.C. work.
- 1918 Library Building completed September 1918.
School of Vocational Education established.
Nearly 2,000 students, alumni, and faculty members were enlisted in the United States war service. In addition, more than 2,000 men were in training at the College in the Students' Army Training Corps and other military and naval training units.
Enrollment of regular students for fiftieth year, 1917-18: 1,668.
Teaching and research staff: 160. Books in Library: 36,478.
Forty-ninth annual Commencement June 3, 1918. Of 164 baccalaureate degrees, 82 were conferred upon candidates present at the exercises, 82 were conferred in absentia upon candidates in military or industrial service. Master's degrees, 3; other degrees and diplomas, 14.
Gold Star Memorial Service June 9, 1918.
- 1918-1928
- 1919 Three-term calendar restored.
Alma Mater written by W. Homer Maris, M.S., '18.
Food Industries Building erected; food industries department established, first in United States.
- 1920 Second millage tax for higher education approved by popular referendum.
Engineering Laboratory erected.
- 1921 Margaret Snell Hall erected.
Campus residence provided for the President.
- 1922 Athletic grounds named Bell Field in honor of Dr. J. R. N. Bell.
New Commerce Hall opened with a Business Show.
Fifty-watt radio station built by Professor Jacob Jordan of the Physics Department, January 1922. Licensed as KFDJ (since 1925 KOAC), December 7, 1922.
- 1923 Little Theater established by Mask and Dagger dramatic club in Administration Building.
- 1924 Oregon State College placed on accredited list of the American Association of University Women.
Pharmacy Building erected.
First Educational Exposition with Dean Thomas Arkle Clark of the University of Illinois as leader of the vocational guidance conference, February 22-23, 1924.
Ulysses Grant Dubach, Ph.D., first dean of men.
Oregon State Chapter of Phi Kappa Phi installed June 6, 1924.
First annual Freshman Week, September 23, 1924.
- 1925 A. D. Taylor revision of the Olmsted campus plan.
Federal Purnell Act passed.
Formal opening of College Museum, February 20, 1925.
Peavy Arboretum authorized by regents April 8, 1925.
- 1926 Child care laboratory provided by opening of Nursery School in Covell House.
Oregon State College placed on accredited list of the Association of American Universities, November 1926.
Women's Building erected.
- 1927 New Greenhouses erected.
Poultry Building erected.
State Drug Laboratory, maintained by Oregon State Board of Pharmacy, established in Pharmacy Building.
Plan for faculty sabbatical leaves adopted by regents March 5, 1927.
Engineering Experiment Station established May 4, 1927.
- 1928 Men's Dormitory Building erected.
Physics Building erected.
- 1928-1938
- 1929 Memorial Union dedicated June 1, 1929.
All Oregon state-supported higher education placed under the State Board of Higher Education.
- 1930 Survey of Oregon higher education under United States Office of Education.

- 1932 New program for Oregon State System of Higher Education adopted March 7, 1932. School of Science and Lower Division of Liberal Arts and Sciences established at Oregon State College; various curricular reorganizations; School of Mines discontinued, School of Commerce transferred to University, landscape architecture and structural design in architecture became joint curricula at State College and University. Celebration of President Kerr's quarter century of service as President of Oregon State College, June 4, 1932. Dr. W. J. Kerr named first Chancellor of the State System of Higher Education, September 6, 1932.
- 1933 Graduate Division established September 11, 1933.
- 1934 George Wilcox Peavy seventh president, January 15, 1934. Mary J. L. McDonald Collection and Kare Book Room presented the College.
- 1935 First Ph.D. degrees in course conferred upon four candidates (three in science and one in agriculture), Sixty-fifth Annual Commencement, June 3, 1935. Summer session extended to ten weeks—first session six weeks, second session four weeks. Frederick Maurice Hunter, Ed.D., LL.D., became second Chancellor of the State System of Higher Education, Dr. W. J. Kerr Chancellor Emeritus, September 1, 1935.
- 1936 Student Health Service Building erected. Museum designated Horner Museum of the Oregon Country, April 27, 1936.
- 1937 Oregon State Chapter of Sigma Xi installed.
- 1938-1939 Nursery School erected. Agricultural Engineering Building enlarged. New Chemistry Hall dedicated December 2, 1939. School of Home Economics celebrated fiftieth anniversary of establishment of home economics, February 27 to March 1, 1939.
- 1940 Frank Llewellyn Ballard eighth President, effective July 1, 1940.
- 1941 Francois Archibald Giffillan acting president, September 9, 1941. Enrollment reached highest total in history of the College—regular session, 5,117; summer session 1940, 997; graduate students, 341. West wing added to Library; Science Reference Room and Engineering and Technology Reference Room provided.
- 1942 Majors in mining engineering restored January 27, 1942. A new major "to meet more adequately the needs of students primarily interested in business as related to the industrial courses distinctive of the land grant type of institution" authorized April 28, 1942. August Leroy Strand assumed duties as President, October 15, 1942. KOAC celebrated its enlargement to 5,000 watts daytime service and twenty years on air, October 16, 1942.
- 1943 Instruction in Army Specialized Training Program began March 29, 1943. Enrollment during seventy-fifth year 1942-43: regular session, 4,743; summer session (1942), 660. Books in Library, 193,479. New business major and secretarial science major organized in Division of Business and Industry. First graduates, Army Specialized Training Program (11 certificates of completion), September 29, 1943. Celebration of seventy-fifth anniversary of designation as Oregon's Land-Grant institution, October 27, 1943. Oregon Academy of Science organized, October 27, 1943. December graduation exercises, December 28—91 certificates of completion, Army Specialized Training Program; 59 baccalaureate degrees.
- 1944 March graduation exercises, March 27. 239 certificates of completion, Army Specialized Training Corps; 82 baccalaureate degrees; 12 advanced degrees.

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 (1940 population 8,392), situated in the heart of the Willamette Valley 85 miles south of Portland, is a healthful city with a remarkably equable climate, the average annual temperature being about 52 degrees Fahrenheit. Rainfall, mostly during the winter months, averages about 42 inches annually. Corvallis has pure mountain water, modern sanitation, good schools, numerous churches, and strong civic and social organizations. The Coast Range mountains and the distant splendor of the Cascades present a constant panorama of mountain scenery.

Development of the State College campus during the past thirty-five 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). The campus proper, exclusive of farm and forest lands, includes about 189 acres. It extends from near Ninth Street westward between Monroe and Jefferson Streets in a wedge-shaped area to Sixteenth Street, thence in a rectangular form to the Mall (Thirtieth Street). The area from Ninth to Fourteenth Streets, known as the East Campus, is a spacious, attractively planted, parklike recreation area and parade ground.

The campus buildings are arranged first as colleges or schools, and further are grouped in quadrangles, so planned that expansion can take place without injury to the established buildings and campus areas. The location of the buildings is shown on the map on page 12.

The East Quadrangle is partly developed, with the Library (built 1918, west wing added 1941) on the north, Agriculture (1909, 1913) and Dairy (1912) on the west, Pharmacy (1924) on the east, and the site for the auditorium on the south. The Museum Building (1899) at present stands at an angle at the southeast corner; along the east side, just outside the quadrangle, are Administration (1889), the Paleontology Laboratory (1889), and Education Hall (1902, 1940). The area south of the East Quadrangle contains the Armory (1910, 1911), the Heating Plant (1923), and the Forest Products Laboratory and Dry Kiln (1927, 1942), along the east border, and Waldo Hall (1907) along the west, with a large area in the center devoted to drives, walks, and plantings.

North and west of the Library are Shepard Hall (1908), the President's House, East Hall, and West Hall. Adjacent to these buildings is an area to be devoted to a large science group, of which Chemistry Hall (1939) is the first to be erected. North and east of the Library is the engineering group, including Mines (1913), Physics (1928), Apperson (1898, 1920), Industrial Arts (1908), the Foundry (1899), and the Engineering Laboratory (1920), with space for later buildings. Commerce Hall (1922), the Student Health Service Building (1936), and Margaret Snell Hall (1921), west of Chemistry and north of the West Quadrangle, are each located so as to afford suitable sites for related buildings.

The West Quadrangle is the heart of the present campus, with Agriculture Hall at its east border, Home Economics (1914, 1920) and the nursery schools at the north, Agricultural Engineering (1912, 1939), the Women's Building (1926), and Kidder (1892) at the west, and the Memorial Union (1928) at the

south. South of the Memorial Union are Forestry (1917) and the Men's Gymnasium (1915, 1921), with adjacent Stadium, Bell Field, and other sports facilities.

Between the West Quadrangle and the Mall are the men's and women's recreational areas. The Men's Dormitory Building (1928) and later halls of residence for men will surround the men's recreational area. On the north road to the Mall are located, to the north the Greenhouses (1927, 1930) and gardens, and to the south Food Industries (1919, 1923), Agricultural Utilities, and the Veterinary Clinic Building (1918). Across the Mall, facing east, are the Poultry-Veterinary Building (1927) and a number of agricultural buildings, each having limited land areas required for the teaching of the particular subject housed. Between this row of buildings and the farms, the barns and stables, some of which are now east of the Mall, will ultimately be located.

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.

Farm and Forest Lands

FOR research and instruction in agriculture the State owns and leases a number of tracts of land in addition to the county-owned land on which branch experiment stations are located. Land used jointly for instruction and research includes the main campus and adjoining area consisting of 1,308 acres. For use of the Agricultural Experiment Station, including the nine branch stations, in conducting research with crops and livestock problems, 22,755 acres are utilized, 2,791 acres of which are owned by the State, 19,963 acres are owned by the County and Federal governments, and 19,963 acres are leased by the Experiment Station. Of these lands 21,266 acres are grazing land, 2,581 acres are crop land, and 222 acres are for fruit experiments.

The Peavy Arboretum, the McDonald Forest, the Blodgett Tract, the Spaulding Woodlot, and the Prospect Tract of the School of Forestry total 8,202 acres.

Library

CONSTRUCTED of brick and gray terra cotta, the Library (1918, 1941) includes the original central unit and the new west wing. It provides at present seating accommodations for twenty per cent of the student body at one time and book storage for two years growth. Public stairways and an elevator facilitate use of the building. An electric elevator and a book lift connect all five decks of the fireproof stack room. The central unit contains the circulation lobby, public catalog lobby, microfilm reader room, reference room, engineering and technology reference room, open-shelf reserve room, and periodical room. Adjoining the stacks are a faculty study room and a graduate students' study room, in addition to twenty-two carrells. Special rooms are provided for the Mary J. L. McDonald Collection of rare books and for the microfilm camera equipment. The west wing provides on the first floor a well-equipped reserved book room seating 132 readers; a science reference room seating 136 readers and affording shelving for 30,000 volumes on the first floor and balcony; quarters for the Library administrative offices, catalog, order, and serials divisions, and the union catalog, accessible to the Circulation and Refer-

ence departments. The various reading rooms provide seating accommodations* for 925 readers at one time.

Collections. The main working collection of the Library includes the scientific and technical books provided for the instructional and research activities of the different schools and of the experiment stations. The State College is a designated depository for the publications of the United States government and the Carnegie Institution of Washington, and for official publications of the State of Oregon. It was also designated, August 1, 1942, a depository for the current cards of the Library of Congress Catalog. The Library contains a practically complete file of the publications of the United States Department of Agriculture and of the agricultural experiment stations of the various states, as well as agricultural literature from foreign governmental and educational institutions. A considerable collection of duplicates is available for lending to students and faculty. The Library owns a collection of more than 2,000 documents received as a gift of the late U. S. Senator Dolph.

The book collection numbered 198,186 volumes on March 1, 1944. Exclusive of the United States government documents, 1,403 periodicals are currently received, the titles of which include the best scientific and technical magazines, selected on recommendation of the specialists on the campus. Back files of these journals and science proceedings form the background for research and advanced study. Newspapers received by subscription, gift, or exchange total 108. In addition, through unified library administration, all the books (totaling 644,941 on March 1, 1944) in the libraries of the several state institutions of higher education are made available to the students and faculties of all the institutions.

The Library's notable collection of books on the history of horticulture includes rare books of the sixteenth, seventeenth, eighteenth, and nineteenth centuries. The home-economics collection is unusually complete, especially in the fields of textiles, costume design, and nutrition. A good foundation has been laid for research work in agriculture, food industries, chemistry, entomology, pharmacy, and other scientific fields. The collections on plant pathology, mycology, and taxonomy probably rank among the upper five in the United States; that on plant ecology is also outstanding for research source material. Approximately 30,000 volumes are devoted to science and are located in the science reference room.

The engineering and technology collection of approximately 17,725 volumes is housed in a special reading room. Progress has been made in the development of source material for graduate study, especially in science and engineering.

Over a period of years the Library has built up a map collection of 5,351 items, which is particularly well adapted to the needs of work in geology, soils, and engineering. A collection of 44,893 pictures has been especially selected to meet the needs of classes in art, household arts, and advertising. There is an excellent file of herd-books. A well-balanced collection of dictionaries, encyclopedias, yearbooks, and other standard reference books is found on open shelves in the main reading room. Departmental libraries are at present limited to the few books needed for laboratory purposes.

In addition to professional and technical literature, effort is made to buy some of the best current and standard books for general and recreational reading. Small circulating collections are sent on request to residence halls and organized houses.

The Mary J. L. McDonald Collection of fine books numbers 4,001 volumes in fine bindings and special editions. Some of the items, such as a Caxton leaf, a

*Hebrew scroll, an Antiphonal, and many others, are rare and of unusual interest. The present collection is largely the gift or bequest of the late Mrs. McDonald, but notable gifts from other sources may be added from time to time. Other additions are 14 items of fine printing presented by Dr. John Henry Nash. The room housing this collection is beautifully furnished in Jacobean style. For the present this room is open on special occasions only.

Catalogs and Indexes. A general catalog of all library books on the campus, arranged alphabetically by author, title, and subject, is accessible to the public. The library is classified according to the Library of Congress system, except for part of the collection not yet changed from the Dewey Decimal system. There is also a card catalog of the publications of the United States Department of Agriculture arranged in the same manner; and card indexes of essays, plays, and short stories are regularly increased as new volumes are added to the library. Special indexes are maintained of material of local interest, including various campus publications, the *Oregon Voter*, *Oregon Historical Quarterly*, *Oregon Education Journal*, and faculty publications. At the reference desk is a card list of periodicals and journal holdings, and a subject list of current periodicals received. The current subject list is duplicated in the periodical reading room, with a visible index of all titles in alphabetical order. In the Reference Room are found many standard indexes, including such notable examples as: the *Reader's Guide*, *Education Index*, and *Agricultural Index*. The Science reference room and the Engineering and Technology reference room also contain important specialized indexes.

Service. The Library is open daily except Sundays from 7:45 a.m. to 10:00 p.m. It is closed during official convocations and artist programs, and on legal holidays. The reference room and periodical reading room are open Sundays from 2 to 5, for reading purposes only.

The circulation lobby is off the main reading room. Books may be taken for home use by anyone connected with the State College. 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, on recommendation of their dean or major professor. Twenty-two tables for these readers are placed on the several stack floors. Two study rooms adjoining the stacks are available for faculty and graduate students.

A system of interlibrary loans is maintained with other libraries on the Coast, especially within the state. The Library is also able to borrow for advanced students from the United States Department of Agriculture Library and other governmental bureaus, and from certain specialized libraries in the East.

The reference desk is in the main reading room, where technical and general reference questions are handled. The staff is ready to assist patrons to use the Library for reference purposes. An information desk is maintained at the card catalog forty-one hours a week.

The periodical reading room on the first floor contains current magazines and newspapers, and unbound numbers of recent general periodicals.

Two reserved-book reading rooms contain the books that have been set aside at the request of the faculty for assigned reading. Although intended for reading in the building, these books may be borrowed for overnight use.

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

(1) A fine of 5 cents per day is charged for all overdue books borrowed from the Circulation Department.

(2) All books especially needed for use at the Library are subject to recall at any time and should be returned promptly when sent for. A maximum fine of \$1.00 per day may be imposed for failure to comply with this request.

(3) The following fines are charged for violation of the rules of the Reserve Department: (a) for overdue books, a regular fine of 25 cents for the first hour and 5 cents for each succeeding hour, or fraction thereof, until the book is returned or reported lost (a maximum charge of \$1.00 per hour may be made in cases of flagrant violation of the rules); (b) for failure to recheck books at stated times, a fine of 25 cents; (c) for failure to return books to proper department desk, a fine of 25 cents.

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

(5) If a book, which has been reported lost and has been paid for, is returned within one year, refund will be made after deduction of the accumulated fines, plus 5 per cent of the list price of the book for each month it was missing from the Library.

Unified Facilities. The library facilities of the state institutions of higher education in Oregon are organized into a single unit under the supervision of a director, with a local librarian on each campus. The director is also librarian of the State College at Corvallis, where the central offices of the library system are located.

The collections at the several institutions are developed to meet special needs on each campus; but the book stock of the libraries, as property of the state, circulates freely to permit the fullest use of all books.

A combined author list of all books and periodicals in the State System is maintained in the central office to facilitate a better distribution of the book stock and to eliminate unnecessary duplication of published material. It has also proved most valuable as a checking source for bibliographical resources of the system. An author list of books in the State College Library is maintained at the University Library.

Museums and Collections

MUSEUMS and collections maintained by the State College include scientific, industrial, historical, and art material classified and arranged for effective 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, Kidder Hall, and elsewhere on the campus.

The Horner Museum of the Oregon Country

MARY BOWMAN HULL.....Curator

The Horner Museum of the Oregon Country, located in the Museum Building, is the repository of notable collections of historic, scientific, industrial, and artistic interest. The Museum was formally opened February 20, 1925. In 1933 it was moved to its present quarters, and in 1934 was named for the late Dr. J. B. Horner, for many years Professor of History and Director of Oregon Historical Research. Dr. Horner was active in the early development of the Museum, and served as its first director.

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; war implements of savage tribes of South America, Africa, the Philippine Islands; trophies from the South Pacific war district; animal skins from Portuguese East Africa and objects made by the natives; marine shells; paintings and sculptures; antiques; oriental fabrics, embroideries, old bronzes, etc., including the valuable collection in the name of Mr. and Mrs.

Louis J. Clarke; square pianos, one of which came around Cape Horn in a sailing vessel and up the Valley by ox team; old-style organs; the famous Hank Monk stagecoach; and a great many other types of exhibits, all representing approximately 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 either as gifts or as loans is solicited.

The Museum is administered by the Curator. A Museum Committee composed of seven faculty members serves in an advisory capacity as needed.

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 sixty-nine 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 Mrs. William Henry Price, who has presented twenty-three of the paintings as a permanent gift to Oregon State College. Mrs. Price has authorized the placing of one of the paintings in the President's Office; one is a gift to the Horner Museum; the others remain in the Memorial Union. 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 the College has been entrusted to a committee composed of Professor J. Leo Fairbanks, E. C. Allworth, Mrs. J. M. Clifford, and Mrs. Mary Bowman Hull.

The Herbarium

HELEN MARGARET GILKEY, Ph.D.....Curator
NORMA ANDERSON REES, B.S.....Assistant to the Curator

The flora of Oregon as well as of other parts of the United States and of the world is represented in the Herbarium, which contains approximately 89,000 mounted ferns, algae, mosses, flowering plants, and packeted fungi; a seed collection of 2,207 numbers; and 242 photographs of types of Northwest species. The largest collection of subterranean fungi in the United States, both of Basidiomycetes and Ascomycetes, is housed on this campus.

The Braly Ornithological Collection

JOHN CLAUDE BRALY.....Curator of Oölogy

The ornithological collection of Mr. J. C. Braly of Depoe Bay was brought to Oregon State College in 1941. It consists of more than a thousand mounts, several thousand skins, and the largest and most complete assemblage of bird eggs in the Northwest. This collection, together with other collections of bird skins and mounts at the State College, forms a complete ornithological unit suited to both research and exhibition. Research students in zoology, fish and game management, and certain phases of agriculture will find the collection indispensable. The exhibit is housed in 308 Education Hall.

The Entomological Collection

The entomological collection contains approximately 150,000 specimens of insects; of these 96,500 are named. About 90 per cent are from Oregon, the remainder being from various regions of the country and about 3,000 from for-

eign lands. Orders represented are: Coleoptera 19,000, Hymenoptera 30,000, Diptera 9,000, Lepidoptera 3,000. Other orders constitute the remainder. The collection now contains more than 285 types, paratypes, and cotypes; *types* are the specimens in the hands of the authorities when the species are first described. A microscope slide collection contains 2,100 minute and fragile forms. In 1942 22,000 specimens were donated to the insect collection from other institutions here and abroad and from individuals interested in entomology in Oregon.

Special attention is being paid to Oregon aquatic insects, of which are included 4,800 vials of preserved specimens. A collection of 820 authentically determined specimens is housed in a special rack system. Arthropods of medical and veterinary importance are receiving attention.

A special student reference collection containing 8,000 forms has been prepared. Specimens are mounted in permanent transparent-topped tin boxes and so arranged that the important taxonomic characters are visible. Illustrated keys to the orders of insects, accompanied by the actual specimens, have been arranged in glass-topped display boxes. Life histories of the most important insects are contained in 450 glass-topped Riker mounts. A catalog of Oregon insects is in the process of preparation.

The value of the collection is greatly enhanced by the research publications available in the entomological library.

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 on page 64.

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

OFFICIAL publications include those issued directly by the State Board of Higher Education and various institutional publications issued by the State College. The legislative act placing all the state institutions of higher education under the control of one Board provided that all public announcements pertaining to the several institutions "shall emanate from and bear the name of the Department of Higher Education and shall be conducted in such a way as to present to the citizens of the state and prospective students a fair and impartial view of the higher educational facilities provided by the state

and the prospects for useful employment in the various fields for which those facilities afford preparation." All publications of the State System are issued under the editorial supervision of the Division of Information of the System, through the central offices of the division or through institutional offices.

System Publications

Announcements emanating directly from the Board are published in a **BULLETIN** and in a **LEAFLET SERIES**.

The **Bulletin** of the Oregon State System of Higher Education, issued monthly, includes announcements of curricula, the annual catalogs, information for students, and official reports.

The **Leaflet Series** of the State System of Higher Education, issued semimonthly, includes special announcements to prospective students and to the general public.

State College Publications

All State College publications that present the results of research and creative scholarship at the State College, except those issued through the Agricultural Experiment Station and the Engineering Experiment Station, are under the general administration of the State College Publications Committee. The committee also has control over any subject-matter periodicals that may be issued by the institution. Members of the committee are: E. C. Gilbert, chairman; D. M. Goode, secretary; R. S. Besse, S. H. Graf, E. L. Packard.

The Oregon State Monographs reporting the results of research and creative scholarship by staff members are selected and published on behalf of Oregon State College by the Publications Committee. The monographs are sold at cost.

Agricultural Experiment Station Publications. The Station **BULLETINS** include reports and monographs on research and experimental investigations conducted at the central station or at the several branch stations. The Station also issues series of **HOME ECONOMICS BULLETINS**, **TECHNICAL BULLETINS**, **CIRCULARS**, a mimeograph series of **CIRCULARS OF INFORMATION**, and occasional pamphlets and reports. Single copies of experiment station publications are supplied free to residents of Oregon who request them.

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

Extension Publications. The Federal Cooperative Extension Service publishes a series of **BULLETINS** meeting the demand for scientific knowledge in popular form, especially with reference to its application to everyday life. The subjects covered by these publications include the various phases of agriculture, agricultural economics, home economics, agricultural engineering, and applied science. A series of **OUTLOOK CIRCULARS** deals with the outlook in respect to major lines of agricultural production. Twenty-one different series of **4-H Club Bulletins** are issued. The Extension Service also publishes occasional miscellaneous circulars, posters, and reports. Single copies of extension bulletins are supplied free to residents of Oregon who request them.

Academic Regulations

Admission

IN ORDER to be admitted to the State College a student must be of good moral character and must present evidence of acceptable preparation for work at the college level. The development of character is regarded as a primary aim in education and is emphasized at all the state institutions of higher education.

Every person applying for admission to the regular sessions of the State College must submit complete records of all his high-school and his college work, if any. (These records become the property of the State College. For failure to submit complete records the State College may cancel the student's registration.) All records should be filed with the Registrar of the State College at least two weeks before the applicant expects to enter Oregon State College. If records are filed later, the student's registration may be unavoidably delayed. The Registrar will evaluate the records submitted, and will notify the applicant of his entrance standing.

A person applying for admission to freshman standing must submit a record of his high-school work on an official application form. Copies of this form may be obtained from high-school principals or from the Registrar of Oregon State College. The record must be certified by the principal or superintendent of the applicant's school. A person applying for admission with advanced or graduate 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).

Admission to Freshman Standing

The requirements for admission to first-year or freshman standing conform to the following uniform entrance requirements adopted by all the institutions of higher education in Oregon:

Graduation from a standard high school, which in Oregon involves the completion of 16 units, 8 of which 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; 1 unit in health and physical education; and 2 units selected from the fields of natural science and mathematics or the field of foreign language. Two units in either natural science or mathematics or 1 unit in each of these subjects will be acceptable; but a minimum of 2 units in a single language will be required if a foreign language is selected. In order to be admitted to any of the four-year curricula in engineering, except industrial arts, a student must present one unit in elementary algebra, one-half unit in higher algebra, and one unit in plane geometry. A student deficient in mathematics may be admitted but must pursue a five-year program to qualify for graduation.

Graduates from standard out-of-state high schools shall be required to present substantially the same distribution of units. Applicants who are not residents of Oregon may be held for additional requirements demonstrating superior ability.

Admission before Graduation from High School. In accordance with a plan for wartime educational acceleration recommended in January 1943 by a committee of high-school administrators and representatives of the colleges and universities of Oregon, following recommendations of the Educational Policies Commission of the National Education Association, selected high-school senior boys may be admitted to Oregon State College during 1944 under the following conditions:

- (1) If he enters the fall term of 1944-45, the applicant must have completed 13 units of high-school work (exclusive of health and physical education); if he enters the winter term, he must have completed 14 units of high-school work.
- (2) He must rank scholastically within the upper 20 per cent of the boys in his high-school class.
- (3) He must have the recommendation of his high-school principal.
- (4) His age on his nearest birthday, when admitted to Oregon State College, must be not less than 17 years.

After January 1, 1945, high-school graduation will be required for admission. This provision is correlated with a plan of the schools for the acceleration of the regular high-school course for superior students.

Admission with Advanced Standing

Advanced standing is granted to students transferring with acceptable records from accredited institutions of collegiate rank. The amount of credit granted depends upon the nature and quality of the applicant's previous work, evaluated according to the academic requirements of the State College.

A student wishing credit for work done elsewhere than at an accredited educational institution must petition the Committee on Academic Requirements for permission to take examinations in specific courses listed in the Catalog of the State College. In general, credit by examination is allowed only for work taken in regularly organized courses in nonaccredited institutions of collegiate rank; normally the granting of such credit is deferred until after the student has been in attendance at Oregon State College for three terms.

Admission as Special Student

An applicant for admission as a special student should be at least 21 years of age; he must file with the Registrar documentary evidence sufficient to prove his special fitness to pursue the subjects desired.

Two classes of special students are recognized: (1) those not qualified for admission as regular students but qualified by maturity and experience to work along special lines; and (2) those qualified for admission as regular students who are not working toward a degree.

A special student may petition for regular standing when he has made up entrance deficiencies or has completed at least 45 term hours in the State College. Credits earned by a special student will not subsequently be counted toward a degree until the student has completed at least two years of work (93 term hours) as a regular student. In case a regular student changes to special status, work done while classified as a special student will not count toward a degree.

Admission with Graduate Standing

Graduates of accredited colleges and universities are admitted to graduate classification by the Dean of the Graduate Division and the State College Registrar on presentation of an official transcript of their undergraduate work. But admission to candidacy for an advanced degree is determined only after a qualifying examination, given when a student has completed not more than one-third of the work for the degree.

Graduates of nonaccredited universities and colleges are expected to obtain the bachelor's degree from an accredited institution before proceeding to graduate work.

Placement Examinations

TO PROVIDE the faculty with a basis for reliable advice and assistance to students planning their college programs, Oregon State College requires entering undergraduates to take several placement 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 of 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 failing to obtain a satisfactory rating in this examination are required to take and pass Corrective English (English K) before registering for work in English Composition.

The physical 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 intending to take mathematics during their freshman year (including students registering in any curriculum in engineering or forestry) are required to take a placement examination in first year high-school algebra, on the basis of which their college work in mathematics is determined.

Degrees and Certificates

THE State College offers curricula leading to certificates on the completion of two years' work, and to baccalaureate and graduate degrees. If changes are made in the requirements for degrees or certificates, special arrangements may be made for students who have taken work under the old requirements. In general, however, a student will be expected to meet the requirements in force at the time he plans to receive a degree or certificate. Oregon State College grants the following academic degrees:

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

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

Business and Industry, *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., B.I.A., M.A., M.S., ChE., C.E., E.E., M.E., Met.E., Min.E.*
 Forestry, *B.S., B.F., M.S., M.F., F.E.*
 Home Economics, *B.A., B.S., M.A., M.S.*
 *Nursing Education, *B.A., B.S.*
 Pharmacy, *B.A., B.S., M.A., M.S.*

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

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

Requirements for Certificates

The *Junior Certificate* admits to upper-division standing and the opportunity to pursue a major curriculum leading to a degree.† A student is expected to fulfill the requirements for the *Junior Certificate* during his first two years at Oregon State College. The requirements are as follows:

- (1) Term Hours: Minimum, 93.‡
- (2) Grade-Point Average: Minimum, 2.00.
- (3) English:
 - (a) Freshmen who do not obtain a satisfactory rating in the English placement examination required upon entrance must take and pass the course designated 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: language and literature, science, social science.§
 The group requirements are as follows:
 - (a) For students in liberal arts and sciences—At least 9 approved term hours in each of the three groups and at least 9 additional approved term hours in courses numbered 200-210 in any one of the three groups.
 - (b) For students in the professional and technical schools—At least 9 term hours in two of the following: English literature or upper-division foreign language; science; social science. If a school

* Conferred on behalf of the University of Oregon Medical School on students who complete the Preparatory Nursing Curriculum at Oregon State College.

† A student who transfers to Oregon State College after completing the equivalent of the requirements for the *Junior Certificate* at another institution may be admitted to upper-division standing without the formal granting of the *Junior Certificate*.

‡ In schools having a graduation requirement of 204 term hours, students should present 96 hours for the *Junior Certificate*.

§ For a classified list of courses satisfying the group requirements see pages 102-103.

cannot meet this requirement by the end of the sophomore year, fulfillment may be deferred by agreement between the dean of the school concerned and the Academic Requirements Committee, such agreement to be filed in the Registrar's Office.

The Junior Certificate with Honors Privileges admits to upper-division standing and permits the student to work for a bachelor's degree with honors in those colleges and schools providing an honors program. For this certificate the student must have a grade-point average of at least 2.75, in addition to fulfilling all the requirements for the Junior Certificate.

The Lower-Division Certificate recognizes the successful completion of two years of lower-division work. This certificate is granted upon request to students whose desire has been only to round out their general education. It does not require the scholastic average specified for the Junior Certificate, and does not admit to upper-division standing.

The Certificate in Agriculture recognizes the completion of the Two-Year Curriculum offered by the School of Agriculture. For this certificate students must meet requirements (3), (4), (5), and (6) specified for **THE JUNIOR CERTIFICATE**, must complete 9 term hours of science and 9 term hours of either language and literature or of social science, must complete a minimum of 85 term hours including 43 term hours in agriculture, and must have the dean's recommendation certifying fulfillment of all requirements of the School of Agriculture.

Requirements for Degrees

The Bachelor's Degree. When a student has fulfilled all the requirements for a Junior Certificate, he is classified as an upper-division student and may become a candidate for a bachelor's degree in the college or school of his choice.* The requirements for a bachelor's degree (including both lower- and upper-division work) are as follows:

- (1) Term Hours: Minimum, 192, including—
 - (a) Hours in upper-division courses: Minimum, 45.
 - (b) Hours in the major: Minimum, 36, including at least 24 in upper-division courses.
 - (c) Hours after receipt of Junior Certificate: Minimum, 45.
- (2) 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.
 - (c) Professional bachelor's degree: Fulfillment of all major requirements.
- (3) Grade-Point Average:
 - (a) Minimum 2.00 on all college work.
 - (b) Minimum 2.00 on last 45 hours for which registered.
- (4) Residence: Minimum, 45 term hours (normally the last 45).
- (5) Dean's recommendation, certifying fulfillment of all requirements of major department or school.

* During the war emergency men students must take 1 hour of physical education each term of the junior and senior years.

(6) Restrictions:

- (a) Correspondence Study: Maximum, 60 term hours.
- (b) Law: Maximum, 48 term hours.
- (c) Medicine: 63 term hours.
- (d) Applied Music: Maximum, 12 term hours.

Senior Honors. Senior honors are conferred each year by the Administrative Council upon those members of the graduating class, candidates for a bachelor's degree, who throughout their entire college course have maintained the highest scholastic standing in their respective schools. A student to be eligible to such honor must have a grade-point average of 3.25 or higher and must have been in attendance at the State College for two regular academic years. Election is limited to 10 per cent of the graduating members of a school. Students attaining this honor are listed in the commencement program as Senior Honor Students.

Advanced Degrees. The requirements for advanced degrees are listed on another page under GRADUATE DIVISION.

Academic Procedure

THE regular academic year throughout the State System of Higher Education is divided into three terms of approximately twelve weeks each. The summer sessions supplement the work of the regular year (see special announcements). Students may enter at the beginning of any term. It is important that freshmen and transferring students entering in the fall term be present for Freshman Week (see page 79). A detailed calendar for the current year will be found on pages 10-11.

Students are held responsible for familiarity with State College requirements governing such matters as the routine of registration, academic standards, student activities, organizations, etc. Complete academic regulations are included in a separate pamphlet, a copy of which is furnished to each student by the Registrar's Office.

Definitions

A **COURSE** is a subject, or an instructional subdivision of a subject, offered through a single term.

A **YEAR SEQUENCE** consists of three closely articulated courses extending through the three terms of the academic year.

A **CURRICULUM** is an organized program of study arranged to provide integrated cultural or professional preparation.

A **TERM HOUR** represents three hours of the student's time each week for one term. This time may be assigned to work in classroom or laboratory or to outside preparation. The number of lecture, recitation, laboratory, or other periods per week for any course may be found in the course descriptions in this catalog, or in the separately published SCHEDULE.

Course Numbering System

Courses throughout the State System of Higher Education are numbered as follows:

- 1-99. Courses in the first two years of foreign language, or other courses of similar grade.

100-110, 200-210. Survey of foundation courses that satisfy the lower-division group requirements in the language and literature, science, and social science groups.

111-199, 211-299. Other courses offered at first-year and second-year level.

300-399. Upper-division courses not applicable for graduate credit.

400-499. Upper-division courses primarily for seniors. If approved by the Graduate Council, these courses may be taken for graduate credit. In this catalog, 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.

The following plan is followed in numbering summer-session courses:

- (1) A summer-session course that is essentially identical with a course offered during the regular year is given the same number.
- (2) A summer-session course that is similar to a course offered during the regular year, but differs in some significant respect, is given the same number followed by "s."
- (3) A course offered during the summer session which does not parallel any course offered during the regular year is given a distinctive number followed by "s."

Grading System

The quality of student work is measured by a system of grades and grade points.

Grades. The grading system consists of: four passing grades, A, B, C, D; failure, F; incomplete, I; withdrawn, W; failure to take final examination, E. The grade of A denotes exceptional accomplishment; B, superior; C, average; D, inferior. Students ordinarily receive one of the four passing grades or F, failure. When the quality of the work is satisfactory, but the

course has not been completed, for reasons acceptable to the instructor, a report of 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. A student who discontinues attendance in a course without official withdrawal receives a grade of F in the course. An E may be removed by taking a make-up final after presenting to a faculty committee satisfactory evidence of reason for not taking the regular final; an E not removed within the first term after a student's return to the institution becomes an F.

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 for graduation is computed on all work for which the student receives credit—including work for which credit is transferred, correspondence study, and work validated by special examination.

Scholarship Regulations

The administration of the regulations governing scholarship requirements is vested in the Personnel Committee of the faculty. This committee has discretionary authority in the enforcement of rules governing probation, and also has authority to drop a student from the State College when it appears that his work is of such a character that he cannot continue with profit to himself and with credit to the institution. In general, profitable and creditable work means substantial progress toward meeting graduation requirements.

(1) A lower-division student is automatically placed on probation if his grade-point average for any term is below 1.50. He is not released from probation until his grade-point average for a subsequent term is at least 1.75.

(2) An upper-division student is given written warning if his grade-point average falls below 2.00 in any term. He is automatically placed on probation if his grade-point average for any term falls below 1.75, or his cumulative grade-point average below 2.00. He is not released from probation until he has made a term grade-point average of at least 2.00 and a cumulative grade-point average of at least 2.00.

(3) A certificate of eligibility must be obtained from the Dean of Men or Dean of Women before a student can qualify for an elective or appointive office in any student, extra-curricular, or organization activity. Scholastic probation automatically removes a student from any such office, and prevents him from participating in any such activities while he is on probation (except as provided in Paragraph 5 below).

(4) Any student elected or appointed to any official position in any student activity becomes ineligible in any term in which he is not regularly registered for at least twelve hours of academic work, or in which at least ten hours were not completed in the preceding term last in attendance.

(5) No student who has been enrolled for 93 term hours or more is eligible to hold an elective office or to accept an appointment in a student activity unless he has a cumulative grade-point average of at least 2.00.

(6) The rules of the Pacific Coast Intercollegiate Athletic Conference govern in all questions of athletic eligibility.

(7) Students who have been suspended or expelled are denied all the privileges of the institution and of all organizations in any way connected with it, and are not permitted to attend any social gathering of students, or to reside in any fraternity, sorority, or club house, or in any of the halls of residence.

Fees and Deposits

STUDENTS at the State College and at the University pay the same fees. In the fee schedule printed below, *regular fees* are those fees paid by all students under the usual conditions of undergraduate or graduate study. Regular fees are payable in full at the time of registration. *Special fees* are fees paid under the special conditions indicated.

The institution reserves the right to change the schedule of tuition and fees without notice.

Payment of the stipulated fees entitles all students registered for academic credit (undergraduate and graduate, full-time and part-time) to all services maintained by the State College for the benefit of students. These services include: use of the State College Library; use of laboratory and course equipment and materials in connection with courses for which the student is registered; medical attention and advice at the Student Health Service; use of gymnasium equipment (including gymnasium suits and laundry service); a subscription to the student daily newspaper; admission to concert and lecture series sponsored by the State College. No reduction 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, \$12.00; incidental fee, \$7.50; building fee, \$5.00. The total in regular fees, which include all laboratory and other charges in connection with instruction, is \$34.50 per term.*

Undergraduate students who are not residents of Oregon pay the same fees as Oregon residents, and, in addition, a nonresident fee of \$50 per term, making a total of \$84.50 per term. (See footnote below.)

The regular fees for undergraduate students for a term and for a year may be summarized as follows:

Fees	Per term	Per year
Tuition	\$ 10.00	\$ 30.00
Laboratory and course fee	12.00	36.00
Incidental fee	7.50	22.50
Building fee	5.00	15.00
*Total for Oregon residents.....	\$ 34.50	\$103.50
*Total for nonresidents (who pay an additional nonresident fee of \$50.00 per term)	\$ 84.50	\$253.50

See footnote below on matriculation fee.

Graduate Students. All graduate students registered for seven term hours of work or more pay a fee of \$32.50 a term. Graduate students do not pay the nonresident fee. Graduate students registered for six hours of work or less pay the regular part-time fee. Payment of the graduate fee entitles the student to all services maintained by the State College for the benefit of students.

* Except special fees for instruction in applied music. See Music. Undergraduate students registered in the State System of Higher Education for the first time pay a matriculation fee. See SPECIAL FEES, page 76.

Deposits

Persons who enroll for academic credit (except staff members) must make a deposit of \$5.00, payable once each year at the time of first registration. This is required as a protection against loss or damage of institutional property such as: dormitory equipment, laboratory equipment, military uniforms, library books, locker keys. If at any time charges against this deposit become excessive, the student may be called upon to re-establish the original amount.

Special Fees

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

Matriculation Fee	\$5.00
Undergraduate students registering in the State System of Higher Education for the first time pay a matriculation fee. For students registering at the State College, the University, or the Medical School, this fee is \$5.00. For students registering at the colleges of education, the matriculation fee is \$2.00. Students transferring from one of the colleges of education to the State College or the University pay an additional matriculation fee of \$3.00.	
Part-Time Fee	\$4.00 per term hour; minimum per term \$10.00
Any student (undergraduate or graduate, including staff members) registering for six term hours of work or less pays a fee of \$4.00 per term hour, but not less than \$10.00 per term, instead of regular registration fees. This fee is payable at the time of registration. Students registered for six term hours of work or less do not pay the nonresident fee. Payment of the part-time fee entitles the student to all services maintained by the State College for the benefit of students. See also REGISTRATION IN ABSENTIA FEE below.	
Late-Registration Fee	\$1.00 to \$5.00
Students registering after the scheduled registration dates of any term pay a late-registration fee of \$1.00 for the first day and \$1.00 for each additional day until a maximum charge of \$5.00 is reached. Students registered for six term hours or less and auditors are not required to pay the late-registration fee.	
Change-of-Program Fee	\$0.25
The student pays this fee for each change in his official program after the program has been approved and accepted by the Registrar's Office.	
Reinstatement Fee	\$2.00
If for any reason a student has his registration canceled during a term for failure to comply with the regulations of the institution, but is later allowed to continue his work, he must pay the reinstatement fee.	
Special-Examination Fees	\$1.00 to \$10.00
A student pays a fee of \$1.00 per term hour for the privilege of taking an examination for advanced credit, or other special examination. A graduate student taking his preliminary or final examination at a time when he is not registered for academic work pays an examination fee of \$10.00.	
Auditor's Fee	per term hour, \$2.00
An auditor is a person who has obtained permission to attend classes without receiving academic credit. The auditor's fee is payable at the time of registration and entitles the student to attend classes, but to no other institutional privileges. Students regularly enrolled in the State College may be granted the privileges of an auditor without paying the auditor's fee.	
Registration in Absentia Fee	\$10.00 to \$24.00
This fee is paid at the rate of \$4.00 per term hour for work taken in absentia up to 6 term hours; minimum fee \$10.00.	
Transcript Fee	\$1.00
This fee is charged for each transcript of credits issued after the first, which is issued free of charge. This fee is not charged persons entering military service.	

Degree Fee	\$6.50
The degree fee is paid for each degree taken. No person may be recommended for a degree until he has paid all fees and charges due the institution, including the degree fee. When a student receives a certificate at the same time that he receives his degree, an additional fee of \$2.50 is charged for the certificate.	
Placement-Service Fees	See SCHOOL OF EDUCATION
Special Music-Course Fees	See MUSIC
Library Fines and Charges	See LIBRARY

Refunds

Fee Refunds. Students who withdraw from the State College and who have complied with the regulations governing withdrawals are entitled to certain refunds of fees paid, depending on the time of withdrawal. The refund schedule has been established by the State Board of Higher Education and is on file in the Registrar's Office. All refunds are subject to the following regulations:

(1) Any claim for refund must be made in writing before the close of the term in which the claim originated.

(2) Refunds in all cases are calculated from the data of application for refund and not from the date when the student ceases attending classes, except in unusual cases when formal withdrawal has been delayed through causes largely beyond the control of the student.

Deposit Refunds. The \$5.00 deposit, less any deductions which may have been made, is refunded about three weeks after the close of the academic year. Students who discontinue their work at the State College before the end of the year may receive refunds, upon petition to the Business Office, about three weeks after the close of the fall or winter term.

Regulations Governing Nonresident Tuition

The Oregon State Board of Higher Education has defined a nonresident student as a person who comes into Oregon from another state for the purpose of attending one of the institutions under the control of the Board.

In order to draw a clear line between resident and nonresident students the Board has ordered that all students in the institutions under its control who have not been domiciled in Oregon for more than one year immediately preceding the day of their first enrollment in the institution shall be termed nonresident students, with the following exceptions:

(1) Students whose father (or mother, if the father is not living) is domiciled in the state of Oregon.

(2) Children of regular employees of the Federal Government stationed in the state of Oregon.

(3) Students holding bachelor's or higher degrees from higher educational institutions whose work is acceptable as preparation for graduate work.

(4) Students in summer sessions.

Student Life and Welfare

Student Personnel Program

THE student personnel program of the State College aims to assist each student to develop a personality of power and influence, to appreciate the joy that may come from accomplishment stimulated by interest and enthusiasm, and to have a keen sense of responsibility for his or her own behavior. College student personnel services include admissions, orientation, records, educational and vocational guidance, loans and scholarships, health service, housing and boarding, and placement. The personnel program includes services institutional in scope as well as services organized within the several schools. All aspects of student personnel work are coordinated through a standing committee of the faculty known as the Committee on Student Personnel. Records and meetings of the committee and of several cooperating committees are centered in the office of the Registrar.

Deans of Students. The Dean of Men and the Dean of Women have general responsibility for student welfare. The deans keep in contact with organized student activities and living groups, and are of assistance to students collectively through these agencies as well as to individuals having special problems. In particular they act as advisers to freshmen, and are concerned with the orientation of new students in college life and work.

Special Committees. The Committee on Student Interests, including student as well as faculty members, assists students with social and living problems. The Committee on Student Housing assists students in making proper adjustments relative to housing and boarding. The Committee on Health and Sanitation takes initiative in the development and maintenance of high standards of health and sanitation in the various places of student residence. The Committee on Religious Education concerns itself with coordinating the various campus religious agencies, and serves as a connecting link between the religious work on the campus and the various local churches. The Committee on Educational Activities, including both student and faculty members, promotes and supervises the various student educational activities. The Student Employment Bureau, the Student Health Service, the Student Loan Fund administration, and other agencies of student welfare, are described on later pages.

Guidance Program. The Committee on Student Personnel seeks to promote an efficient personnel service in each school or division of instruction, and makes available to all students the advisory and guidance services of the entire institution, including the clinical services. It makes contacts with individual students, and invites students to come to it as they may desire. It may scrutinize the scholastic record of a student. It gives particular attention to any student who is not measuring up to his possibilities. When the causes of poor accomplishment can be ascertained, suggestions for improvement are offered. To students who are placed on probation under the regulations governing scholarship, the committee seeks to give all possible aid.

Placement. In all of the schools the placement of graduates is recognized as an important concern of the faculty generally, and especially of the dean's office. Each school maintains vital contacts with the professional fields for which its curricula give preparation, and is thus enabled to be of greater service

both to the profession and to graduates. The demands of the professions and the industries are taken into account in the revision of courses of study. Assistance is regularly given to students in finding work for which they are qualified by personality and training. In the counseling of students special assistance is given to the selection of a program of studies for each student that will develop his particular abilities and at the same time prepare him for some type of service for which there is demand.

The aid given students in obtaining part-time and vacation jobs is described under SELF-SUPPORT (pages 82-83). The Teacher Placement Service is described under SCHOOL OF EDUCATION.

Freshman Week

FRESHMAN WEEK, a program of orientation for entering undergraduate students, is held annually the first week of the fall term. By means of general assemblies, group lectures and discussion, individual conferences, and examinations and tests (see page 69), an effort is made to assist every new student in getting the best possible start in his new work. During Freshman Week new students are made familiar with the aims of higher education, the principles governing the wise use of time and money, methods of study, and the ideals and traditions of Oregon State College. Full directions concerning Freshman Week and registration procedure are sent to each new student who is accepted for admission.

The examinations and tests given entering students during Freshman Week provide the State College faculty with reliable information as a basis for advising and assisting students in planning their college programs. These examinations are scheduled at regular times during the week. Each entering student will receive from the Registrar a detailed program of the Freshman Week activities. The student should follow this schedule faithfully, in order to avoid delay in registration and possible penalty for make-up appointments.

The 1944-45 session of the State College officially opens for new undergraduate students on Monday, September 18, 1944; the first freshman assembly and the first sections of the placement examinations required of entering students are scheduled for this day. New students should arrive on the campus by Sunday, September 17, in order to be ready for the opening of Freshman Week at 8:00 o'clock Monday morning. Rooms in the dormitories will be available Saturday, September 16. Meals will be served beginning Sunday evening.

Oregon State College, recognizing that fraternities and sororities are a part of university life and provide living quarters for a substantial part of the student body, has, with the cooperation of these organizations, made provisions by which they may choose their members in an orderly fashion, with a minimum of interference with fall-term registration and the beginning of college work. A definite period has been designated, during which the members of fraternities and sororities and new students interested in fraternity membership may become acquainted. (During the war period fraternities are inoperative.)

Student Living

COMFORTABLE, healthful, and congenial living conditions contribute much to the success of college life and work. Living conditions of the right kind not only aid students to do the best in their studies but also through the experiences of group life contribute to the building of character and

personality. Hence Oregon State College is vitally concerned with student housing. Halls of residence are maintained on the campus by the institution, and the living conditions of students residing outside the dormitories are closely supervised. Increased enrollment of women students has made necessary the organization of smaller living units in private homes. Reservations for the residence halls are accepted in order of application. After the residence halls are filled, women students will be assigned to approved smaller living units.

Many students live in fraternity, sorority, or club houses accommodating groups of from twenty to fifty persons. Admission to these groups is by invitation only. Students also live with relatives near the campus or in private homes or boarding houses.

Seven cooperative houses for women, incorporated in 1943 to carry out effective and economical management, comprise the Co-Resident Women, Incorporated. Under student organization, with a house mother in charge in each house, opportunity for cooperative living is provided. By sharing house-keeping duties for approximately one hour per day the student living in a co-operative house may reduce living expenses \$10 to \$15 per month below the usual cost of room and board. Applications and requests for information should be addressed to the Dean of Women.

Two cooperative houses have been established for men, accommodating a limited number. Applications should be addressed to the Dean of Men.

The halls of residence provide comfortable, democratic living conditions favorable to successful work as a student and to participation in the wholesome activities of campus life.

Men's Dormitories. Five halls of residence for men—Buxton, Cauthorn, Hawley, Poling, and Weatherford—are maintained, accommodating a total of 344 students. The five halls are part of a single structure known as the Men's Dormitory Building.

Rooms accommodate two students each and are equipped with study tables, chairs, dressers, and wardrobe facilities. All floors are covered with a good grade of linoleum. Adequate lighting is provided, besides which there are attachments for study lamps. Each floor has lavatory and shower-bath facilities. For each floor common sleeping rooms are provided, equipped with cots, mattresses, mattress-covers, and pillows. Each student furnishes his own student lamp, bedding, towels, and personal furnishings. In each hall a club or social room, comfortably and tastefully furnished, is available for the use of all students in the hall. Telephone service is provided on each floor of each hall, and in the basement of each hall laundry facilities, with electric irons, and trunk storage accommodations are available. One of the halls contains a general reception room and guest suite for the entertainment of parents and other guests.

Women's Dormitories. Four halls of residence for women—Margaret Snell, accommodating 141 students, Waldo 243, East Hall 30, and West Hall 32—are maintained. All halls are homelike and attractive and are supplied throughout with pure mountain water, electric lights, and steam heat. The rooms are furnished with single beds, mattresses, dressers, tables, and chairs. Other furnishings, including pillows, pillowcases, sheets, blankets, bed spreads, curtains, rugs, and towels, are furnished by the student. The bedrooms average about 12 by 15 feet with one window 3 by 7 feet. Many of the rooms are larger and a few of them have two or three windows. All rooms in Margaret Snell

Hall have two or more windows. East Hall and West Hall are small living units, providing living and dining rooms with sleeping accommodations on sleeping decks. Each hall contains reception and social rooms for the use of students. Laundry facilities and trunk storage accommodations are available in each hall. Telephone service is provided.

Dormitory Living Expenses. The charge for board and room in the dormitories is \$43.00 a calendar month; room only, \$12.00 a calendar month; board only, \$31.00 a calendar month. Board-and-room payments must be made monthly in advance.

Students paying board or room charges after the date on which payment is due are charged a late-payment fee of \$1.00 for the first day, and \$1.00 for each additional day until a maximum charge of \$5.00 is reached. If dormitory charges are not paid within ten days after the date due, the student's registration may be canceled.

The right is reserved to increase the charges for room and board should advance in costs require it. The charges will be decreased whenever decreased costs make this possible.

Students should not arrive at halls of residence until the day the halls are officially open, usually one day before the opening of a term.

Dormitory Room Deposit. A deposit of \$5.00 must be sent to the Business Office at the time of application for room. The amount of the deposit will be deducted from the first room-rent installment.

If a student, after making deposit, does not enter the State College, the deposit will be refunded, provided the Director of Dormitories is notified at least one week before the opening day of the term. Rooms will not be held after the first day of registration.

Private Board and Room. Board and room can be obtained in private homes or boarding houses at rates from \$35.00 to \$40.00 a month. For a room without board the rates are from \$15.00 to \$20.00 a month for a double room and \$12.00 to \$20.00 a month for a single room. Board alone can be obtained for \$30.00 a month.

The Housing Committee exercises general supervision over all student living quarters and endeavors to see that all students have comfortable rooms and wholesome living conditions. Students are allowed to live only in rooms approved by the committee.

Housing Regulations. The following regulations govern housing of students, with the provision that when financial reasons make it necessary the housing committee may excuse students from dormitory residence and permit them to live in approved homes when rates for board and room are lower.

All unmarried students are required to live either in private homes, dormitories, or fraternity, sorority, or cooperative houses.

All freshman women at the State College are required to live in the dormitories during the first year. Increased enrollment of women students has made necessary the organization of smaller living units in private homes. Reservations for the residence halls are accepted in order of application. After residence halls are filled, women students will be assigned to approved smaller living units.

Women students not living with relatives as residents of Corvallis are required to live in the dormitories, sorority houses, cooperative houses, or private

living units and housekeeping units approved by the Housing Committee. Upon application to the Housing Committee permission may be obtained to live in approved homes to work for room and board or some portion thereof.

Upperclass women at the State College may move to the sorority houses at the beginning and end of any term.

Freshman and sophomore men not living with relatives in Corvallis must live in the dormitories or in the present organized fraternities. Any exemptions from this requirement must be approved by the Housing Committee.

Any student reserving a room in the men's halls must occupy it until the end of the term. If he moves out of the dormitory before the end of the term without proper permission, he must pay his room and board to the dormitory for the remainder of the term or forfeit his registration. A student who pledges to a fraternity may move to a fraternity house at the end of either the first or the second term.

All women students living in the dormitories must take their meals at the dormitories. All men students living in the dormitories must take their meals in the dining room provided for them in the Memorial Union.

Student Expenses. The average expenses incurred by a student at the State College during an academic year are shown in the table below. Some students with ample means spend more; but many students find it possible to attend the State College at a much lower cost. Board and room estimates are based on charges in the halls of residence. The incidental item will vary greatly with the individual. The expenses of the fall term are listed also, since there are expenses during this term not incurred during the winter or spring terms.

Fees	Per term	Per year
Fees	\$ 34.50	\$103.50
Deposits	5.00	5.00
Books, supplies, etc.	20.00	35.00
Board and room	120.00	360.00
Incidentals	25.00	75.00
	\$204.50	\$578.50

Note: This table does not include the matriculation fee of \$5.00 paid by undergraduate students registering for the first time.

It should be remembered that, in thinking of the cost of a year at college, a student usually has in mind the amount he will spend from the time he leaves home until he returns at the close of the year. Such an estimate would include clothing, travel, and amusements—items, not included in the table, that vary according to the thrift, discrimination, and habits of the individual.

Self-Support. Many students earn a large part of their expenses by work in the summers and during the academic year. Some students are entirely self-supporting. In some cases students devote an occasional term or two to regular employment in addition to vacation periods, thus taking more than the usual number of years to complete a curriculum.

The work available during the academic year consists of such tasks as janitor work, house cleaning, typewriting, reporting, tutoring, waiting on table, dish washing, clerking, service-station work, service as hotel bell boys, messenger service, caring for children, odd jobs, etc.

Organized effort is made to assist those desiring to find work. The employment bureau for men is conducted in Shepard Hall under the direction of the office of the Dean of Men. The employment bureau for women is conducted by the office of the Dean of Women in Commerce Hall.

Remunerative employment cannot be guaranteed to all who may desire it, and the new student should have sufficient funds to cover the expenses of at least the first term. It is difficult to earn one's way while carrying a 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) No student should come expecting to earn money unless he knows how and is willing to work. Only those students who do their work well can succeed in obtaining sufficient employment to meet their needs. Those who have skill in some field of work usually have greater opportunity and receive better pay.
- (4) There is a constant oversupply of those wishing to do teaching and clerical work. None but those having superior qualifications and experience is likely to obtain employment of this type during the first term.
- (5) There is a considerable demand for efficient stenographers, but generally there is not sufficient work of this kind to meet the needs of all applicants. There is a considerable demand for radio repair men, printers, licensed electricians, motion-picture operators, high-school and city bus operators, clerks, and barbers.
- (6) A limited number of opportunities exist for students who have good health, and who can perform domestic or manual labor well, to earn the equivalent of board and room by working three hours a day for board or three and one-half hours a day for board and room. There are always more applications for this type of employment than there are openings.
- (7) A student who is planning to work should come equipped with working clothes and, if possible, a bicycle.

Student Health Service

THROUGH the Student Health Service the State College does all in its power to safeguard the health of its students. This is accomplished through health education, detection of incipient diseases, medical treatment of acute diseases, and the maintenance of hygienic student living conditions.

The student health services at the institutions in the Oregon State System of Higher Education are supported by student registration fees. Every student registered for credit is entitled to receive general medical attention and advice at the Student Health Service during office hours. 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, 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 a private hospital bill.

An additional charge is made for each room call and for each call at the Health Service after office hours. Emergency calls after office hours should be telephoned to the Student Health Service telephone number 1167.

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 examination and 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. Patients who are confined to bed are cared for on the third floor. 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 of successful vaccination). Exception is made, however, for students who decline vaccination because of religious convictions. Such students may be admitted, but only on the condition that they or (in case of minor or dependent students) their parents or guardians agree in writing to assume all expenses incident to their care or quarantine, should they fall ill with smallpox while students at the institution.

Loan Funds

AS AN aid to students in financing a part of their study at the State College a number of loan funds have been established. In addition to the general "Student Loan Fund," to which there are many donors, a number of special loan funds have been established.

The Student Loan Fund

The Student Loan Fund, 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 of the State College, a membership organization, incorporated under the laws of the State of Oregon. Members are known and designated as trustees and are appointed by the President of the State College. This fund has arisen through the liberality of friends of the institution and through the accumulation of interest on loans.

The purpose, as expressed by one of the donors, is "not to induce students to attend school by providing money that can be easily obtained, but rather to aid those who have determined to secure an education and are paying the cost wholly or in part from their own earnings." Students are eligible to loan aid after they have been in attendance at the State College *at least one term*.

Among the many donors to the Student Loan Fund may be mentioned the following: Hon. R. A. Booth, Dr. Clara Humason Waldo, Mr. Ashby Pierce, Mr. R. M. Johnston, Mr. L. J. Simpson, Mr. Ben Selling, Dr. U. M. Dickey, the College Folk Club, the Agricultural Club, the Oregon Countryman, miscellaneous contributions by Faculty, Professors Paul Petri and Lillian Jeffreys Petri, Winter Short Course Students, the A. Grace Johnson Memorial Fund, the Forestry Fund, the Piano Practice Fund, various Class Donations, the Phi Pi Phi fraternity, Y.M.C.A. Rifle Club, Marguerite MacManus String Quartet, Salem Oregon State Club, Portland Oregon State Club, Oregon State Barom-

eter, Domestic Science Dining Room (Panama-Pacific International Exposition, San Francisco), Waldo Hall Club, Cauthorn Hall Club, Miners' Club, Silverton Rotary Club, Grand Army of the Republic and Women's Relief Corps, Oregon Technical Council Engineers Fund, student chapter of the American Society of Civil Engineers, Oregon State College Chamber of Commerce.

A special faculty committee with offices in the Memorial Union is charged with the responsibility of administering the Student Loan Fund and cooperates in the administration of the other loan funds available for students at the State College. The fundamental principles upon which the Student Loan Fund is administered and upon which the success of the fund has been built are:

- (1) Care in the selection of student character as a credit basis.
- (2) Detailed budgeting of expenses and receipts to assure that the sums borrowed are not disproportionate with the student's capacity to pay.
- (3) Insurance against loss by a "Contract of Guaranty" signed by the parent or guardian.
- (4) Effective follow-up system on delinquent loans.

Other Loan Funds

The Crawford Loan Fund. By the wills of the late Edward G. Crawford and his wife Ida M. Crawford a fund has been left in trust with the United States National Bank of Portland to assist worthy young men desiring to educate themselves. Applications for assistance are made through the local loan office. Applicant must be a native-born citizen of the United States, have attended primary school, either public or private, and have shown a desire and ability to help to educate himself. He must be regularly enrolled as a student in the school or college at which the proceeds of the loan will be used. According to the terms of the will, this fund can be used to assist young men who require financial aid in obtaining an education in any of the mechanical arts, trades, or in practical business, or along any particular line of study except the professions of medicine, law, theology, pedagogy, and music.

The Federation of Women's Clubs Educational Fund provides loans to women students who are well recommended.

Eastern Star Educational Fund. Loans are available to students who are members or daughters of members of the Order of the Eastern Star. Loans are made upon honor, no security being asked, and will be made by the Trustees of the Grand Chapter on the recommendation of the president of the institution which the student is attending and the approval of the Worthy Matron and Worthy Patron of the chapter of the Order of the Eastern Star located in the same place as the institution of learning.

The J. T. Apperson Educational Fund. By the will of the late Hon. J. T. Apperson, who had been a Regent of the State College from its foundation, a fund amounting to between \$55,000 and \$75,000 is to be a perpetual endowment, administered by the State Land Board of Oregon, for the assistance of worthy young men and women who are actual bona fide residents of the State of Oregon and who would otherwise be unable to bear the expense of a college course at Oregon State College. The income from this estate is loaned to students. Applicants for loans must be recommended to the State Land Board by the President of the State College and the State Superintendent of Public Instruction. Application is made through the Student Loan Committee.

The Arthur Palmer Tift Memorial Loan Fund. By the will of the late Mrs. Joan C. Palmer Tift, practically her entire estate is left as a perman-

ent loan fund for deserving young men needing financial assistance while attending Oregon State College. This fund is left as a memorial to her son, Arthur Palmer Tift, Portland attorney, who died on January 14, 1919. The fund is irreducible and all interest accruing therefrom is added to the fund.

The Joseph N. Teal Loan Fund. By bequest the late Joseph N. Teal of Portland gave to the State College the sum of \$5,000 "to be administered as a perpetual revolving fund to be loaned . . . to worthy students pursuing courses of instruction in said College."

The Ben Selling Scholarship Loan Fund. By the will of the Honorable Ben Selling of Portland, \$100,000 is set aside, from a part of the income of which loans may be made to men and women of the State College. Applicants must be approved by the State College Student Loan Committee.

A. W. S. Emergency Loan Fund for Women Students. The Associated Women Students have set aside a sum of money which is available to women students who are in need of small amounts of money for short periods of time. The fund is administered by the Dean of Women.

Scholarships and Fellowships

A NUMBER of scholarships and fellowships have been established largely through the generosity of private donors, providing funds in varying amounts for the encouragement of students of ability and promise. Some of these are general scholarships. Others are limited to special fields.

State Scholarships. A limited number of scholarships are awarded annually to students in the institutions of the Oregon State System of Higher Education. These scholarships cover tuition and laboratory and course fees (a total of \$22.00 a term or \$66.00 a year for a student attending Oregon State College). Recipients of scholarships must, however, pay the matriculation fee, incidental fee, the building fee, and special fees. At least fifty per cent of the scholarships are awarded to entering freshmen. To be eligible, an entering student must rank in the upper third of his high-school graduating class. Students who have previously attended an institution of higher learning must have a grade-point average of 2.50 (computed according to the grade-point system in use at the Oregon state institutions of higher education). All applicants, to be eligible, must be in need of financial assistance. Application should be made on official blanks to the State College Registrar. All applications must be filed by April 1.

State College Assistantships, Scholarships, and Fellowships. A number of graduate and research assistantships, scholarships, and fellowships are awarded annually by the State College to qualified graduate students in various fields. For stipends and application procedure, see GRADUATE DIVISION.

The Amalgamated Sugar Company Home Economics Scholarships. The Amalgamated Sugar Company contributes a total of \$400 annually for awards in varying amounts to worthy students in need of financial assistance in pursuing their education.

The American Association of University Women Graduate Scholarship. Every two years the Oregon Division of the American Association of University Women gives a scholarship of \$1,200 to a woman who is a resident

of Oregon, and who holds at least a bachelor's degree, for advanced study at an American or foreign university.

Blumauer-Frank Drug Company Scholarship. A scholarship of \$50, established 1935, is awarded annually to the junior student in pharmacy who makes the highest average in a competitive examination given to selected members of his class whose records have been outstanding during their three years in college. Should the winner not return the following academic year, the scholarship is awarded to the student making the next highest average. The purpose of the scholarship is to further the advancement of professional pharmacy and to aid a worthy student in completing his senior year. The Blumauer-Frank Drug Company has furnished a heavy bronze plaque upon which is engraved the name of the winner and the year.

Bernard Daly Scholarships. Under terms of the will of the late Dr. Bernard Daly of Lakeview, Oregon, worthy self-supporting young men and women of Lake County, Oregon, may receive a part or all of their necessary college expenses. The terms of the will provide that the income from this fund be used to pay the college expenses of at least fifteen students each year. The fund is administered by the board of trustees, who select candidates annually from a list of applicants recommended by the county judge and county school superintendent of Lake County, following a qualifying examination held in Lake County.

Danforth Fellowships. The Danforth fellowships include a freshman fellowship to a student in home economics, offering two weeks in a Michigan summer camp; a junior fellowship to a student in home economics, offering four weeks experience and study in problems of manufacturing, commercial research, distribution, advertising, personnel, and leadership, two weeks in St. Louis, Missouri, and two weeks in Michigan summer camp; and a graduate fellowship offering opportunity to study in the field of religious education, including five weeks at Michigan summer camp and a year of study at certain colleges and universities—awarded jointly by Danforth Foundation and Ralston Purina Mills.

Martin Dennis Fellowship. The Martin Dennis fellowship of \$750 is provided for research in electrochemistry in the Department of Chemistry by the Martin Dennis Company of Newark, N. J., by Mr. C. D. Marlatt.

The Corvallis Elks Senior Award, provided by Corvallis Lodge No. 1413, Benevolent and Protective Order of Elks, includes registration fees for one year and \$10 a month for eight months, is given annually to the junior man who during his three years in college has contributed most to the welfare of Oregon State College.

J. A. Hanson Scholarship. The J. A. Hanson Scholarship of \$75 is awarded annually to the outstanding junior majoring in poultry husbandry.

The Home Economics Freshman Scholarship. Through the generosity of an anonymous donor, the Home Economics Freshman Scholarship of \$100 is awarded each year to a worthy home economics freshman in need of financial assistance in her college course.

International Friendship Scholarship. The Home Economics Club of the State College on March 2, 1926, established a scholarship of \$500 which is awarded annually to a graduate foreign student to study home economics at Oregon State College. The recipient of the scholarship is selected by a committee composed of the executive council of the Home Economics Club, the Dean of the School of Home Economics, and a representative of Omicron Nu.

The **A. Grace Johnson Memorial Scholarship** is awarded in units of \$25 or less to a worthy, needy home economics student who is registered as an upper classman and whose scholastic average is equal to or above that of the student body. The scholarship fund, started in the spring of 1935, is a continually growing one contributed to by former fellow workers, students, friends, and relatives of Miss Johnson, professor of household administration at the State College from 1915 to the time of her death in 1933.

The **Leonora Kerr Scholarship** is an award of \$66.00 made annually to an outstanding woman student, a high-school graduate, selected by the scholarship committee of the College Folk Club. The scholarship was established by the College Folk Club as a tribute to its founder and first president, Mrs. W. J. Kerr.

The **Lee Scholarship** is awarded each year to a woman student in home economics registered as a junior, who during her career in college has shown improvement in her work, stability and meritorious record in all her activities, and general all-round worthiness. This scholarship provides a sum of money derived from the annual income of a fund of \$1,000 bequeathed by Minnie E. Lee as a memorial to her husband J. B. Lee and herself, to be paid to the recipient at the time of her registration in the senior year. The award is not open to any student who has received any other monetary prize.

The **William Clark Leedy Aeronautical Scholarship**. As an aid in the development of aeronautical engineering, Jay Clark Leedy, '12, and Mildred Wilson Leedy, '14, of Brooks, Oregon, have established the William Clark Leedy Aeronautical Scholarship in memory of their son, Lieutenant William Clark Leedy, who was killed in line of duty in the service of his country as an aviator in the United States Navy May 18, 1943; Meredith Ann Leedy has joined in sponsoring the award in memory of her husband. The scholarship provides \$200 applicable toward tuition and other expenses while a student in aeronautical engineering at Oregon State College and is awarded annually by the Committee on Scholarships to a student recommended by the faculty of the School of Engineering on the basis of scholarship, aptitude, and character, as deserving of encouragement in the study of aeronautical engineering. The scholarship is paid in two installments of \$100 each at the time the student registers for the second term of his junior year and senior year.

The **Mary J. L. McDonald Fellowship in Reforestation**. Through the generosity of the late Mrs. Mary J. L. McDonald of San Francisco, a fellowship has been established giving opportunity to do advanced study in problems of reforestation. The fellowship is awarded each year by a committee of the faculty of the Oregon State School of Forestry to a graduate of a recognized school of forestry on the basis of proficiency in forestry studies, personality, and demonstrated ability to do independent work.

The **Multnomah Anglers and Hunters Club Scholarship** is an annual scholarship of \$150 to a male student, junior or senior, in the Department of Fish and Game Management to encourage students to continue their studies in the field of wildlife conservation and management. The recipient must have a sincere interest in this field and a desire to continue in it after graduation.

Phi Kappa Phi Exchange Scholarship. To encourage interchange among students of the cultures of this and other countries, the local chapter of Phi Kappa Phi supports in alternate years an international exchange scholarship, under which a foreign student receives tuition, board, and room for one

academic year at Oregon State College. The Oregon State student who goes abroad receives similar assistance from the foreign institution; he returns to this campus for the year following the one spent abroad.

Portland Mothers Club Scholarships. The Portland Mothers Club of Oregon State College provides annual awards of \$25 each to men and women who have shown courage and determination in obtaining an education.

Rotana Club Scholarship. The Rotana Club of Portland provides a scholarship of \$25 awarded each year to a sophomore student in the School of Home Economics on the basis of scholastic promise, qualities of personality, and leadership. In making the selection consideration is given to the need of the student for assistance in financing her education. The recipient of the scholarship is selected by the Dean of the School of Home Economics from nominations made by the school faculty.

The Salem Mothers Club Scholarships are awards of \$20 each given to men and women in the schools of Agriculture, Forestry, and Home Economics who show promise and are deserving of financial assistance.

The School of Pharmacy Scholarships. Approximately twenty scholarships of \$100 each, applicable toward tuition and fees, are maintained each year by alumni and friends of the School of Pharmacy. Some of these scholarships have been made possible by memorial gifts. Selection is made by the Committee on Scholarships on the basis of scholarship, promise, and financial need in obtaining an education. Recommendation of candidates is made by the faculty of the School of Pharmacy on the basis of application blanks submitted by applicants, letters of recommendation, investigation by an alumnus or practicing pharmacist, and where practicable by personal interview.

The Sears, Roebuck and Company Scholarships. A grant of \$2,000 is made by Sears, Roebuck and Company for scholarships in the School of Agriculture of Oregon State College to be awarded to worthy Oregon farm boys of good character and scholastic attainment, who have for the past several years demonstrated leadership ability through participation in 4-H Club, Future Farmers, or agricultural or community activities.

Standard Oil Company of California Agricultural Scholarships. The Standard Oil Company of California grants a total of six \$100 scholarships, each year during the five-year period 1942-46 ending with the fall term 1946, to worthy boys graduating from high school, three of the scholarships to be awarded to boys belonging to 4-H Clubs and three to boys belonging to the Future Farmers of America.

Standard Oil Company of California Home Economics Scholarships. The Standard Oil Company of California grants through Oregon State College four \$100 scholarships, each year during the five-year period 1942-46, to worthy girls graduating from high schools that are qualified and operating under the George-Deen Act.

Prizes and Awards

DISTINCTION in scholarship is recognized at the State College by the presentation of Senior Honors at the time of graduation, through election to the various honor societies, and through prizes and awards. A description of requirements for recognition as Senior Honor Students and a list

of honor societies will be found elsewhere in this Catalog. There are also essay and oratorical prizes, and awards for proficiency in special fields, and for all-round distinction in student life. Oregon State College students compete for awards provided by national and regional sponsors in many fields.

Freshman Honors. Under the sponsorship of the Oregon State Chapter of Phi Kappa Phi, Freshman Honors are awarded each year to sophomore students who during their freshman year completed a total of at least 45 term hours of credit with a grade-point average of 3.25 or higher, and with no failure. The certificates are provided by Phi Kappa Phi and are presented each year by the President of the College at an all-College convocation.

The Clara H. Waldo Prizes, totaling \$110 annually, are awarded each spring in the proportions of \$50, \$30, \$20, and \$10 respectively to the woman student of highest standing registered as a regular student in the senior, junior, sophomore, and freshman year. The committee having charge of the award of these prizes is guided by the following points: (a) proficiency in scholarship, (b) success in student activities, (c) qualities of womanhood, and (4) qualities of leadership.

The Lipman Wolfe Prizes, totaling \$100 annually, are awarded each year in the proportions of \$50, \$30, and \$20 respectively to the man or woman of highest standing registered as a regular student in the senior, junior, and sophomore classes. The committee having charge of the award of these prizes is guided by the following points: (a) proficiency in scholarship, (b) qualities of manhood or womanhood with special emphasis on unselfishness and kindness, (c) qualities of leadership, and (d) contribution to campus welfare.

Sigma Xi Award. The Oregon State College chapter of The Society of Sigma Xi has established an annual award of \$25 for the best master's thesis in science or related fields. The society reserves the right of nonaward in case no thesis of exceptional merit is submitted.

The Chi Omega Prize. Eta Alpha of Chi Omega offers an annual award of \$25 to the senior woman who is adjudged by a college committee on honors and awards to approach most nearly an ideal of intellect and spirituality and to have exerted the most wholesome influence upon her associates.

Mortar Board Senior Award. An award of \$40 provided by Mortar Board is presented to the woman who, in adversity as well as good fortune, has demonstrated the qualities of fortitude, confidence, and resourcefulness that make for progress.

Altrusa Award is an award of \$50 given by the Altrusa Club of Portland to a senior woman whose performance during her college years has shown the qualities of integrity, loyalty, and firmness of purpose in making the most of her opportunities.

The Panhellenic Cup is awarded by the Panhellenic Council to the sorority making the highest scholastic average for the year.

The Phrateres Scholarship Cup is awarded to the member of Phrateres who has attained the highest standing in scholarship for the year.

Sigma Delta Pi Spanish Award. A Spanish masterpiece and the medal of the American Association of Teachers of Spanish are given annually by the

Oregon chapter of Sigma Delta Pi (Spanish national honor society) to the advanced student of Spanish who has made the greatest progress during the academic year.

The **Alpha Chi Omega Cup** is awarded by Xi Xi chapter of Alpha Chi Omega to the student of music who has rendered the greatest service to the campus.

The **Women's Athletic Association Plaque** is maintained by the Women's Athletic Association and on it each year is inscribed the name of the senior woman student who has rendered the highest service to the association and best represents the ideals of physical education.

The **Locey Athletic Award** is a medal given annually to the senior man outstanding in athletic participation, citizenship, and sportsmanship, in inspiration and leadership as a member of his team, and in scholarship.

Alpha Lambda Delta Awards. The local chapter of Alpha Lambda Delta gives an award to the senior woman in Alpha Lambda Delta with the highest scholastic standing. The national society gives certificates to senior members who have a grade-point average of 3.33 or above for eleven terms.

Phi Sigma Scholarship Award. The Phi Sigma scholarship award is a sterling silver medal awarded annually by the national organization of Phi Sigma, honor society in biological science, to the outstanding senior student at Oregon State College, who has shown creative interest in biology. The purpose of the award is to stimulate interest and application in science, especially in the biological sciences.

The **Co-op Book Awards**, consisting of two \$25 purchase orders donated annually by the Oregon State College Cooperative Association, are made each year to the two upperclassmen, men or women, judged to possess the most outstanding personal libraries.

The **Alpha Zeta Scholarship Cup** is awarded during the first term of the sophomore year to the student in agriculture receiving the highest grade average in the freshman class.

Swift & Company Essay Award. An award of \$130 is given to the student registered in agriculture who submits the best essay on any phase of the methods employed by the meat-packing business in marketing meats, poultry, eggs, butter, and cheese. The award is used for traveling and other expenses in making a trip to Chicago to attend the International Livestock Exposition and participate while there in a market study program under the direction of Swift & Company.

The **Phi Chi Theta Awards** in secretarial science include: (a) a prize of \$5 to the freshman having the highest scholastic standing; (b) a senior key.

The **Kappa Delta Pi Award** of \$25 is made annually to the sophomore enrolled in the School of Education who as a freshman in that school made the highest scholastic average.

The **American Institute of Electrical Engineers Prize** is an associate membership in the institute, awarded annually by the Portland Section for the best paper prepared and delivered by an undergraduate member of the Oregon State College student branch.

The A. S. M. Awards. The American Society of Metals (Oregon Chapter) awards annually three memberships in the society and cash awards of \$10 and \$5 each for the best papers prepared by student members of the society.

Epsilon Pi Tau Award. A certificate of merit is awarded annually to the sophomore in industrial arts who during his freshman year has made the greatest progress in scholarship and development of fellowship.

The American Society of Civil Engineers Prizes are junior memberships in the society awarded annually for the three best papers prepared and delivered in the student branch of the society.

The American Society of Mechanical Engineers Prizes of \$25, \$15, and \$10 respectively are awarded annually for the three best papers prepared and delivered in the student branch of the society.

Institute of the Aeronautical Sciences Awards. The Student Branch of the Institute of the Aeronautical Sciences awards annually a certificate of merit and a two-year membership (\$20) in the Institute to the senior member having the highest scholastic rank during the junior and senior years and to the student member preparing and presenting the best lecture at a regular meeting of the Student Branch.

Eta Kappa Nu Award. A certificate of merit is awarded annually to the outstanding student in the sophomore electrical engineering class. A permanent record of this award is kept on a bronze plaque in Apperson Hall.

The S. A. E. Awards. The Society of Automotive Engineers (Oregon Section) awards annually three prizes of \$25, \$15, and \$10 for the best papers prepared by student members of the society.

The A. I. Ch. E. Award. The American Institute of Chemical Engineers awards a pin each year to the junior member of the student chapter who made the highest record during his freshman and sophomore years.

Sigma Tau Award. A medal is awarded each year to the sophomore student in engineering who as a freshman was the most outstanding student.

Tau Beta Pi Local Awards. Two awards valued at \$5.00 each are made annually by the local chapter of Tau Beta Pi for the best papers presented by initiates of the chapter. Certificates of merit are also awarded to six freshmen in engineering having the highest scholastic standing during the first two terms of the year.

The Tau Beta Pi Award of \$50 is presented by the national society of Tau Beta Pi for the best essay submitted in the student chapters of the society.

The Pi Tau Sigma Award is three mechanical engineering handbooks presented to the outstanding student in the sophomore mechanical engineering class.

The Charles Lathrop Pack Forestry Prize. Through the generosity of Mr. Charles Lathrop Pack of New Jersey, a gift of \$2,000 has been made to the State College to encourage forestry students to write for publication. The income from the gift is awarded each year to the student in forestry who produces the most interesting, logical, and technically significant paper for publication.

The Xi Sigma Pi Plaque is awarded each year to the student in forestry who has maintained the highest grade average during the sophomore year.

The Omicron Nu Plaque is awarded each year to the senior woman who has best lived the teachings of home economics throughout her college career. Candidates are first selected by a committee of the home economics faculty and their names then submitted to vote of the home economics faculty, final decision resting with the committee.

Oregon Home Economics Association Award. An award of \$25 is made annually by the Oregon Home Economics Association to an Oregon girl majoring in home economics who is a sophomore and needs financial aid to continue her education. The selection is made by a committee made up of the President of the Oregon Home Economics Association, the Dean of the School of Home Economics, and a member of the home economics staff.

The Home Economics Freshman Award of \$10 was established (1928) by members of Omicron Nu for the purpose of promoting scholarship and leadership in home economics, the recipient being selected by a joint committee representing Omicron Nu and the faculty in home economics.

The Oregon Home Economics Extension Council Award is made annually to the junior or senior in home economics who stands high in scholarship, is outstanding in ability, is interested in becoming a home demonstration agent, and is in need of financial assistance to complete her education.

The Lamplighter Award of \$15 is presented annually by the Lamplighter Club to the senior who during his college career has, in the opinion of the Committee on Honors and Awards, contributed most to the success of **THE LAMPLIGHTER** magazine.

The Drucilla Shepard Smith Prize. Through the generosity of John E. Smith of the Class of 1902 a sum of \$500 has been contributed as a memorial to his mother, the late Drucilla Shepard Smith (Mrs. F. S. Smith) formerly of McCoy, Polk County, Oregon. The income from this gift is awarded annually to the senior woman having the highest scholastic standing during the eight terms preceding her selection for this award, provided that it shall not be given to any student who receives any other award during the same academic year.

The Lehn and Fink Medal. A gold medal, appropriately engraved, is awarded each year to the senior student in the School of Pharmacy who has attained the highest scholarship rank, or who in the judgment of the faculty has made the most distinctive contribution to the advancement of science in pharmacy.

Women's Auxiliary to Oregon State Pharmaceutical Association Prize. A cash prize of \$25 is awarded annually to the senior woman in pharmacy who in the judgment of the faculty in pharmacy has shown the greatest proficiency in scholarship, qualities of leadership and womanhood, and success in student activities.

North Pacific Branch of the American Pharmaceutical Association Award. This award, consisting of a year's membership in the American Pharmaceutical Association and a scholarship certificate, is made annually to an outstanding junior in pharmacy.

The Merck and Company Awards. Merck and Company make annual awards of pharmaceutical books (value \$20) to two senior students who have

attained the highest standing in the fields of pharmacology and pharmacognosy and practical pharmacy.

The **Phi Lambda Upsilon Award** is a handbook presented to the two highest ranking sophomores in chemistry or chemical engineering.

Extracurricular Activities

THE State College recognizes the values of extracurricular student activities as a part of a college education: formation of habits of civic responsibility and leadership through self-government and student clubs and societies; the broadening of outlook and sympathies through varied human associations; cultural development through participation in the intellectual and esthetic life of the campus.

The **Memorial Union** provides a center for democratic fellowship among all students, faculty, alumni, and friends of the College. While the building is beautiful in design, materials, and furnishings, it has been planned for practical usefulness and, with its social rooms, student bookstore, post office, telegraph office, barber shop, tea room, and other facilities, is a busy center of student life throughout each day of the academic year. Students read or converse in the lounges; the business of the student body is transacted in the various student offices; here the student publications are edited and student activities are planned and carried out. In the tea room small and large groups hold social and conference luncheons and dinners. In the ball room are held afternoon or evening dances. In the various committee and assembly rooms meetings of many kinds fill a busy calendar each week.

Here faculty and students meet in many relationships. Alumni, especially at Homecoming, Commencement, and on other similar occasions, use the Union as their campus headquarters. Visitors from within and without the state, parents and friends of students, and notable institutional guests are welcomed in the Union.

The Memorial Union has demonstrated its efficiency as a center of College life on the Oregon State campus. Dedicated in 1928 "to the service and inspiration of the living and to the memory of our immortal dead," it conforms to the standard set by the International War Memorial Association, which determined that all memorials should be, not only commemorative of the dead, but of use to the living. The president of the Memorial Union is a student, and students share actively in the management of the Union.

Associated Students. The students of Oregon State College are organized for self-government. The Associated Students of Oregon State College sponsors such activities as intercollegiate athletics, student publications, forensics and dramatics, and concert and lecture series.

The Associated Women Students, a group within the general student body organization, sponsors and supervises activities of women students. The A. W. S. is a chapter of the Intercollegiate Association of Women Students.

Each entering class forms an organization that retains its identity throughout the four undergraduate years at Oregon State College and after graduation. Class reunions are held regularly by alumni. During their undergraduate days students in the different classes uphold various distinctive traditions. Graduating classes usually leave a gift to the institution. Classes returning for

their silver anniversary jubilee also may make gifts as an expression of their loyalty and appreciation toward the institution at which they received their undergraduate education.

Clubs and Associations. A large number of clubs and associations flourish on the State College campus. Some of these organizations are:

American Institute of Agricultural Engineers (Oregon student branch); Agricultural Club; American Institute of Chemical Engineers (Oregon State chapter); American Society of Civil Engineers (Oregon State student chapter); American Society of Mechanical Engineers (Oregon State student branch); American Institute of Electrical Engineers (Oregon State chapter); American Institute of Mining and Metallurgical Engineers; Artists' Guild; Christian Science Organization; Co-op Managers; Dairy Club; Daughters of the American Revolution; Ding Darling Wildlife Club; Engineers Student Council; Society of Automotive Engineers (Oregon State student branch); Bernard Daly Club (students holding Daly scholarships); Farm Crops Club; Farm Economic Forum; Food Technology Club; Forestry Club; 4-H Club; Future Farmers of America; Home Economics Club; Industrial Arts Club; Institute of Aeronautical Sciences; Lutheran Student Association; Merry Ti-eds (married students); Newman Club; Oregon State Rifles; Pharmaceutical Association; Physical Education Club; Poultry Club; Round Table (YM-YW-CA); Science Club; Society of American Military Engineers (Oregon State student chapter); Student Affiliates of the American Chemical Society; Temenids (Eastern Star); Wesley Foundation; Westminster Association; Withycombe Club; Women's Athletic Association; Wood Products Club.

Faculty organizations include:

American Association of University Professors; Biology Club (faculty); the Faculty Men's Club; the Faculty Women's Club; American Association of University Women (Covallis branch); College Folk Club (faculty women and wives of staff members); Oregon State Dames (wives and mothers of students, affiliated with the national University Dames).

The parents of Oregon State students are organized into two groups, Oregon State Dads and Oregon State Mothers, both active in the support of Oregon State College.

Honor Societies. A number of honor societies are maintained on the Oregon State College campus for the recognition of general scholarship, scholarship in particular fields, and student leadership. Most of them are national organizations with chapters at the leading colleges and universities of the country. Among these societies are:

Phi Kappa Phi (all-college scholastic, men and women); Sigma Xi (research, science; men and women); Alpha Lambda Delta (sophomore women); Alpha Zeta (agriculture, men); Aquabats (swimming, women); Blue Key (senior men); Delta Sigma Rho (forensics, men and women); Eta Kappa Nu (electrical engineering); Euterpe (music, women); Gamma Sigma Delta (agriculture); Kappa Kappa Alpha (art, men and women); Kappa Kappa Psi (band); Mortar Board (senior women); Mu Beta Beta (4-H Clubs, men and women); National Collegiate Players (dramatics, men and women); Omicron Nu (home economics); Orchesis (dancing, women); Parthenia (physical education, women); Phi Lambda Upsilon (chemistry); Phi Sigma (biology, men and women); Rho Chi (pharmacy, men and women); Sigma Pi Sigma (physics, men and women); Sigma Tau (engineering); Tau Beta Pi (engineering); Talons (sophomore women); Thanes (sophomore men); Theta Sigma Phi (journalism, women).

Professional and Departmental Societies. Student societies are maintained in many of the schools and departments for the promotion of high standards of scholarship and professional training. Most of them are national organizations. Among these societies are:

Alpha Delta Sigma (advertising, men); Epsilon Pi Tau (industrial arts); Kappa Delta Pi (education, men and women); Kappa Psi (pharmacy, men); Phi Chi Theta (commerce, women); Pi Mu Epsilon (mathematics, men and women); Scabbard and Blade (military); Sigma Delta Chi (journalism, men); Sigma Delta Psi (physical education, men); Sigma Gamma Epsilon (geology and mining); Xi Sigma Pi (forestry).

Athletics and Sports. Oregon State College is a member of the Pacific Coast Intercollegiate Athletic Conference composed of ten leading universities and colleges of the coast region. In addition to intercollegiate athletics a comprehensive program of intramural sports is sponsored by the institution through the Division of Physical Education. The sports program is closely correlated

with instruction in physical education. The Varsity "O" Association (men), the Minor "O" Association (men), the Women's Athletic Association, and the Orange "O" Association (women) encourage sports participation and give recognition for proficiency.

Lectures. The regular State College curriculum is supplemented by frequent public lectures by faculty members and visiting scholars. Lectures are sponsored by the Committee on Convocations and Lectures, the Faculty Men's Club, the American Association of University Women, the College Folk Club, the Committee on Religious Education, the Associated Students, the Associated Women Students, Phi Kappa Phi, Sigma Xi, and schools and departments.

Forensics and Dramatics. Forensics and dramatics are fostered at the State College not only for their value to those participating but also for their intellectual and cultural value for the whole campus community. The State College is a member of the Pacific Forensic League composed of the leading colleges and universities on the coast, and of the Intercollegiate Forensic Association of Oregon composed of ten colleges and universities.

Training and experience in acting, play production, and stage craft are provided by the Speech Department. Each season groups of short plays are given in connection with the instruction in community drama. Three major and two minor plays are presented each year by the National Collegiate Players, Workshop Theater Players, or Mask and Dagger, the campus dramatic groups. Special student organizations such as the Wesley Players and the Westminster Players also provide outlets for dramatic talent. The Associated Students sponsor a full schedule of varsity and freshman debate and oratory for both men and women. From 36 to 40 Oregon State teams supporting both negative and affirmative of many questions participate each year in more than 100 intercollegiate debates. Oregon State representatives compete in the old-line State Oratorical Contest, the state Peace oratorical contest, and the state and Pacific Coast extempore-speaking contests. Interclass extempore speaking contests are held each term, the winners receiving loving cups.

Art and Music. The State College gives special encouragement to extra-curricular activities in art and music. Exhibitions, concerts, and recitals sponsored by the departments of Art and Music, the Associated Students, and student musical and art organizations play a central part in the cultural life of the State College community.

The Oregon State Symphony Orchestra, composed of about fifty student musicians, gives two or more major concerts each year; it plays for Commencement and other important institutional events. The orchestra cooperates with the choral organizations in oratorio productions. Any State College student is eligible to try out for the orchestra.

Membership in the 75-piece, uniformed R.O.T.C. Band is open to students passing a satisfactory examination in the elements of music and ability to perform on a band instrument. Individual practice and attendance at rehearsals are required. The Band furnishes basses, baritones, altos, and drums; otherwise, members must furnish their own instruments, which must be in low pitch.

The Co-ed Band, composed of women students who can play a band instrument, appears in concert two or three times a year.

The Glee Club, student men's organization, prepares programs of male choruses, glees, and compositions of a lighter nature. Membership is determined through individual examination of candidates. The Madrigal Club, student

women's organization, studies compositions for women's voices of various types and gives concerts both alone and in conjunction with the Glee Club at various times during the year. Membership is determined through individual examinations of candidates. The College Chorus is composed of the members of both the Glee and Madrigal clubs. Besides attending regular rehearsals of the club to which they belong, the members are required to attend additional rehearsals of the combined clubs, at which numbers are rehearsed for concerts given at Christmas time, Easter time, and Commencement.

The Educational Activities Board brings artists of international fame to the campus each year for concerts and recitals. Free Sunday afternoon concerts are offered to students and the public. Free public recitals by advanced music students are given frequently during the academic year.

Under the patronage of the Convocations Committee, seven or eight exhibitions are held each year in the lobby of Kidder Hall for the purpose of stimulating interest in the fine arts and of acquainting students with arts movements throughout the country. Kappa Kappa Alpha, honor society in art, is active in promoting art interests on the campus. The Artists' Guild sponsors field trips, sketching exhibitions, and lectures on art subjects.

Several dance recitals are given each year under the auspices of the Division of Physical Education, Orchesis, and other organizations.

Social Organizations. Personal associations with fellow students through social organizations and living groups constitute one of the pleasantest features of campus life. All students have opportunity to belong to some social organization.

Students not belonging to fraternities or sororities are organized for social activities. Each residence hall and cooperative house has its own group organization. The men's halls and the women's halls are organized for united activities. Independent women are organized in Phrateres, national society for college women. Independent men maintain a group of clubs. All independent students, including those residing in the dormitories, are represented in the Independent Student Council.

Membership in fraternities and sororities is by invitation. Fraternities on the Oregon State campus are organized into the Interfraternity Council, which is a member of the National Interfraternity Conference. The sororities on the campus are organized into the Panhellenic Council, which is a member of the National Panhellenic Congress.

Fraternities at Oregon State College are:

Alpha Chi Rho, 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 Tau, Phi Sigma Kappa, Pi Kappa Phi, Sigma Alpha Epsilon, Sigma Chi, Sigma Nu, Sigma Phi Epsilon, Sigma Phi Sigma, Sigma Pi, Theta Chi, Theta Xi.

Sororities at Oregon State College are:

Alpha Chi Omega, Alpha Delta Pi, Alpha Gamma Delta, Alpha Xi Delta, Chi Omega, Delta Delta Delta, Delta Zeta, Gamma Phi Beta, Kappa Alpha Theta, Kappa Delta, Kappa Gamma, Pi Beta Phi, Sigma Kappa.

Student Publications. Oregon State College student publications are listed below. The official publications of the State College and of the State System of Higher Education are listed on another page.

THE OREGON STATE BAROMETER is a full-sized newspaper, containing campus news and selected general and educational news, issued five days a week during the academic year. It is edited, managed, and financed by students. Any student may qualify for a position on the staff.

THE BEAVER, the year book of the Associated Students, is a substantially bound, pictorial record of student life. The volume is published in May.

THE AGRICULTURAL JOURNAL, a quarterly magazine published by the Agricultural Club, is devoted to the promotion of agricultural interests.

THE LAMPLIGHTER, a monthly literary magazine written and printed by students, has as its aim to give encouragement to students having talent for writing.

THE OREGON STATE TECHNICAL RECORD, a quarterly magazine (a member of Engineering College Magazines Associated), is devoted to engineering and industry.

THE ANNUAL CRUISE, an illustrated magazine published annually by the Forestry Club, is devoted to scientific forestry and lumbering and to the forestry and lumbering industries.

THE STUDENT DIRECTORY is compiled and published twice a year by the Oregon State chapters of Sigma Delta Chi, Alpha Delta Sigma, and Theta Sigma Phi.

Alumni Association

ALUMNI of Oregon State College include 15,165 graduates and approximately 37,500 former students. The association is governed by a board of seventeen directors, some of this number being elected each year at the annual business meeting held at Commencement. Each board member represents a particular section of the state or area outside the state and serves for a term of three years. Membership in the association may be obtained by the payment of \$3 annual dues or by the payment of \$50 that entitles one to a Life Membership. The Life Membership includes a copy of the ORANGE AND BLACK, a 70-year pictorial book of the College published in 1938 by the association. The association maintains its permanent manager and office staff in Room 110, Memorial Union, where complete files are kept of all graduates and former students of the State College. The officers of the association for 1944-45 are as follows:

CLYDE WILLIAMSON, '08, Albany.....	President
GEORGE F. CHAMBERS, '16, Salem.....	Vice President
CLARENCE L. MATHES, '23, Corvallis.....	Treasurer
EUNICE COURTRIGHT, '25, Corvallis.....	Acting Manager
RICHARD M. BROWN, '34, Portland.....	Director
ADOLPH G. SIEBERTS, '17, Portland.....	Director
URSEL C. NARVER, '28, Portland.....	Director
ERLING BRAUTI, '22, Wheeler.....	Director
MRS. EDITH HOWARD HOUCK, '02, Roseburg.....	Director
J. VERNON OWENS, '27, Klamath Falls.....	Director
J. DONALD MEYERS, '15, La Grande.....	Director
MARION WEATHERFORD, '30, Arlington.....	Director
ROSS CADY, '09, Boise, Idaho.....	Director
NORMAN OLIPHANT, '31, Seattle, Wash.....	Director
LINDSEY SPIGHT, '25, San Francisco, Calif.....	Director
HAROLD WAHLBERG, '14, Santa Ana, Calif.....	Director
MARK D. MCCALLISTER, '05, Corvallis.....	Director

The official publication of the association is THE OREGON STATER, a monthly magazine devoted to the upbuilding of Oregon State College and its program of service. It is mailed regularly to all members of the association.

Part III

Resident Instruction

Lower Division

MAHLON ELLWOOD SMITH, Ph.D., Dean and Director of Lower Division, Oregon State System of Higher Education.

LENA CURRIER EMERSON, Secretary to the Dean.

General Statement

FRESHMAN and sophomore work in the liberal arts and sciences is unspecialized. The work is offered through the Lower Division on a parallel basis at the University and the State College and leads to the Junior Certificate. Students completing the work of the Lower Division and fulfilling all requirements for the Junior Certificate may select a major in a specialized field at the close of the sophomore year.

For students who plan to complete work for the bachelor's degree the two lower-division years provide broad general education and a foundation for specialization during the junior and senior years in some major field in the liberal arts and sciences or in a professional or technical curriculum. Lower-division students explore several fields of study with a view to determining special interests and aptitudes.

For students who complete no more than the first two years of college work, the Lower Division aims to afford a balanced cultural program and preparation for intelligent citizenship.

The State Board of Higher Education, in establishing the Lower Division, defined its primary purpose as follows:

(1) **Basic Education.**

Insuring to all students the elements of a sound general education during their first two years; delaying specialization until the junior and senior years and then encouraging it to a high degree.

(2) **Orientation.**

Providing students with a period of exploratory contact which will enable the institution to assist them to make a wise selection of specialization on the basis of their abilities and aptitudes.

Lower-Division Groups. For the purpose of adjusting the work to the two-fold objectives of basic education and orientation, lower-division work in the liberal arts and sciences has been arranged in three groups, each representing a comprehensive field of knowledge, as follows: **LANGUAGE AND LITERATURE, SCIENCE** (including the biological and physical sciences and mathematics), and **SOCIAL SCIENCE**.

Group Requirements. Students intending to major in the liberal arts and sciences must complete at least 9 approved term hours in each of the three groups and at least 9 additional approved term hours in courses numbered 200-210, or equivalent, in any one of the same three groups. Courses that satisfy group requirements are numbered from 100 to 110 and from 200 to 210. (For group requirements for students in the professional schools see pages 71-72.)

Required Courses. Besides fulfilling group requirements, lower-division students must take required work in English Composition, Hygiene, Physical

Education, and Military Science and Tactics, as stated on page 70. 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 104.

Lower-Division Advisers. Each entering student is assigned to a lower-division adviser, whom the student consults in making out his study program. It is the duty of the adviser to assist the student in building an integrated program, in line with his interests and with institutional and lower-division requirements.

Certificates

STUDENTS who have met the group requirements, and have completed a total of at least 93 term hours of required and elective freshman and sophomore work, qualify for one of three certificates, depending on their objectives and attainments:

The Junior Certificate, which admits to upper-division standing and the opportunity to pursue a major curriculum leading to a degree. It requires a grade-point average of at least 2.00.

The Junior Certificate with Honors Privileges, which admits to the privilege of working for honors in the colleges and schools providing honors work. To receive this certificate the student must have a grade-point average of at least 2.75 in addition to fulfilling all requirements for the Junior Certificate.

The Lower-Division Certificate, which recognizes the successful completion of two years of lower-division work. It is granted upon request to students whose desire has been only to round out their general education. The scholastic average specified for the Junior Certificate is not required. The Lower-Division Certificate does not admit to upper-division standing.

Group Courses

YEAR sequences applicable in meeting group requirements are listed below. These courses may also be taken as electives. Descriptions of the courses are printed under the several departmental headings.

LANGUAGE AND LITERATURE GROUP

English

- Eng 101, 102, 103. Literature Survey, 3 hours each term.
- Eng 104, 105, 106. Introduction to Literature, 3 hours each term.
- Eng 201, 202, 203. Shakespeare, 3 hours each term.

Germanic Languages
GL 201, 202, 203. German Literature, 3 hours each term.

Romance Languages
FRENCH
RL 201, 202, 203. French Literature, 3 hours each term.
SPANISH
RL 207, 208, 209. Spanish Literature, 3 hours each term.

SCIENCE GROUP

Science Surveys
GS 101, 102, 103. Biological Science Survey, 4 hours each term.
GS 104, 105, 106. Physical Science Survey, 4 hours each term.

Bacteriology
Bac 201, 202, 203. Elementary Bacteriology, 3 hours each term.
Bac 204, 205, 206. General Bacteriology, 3 hours each term.

Botany
Bot 201, 202, 203. General Botany, 3 hours each term.

Chemistry
Ch 101, 102, 103. Elementary General Chemistry, 3 hours each term.
Ch 201, 202, 203. Principles of Chemistry, 4 hours each term.
Ch 204, 205, 206. General Chemistry, 5 hours each term.
Ch 208, 209. General Chemistry, 5 hours winter and spring terms.

Entomology
Ent 201, 202, 203. General Entomology, 3 hours each term.

Geology
G 201, 202, 203. Geology, 3 hours each term.
G 204, 205, 206. Geology Laboratory, 1 hour each term.

Mathematics
Mth 100. Intermediate Algebra, 4 hours one term.
Mth 101, 102, 103. Elementary Analysis, 4 hours each term.
Mth 106. Trigonometry, 4 hours one term.
Mth 108. Mathematics of Finance, 4 hours one term.
Mth 109. Elements of Statistics, 4 hours one term.
Mth 201, 202, 203. Differential and Integral Calculus, 4 hours each term.

Physics
Ph 201, 202, 203. General Physics, 4 hours each term.
Ph 204, 205, 206. Astronomy and Meteorology, 3 hours each term.

Psychology
Psy 201, 202, 203. Elementary Psychology, 3 hours each term. (Applicable in satisfying group requirements in Science group if accompanied by Psy 204, 205, 206.)
Psy 204, 205, 206. Elementary Psychology Laboratory, 1 hour each term.

Zoology
Z 201, 202, 203. General Zoology, 3 hours each term.
Z 204, 205, 206. Vertebrate Zoology, 4 hours each term.
Z 208, 209, 210. Elementary Human Anatomy, 3 hours each term.

SOCIAL SCIENCE GROUP

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

Economics
Ec 201, 202, 203. Principles of Economics, 3 hours each term.

History
Hst 201, 202, 203. History of Western Civilization, } Hst 204 may be substituted for
3 hours each term. } Hst 203
Hst 204. History of the Far East, 3 hours. }
Hst 207, 208. England and the British Empire, 3 hours } Hst 207, 208, 209 consti-
fall and winter terms. } tute a year sequence.
Hst 209. The World Since 1914, 3 hours spring term.

Political Science
PS 201, 202, 203. Modern Governments, 4 hours each term.

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

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

Lower-Division Curriculum

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
Military Science and Tactics (men)	1	1	1
¹ Physical Education	1	1	1
² Departmental or school requirements or exploratory electives	5-3	5-3	5-3
	16	16	16

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
Military Science and Tactics (men)	1	1	1
Physical Education	1	1	1
² Departmental or school requirements or exploratory electives	8-6	8-6	8-6
	16	16	16

¹General Hygiene (PE 150), 2 term hours, must be taken in place of physical education one term of the freshman year. Women take Social Ethics (PE 131) in addition to physical education one term of the freshman year.

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

Lower Division and Service Departments

Faculty

MAHLON ELLWOOD SMITH, Ph.D., Dean of Lower Division and Service Departments.

LENA CURRIER EMERSON, Secretary to the Dean.

Arts and Letters

English

PROFESSORS S. H. PETERSON (department head), M. E. SMITH, KIERZEK.

ASSOCIATE PROFESSORS ORDEMAN, COLBY, H. E. CHILDS.

ASSISTANT PROFESSORS McELFRESH, BALDWIN (emeritus), NELSON, REICHART.

INSTRUCTORS BEEBE, MUNFORD*, K. G. PETERSON*, ADRIAN, SULLIVAN, WHITTAKER, POPOVICH, ANDERSON, GIBBS.

Modern Languages

PROFESSORS M. M. MARTIN (department chairman), JAMESON, GILFILLAN.

ASSOCIATE PROFESSORS KUNEY, M. E. LEWIS.

ASSISTANT PROFESSORS RIASONOVSKY, GRAJDANZEV, BOURBOUSSON.

INSTRUCTORS BRANDT, ARNOLD, ELSTON, ANNE ELSTON, HUGLEY, BEALL, P. BEALL, JORQUERA, ALONSO, GONZALEZ, TAYLOR, N. P. KOZOO LIN, KOBILKIN, P. I. KOZOO LIN, VARGAS-BARON, WONG, YANG.

Speech

PROFESSORS MITCHELL (department head), WELLS.

ASSOCIATE PROFESSORS BARNES, KNOLL, D. P. YOUNG.

ASSISTANT PROFESSORS WINGER*.

INSTRUCTOR MARSHALL*.

Social Science

Economics

PROFESSORS M. N. NELSON (department head), DREESEN, MASER.

ASSOCIATE PROFESSOR R. H. DANN.

ASSISTANT PROFESSOR KLEINSORGE*, GRAJDANZEV.

INSTRUCTOR STEINER*.

History

PROFESSORS VAUGHN (in charge of department), ELLISON.

INSTRUCTOR R. W. SMITH.

* On leave for war service.

Philosophy

PROFESSOR WARRINGTON (department head).

Political Science

PROFESSORS DUBACH (department head), MAGRUDER.

ASSISTANT PROFESSOR POLING.

Psychology

PROFESSORS O. R. CHAMBERS (department head), BRUMBAUGH (emeritus),
SHERBURNE.*

ASSISTANT PROFESSOR KRAWIEC.*

INSTRUCTORS G. D. CHAMBERS, L. M. DANN.

Sociology

PROFESSOR G. A. BAKKUM (department chairman).

ASSOCIATE PROFESSOR R. H. DANN.

*Architecture and Allied Arts**Art and Architecture*

PROFESSOR FAIRBANKS (department head).

ASSOCIATE PROFESSORS SINNARD*, MATSEN.

ASSISTANT PROFESSOR FOX.

INSTRUCTORS EGBERT*, RUNKLE*, FIELD, WASSON.

Landscape Architecture

PROFESSOR PECK (department head).

ASSOCIATE PROFESSOR CUTHBERT.*

Journalism

ASSOCIATE PROFESSOR SHIDELER (in charge of department).*

PROFESSORS McINTOSH (emeritus), BURTNER.

ASSISTANT PROFESSOR LAKE.

Music

PROFESSORS P. PETRI (department head), BEARD, L. J. PETRI, D. W. MOORE.

INSTRUCTORS BOWDEN, VON LEHE.

Religion

PROFESSOR WARRINGTON (department head).

General Statement

ALL departments of instruction at the State College not included in the major departments and schools, except the departments of Military Science and Tactics and Physical Education, are administered under the Dean of Lower Division and Service Departments. In this administrative unit are the several departments of arts and letters and social science, architecture and allied arts, journalism, music, and religion.

* On leave for military or civilian war service.

Under the plan adopted for the Oregon State System of Higher Education, major work in these fields is confined to the University. The work at the State College in these fields parallels the lower-division work at the University. Similarly, in certain fields in which major work is confined to the State College work is offered at the University as follows: in home economics, lower-division and service courses; in secretarial science, lower-division service courses. At each institution, in addition to the lower-division work, upper-division service courses are offered in the nonmajor departments for students in other fields.

While it is recommended that students intending to major in any of these fields enter the institution at which major work is offered at the beginning of the freshman year, they may, if they wish, complete the first two years of work in any of these fields at the nonmajor institution, and transfer to the major institution at the beginning of the junior year with fundamental requirements for upper-division work fully met.

In the organization and administration of the instruction in the nonmajor departments at the two institutions, the deans of the major schools serve as advisers to the end that the offerings shall bear a proper relation to the work of the major school. (See page 6.)

The departments offer work required or elected by students in the Lower Division of Liberal Arts and Sciences (pages 101-104) and in the professional schools. Year sequences, paralleled by similar sequences in science offered in the School of Science, are offered to meet "group requirements" in the fields of arts and letters and social science. Other courses meet elective and service needs of students enrolled in the major schools throughout the institution.

Arts and Letters

INSTRUCTION in arts and letters, offered at Oregon State College through the departments of English, Modern Languages, and Speech, aims to help the student to think clearly, to read with discrimination, to express himself effectively, and to appreciate the masterpieces of literature.

The State College offers lower-division and service courses in arts and letters for students planning to major in this field at the University, and for students majoring in other fields.

English

THE Department of English offers instruction in literature and written English. The courses are intended to supply the training in writing necessary to every educated man, to afford a cultural background for those students who are limited to two years of work in 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 lit-

erary movements; a careful analysis of the chief literary forms such as the novel, drama, and poetry; and a more intensive study of the major authors.

Written English. The purpose of the study and practice of written English is technical accuracy in the fundamental forms of composition, the development of the power of expression, and the survey of special art forms such as versification, play writing, the essay, and short story.

English K. All entering students are required to take an examination in English. Those who fail in this examination are enrolled in a writing course called English K, the object of which is the diagnosis and correction of defects manifested in the placement examination. Those who pass the examination enter the regular freshman course (Eng 111, 112, 113).

COURSES IN LITERATURE

LOWER-DIVISION COURSES

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

History of English literature in general outline. Fall: nineteenth century. Winter: from beginnings to seventeenth century. Spring: seventeenth and eighteenth centuries. Associate Professor Ordeman.

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

Aim is to stimulate appreciation and criticism of literature. The emphasis throughout is on ideas and motives. Professors Peterson and Kierzek, Associate Professors Colby, Childs, and Ordeman.

Eng 163, 164, 165. American Literature. 3 hours each term.

American literature from its beginnings to the present day. Professor Peterson, Associate Professor Childs.

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

The important historical plays, comedies, and tragedies. Courses in sequence but may be taken separately. Prescribed for major. Professor Smith.

Eng 231. Directed Recreational Reading. 1 or 2 hours.

Readings and discussions based on the principle of interest. For students in professional schools and others who do not take other literature courses. Prerequisite: consent of instructor. Associate Professor Childs.

Eng 261, 262. Individual Authors. 3 hours fall.

Each term devoted to the study of a single author. (Eng 261, Browning; 262, Tennyson or another author—only one course given each year.) Professor Smith.

Eng 263. Great Books. 3 hours winter.

The Bible, the *Odyssey*, *Arabian Nights*, *Divine Comedy*, *Autobiography of Benjamin Franklin*, *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.

Continental European literature in approved translations—fall term, Romance literature; winter term, Germanic; spring term, Slavic. Lectures and reports. Associate Professor Colby.

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

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

* Students intending to major in English should take either Eng 101-103 or Eng 104-106.

Eng 274. The Short Story. 3 hours spring.

The development of the American short story; analysis of recognized masterpieces as well as of the best present-day magazine stories, with the idea of developing critical taste in reading. Professor Peterson.

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

Designed to 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 Baldwin.

Eng 276. The Novel. 3 hours winter.

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

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. Assistant Professor Riasanovsky.

COURSES IN WRITTEN ENGLISH

LOWER-DIVISION COURSES

English K. 1 hour fall or winter.

A one-term course in the mechanics of composition. The student must pass the English placement examination or English K before he is permitted to register for any other written English course. Three recitations.

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

Composition and rhetoric; frequent written themes in the various forms of discourse; special attention to fundamentals and to organization of papers. Prerequisite: English placement examination. Professor Kierzek and staff.

Eng 118. Technical Report Writing. 3 hours fall or spring.

Application of principles learned is made to specific needs and interests of students having papers in progress during the term. Prerequisite: Eng 111, 112, 113, or equivalent. Associate Professor Ordeman.

Eng 211. Vocabulary Building. 3 hours winter.

Advanced course in writing; the study and perfection of style and vocabulary; the analysis of various forms and models. Prerequisite: Eng 111, 112, 113. Associate Professor Ordeman, Assistant Professor Reichart.

Eng 213, 214, 215. Short Story Writing. 2 hours each term.

Designed to develop proficiency in the art of writing the short story. Courses in sequence but may be taken separately. Prerequisite: consent of instructor. Professor Peterson.

Eng 217. Business English. 3 hours any term.

Modern practices in business correspondence; analysis and writing of all types of correspondence. Prerequisite: Eng 111, 112, 113. Assistant Professor Nelson.

Eng 218. Creative Writing. 3 hours winter.

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 111, 112, 113.

UPPER-DIVISION SERVICE COURSE

Eng 324. English Composition for Teachers. 3 hours spring.

For students expecting to teach English in high schools. Practice in writing and a review of the rules of composition. Prerequisite: Eng 111, 112, 113. Assistant Professor Nelson.

COURSES IN LIBRARY

UPPER-DIVISION SERVICE COURSES

Lib 381. Secondary School Library. 3 hours.

Aims to aid teacher librarian in planning, organizing, and administering a high-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 secondary-school students, including reading for information and recreation. Various approved lists are examined. Individual books are considered critically. Prerequisite: junior standing.

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 conversational drill. Professor Martin and Associate Professor Lewis.

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 conversational drill periods, 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. Associate Professor Lewis.

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

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. Associate Professor Lewis.

UPPER-DIVISION SERVICE COURSES

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

GL 311, 312, 313. **German Literature.** 3 hours each term.

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. Associate Professor Lewis.

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. 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.

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 conversational drill. Associate Professor Kuney.

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 conversational drill periods, including student discussion of current topics and systematic vocabulary building. (c) For 5 hours credit: (a) and (b) combined. Associate Professor Kuney, Assistant Professor 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 Kuney.

RL 211, 212, 213. **Directed Reading in French.** 1 hour each term.

Reading in French in the field of the student's major. Prerequisite: equivalent of second-year college French, or 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.

COURSES IN ROMANCE LANGUAGES: PORTUGUESE

LOWER-DIVISION COURSES

RL 21, 22, 23. **First-Year Portuguese.** 4 hours each term.

Elements of pronunciation, grammar, reading, and conversation. Three recitations; 2 periods conversational drill. 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 two-hour conversational drill periods. Professor Martin.
- 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 conversational drill periods, including student discussion of current topics and systematic vocabulary building. (c) For 5 hours credit: (a) and (b) combined. Professor Martin.
- RL 207, 208, 209. **Spanish Literature.** 3 hours each term.
(Third-year Spanish.) Reading of masterpieces of various periods; general survey of Spanish literature. Prerequisite: two years of college Spanish or the equivalent. Professor Martin.
- RL 214, 215, 216. **Directed Reading in Spanish.** 1 or 2 hours each term.
Reading in Spanish in the field of the student's major. Open to students who have had the equivalent of second-year college Spanish. 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.

COURSES IN SLAVIC LANGUAGES: RUSSIAN

LOWER-DIVISION COURSES

- SL 1, 2, 3. **First-Year Russian.** 3 or 4 hours each term.
Elements of pronunciation, grammar, reading, and conversation; scientific and technical articles. Prerequisite: consent of instructor. Assistant Professor Riasanovsky.
- 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 conversational drill periods, 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 Riasanovsky.

Speech

I NSTRUCTION in speech has for its purpose to build strength of personality by aiding students in the development of clear, original thinking, and by giving training in the correlation, organization, and presentation of knowledge gained through study and experience. Much drill and criticism are given on organization of material, on platform work, and on the principles that underlie effective reading and speaking. The training goes far in helping to overcome self-consciousness and other emotional inhibitions, and in aiding to build up a strong personal address.

Courses in interpretation and community drama are conducted not only as a means of rounding out the speech training, but also as an aid to prospective teachers and other community leaders in the directing of plays and in the making of stage settings, costumes, and other equipment. A well-equipped radio studio is 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 on the campus each year, and much individual attention is given to students who wish to prepare for such work.

Speech Correction. A clinic is maintained by the department for those who are handicapped with the various speech impediments, such as stammering, lisping, nasality, and the like. Advice and treatment are given for both organic and functional difficulties. An attempt is made to understand the factors in the life of the individual that have caused any emotional difficulties, and when they are located an attempt is made to eradicate them. For each student wishing to take this work individual conferences are given during which his speech difficulties receive special consideration.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

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

Development and presentation of original speeches; vocabulary building; pronunciation; voice, gesture, bearing; organization; delivery. Professors Mitchell and Wells, Associate Professor Knoll. 1

Sp 120. Voice and Diction. 3 hours spring.

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

Sp 121. Interpretation I. 3 hours any term.

Analysis of material for content and purposes; emotional reactions that give color and interest; expressive voice; correction of erroneous habits; poise. Associate Professors Barnes and Young.

Sp 122. Interpretation II. 3 hours any term.

Impersonation; character analysis and characterization. Prerequisite: Sp 121. Associate Professors Barnes and Young.

Sp 123. Interpretation III. 3 hours spring.

Interpretation of poetry; psychology of audience reaction to material presented; the speech chorus; advanced work in expressive voice. Prerequisite: Sp 120. Associate Professor Barnes.

Sp 211, 212, 213. Oratory Squad. 3 hours each term.

Original manuscript speeches; preparation for intercollegiate competition. Credit in only one of these courses may be earned in any academic year. Prerequisite: Sp 111, 221; consent of instructor. Professors Mitchell and Wells.

- Sp 214, 215, 216. **Extempore Speaking Squad.** 3 hours each term.
Preparation for intercollegiate competition. Maximum of 3 hours credit in any academic year. Prerequisite: Sp 111, 112; consent of instructor. Professors Mitchell and Wells, Associate Professor Knoll.
- Sp 217, 218, 219. **Debating.** 3 hours each term.
Argumentation principles; analysis and brief-drawing; debate participation. Credit in only one of these courses may be earned in any one year. Prerequisite: consent of instructor. Professor Mitchell, Associate Professor Knoll.
- 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. Associate Professor Knoll.
- Sp 221. **Speech Composition.** 3 hours fall.
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 fall or spring.
Parliamentary usage applied in deliberative assembly, conference, symposium, and panel discussion. Students serve as chairman and secretary of meetings. Practice in group discussions and procedure. Professor Wells.
- Sp 244. **Stagecraft and Lighting.** 3 hours any term.
Construction of scenery and stage properties; lighting and lighting equipment; practical experience in lighting, stage management, construction of settings, including realistic and suggestive. Associate Professor Young.
- Sp 247, 248, 249. **Community Drama.** 3 hours each term.
For community leaders. The community-drama idea; suitable plays; stage technique and acting; directing and play production; experience in producing plays. Prerequisite: consent of instructor. Associate Professor Barnes.
- Sp 251. **Workshop Theater Players.** 1 to 3 hours any term.
For participation in campus plays, credit totaling not exceeding 6 hours is given on recommendation of the instructor. Professor Mitchell, Associate Professors Barnes and Young.
- 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.
- Sp 292. **Speech Defects.** 3 hours spring.
Nature, causes, diagnosis, and treatment of speech defects. For students requiring knowledge of speech problems of children and adolescents. Offered also in special sections for students who wish to overcome their own speech difficulties. Professor Wells.

UPPER-DIVISION SERVICE COURSES

- 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; practice broadcasting over KOAC. Prerequisite: Sp 111, 120, 121, or consent of instructor. Professor Mitchell.

Social Science

KNOWLEDGE of the social sciences is essential for enlightened citizenship and for leadership in the political and economic life of our time. Instruction in this field is offered at Oregon State College through the departments of General Social Science, Economics, History, Philosophy, Political Science, Psychology, and Sociology.

The State College offers lower-division and service courses in the social sciences, not only for students planning to major in this field at the University, but also for students majoring in other fields.

General Social Science

CERTAIN phases of the instructional work in social science are of general character, being broader in scope and objectives than any of the departments. Instruction of this type is given through the survey for freshmen and sophomores, which aims to give the student a comprehensive view of social science as a division of knowledge. The subject matter is non-technical and is adapted to the student interested in social science more as a cultural subject than for any other specific purpose. The survey may serve as satisfaction of a Lower-Division Social-Science group requirement but is not usually considered as prerequisite to advanced courses in specialized social science.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

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

Factors that constitute the make-up of society; student thought on social phenomena challenged; scientific methods and application in social sciences; psychology of prejudices, crowd egoism, etc.; social controls; social institutions. Associate Professor Dann.

Economics

INSTRUCTION in the Department of Economics includes lower-division and service courses intended to serve the cultural and informational needs of all students interested in economic problems in relation to citizenship; to supply a lower-division foundation for law, business, or public service, or for majoring in economics at the upper-division level; and to meet the prescriptions found in professional curricula.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Ec 115. Economic Geography. 4 hours winter.

Physiographic basis of commerce and industry; natural resources of the world including Pacific Northwest and Oregon; distribution of labor and industry as determined by natural conditions.

Ec 201, 202, 203. Principles of Economics. 3 hours each term.

The principles that underlie production, exchange, and distribution; practical problems, such as monetary and banking reform, trade regulations, taxation, labor movements, regulation of railways and public utilities.

Ec 211. Outlines of Economics. 4 hours any term.

Economic institutions and their relation to individual and group conduct; 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.

Similar to Ec 201, 202, 203. For students in business and industry.

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 War and Reconstruction. 3 hours fall.

Human and material resources as war potentials; problems of war production; labor problems; war finance; wartime monetary and banking management; economic warfare; reconstruction. Prerequisite: consent of instructor.

Ec 411. Economics of Consumption. 3 hours fall.

Economic principles applied to consumer problems; wealth consumption; living standards; living cost; 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 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) 4 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.

Ec 420. Business Combinations. 4 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. 4 hours fall.

Variations in economic activity viewed in historical perspective; fluctuations and cycles; prosperity and depression; measurement and control. Prerequisite: elementary economics and statistics.

Ec 425. Labor Problems. (g) 4 hours.

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 winter.

Wages and hours; unemployment; labor relations and social insurance; collective bargaining; legal, social, and economic implications of the labor movement. Prerequisite: Ec 425.

Ec 427. Comparative Economic Systems. 3 hours fall.

Analysis and critical appraisal of contemporary economic systems. Prerequisite: elementary economics.

Ec 435. Transportation. (g) 4 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 fall.

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.

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.

Origins and development of western civilization to the present; social, economic, and political factors; relation of the past to contemporary civilization. Professors Vaughn and Ellison.

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

The aim is to introduce students to the history, civilization, and political, economic, cultural, and social problems of the Far East. Professor Ellison.

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

The constitutional and political history of England; the expansion and present position of the British Empire. Hst 207, 208 when followed by Hst 209 satisfy group requirement in Social Science. Professor Vaughn.

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

The war and the problems of reconstruction in the light of their historical antecedents and causes. With Hst 207, 208, satisfies group requirement. Professor Vaughn.

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

The rise and development of American civilization from the beginning to the present; special attention to economic, social, and cultural life, political changes, and international relations. Professor Ellison.

UPPER-DIVISION SERVICE COURSE

Hst 377. History of Oregon. 3 hours winter or spring.

Aims to present a fairly detailed survey of the political, economic, social, and cultural development of Oregon and the Pacific Northwest from the beginning to the present. Lectures, readings, reports. Professor Ellison.

Philosophy

LOWER-division instruction in philosophy is intended both for students who anticipate more advanced study of philosophy and for those who desire a brief introductory study only.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Phl 211, 212, 213. Practical Life Philosophies. 2 hours each term.

The American gospel according to Benjamin Franklin and Abraham Lincoln; the Nietzschean Superman or Dictator; Marxist socialism and Christian democracy; introduction to Plato. Professor Warrington.

Political Science

THE courses in political science are designed primarily to prepare for intelligent citizenship and effective participation in public affairs; to give the student an active interest in the structure of political life and the operation of governments, and an understanding of current political questions; and to lay a foundation for majoring in political science at the upper-division level.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

PS 201, 202, 203. Modern Governments. 4 hours each term.

(1) American National Government; contemporary reforms. (2) State and Local Governments; practical operation and contemporary reforms in

Oregon. (3) European Governments; England, France, and Germany. Professor Magruder.

PS 212. **American National Government.** 3 hours any term.

An abridgment of PS 201. Restricted to professional-school students. Professors Dubach, Magruder, Assistant Professor Poling.

PS 231, 232, 233. **Current Affairs.** 2 hours each term.

Man's activities as told in the press and by telegraph, cable, and radio; relation of current happenings to established principles and existing organizations. For freshmen and sophomores only. Professor Dubach, Assistant Professor Poling.

UPPER-DIVISION SERVICE COURSES

Prescribed in major curricula in degree-granting schools at the State College and also available as electives to students majoring in such schools.

PS 331. **Current Affairs.** 2 hours spring.

For juniors and seniors only. Similar to PS 231 except that much more extensive readings are required. Professor Dubach.

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

The organization, functions, and present-day problems of city and town government; the cities of the Northwest. Professor Magruder.

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

Nature and history of international relations; League of Nations and the World Court; international interdependence; United States foreign affairs; her protectorates; causes of wars; contemporary conditions. Professor Magruder.

PS 418. **Latin-American Relations.** (g) 3 hours fall or winter.

Critical study of resources, population, social and political movements; form of government, particularly emphasizing the effects on inter-American relationships. Professor Dubach.

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

Races; trade conditions; Chinese-Japanese relations; Russo-Japanese affairs; the possessions of the United States in the Pacific. Professor Dubach.

PS 430. **Public Service.** 3 hours.

Governmental employment in the United States; opportunities and responsibilities; policies and problems.

GRADUATE SERVICE COURSES

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

Psychology

PSYCHOLOGY courses are intended to meet the needs of students desiring a knowledge of psychology as part of their general education or as a foundation for work in education or in child development; to prepare students to major in psychology at the upper-division level; and to meet the service needs of various schools and departments that require psychology as a part of their program of training.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- Psy 111. **Mental Hygiene.** 3 hours any term.
The conditions of healthy mental development and of effective reactions to life and the college environment; the habits, attitudes, and reactions of the efficient mind. No credit is given to students who have taken Ed 102.
- Psy 112, 113, 114. **Aids to Effective Thinking.** 3 hours each term.
An examination into the main travelways of human thinking (past and present) to reveal the modes, methods, illusions, and errors of the mind in attempting to solve the problems of life. Professor Brumbaugh.
- Psy 201, 202, 203. **Elementary Psychology.** 3 hours each term.
An introductory study of the material of general experimental psychology, learning, memory, perception, imagination, sensation, attention, reasoning, instinct, emotion, will, etc.
- Psy 204, 205, 206. **Elementary Psychology Laboratory.** 1 hour each term.
An introduction to laboratory experimental methods. Operated in coordination with Psy 201, 202, 203, which must be taken at the same time or have been taken previously. One three-hour laboratory period.
- Psy 212, 213, 214. **Modern Logic and Scientific Method.** 3 hours each term.
Revised use and application of syllogistic reasoning and the present elaboration of new investigational, logical methods of scientific procedure; class roundtable discussion. Professor Brumbaugh.
- Psy 215. **Industrial Psychology.** 3 hours any term.
Application of psychology to industrial problems; measurement, prediction and influence of individual and group behavior; industrial psychology research. Professor Chambers.
- Psy 221, 222. **Outlines of Psychology.** 3 hours each term.
A study of the fundamental facts of human equipment and behavior; instinct, emotion, sensation, feeling, memory, imagination, suggestions, will, reason, and personality.

UPPER-DIVISION SERVICE COURSES

- Psy 471, 472, 473. **Individual Differences.** (g) 3 hours each term.
Theories in regard to individual differences; experimental evidence; importance in personal, educational, and social adjustments; guiding and directing normal development. Prerequisite: Psy 201, 202, 203, or Psy 221, 222. Professor Chambers.

GRADUATE SERVICE COURSES

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

Sociology

ALL the lower-division instruction in sociology, like that in the related social sciences, is intended to contribute to the task of training for good citizenship through a better understanding of the principles that govern human associations and relationships. Particular attention is given to attitudes and habits of mind and characteristic reactions to public events and social institu-

tions. An insight is given into contemporary social problems. Fundamental instruction is provided for students who may later wish to major in sociology at the upper-division level. Courses are also designed to meet the needs of those who are majoring in home economics, engineering, education, and other fields.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- Soc 201, 202, 203. **Elements of Sociology.** 3 hours each term.
Man's cultural heritage; man's social nature; collective behavior; community and social organization; social interaction; social change and its effects; social problems. Professor Bakkum, Associate Professor Dann.
- Soc 211. **General Sociology.** 4 hours any term.
Phenomena of group life; social origins; group behavior and social institutions; sociological principles and their application to modern social problems. Professor Bakkum, Associate Professor Dann.
- Soc 212. **General Sociology.** 3 hours any term.
An abridgement of Soc 211. Restricted to science and upper-division professional and technical school students. Professor Bakkum, Associate Professor Dann.

UPPER-DIVISION SERVICE COURSES

Prescribed in major curricula in degree-granting schools at the State College and also available as electives to students majoring in such schools.

- Soc 312. **The Family.** 3 hours winter.
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. Associate Professor Dann.
- Soc 314. **Educational Sociology.** 3 hours spring.
Analysis of contributions of sociology to educational problems and practices. School of Education students may count this course toward the 36 required hours in education. Prerequisite: elementary sociology. Professor Bakkum.
- Soc 364. **Rural Sociology.** 3 hours fall.
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) 2 or 3 hours each term, winter and spring.
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. Prerequisite: basic work in general sociology. Professor Bakkum.
- Soc 465. **Urban Sociology.** 3 hours.
The modern city and metropolitan region; differentiation of function; transportation; communication; urban complexity; ecological segregation; city as a human phenomenon. Professor Bakkum.
- Soc 474. **Social Psychology.** (g) 3 hours fall.
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. Professor Bakkum.

GRADUATE SERVICE COURSES

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

Architecture and Allied Arts

IN THE field of Architecture and Allied Arts Oregon State College offers instruction through two departments: Art and Architecture, and Landscape Architecture. The program of courses is intended, not only to lay the foundation for specialization in architecture and allied arts, but also to serve the needs of students majoring in other fields.

Art and Architecture

FUNDAMENTAL instruction in drawing, painting, architectural theory, design, composition, and color is offered in the Department of Art and Architecture, together with training in art appreciation. Students majoring in other fields may take art or architecture as a minor or as service courses, or students may pursue the courses in preparation for majoring in art or architecture at the University.* A joint curriculum in Structural Design in Architecture, with the first two years at the University and the last two years in the School of Engineering and Industrial Arts at the State College is described under SCHOOL OF ENGINEERING AND INDUSTRIAL ARTS.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

AA 111, 112, 113. Graphics I. 2 hours each term.

First year. The principles of orthographic projection or descriptive geometry; application to the construction of plans and elevations; projections of points, lines, and planes; location of shades and shadows for design problems.

AA 114, 115, 116. Survey of Creative Arts (Art Appreciation). 1 to 3 hours each term.

Principles and practices of the arts. The aim is an understanding of why men had the urge to produce the arts in the first place; the types of usefulness the arts serve today.

AA 120. Construction. 1 hour spring.

Introduction to architectural elements by means of individual research and observation; sketching of existing examples; class discussion.

* Under present budget conditions, however, the lower-division work is not completely parallel and such students may be required to take at the University certain required lower-division work not at present offered at the State College.

- AA 160, 161, 162. Color and Composition.** 3 hours each term.
Relations of line, areas, mass, neutral values, and color values in pictures, decorations, and interior schemes. Applies to both creative processes and appreciation. Adapted to needs of home economics students.
- AA 178, 179, 180. House Planning and Architectural Drawing.** 2 or 3 hours each term.
Small-house construction, detail drawing, and architectural drafting, with particular reference to the needs of students majoring in home economics and industrial arts.
- AA 212. Graphics II.** 2 hours.
Second year. Continuation of AA 113. Completion of the work in shades and shadows; practical methods of constructing perspectives.
- AA 290. Lower-Division Painting.** 2 or 3 hours each term, six terms.
First year: still life, figure, and landscape; arrangement in relation to the background. Various mediums employed. Second year: advanced still life and human figure. Individual achievement in technique is encouraged.
- AA 291. Lower-Division Drawing.** 2 or 3 hours each term, six terms.
First year: shading and perspective, leading to an understanding of essential structure. Second year: human figure; interrelationships of forms and adaptation to decoration.
- AA 295. Lower-Division Decorative Design.** 2 or 3 hours each term, six terms.
First year: lines, shapes, neutral tones, and colors in decorative expression. Second year: further decorative problems. Aim is to develop ability to plan and carry out a design for a given purpose.
- AA 297. Lower-Division Architectural Design.** 1 to 5 hours each term.
Fundamental principles of architectural design are studied by means of plans and renderings of architectural details.

Landscape Architecture

ALL instruction in landscape design is correlated with the instruction in closely related arts. In addition to the landscape courses, the student is instructed also in plant propagation, soils, surveying, and other practical phases of the profession. The campus constitutes an out-of-door living laboratory of unusual interest and value to students in landscape architecture.

Field Trip. It is recommended, but not required, that students take the departmental field trip of about one week. Parks, gardens, city planning, and other landscape projects are studied. The areas about Seattle, Portland, and San Francisco are visited in turn. Students majoring in the department have opportunities to speak before garden clubs and other organizations, and on radio garden programs.

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

Joint Major Curriculum. A five-year curriculum in landscape architecture involving attendance at both the State College and the University was

established in 1932. A student may spend his first two years at the State College, completing during these years the required professional work offered at Corvallis, and transfer to the University for the last three years of professional work. A student may spend his first two years at the University, in which case he spends his third year at the State College, returning to the University for his last two years. Curricula for students who begin at the State College and for those who begin at the University are printed below.

FOR STUDENTS TAKING FIRST TWO YEARS AT STATE COLLEGE

First Year (State College)

	Term hours		
	F	W	S
Graphics (AA 111, 112, 212)	2	2	2
General Botany (Bot 201, 202, 203)	3	3	3
Home Ground Planning (LA 279)	3	3	3
History and Literature of Landscape Architecture (LA 356, 357, 358)	2	2	2
English Composition (Eng 111, 112, 113)	3	3	3
Lower-Division Architectural Design (AA 297)	2	---	---
Construction (AA 120)	---	---	1
¹ Group requirements in Language and Literature or Social Science	3	3	3
² Military Science (men) and Physical Education	2	2	2
	17	18	16

Second Year (State College)

Lower-Division Architectural Design (AA 297)	---	1	1
Lower-Division Landscape Design (LA 290)	2	2	2
Plane Surveying (CE 226, 223)	3	---	3
Plant Propagation (Hrt 311)	---	3	---
Maintenance and Construction (LA 359, 360, 361)	3	3	3
Plant Materials (LA 326, 327, 328)	3	3	3
Soils Improvement (Sls 215)	2	---	---
Military Science (men) and Physical Education	2	2	2
Electives	2	3	3
	17	17	17

Third Year (University)

Lower-Division Architectural Design continued, Lower-Division Drawing, Construction, Upper-Division Landscape Design, Plant Composition, and electives.

Fourth and Fifth Years (University)

Same as for Students Beginning at University (see below).

FOR STUDENTS TAKING FIRST TWO YEARS AT UNIVERSITY

First and Second Years (University)

Graphics, Architectural Design, Drawing, Landscape Architecture, Architectural History, Construction, Landscape Design, Botany, English Composition, group requirement and electives.

Third Year (State College)

	Term hours		
	F	W	S
Plant Materials (LA 326, 327, 328)	3	3	3
History and Literature of Landscape Architecture (LA 356, 357, 358)	2	2	2
Plane Surveying (CE 226, 223)	3	---	3
Maintenance and Construction (LA 359, 360, 361)	3	3	3
Plant Propagation (Hrt 311)	---	3	---
Soils Improvement (Sls 215)	2	---	---
Intermediate Landscape Design (LA 390)	3 or	(3) or	(3)
Graphics II (AA 212)	---	---	2
Electives	---	4	3
	16	15	16

¹Work in a foreign language is not required for the Bachelor of Landscape Architecture degree. Students wishing to earn the Bachelor of Arts degree will take a modern foreign language during their freshman and sophomore years, and will complete group requirements in Language and Literature or Social Science in the third or fourth year of the curriculum.

²General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education. Women take Social Ethics (PE 131) one term.

Fourth and Fifth Years (University)

Upper-Division Landscape Design, Architectural History, Construction, Plant Composition, City Planning, Office Practice, Field Practice, group requirement or electives.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- LA 179. **Landscape Architecture (Descriptive).** 2 hours fall.
Home-ground layouts, city parks, national parks, wilderness areas, city planning, and modern garden cities; good taste and general information. No drawing.
- LA 279. **Home Ground Planning.** 2 or 3 hours any term.
Layout and organization of different kinds of property; improvement of home grounds, rural and urban; drafting. Two two-hour drafting periods; 1 lecture. Professor Peck.
- LA 290. **Lower-Division Landscape Design.** 2 hours each term.
Design of small residence properties, ordinary city lot, town-house, and suburban residence properties of not more than three acres. Prerequisite: LA 279.

UPPER-DIVISION COURSES

- LA 326, 327, 328. **Plant Materials.** 3 hours each term.
Trees, shrubs, vines, and perennials and their uses in plant composition. Professor Peck.
- LA 356, 357, 358. **History and Literature of Landscape Architecture.** 2 hours each term.
Story of gardens as an outgrowth of living conditions of the times from early Egyptian to the modern America; builds up judgment and knowledge concerning landscape design. Professor Peck.
- LA 359, 360, 361. **Maintenance and Construction.** 3 hours each term.
Concise and practical knowledge of the maintenance of parks, estates, cemeteries, and golf courses; golf-course construction and the building of tennis courts, walks, roads, and water effects. Professor Peck.
- LA 379. **Landscape Architecture.** 3 hours spring.
Arrangement of features and elements in ranger stations, recreation areas, state parks, overlooks, and summer-home sites. Prerequisite: LA 279. Two lectures; 1 two-hour drafting period. Professor Peck.
- LA 382, 383, 384. **Layout of Small Properties.** 2 or 3 hours each term.
The city lot, small suburban properties, and other areas; sketch plans, finished renderings, and contour problems. Two three-hour laboratory periods. Prerequisite: LA 279, 290. Miss Edith Schryner, nonresident lecturer.
- LA 390. **Intermediate Landscape Design.** 3 hours.
Continuation and enlargement of LA 290.
- LA 392, 393, 394. **Planting Plans.** 2 hours each term.
Planting plans; estimates of costs; construction and seasonal care of the planting areas. Two three-hour laboratory periods. Prerequisite: LA 279, 326, 327, 328. Miss Edith Schryner, nonresident lecturer.

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.

The lower-division courses permit a student to prepare to major in journalism at the University. A full journalistic training combined with a technical specialty may be arranged in a four- or five-year curriculum utilizing the facilities at both the University and the State College.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

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

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. Associate Professor Shideler, Assistant Professor Lake.

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 McIntosh, 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. Associate Professor Shideler.

UPPER-DIVISION SERVICE COURSES

J 312. Special Feature Articles. 3 hours winter or spring.

Writing of special articles along the line of the student's own major; study of the media of such articles; practice in popularization of scientific material. Prerequisite: J 111. Assistant Professor Lake.

J 313. Public Information Methods. 3 hours winter or spring.

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. Associate Professor Shideler.

J 314. Technical Writing. 3 hours any term.

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

Music

STUDENTS may pursue music study at the State College as a part of a curriculum involving a major in another field, or they may prepare in the freshman and sophomore years to major in music at the University. Music is recognized at the State College as of fundamental value in the development of personality, enriching the life of every man or woman who learns to appreciate it. In the education of every young woman preparing for homemaking, in supplementing the resources of the teacher and others, music is regarded as of special importance. The institution maintains a noteworthy program of musical activities, together with exceptional opportunities for music study. The faculty in music has been selected with great care, numbering among its members musicians of the highest rank, who, through study and concert work in the large musical centers of this country and Europe, bring to their students the highest ideals prevailing in these centers. The assistant instructors employ the same methods as their superiors, thus preparing the less advanced students for effective study under the principal instructors when they later enter upon more advanced study.

Training and experience in performance before the microphone of radio station KOAC are valuable features in all phases of the work.

Musical Activities. Musical organizations at the State College include the R. O. T. C. Band, the Co-Ed Band, the Orchestra, the Glee Club, and the Madrigal Club. Under the direction of the faculty in music a series of Sunday afternoon Vesper Concerts is presented throughout the college year. The Orchestra and the Glee Club give programs both entertaining and educational in character. Recitals by members of the faculty and by the more advanced students are also given.

Courses. Students enter the State College with varying degrees of proficiency in music. Consequently a considerable range of music courses has been provided. For students carrying a heavy program of required work, many of the courses permit carrying from one to three hours credit, while for students in curricula providing opportunity for more elective work, more credit may be carried with the approval of the Director, as determined by the individual student's previous preparation.

Students who have had sufficient preparation may pursue advanced study in music under one of the principal instructors. So far as their music work is concerned such students are artist students of the music faculty; they are registered in the State College only in so far as they may be pursuing regular courses, either as carrying a full major curriculum in one of the degree-granting schools or as optional or special students, not candidates for a degree.

Teaching Minor. Students who are preparing to enter some field of teaching for which training is given at the State College may take a minor in music designed to fit them to take charge of high-school choruses, bands, and orchestras in connection with their other teaching. For the minor see SCHOOL OF EDUCATION.

Applied Music. Courses are offered in all phases of applied music at the State College, including piano, singing, violin and violoncello, plectral instruments, and band instruments. Students may study any phase of applied music throughout four years, taking from one to four term hours in any term accord-

ing to the course pursued. The maximum credit in applied music acceptable toward a B.A. or B.S. degree is twelve term hours.

Group instruction in voice, stringed instruments, and band instruments is available to students pursuing the minor in music in the School of Education (see courses Mus 191, 192).

PIANO. Instruction in piano is offered to meet the needs of students in various stages of proficiency from the beginner to the artist student. Thorough foundation in technique is developed on a highly scientific basis. Monthly group meetings of the more advanced students give an opportunity to accustom the students to play before others. Students may take from one to six term hours each term and are required to devote from one to three hours daily to practice.

VOICE. Students who wish to develop their singing voices are offered excellent opportunity for instruction. Each student is treated individually and is assigned exercises and songs according to his stage of vocal development. For the more advanced students opportunity to sing before various campus audiences and over the radio is provided. Students may take from one to four term hours each term, requiring from one-half to two hours daily practice.

VIOLIN AND VIOLONCELLO. Instruction in violin and violoncello is available to suit the requirements of the student, from beginner to finished artist. To those of adequate ability opportunity is afforded to play in the symphony orchestra and in similar groups and to appear as soloists before various campus audiences and over the radio. Students may take from one to six term hours each term, requiring from one to three hours daily practice.

LECTRAL INSTRUMENTS. Mandolin, guitar, and banjo instruction is available at reasonable cost. Students reaching a fair degree of proficiency have opportunity to join the Mandolin and Guitar Club, which meets weekly for ensemble playing. Students may take two term hours each term, requiring one hour daily practice.

BAND INSTRUMENTS. Courses in band instruments include cornet, trombone, clarinet, oboe, bassoon, baritone, saxophone, flute, Bb bass, Eb bass, drums, French horn, bells, and xylophone.

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

Equipment. The entire top floor of the Administration Building is devoted to studios, offices, and other needs of the work in music. Ample facilities for teaching and practicing are provided.

Tuition and Fees. Private lessons are one-half hour in length. Class lessons are fifty minutes in length. All fees are payable strictly in advance.

	One term	
	One lesson a week	Two lessons a week
INDIVIDUAL INSTRUCTION		
<i>Piano</i>		
Mrs. Petri	\$30.00	\$60.00
Mrs. von Lehe	18.00	36.00
<i>Voice</i>		
Mrs. Petri	30.00	60.00
<i>Violin, Viola, Cello</i>		
Mr. Moore	30.00	60.00
Miss Bowden	15.00	30.00
<i>Banjo, Guitar, and other Small Strings</i>		
Miss Bowden	15.00	30.00
<i>Band Instruments</i>		
Mr. Beard	15.00	30.00
<i>Theory and Allied Subjects</i>		
Private Instruction	30.00	60.00

	One lesson a week	Two lessons a week
*GROUP INSTRUCTION (see Mus 191, 192)		
<i>Voice</i>		
Mr. Petri	15.00	.....
<i>Stringed Instruments</i>		
Mr. Moore	7.50	.....
<i>Band Instruments</i>		
Mr. Beard	7.50	.....
RENTAL		
<i>Piano Rental</i>		
1 hour a day, a term (for voice students only)		\$ 3.00
1 hour a day, a term		5.00
2 hours a day, a term		7.50
3 hours a day, a term		10.00
4 hours a day, a term		12.50
<i>Orchestra Instruments, Band</i>		
Viola, cello, bassoon, and oboe are available for practice purposes for \$3.00 per term for one hour weekly. Bassoon and oboe players must furnish their own reeds, and viola and cello students must replace broken strings with new ones. Any damage done to the instruments through carelessness or negligence of student must be replaced at student's expense.		
<i>Studio Rental</i>		
1 hour a day, a term (without use of piano)		\$2.50

DESCRIPTION OF COURSES

Mus 111, 112, 113. **Harmony I, II, III.** 3 hours each term.

Laws of overtone; diatonic scale; scale drills; melodic principles developed from tetrachord relations, and awakening of harmonic consciousness; triads, seventh chords; by-tones; keyboard drills; ear drills; free harmonization; melody writing; simple transposition and modulation.

Mus 121. **Appreciation of Music.** 1 hour any term.

Illustrated lectures, using the phonograph and other means to stimulate and arouse interest in good music. Elementary in nature. Required of home economics students; elective to others. Two lectures.

Mus 122, 123. **Appreciation of Music.** 1 hour each term, winter and spring.

Winter term: symphonic music; request numbers; general discussion. Spring term: grand operas; request numbers; general discussion. Two lectures.

Mus 127, 128, 129. **Music Survey.** 1 hour each term.

Intensive study of rhythm and melody writing or construction; study of acoustics; orchestral instruments; terminology and embellishments; song form, suite, sonata. Two lectures.

Mus 147, 148, 149. **Sightsinging and Ear Training.** 1 hour each term.

Writing from tonal dictation, singing melodies, rhythmic problems; rhythmic dictation. Two recitations.

Mus 190. **Individual Instruction.** 1 to 4 hours each term.

Individual instruction, any six terms, in piano, voice, violin, plectral instruments, and band instruments.

Mus 191. **Group Instruction in Voice.** 1 hour each term, two terms.

Open only to students pursuing the minor in music in the School of Education.

* Group instruction is not given to classes of fewer than four, and is available only to students pursuing a teaching minor in music.

Mus 192. Group Instruction in Stringed Instruments and Band Instruments. 2 hours each term.

Group instruction, though not intended to supplant individual instruction, has its own advantages: economy, extra interest, the benefit of composition. Classes of four or more for any stringed instrument or band instrument.

Mus 211, 212, 213. Harmony IV, V, VI. 3 hours each term.

Use of secondary chords in free harmonization; altered chords; modulation and keyboard work continued; analysis of great composers' use of harmony and modulation. Two periods.

Mus 290. The College Chorus. 1 hour each term, three terms.

For students who can pass the necessary vocal test. Glee and Madrigal Clubs. Three periods.

Mus 291, 292, 293. Orchestral Conducting (Elementary). 2 hours each term.

Organization of the amateur orchestra; progressive materials; transposition; simple arrangements; manipulation of the various instruments; baton technique; experience in conducting. Prerequisite: Mus 111, 112, 113.

Mus 295. Band. 1 hour each term, three terms.

This organization is maintained for women students who have been active in high-school bands and wish to continue with this type of musical expression. Open to all who can pass the necessary test. Two periods.

UPPER-DIVISION SERVICE COURSES

Mus 324, 325, 326. Advanced Conducting and Orchestration. 2 hours each term.

Applied orchestral conducting for the advanced student. The fine points of conducting, scoring, and arranging for full symphonic orchestra; literature suitable for such a group. Prerequisite: Mus 291, 292, 293. Professor Moore.

Mus 331, 332, 333. Band Organizations. 2 hours each term.

Technique and repertoire of band instruments; organizing and developing ensembles; band administration; instrumentation; elementary arranging; use of baton. Prerequisite: Mus 111, 112, 113. Professor Beard.

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

Organization and administration of the military and concert band. The student is given opportunity to conduct the band in public performance of a standard overture. Prerequisite: Mus 331, 332, 333. Professor Beard.

Mus 390. Individual Instruction. 1 to 4 hours each term.

Continuation of Mus 190. Individual instruction, any six terms, in piano, voice, violin, plectral instruments, and band instruments.

Mus 391. The College Orchestra. 1 hour each term, three terms.

For students who play orchestral instruments and who can pass the necessary test. Three periods. Professor Moore.

Mus 433. Glee Club Conducting. 1 hour spring.

High-school chorus conducting; baton technique; choral arrangements suitable for high-school students; other topics. For students who have completed all other requirements of a teaching minor in music. Professor Petri.

Religion

ESTABLISHMENT of a chair of Religion was authorized in 1928, and the first courses were offered in the fall term of 1928-29. The Department of Religion is nonsectarian in spirit and organization.

The purpose of the Department of Religion is threefold:

(1) The courses in religion seek to develop an appreciation of the nature and processes of religion in the light of conditions affecting life today, thus enabling students to make such adjustments as will vitalize religion for them.

(2) The courses are determined for the most part by the needs of the larger group of students at the College, who are preparing for service in the fields of science, engineering, agriculture, home economics, teaching, etc.

(3) Special attention is given to the religious training of those students who anticipate lay-leadership in the churches of their local communities, as well as to those who plan to enter social service or the religious vocations, such as missionary work, the ministry, directors of religious education, pastor's assistant, professional leadership of religious organizations, etc.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

R 211. The New Testament and Its Historical Background. 2 hours winter.

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

R 220. The Sermon on the Mount. 1 hour any term.

Intensive study of a limited New Testament passage; the content of Jesus' teaching as embodied in the selected passage; the nontechnical method of Bible study. Professor Warrington.

R 225. The Prophets and Their Message. 1 hour spring.

The early Hebrew prophets as heralds of a new day, spokesmen of a new idealism; significance of the prophets and the value of their messages for the present day. Professor Warrington.

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

Designed to enlarge appreciation of the art and beauty of Bible folklore, story telling, history, poetry, drama, wisdom literature, oratory, and essay. Assistant Professor Baldwin.

UPPER-DIVISION COURSES

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

Work with individuals and groups; social conditions determining program; the Bible in religious education. Prerequisite: students must be engaged in some religious activity on campus or in community. Professor Warrington.

R 461. Religious Orientation. 3 hours fall.

Present status of religion; effect of the new scientific discoveries and significant trends in present-day life; religion in a world of change; basis of authority in religion; the concept of God. Professor Warrington.

R 462. History of Great Religions. 3 hours winter.

Comparative study of the religions that command a large following today, such as Hinduism, Buddhism, Confucianism, Judaism, Christianity, and Islam. Professor Warrington.

R 463. Psychology of Religion. 3 hours spring.

The bearing of psychology on religious thought and life; effects of faith, prayer, worship on personality exemplified by such leaders as Gandhi, Schweitzer, and Kagawa. Professor Warrington.

School of Science

Faculty

FRANCOIS ARCHIBALD GILFILLAN, Ph.D., Dean of the School of Science.
GEORGENA SAMSON, B.S., Secretary to the Dean.

*General Science**

PROFESSORS ALLISON, STEVENSON.
ASSOCIATE PROFESSOR WILKINSON.†
ASSISTANT PROFESSORS H. P. HANSEN, F. H. SMITH.

Bacteriology

PROFESSORS COPSON (department head), LANGTON, SIMMONS.
ASSOCIATE PROFESSORS BOLLEN, H. MORRIS.

Botany

PROFESSORS OWENS (department head), ATWOOD, GILFILLAN (chairman of executive committee, Institute of Marine Biology), PACKARD (director of research, Institute of Marine Biology).
ASSOCIATE PROFESSORS LAWRENCE, GILKEY, SANBORN.
ASSISTANT PROFESSORS F. H. SMITH, H. P. HANSEN.
INSTRUCTORS ROTH‡, LUND (technician).
ASSISTANT REES.

Chemistry

PROFESSORS GILBERT (department chairman), FULTON (emeritus), JONES, GILFILLAN, BUTTS‡, CHRISTENSEN.
ASSOCIATE PROFESSORS MEHLIG, CALDWELL‡, PEASE, FRIEDMAN, CHELDELIN.
ASSISTANT PROFESSORS ROOF‡, WEST, VAN WAGTENDONK.
INSTRUCTORS CALLAWAY, SCOTT‡, M. B. WILLIAMS, CORRUCINI.
RESEARCH ASSOCIATES SCHULEIN, SARETT.
RESEARCH FELLOW COX.
RESEARCH SCHOLAR WOOSTER.
RESEARCH ASSISTANTS GRAHAM, GRIFFITH, PAPP, SIMONSEN, CARLSON (Williams-Waterman Research Project).
GRADUATE SCHOLARS ENGLERT, PEDERSON.
GRADUATE ASSISTANTS JACKSON, RATHKEY, THURLOW, TOMISEK, ZILL.

Entomology

PROFESSOR MOTE (department head).
ASSOCIATE PROFESSORS CHAMBERLIN‡, SCULLEN.

* 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.

† On leave of absence for military or civilian war service.

‡ On sabbatical leave.

ASSISTANTS POST (technician)*, DAVIS (technician and curator).*

Geology

PROFESSORS PACKARD (department head, director of research, Institute of Marine Biology), HODGE, ALLISON.

ASSOCIATE PROFESSORS SANBORN, WILKINSON.*

Mathematics

PROFESSORS MILNE (department head), McALISTER (emeritus), BEATY, G. A. WILLIAMS.

ASSOCIATE PROFESSORS VAN GROOS (emeritus), SOBczyk.*

ASSISTANT PROFESSORS BEARD, KIRKHAM*, HOSTETTER, HAMMER, MANNING, EAGLE.

INSTRUCTORS YOUNG, FOOTE, F. S. BAKKUM, HYLAND (acting), FUNKENBUSCH (acting), RAMSEY (acting).

Nursing Education†

ASSOCIATE PROFESSOR DOLTZ (acting director of department).

ASSOCIATE PROFESSORS WHEELock‡, and WETZEL.

Physics

PROFESSORS WENIGER (department head), BOYNTON (emeritus), ANDERSON (emeritus), YUNKER.*

ASSOCIATE PROFESSORS BRADY*, VARNER.

ASSISTANT PROFESSORS MORGAN, H. R. VINYARD, GARMAN, L. VINYARD (acting).

INSTRUCTORS J. M. MORRIS (acting), CHURCH (acting), LARoe (acting), MARKER (acting).

Science Education

PROFESSORS STEVENSON (department head), ATWOOD.

ASSOCIATE PROFESSORS H. MORRIS, WILKINSON.*

Zoology

PROFESSORS FASTEN (department head), GILFILLAN (chairman of executive committee, Institute of Marine Biology), PACKARD (director of research, Institute of Marine Biology).

ASSOCIATE PROFESSORS ALLMAN, GORDON, WULZEN.

ASSISTANT PROFESSORS OSBORN, SWAN*, DORNFELD, VAN WAGTENDONK (Williams-Waterman research project).

INSTRUCTOR GROBSTEIN.*

ASSISTANTS LAMFROM, WICKERT (Williams-Waterman research project).

* On leave for military or civilian war service.

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

‡ On leave of absence.

General Statement

MAJOR work in the Oregon State System of Higher Education leading to baccalaureate and advanced degrees in the biological and physical sciences and mathematics is centered in the School of Science at the State College. The School of Science performs a three-fold function; it provides:

1. Liberal-arts education with majors in science leading to degrees of Bachelor of Arts or Bachelor of Science.
2. Professional education for students planning to enter some scholarly occupation in the realm of science. Such students take an undergraduate science major and from one to three or more years of graduate study in science.
3. Elective and service courses in science for students majoring in other schools, or for students 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 college; for study in medicine or nursing; for positions in which a knowledge of science is fundamental for research; or for professional work in science or in its many applications in modern civilization.

The instruction in the first two years is made as broad and liberalizing as possible, laying a solid foundation for upper-division and graduate work in the various fields of science and professional schools.

Major Curricula

The departments of General Science, Bacteriology, 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. Each curriculum permits election of at least one-half of a student's work outside of the School of Science, thus enabling the student to obtain a liberal-arts education even though he may be preparing for specialized work in some field of science. The electives should be utilized to meet a definite objective rather than as an easy way of accumulating credit for graduation.

Where the student's chosen field involves an applied field as well as science, he may elect one or more minors in a professional school.

The undergraduate departmental curricula are printed on pages 139-147.

General Science Majors. The general science majors have been organized to meet the needs of students of scientific interests who desire broad general education in science; or plan to be teachers of high-school science, and hence must be adequately prepared in a considerable range of subject matter.

The courses pursued by students are selected on a rather flexible basis from the offerings of the various departments. A special committee is responsible

for the advising of students majoring in this department. The curriculum in General Science is printed on page 140.

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. Under SCHOOL OF EDUCATION are printed the state certification requirements, together with approved teaching majors and minors in biological sciences, general science, mathematics, and physical sciences. Advanced work in Science Education may be obtained by taking courses in the Department of Science Education.

Students preparing to teach health education major in either the School of Science or the School of Education; they will find a wide range of health-education courses in the School of Science; in the Schools of Agriculture, Education, Engineering, and Home Economics; and in the Division of Physical Education. A student can utilize such courses toward a major in the School of Science, electing from the other schools such work as most closely meets his requirements. Both undergraduate and graduate majors in Hygiene and Sanitation are offered in the Department of Bacteriology.

Special Curricula

To meet the needs of special groups of students, the School of Science offers special curricula (1) for premedical students; (2) for nursing education students, and (3) for students preparing to be medical laboratory technicians. Students may likewise prepare for entrance to dental schools and other fields where preparation in science is a prerequisite; for such students programs of study are outlined and guidance given in the work pursued.

Premedical Curriculum. A premedical curriculum including courses prescribed by the American Medical Association for entrance to standard medical schools is offered at both Oregon State College and the University of Oregon. At each institution students pursuing this curriculum work under the supervision of a special Premedical Advisory Committee to insure a selection of studies that will satisfy medical-school entrance requirements and the cultural needs of students planning to enter the profession of medicine. At the State College the chairman of this committee is Professor Nathan Fasten.

For entrance to a standard medical school the student must not only complete prescribed work but also show an aptitude for medical studies. The medical-aptitude test of the Association of American Medical Colleges is given each year by the Premedical Advisory Committee to all students who expect to apply during the next academic year for admission to a medical school. Further knowledge of the student's ability is obtained through frequent conferences between the student and his instructors and authorized advisers.

The 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:

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

(2) Collegiate Preparation. Under its accelerated wartime training program, the Medical School requires for admission a minimum of 123 term hours of college work (exclusive of credit in military science). This work may be completed in two calendar years of four terms each. The following work is prescribed:

	Term hours
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
Vertebrate anatomy	6
Physics	12
Mathematics	6
English	9
French or German	12
Total prescribed credit	77

The work in organic chemistry must include the chemistry of both aliphatic and aromatic compounds. Biochemistry will not be accepted toward meeting the requirements. 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 embryology 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.

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 work in 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 electricity), and elementary physical chemistry.

The specialized premedical training programs of the Army and the Navy, which for the duration of the war will largely determine the organization and content of the premedical curriculum, may require some changes in the prescribed collegiate preparation outlined above.

The Medical School also requires that the student who enters without a Bachelor of Arts or Bachelor of Science degree must complete the work for one of these degrees in the Oregon State System of Higher Education, or in the institution at which he received his premedical preparation, before entering upon the work of the third year at the Medical School. Since the State College, together with most of the colleges and universities of the Pacific Northwest, recognizes credit earned during the first year at the Medical School as credit earned in residence toward a bachelor's degree, the student may obtain a bachelor's degree after one year at the Medical School.

Before entering the Medical School, the student should satisfy all requirements for the Junior Certificate and all requirements for a degree (including State College requirements and requirements for a major within the School of Science) that cannot be satisfied at the Medical School. The courses taken during the first year of medical training, together with the science courses prescribed in the premedical curriculum, will satisfy all major requirements in general science or zoology. Students selecting other liberal-arts majors in the School of Science must satisfy all major requirements before entering the

Medical School, with the exception that Biochemistry (BCh 411, 412), offered at the Medical School, may be counted toward the satisfaction of the major requirement in chemistry.

Students at the Medical School who are candidates for a bachelor's degree from Oregon State College are eligible for loans from the Student Loan Fund of the State College on making arrangements acceptable to the loan fund administration. The Premedical Curriculum is printed on pages 146-147.

Preparatory Nursing Curriculum. Under its accelerated wartime training program, 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 examinations for nurse registration. The student takes four terms of work at Oregon State College at Corvallis, or at the University of Oregon at Eugene. This preparatory work is followed by three years in the Department of Nursing Education on the campus of the Medical School in Portland. The work in Portland is coordinated with clinical education in the Multnomah Hospital, the Doernbecher Memorial Hospital for Children, the University State Tuberculosis Hospital, the Outpatient Clinic, and the Communicable Disease Hospital.

Students in nursing education receive their degree from the University, with the exception that students who take their first two years at Oregon State College receive their degrees from the latter institution.

The Preparatory Nursing Curriculum is printed on page 147.

Curriculum for Medical Technicians. The two-year Curriculum in Preparation for Medical Technicians (page 147) represents the minimum requirements of the American Society of Clinical Pathologists as given in regular courses at Oregon State College with the addition of two terms in physics (12 hours of physics is highly recommended by the Society). As it is difficult to complete all the courses listed here in two years, it is recommended that three years or more be devoted to this curriculum since some hospitals require three years of college work and a few demand a college degree for entrance to the technician's course.

Requirements for Admission and Graduation

STUDENTS entering as freshmen with the definite intention of specializing in science or mathematics or of preparing to enter a medical school, register in the Lower Division for the first two years, designating Science as their "group" of principal interest. The student's aim in the Lower Division is to obtain a broad general education and to determine upon a field in which he desires a major. Students who complete all requirements of the Lower Division receive the Junior Certificate. A student who has not fulfilled all lower-division requirements but has completed two years of college work (93 term hours or more) may be admitted to the School of Science but is responsible to the Lower Division for the completion of the Junior Certificate requirements.

The science advisers, representing the different departments in which upper-division students may major, help students in the Lower Division in the selection of specific courses prerequisite to major work. In the science curricula (pages 139-147), suggested lower-division programs are included to aid students in meeting the requirements for a Junior Certificate and in the selection of those courses that will best prepare for majoring in a particular department.

Baccalaureate Degrees. A student may be granted the degree of Bachelor of Arts or Bachelor of Science by meeting the institutional requirements for the particular degree and completing 192 term hours, of which 45 must be in upper-division work and of these at least 24 must be in 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 Division graduate work is offered leading to the degrees of Master of Arts and Master of Science in each of the science departments, and to the degree of Doctor of Philosophy in the departments of Bacteriology, Botany, Chemistry, Entomology, Geology, Mathematics, Physics, and Zoology. For the requirements for the M.A., M.S., and Ph.D. degrees see GRADUATE DIVISION.

Facilities

MATERIAL facilities for the work of the School of Science include the various laboratories equipped for instruction and research in science. The biological-science laboratories are located in Agriculture Hall. The Department of Mathematics occupies the third and fourth floors of Education Hall; the Department of Geology occupies the first floor of Education Hall, also the former Health Service Building now known as the Paleontology Laboratory; the Department of Chemistry occupies the new Chemistry Hall. The Department of Physics occupies the Physics Building and a part of the Mines Building. Important adjuncts to the instruction in physics are radio station KOAC and the Photographic Service, both located in the Physics Building.

Oregon is a region of almost unlimited opportunities for field studies with plants, animals, and geological materials, thus offering many interesting research problems for advanced and graduate students.

Scientific Collections. In addition to the usual laboratory equipment available in each department, mention should be made of the Herbarium, consisting of 89,000 plants, the Department of Entomology collection of insects numbering more than 150,000 specimens, the Department of Zoology collection of representative birds of Oregon, the Braly Ornithological Collection, and the extensive geological collections of invertebrate fossils and igneous rocks of Oregon. See MUSEUMS AND COLLECTIONS.

Institute of Marine Biology. The Oregon State System of Higher Education maintains an interinstitutional Institute of Marine Biology at Coos Head on the Oregon coast during the summer months. (The operation of the institute has been suspended for the duration of the war.) The institute is located on a 100-acre tract and occupies a group of buildings erected by the Civilian Conservation Corps. The institute is administered under an executive committee of which the Dean of the School of Science is chairman.

Curricula in Science

B.A., B.S., M.A., M.S., Ph.D. Degrees

For each department a general undergraduate curriculum is outlined, including a suggested freshman and sophomore program for students in the Lower Division. Where several majors are listed in a department, the student's electives, or in some cases approved substitutions, provide the desired differentiation.

For the graduate level no specific curricula are outlined. Each graduate student's program is planned according to his particular needs and objectives, under the regulations of the Graduate Division.

GENERAL NOTES

All students in science curricula should observe carefully the following notes:

- The maximum number of term hours required within the School of Science does not exceed 102 in any major curriculum. The maximum number of hours required for a major in any department is 66. The student thus has liberal opportunity to elect courses in other fields as well as in science.
- In the freshman year General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education. Women take Social Ethics (PE 131) one term.
- Students expecting to meet the language requirements for a B.A. degree or to obtain a reading knowledge of German or French in preparation for graduate work may elect a language in the freshman and sophomore years. If two years of German or French are elected in the freshman and sophomore years, the completion of the group requirement in either Language and Literature or Social Science may be postponed until the junior year. Students expecting to major in chemistry or physics may similarly postpone two groups.
- For state teacher's certificate 6 hours of psychology should be elected in the sophomore year as it is prerequisite to upper-division courses in education. Psy 221, 222 meets this requirement; Psy 201, 202, 203 also meets this requirement as well as the Social Science group requirement.
- 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
Group requirement in Social Science or Language and Literature	3	3	3
Approved group requirement in Science	3-5	3-5	3-5
English Composition (Eng 111, 112, 113)	3	3	3
Elementary Analysis (Mth 101, 102, 103) or approved science elective	4	4	4
Military Science (men)	1	1	1
Physical Education	1	1	1
	15-17	15-17	15-17
Sophomore Year			
Group requirement in Social Science or Language and Literature	3	3	3
Sophomore Science sequence	3-5	3-5	3-5
Military Science (men)	1	1	1
Physical Education	1	1	1
² Approved electives	7	7	7
	15-17	15-17	15-17
Junior Year			
² Approved upper-division Science	4	4	4
³ Approved electives	12	12	12
	16	16	16
Senior Year			
² Approved upper-division Science	4	4	4
³ Approved electives	12	12	12
	16	16	16

DEPARTMENT OF BACTERIOLOGY¹

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

Graduate majors: Bacteriology, Agricultural Bacteriology, Food Bacteriology, Hygiene and Sanitation, Soils Bacteriology.

¹See GENERAL NOTES above.

²These 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.

³The electives may include courses in health education leading to special training in that field.

	Term hours		
	F	W	S
Freshman Year			
Group requirement in Social Science or Language and Literature	3	3	3
General Zoology (Z 201, 202, 203)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
General Chemistry (Ch 204, 205, 206)	5	5	5
Military Science (men)	1	1	1
Physical Education	1	1	1
	16	16	16
Sophomore Year			
General Bacteriology (Bac 204, 205, 206)	3	3	3
Group requirement in Language and Literature or Social Science	3	3	3
Organic Chemistry (Ch 226, 227), Quantitative Analysis (Ch 234)	5	5	5
Military Science (men)	1	1	1
Physical Education	1	1	1
¹ Electives	3	3	3
	16	16	16
Junior Year			
Dairy Bacteriology (Bac 411), Pathogenic Bacteriology (Bac 332), Immun- ity and Serum Therapy (Bac 333)	3	3	3
General Physics (Ph 201, 202, 203)	4	4	4
Elementary Physical Chemistry (Ch 340)			3
Electives (recommended)	9	9	6
	16	16	16
Senior Year			
Bacteriological Technique (Bac 431)	5		
Systematic Bacteriology (Bac 441)		3	
Systematic Bacteriology Laboratory (Bac 442)		2	
Physiology of Bacteria (Bac 451)			3
Physiology of Bacteria Laboratory (Bac 452)			2
Seminar (Bac 407)	1	1	1
Electives (recommended)	10	10	10
	16	16	16

DEPARTMENT OF BOTANY²

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

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

	Term hours		
	F	W	S
Freshman Year			
Group requirement in Language and Literature or Social Science	3	3	3
General Botany (Bot 201, 202, 203)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
³ Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
Military Science (men)	1	1	1
Physical Education	1	1	1
Electives	3	3	3
	17	17	17
Sophomore Year			
Group requirement in Social Science or Language and Literature	3	3	3
The Lower Plants (Bot 311), The Higher Plants (Bot 312), Systematic Botany (Bot 313)	4	4	4
General Zoology (Z 201, 202, 203)	3	3	3
Elementary Analysis (Mth 101, 102, 103)	4	4	4
Military Science (men)	1	1	1
Physical Education	1	1	1
	16	16	16
Junior Year			
Principles of Plant Pathology (Bot 351), Principles of Plant Ecology (Bot 341), Principles of Plant Physiology (Bot 331)	4	4	4
General Physics (Ph 201, 202, 203)	4	4	4
⁴ Electives	8	8	8
	16	16	16

¹Mathematics recommended.

²See GENERAL NOTES on page 140.

³Students 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.

⁴Students majoring in botany should elect work in bacteriology and entomology and, if possible, advanced work in the botanical field of chief interest. Hrt 311 is advised for second term of junior or senior year.

	Senior Year	Term hours		
		F	W	S
Microtechnique (Bot 469)		1	3	
Seminar (Bot 407)		1	1	1
Geology (G 201, 202, 203)		3	3	3
Electives		11	8	11
		15	15	15

DEPARTMENT OF CHEMISTRY¹

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

	Freshman Year	Term hours		
		F	W	S
Group requirement in Language and Literature or Social Science		3	3	3
General Chemistry (Ch 204, 205, 206)		5	5	5
English Composition (Eng 111, 112, 113)		3	3	3
Elementary Analysis (Mth 101, 102, 103)		4	4	4
Military Science (men)		1	1	1
Physical Education		1	1	1
		17	17	17

Sophomore Year

Advanced Qualitative Analysis (Ch 231), Quantitative Analysis (Ch 232, 233)	5	5	5
Group requirement in Language and Literature or Social Science	3	3	3
General Physics (Ph 201, 202, 203)	4	4	4
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
Military Science (men)	1	1	1
Physical Education	1	1	1
	18	18	18

Junior Year

² Organic Chemistry (Ch 430, 431, 432)	4	4	4
² Physical Chemistry (Ch 440, 441, 442)	4	4	4
³ Electives	4	4	4
⁴ German or French	4	4	4
	16	16	16

Senior Year

⁵ Approved upper-division Chemistry courses	4	4	4
Electives	9	9	9
	13	13	13

DEPARTMENT OF ENTOMOLOGY¹

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

	Freshman Year ⁶	Term hours		
		F	W	S
Group requirement in Language and Literature or Social Science		3	3	3
General Entomology (Ent 201, 202, 203)		3	3	3
General Zoology (Z 201, 202, 203)		3	3	3
English Composition (Eng 111, 112, 113)		3	3	3
⁴ Elementary General Chemistry (Ch 101, 102, 103)		3	3	3
Military Science (men)		1	1	1
Physical Education		1	1	1
		17	17	17

¹See GENERAL NOTES on page 140.

²Both of these sequences need not be taken in the junior year although the program as listed above is strongly recommended.

³Electives must include at least 5 term hours in humanities, social science, or biological science in addition to the freshman and sophomore requirements in these fields.

⁴Students are expected to acquire a reading knowledge of German (or of French) prior to graduation.

⁵Of the 12 upper-division chemistry electives, 6 term hours must consist of laboratory work, of which 3 must be in Organic Chemistry.

⁶Students planning to major in Forest Entomology should confer with Dr. Don C. Mote.

	Term hours		
	F	W	S
Sophomore Year			
Principles of Forest Entomology (Ent 321), Principles of Economic Entomology (Ent 314), Practical Bee Culture (Ent 335)	3	3	3
General Botany (Bot 201, 202, 203)	3	3	3
Military Science (men)	1	1	1
Physical Education	1	1	1
Electives or group requirement	9	9	9
	17	17	17
Junior Year			
Approved upper-division courses in Entomology	6	6	6
Historical Entomology (Ent 351), Entomological Nomenclature and Literature (Ent 352)	3	3	—
Principles of Plant Pathology (Bot 351)	4	—	—
General Bacteriology (Bac 204)	—	3	—
*Electives	2	3	9
	15	15	15
Senior Year			
Seminar (Ent 407)	1	1	1
Research (Ent 401)	2	2	2
*Electives	12	12	12
	15	15	15

DEPARTMENT OF GEOLOGY²

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

	Term hours		
	F	W	S
Common 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
Military Science (men)	1	1	1
Physical Education	1	1	1
*Electives	4	4	4
	16	16	16

MAJOR IN GENERAL GEOLOGY

Sophomore Year			
Group requirement in Language and Literature or Social Science	3	3	3
Military Science (men)	1	1	1
Physical Education	1	1	1
Geology electives	3	3	3
*Electives	8	8	8
	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

¹Students interested in the statistical phases of applied entomology should elect Elementary Analysis and Statistical Methods. Prospective professional entomologists should elect Ch 251, 252, and 254, or their equivalent as early as convenient. Students majoring in entomology should also elect courses in geology.

²See GENERAL NOTES on page 140.

*Students preparing for professional geology are advised to elect Ch 201, 202, 203.

*Advanced Field Geology (G 380) can be taken during the summer.

MAJOR IN PALEONTOLOGY

Students majoring in Paleontology must take certain courses in addition to meeting the requirements of the curriculum in General Geology. In the sophomore year the geology courses should include Rocks and Minerals (G 350) and either General Botany (Bot 201, 202, 203) or General Zoology (Z 201, 202, 203). The junior year program should include Invertebrate Paleontology (G 340, 341), Paleobotany (G 442); and a second year sequence in biology. In the senior year the student majoring in Paleontology should include Stratigraphy (G 323) in the upper-division electives and 9 to 12 hours of upper-division Zoology or Botany. These latter courses may very profitably be earned at the Institute of Marine Biology.

MAJOR IN PROFESSIONAL GEOLOGY

Sophomore Year

	Term hours		
	F	W	S
Group requirement in Language and Literature or Social Science	3	3	3
Stratigraphy (G 323)	4	---	---
Physiography (G 322)	---	4	---
Structural Geology (G 321)	---	---	4
Intermediate Algebra (Mth 100), Trigonometry (Mth 106)	4	4	---
Plane Surveying (CE 226)	---	---	3
Engineering Drawing (GE 111, 112, 113)	2	2	2
Military Science (men)	1	1	1
Physical Education	1	1	1
Electives	1	1	2
	16	16	16

Junior Year

Mineralogy (G 312, 313, 314)	4	4	4
¹ Advanced Qualitative Analysis (Ch 231), Quantitative Analysis (Ch 232), Elementary Physical Chemistry (Ch 340)	4	4	3
Fire Assaying (Met 471, 472)	2	2	---
Mine Surveying (MIE 453)	---	---	3
Mineral Dressing (Met 481, 482)	3	3	---
Electives	3	3	6
	16	16	16

Senior Year

Petrography (G 412, 413), Mineral Deposits (G 414)	4	4	4
Invertebrate Paleontology (G 340, 341), Paleobotany (G 442)	4	4	4
Approved sequence in Engineering or Physics or Chemistry	4	4	4
Electives	4	4	4
	16	16	16

DEPARTMENT OF MATHEMATICS²

Undergraduate majors: Mathematics with emphasis on any of the fields of the graduate majors.

Graduate majors: Analysis, Algebra, Geometry, Applied Mathematics (including Statistics).

Freshman Year

	Term hours		
	F	W	S
Group requirement in Language and Literature or Social Science	3	3	3
Elementary Analysis (Mth 101, 102, 103)	4	4	4
English Composition (Eng 111, 112, 113)	3	3	3
Military Science (men)	1	1	1
Physical Education	1	1	1
Electives	4	4	4
	16	16	16

Sophomore Year

Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
Group requirement in Language and Literature or Social Science	3	3	3
Physical or Biological Science	3-4	3-4	3-4
Military Science (men)	1	1	1
Physical Education	1	1	1
Electives	3-4	3-4	3-4
	15-17	15-17	15-17

¹Or General Physics (Ph 201, 202, 203), 4 hours each term.

²See GENERAL NOTES on page 140.

Junior Year

	Term hours		
	F	W	S
Upper-Division Mathematics	6	6	6
Physical or Biological Science	3-4	3-4	3-4
Electives	7	7	7
	16-17	16-17	16-17

Senior Year

Upper-Division Mathematics	3	3	3
*Electives	13	13	13
	16	16	16

DEPARTMENT OF PHYSICS²

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
Group requirement in Language and Literature or Social Science	3	3	3
General Physics (Ph 201, 202, 203) or Engineering Physics (Ph 111, 112, 113)	4-3	4-3	4-3
Elementary Analysis (Mth 101, 102, 103)	4	4	4
English Composition (Eng 111, 112, 113)	3	3	3
Military Science (men)	1	1	1
Physical Education	1	1	1
	16-15	16-15	16-15

Sophomore Year

Group requirement in Language and Literature or Social Science	3	3	3
Introduction to Modern Physics (Ph 311, 312, 313)	3	3	3
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
General Chemistry (Ch 204, 205, 206) or Principles of Chemistry (Ch 201, 202, 203) or Elementary General Chemistry (Ch 101, 102, 103)	5-3	5-3	5-3
Military Science (men)	1	1	1
Physical Education	1	1	1
	17-15	17-15	17-15

Junior Year

Physical Measurements (Ph 321, 322, 323)	3	3	3
*Electives	12-14	12-14	12-14
	15-17	15-17	15-17

Senior Year

Radio Communication (Ph 331, 332, 333)	3	3	3
Photography (Ph 361)	3	3	3
Light (Ph 465, 466)	3	3	3
Electives	11-9	11-9	11-9
	17-15	17-15	17-15

DEPARTMENT OF ZOOLOGY³

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

Graduate majors: Invertebrate Zoology, Vertebrate Zoology, Anatomy, Cytology, Embryology, Field Zoology, Histology, Parasitology, Physiology.

¹Include supporting science courses for students planning graduate work in mathematics.

²See GENERAL NOTES on page 140.

³Suggestions: mathematics, photography, modern languages, physics.

	Freshman Year		
	F	W	S
Group requirement in Language and Literature or Social Science	3	3	3
General Zoology (Z 201, 202, 203)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
General Chemistry (Ch 204, 205, 206)	5	5	5
Military Science (men)	1	1	1
Physical Education	1	1	1
	16	16	16

Sophomore Year			
Group requirement in Language and Literature or Social Science	3	3	3
Vertebrate Zoology (Z 204, 205, 206)	4	4	4
Organic Chemistry (Ch 226, 227)	5	5	5
Military Science (men)	1	1	1
Physical Education	1	1	1
*Electives	3	3	8
	17	17	17

Junior Year			
Evolution and Eugenics (Z 314), Genetics (Z 315)	3	3	---
Approved upper-division Zoology	3	3	3
General Physics (Ph 201, 202, 203) or suitable science substitute	4	4	4
*Electives	5	5	5
	15	15	15

Senior Year			
Approved upper-division Zoology	3	3	3
Seminar (Z 407)	1	1	1
Electives	12	12	12
	16	16	16

PREMEDICAL CURRICULUM*

(School of Science and Medical School)

This curriculum during the war period is superseded by the accelerated program outlined on pages 136-138.

Freshman Year			
General Zoology (Z 201, 202, 203)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
General Chemistry (Ch 204, 205, 206)	5	5	5
Military Science (men)	1	1	1
Physical Education	1	1	1
*Electives	4	4	4
	17	17	17

Sophomore Year			
Vertebrate Zoology (Z 204, 205, 206)	4	4	4
Organic Chemistry (Ch 226, 227), Quantitative Analysis (Ch 234)	5	5	5
German or French	4	4	4
Military Science (men)	1	1	1
Physical Education	1	1	1
*Electives	1	1	1
	16	16	16

Junior Year			
General Physics (Ph 201, 202, 203)	4	4	4
German or French	4	4	4
*Electives	9	9	9
	17	17	17

*Ch 234, and Bot 201, 202, 203 are recommended for those wishing a physiological major.

*Ent 471 and G 340, 341 are suggested electives outside the department.

*See GENERAL NOTES on page 140.

*Students should confer with their premedical adviser in the selection of all electives. These electives should include the nonscience group requirement in Language and Literature and in Social Science in order to satisfy the requirements for a Junior Certificate.

MAJOR IN SCIENCE AT THE STATE COLLEGE

B.A., B.S. Degrees

The student preparing to enter a medical school should complete by the end of his junior year an approved major in science and all requirements for a degree except the fourth year of undergraduate residence. The first year at the medical school may be counted in lieu of the fourth year of undergraduate residence. The courses taken during the first year of medical training, together with the science courses prescribed in the premedical curriculum, will satisfy all major requirements in general science or zoology, and biochemistry taken at medical school may be applied toward a major in chemistry.

PREPARATORY NURSING CURRICULUM¹

FOUR-YEAR DEGREE CURRICULUM

See page 138.

Freshman Year

	Term hours			
	F	W	S	Sum.
Elementary General Chemistry (Ch 101, 102, 103)	4	4	4	....
General Zoology (Z 201, 202, 203)	3	3	3	....
English Composition (Eng 111, 112, 113)	3	3	3	....
Introduction to Literature (Eng 104, 105, 106)	3	....	3	3
Elements of Sociology (Soc 201, 202) .....	....	....	....	6
American History and Government	3	3	....	....
Psychology .....	....	3	3	3
² Elective .....	....	....	....	3
	17	17	17	16

CURRICULUM IN PREPARATION FOR MEDICAL TECHNICIANS

The following curriculum is suggested as meeting the requirements of the American Society of Clinical Pathologists for admission to approved training schools. Some hospital authorities require three years of college work and some a bachelor's degree. It is recommended that, where possible, students devote at least three years to preparing for their clinical-laboratory training.

Freshman Year

	Term hours		
	F	W	S
General Zoology (Z 201, 202, 203)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
Social Science including 6 hours in American History and Government	3	3	3
Elementary General Chemistry (Ch 101, 102, 103)	4	4	4
Literature Survey (Eng 101, 102, 103; or Eng 104, 105, 106; or Eng 201, 202, 203, or approved elective)	3	3	3
General Hygiene .....	....	....	2
Physical Education	1	1	....
	17	17	18

Sophomore Year

General Bacteriology (Bac 204). Pathogenic Bacteriology (Bac 332), Immunity and Serum Therapy (Bac 333)	3	3	3
Organic Chemistry (Ch 226, 227), Quantitative Analysis (Ch 234)	5	5	5
Qualitative Physics (Ph 211, 212)	3	3	....
Elementary Human Physiology (Z 211) .....	....	....	5
Physical Education	1	1	1
Approved electives	5	4	3
	17	16	17

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 of the science departments, with the function of supplementing and correlating the work. The courses aim to give the student a comprehensive view of science as a division of knowledge, and are open, both to students majoring in science, and to students in the professional schools. Through the general science major students pursue a broad program of study in science, either for a liberal-arts

¹Shakespeare (Eng 201, 202, 203) may be substituted.²Social Ethics (PE 131) is taken fall term in addition to Physical Education.

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, life sciences, and other fields involving joint majors.

The survey courses in biological and physical science cover the fundamental fields of science rather than the content usually included in the special-science departments. These courses are nontechnical and are designed for the student interested in science more as a cultural subject than for any other specific purpose. The courses may serve as satisfaction of a Lower-Division Science group requirement or as part 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. Assistant Professor Hansen.

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. Professor Allison.

UPPER-DIVISION COURSES

GS 405. **Reading and Conference.** Terms and hours to be arranged.

GS 411, 412, 413. **History of Science.** (G) 2 hours each term.

The development of science from the beginnings, with emphasis on the scientific method and spirit. Prerequisite: eighteen hours of upper-division science, or equivalent.

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. Professor Stevenson.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

GS 505. **Reading and Conference.** Terms and hours to be arranged.

GS 507. **Seminar.** Terms and hours to be arranged.

Bacteriology

BACTERIOLOGY, especially through its 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, agricultural 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.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

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 demonstration period.

Bac 204, 205, 206. **General Bacteriology.** 3 hours each term.

General principles; studies of water, milk, foods, infectious diseases, disinfection, germicides, and preservatives. Prerequisite: one year of chemistry. Two lectures; 2 two-hour laboratory periods. Bac 204 is offered each term.

Bac 230. **Principles of Bacteriology.** 3 hours spring.

Lectures and demonstrations in the basic principles of bacteriology as applied to everyday life.

UPPER-DIVISION COURSES

Bac 332. **Pathogenic Bacteriology.** 3 hours winter.

Confined strictly to the microorganisms associated with disease in man. Prerequisite: Bac 204. Two lectures; 2 two-hour laboratory periods. Professor Simmons.

Bac 333. **Immunity and Serum Therapy.** 3 hours spring.

Theories of immunity and their application to serum therapy; toxins, anti-toxins, vaccines, etc.; normal and pathological blood. Prerequisite: Bac 205 or 332. Two lectures; 2 two-hour laboratory periods. Professor Simmons.

Bac 350. **Applied Hygiene.** 3 hours spring.

Application of the principles of hygiene to sanitary, statistical, governmental, epidemiological, and sociological problems. Prerequisite: junior or senior standing. Associate Professor Morris.

Bac 361. **Forest Sanitation.** 3 hours fall.

The sanitary provisions necessary for forest camps, camp grounds, and summer homes; location and construction of camp facilities. Prerequisite: junior standing in forestry or equivalent. Professor Langton.

Bac 401. **Research.** Terms and hours to be arranged.

Bac 403. **Thesis.** Terms and hours to be arranged.

Bac 405. **Reading and Conference.** Terms and hours to be arranged.

Bac 407. **Seminar.** One hour each term. Professor Copson.

Bac 411. **Dairy Bacteriology.** (g) 3 hours fall.

Physiological activities of bacteria underlying bacterial analysis of dairy products; dairy sanitation; bacteriology of dairy-cattle diseases. Prerequisite: Bac 204. Two lectures; 2 two-hour laboratory periods. Professor Simmons.

- Bac 412. Dairy Bacteriology.** (g) 3 hours winter.
Continuation of Bac 411. A more thorough study of specific problems in dairy bacteriology and practice in special technique. Prerequisite: Bac 411. One lecture; 2 two-hour laboratory periods. Professor Simmons.
- Bac 413. Agricultural Bacteriology.** 3 hours spring.
Application of bacterial activities to farm practices; rural sanitation, disease control, fermentation, food preservation. Prerequisite: Bac 204, Ch 250. One lecture; 2 two-hour laboratory periods. Professor Copson.
- Bac 421. Soil Bacteriology.** (g) 4 hours spring.
Relation of microorganisms to soil fertility; biochemistry of humus decomposition; nitrogen-fixation; ammonification. Prerequisite: Bac 204. Two lectures; 3 two-hour laboratory periods. Associate Professor Bollen.
- Bac 422. Soil Bacteriology.** (G) 3 hours winter.
Continuation of Bac 421. Review of literature on soil bacteriology. Prerequisite: Bac 421. One lecture; 2 two-hour laboratory periods. Associate Professor Bollen.
- Bac 431. Bacteriological Technique.** (g) 5 hours fall.
Intensive study of the fundamental principles involved in the study of bacteria. Prerequisite: Bac 206 or equivalent and two years of chemistry. Three lectures; 2 laboratory periods. Associate Professor Bollen.
- Bac 441. Systematic Bacteriology.** (g) 3 hours winter.
Taxonomy and nomenclature; history of bacterial classifications; International Rules of Nomenclature and Bacteriological Code; Bergey's Manual. Prerequisite: Bac 206 or equivalent and two years of chemistry. Associate Professor Bollen.
- Bac 442. Systematic Bacteriology Laboratory.** (g) 2 hours winter.
Laboratory studies to accompany Bac 441. Prerequisite: Bac 431.
- 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. Associate Professor Bollen.
- Bac 452. Physiology of Bacteria Laboratory.** (g) 2 hours spring.
Laboratory studies to accompany Bac 451. Prerequisite: Bac 442.
- Bac 461. Sanitary Bacteriology.** 3 hours spring.
Principles of bacteriology as applied to problems of community and municipal sanitation. Prerequisite: Bac 205. Two lectures; 2 two-hour laboratory periods. Professor Copson.
- Bac 462. Microscopy of Waters.** 3 hours spring.
Microorganisms found in surface waters; treatment of water by chemicals, aeration, etc. Prerequisite: Bac 461. One lecture; 2 two-hour laboratory periods. Professor Copson.
- Bac 472, 473. Bacteriological Problems.** (g) 5 hours each term, winter and spring.
For students qualified to study intensively some of the problems concerned with systematic bacteriology and the principles underlying physiological activities of bacteria. Prerequisite: Bac 441, 442, or their equivalent. Staff.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

Bac 501. **Research.** Terms and hours to be arranged.

Bac 503. **Thesis.** Terms and hours to be arranged.

Bac 505. **Reading and Conference.** Terms and hours to be arranged.

Bac 507. **Seminar.** Terms and hours to be arranged. Professor Copson.

Bac 551, 552. **Advanced Bacterial Physiology.** 3 hours each term, fall and winter.

Growth, fermentation, and death of microorganisms; emphasis on the morphology, cytology, and cell microchemistry. Prerequisite: Bac 451 or equivalent; organic and physical chemistry. Associate Professor Bollen.

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.

Botany

THE courses in botany provide comprehensive and advanced training in the various branches of this subject: first, for those who expect to make some field of plant science their major or life work; second, as a foundation for the work of students majoring in such professional schools as Agriculture and Forestry; and third, for those interested largely or entirely in botany from the cultural point of view.

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 paleobotany.

The herbarium collections total approximately 89,000 specimens, including 47,000 classified specimen sheets of higher plants, 10,000 unmounted specimens, and 32,000 packets of parasitic fungi.

Excellent greenhouse facilities are available at the State College for botanical instruction and research.

An extensive and diversified research program relating to plant disease is conducted under the Botany Department by a group of State and Federal investigators. This involves the use of modern equipment and technique for laboratory, greenhouse, and field. Students are therefore provided with exceptional opportunities for training in plant pathology and often for part-time employment under able scientists.

Botany students also have a special advantage at this institution since they may elect minor work in the fields of forestry and agriculture, which provide the greatest opportunities for the useful application of plant science.

LOWER-DIVISION COURSES

- Bot 201, 202, 203. **General Botany.** 3 hours each term.

Structure and functions of higher plants; chief groups of plants, reproduction and genetics; plant identification. Prerequisite to further work in botany. One lecture; 1 recitation; 2 two-hour laboratory periods. Staff.

UPPER-DIVISION COURSES

- Bot 311. **The Lower Plants.** 4 hours fall.

Typical structure and life histories of the algae, fungi, hepatics, and mosses. Prerequisite: Bot 201, 202 or equivalent. Two lectures; 2 three-hour laboratory periods. Associate Professor Sanborn.

- Bot 312. **The Higher Plants.** 4 hours winter.

Typical structure and life histories of the ferns, fern allies, gymnosperms, and flowering plants. Prerequisite: Bot 201, 202 or equivalent. Two lectures; 2 three-hour laboratory periods. Associate Professor Sanborn.

- Bot 313. **Systematic Botany.** 4 hours fall or spring.

Principles of classification; families and orders; collection and identification of higher plants. Fall course concentrates on range plants. Prerequisite: Bot 203. Two lectures; 3 two-hour laboratory periods. Associate Professor Gilkey.

- Bot 314. **Range and Pasture Botany.** 3 hours spring.

Range and pasture ecology: requirements, distribution, and value of range plants; poisonous plants; taxonomy of grasses. Prerequisite: Bot 201, 202. Two lectures; 2 two-hour laboratory periods. Associate Professor Lawrence.

- Bot 315. **Forest Pathology.** 3 hours winter.

Nature, cause, and prevention of tree diseases and timber defects, especially those related to fungal parasites, saprophytes, and symbionts. Prerequisite: Bot 201, 202. One lecture; 2 two-hour laboratory periods.

- Bot 321. **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. One lecture; 2 three-hour laboratory periods. Associate Professor Gilkey.

- Bot 331. **Principles of Plant Physiology.** 4 hours spring.

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. Professor Atwood.

- Bot 341. **Principles of Plant Ecology.** 4 hours winter or spring.

Interrelations of plants and environment; influence on native vegetation and cultivated crops. Prerequisite: Bot 201, 202, and upper-division standing. Two lectures; 2 two-hour laboratory periods. Associate Professor Lawrence.

- Bot 351. **Principles of Plant Pathology.** 4 hours fall.

Cause, symptoms, effects, spread, and control of plant diseases; laboratory examination of typical specimens. Prerequisite: Bot 201, 202. Two recitations; 3 two-hour laboratory periods. Professor Owens.

- Bot 401. **Research.** Terms and hours to be arranged.

- Bot 403. **Thesis.** Terms and hours to be arranged.

- Bot 405. **Reading and Conference.** Terms and hours to be arranged.
- Bot 407. **Seminar.** Terms and hours to be arranged.
- Bot 411, 412, 413. **Comparative Morphology.** (G) 3 hours each term.
The plant groups, their morphology and relationships. Prerequisite: Bot 311, 312, or equivalent. One lecture; 2 three-hour laboratory periods. Offered alternate years. Not offered 1944-45. Associate Professors Lawrence and Sanborn.
- Bot 414. **Advanced Range and Pasture Ecology.** (g) 3 hours winter.
Plant successions on the range; methods of vegetation analysis; ecology of range species. Prerequisite: Bot 314, 341. Two lectures; 2 two-hour laboratory periods. Associate Professor Lawrence.
- Bot 421, 422, 423. **Advanced Systematic Botany.** (G) 3 hours each term.
Field and laboratory studies of higher plants; phylogeny; preferred systems; evaluation of taxonomic criteria. Prerequisite: Bot 313. One lecture; 2 three-hour (or 3 two-hour) laboratory periods. Offered alternate years. Not offered 1944-45. Associate Professor Gilkey.
- Bot 431, 432, 433. **Advanced Plant Physiology.** (G) 3 hours each term.
Plant physiological processes and relations; reviews of literature. Prerequisite: Bot 331 and organic chemistry. One lecture; 2 three-hour laboratory periods. Offered alternate years. Offered 1944-45. Professor Atwood.
- Bot 441, 442, 443. **Advanced Plant Ecology.** (G) 3 hours each term.
Measurement of environmental factors and their relation to field practice, with special reference to forest, grazing, and agricultural ecology. Prerequisite: Bot 341, or equivalent. Two lectures; 1 three-hour laboratory period. Bot 441, 442 offered alternate years. Not offered 1944-45.
- Bot 451. **Plant Pathological Technique.** (g) 3 hours fall.
Introduction to the treatment of problems involved in study and research on the fungous, bacterial, and virous diseases of plants. Prerequisite: Bot 351 or equivalent. One lecture; 2 three-hour laboratory periods.
- Bot 452. **Field and Truck Crop Diseases.** (G) 3 hours winter.
Chief diseases of field crops and vegetables; control. Especially for farm crops, vegetable crops, and plant pathology students. Prerequisite: Bot 351 or equivalent. Three two-hour periods. Professor Owens.
- Bot 453. **Fruit Diseases.** (G) 3 hours spring.
Chief diseases of fruits and their control. Especially for students in horticulture and plant pathology. Prerequisite: Bot 351 or equivalent. Three two-hour periods. Professor Owens.
- Bot 461, 462, 463. **Mycology.** (G) 3 hours each term.
Mushrooms, smuts, rusts, and other Basidiomycetes; Ascomycetes and imperfect fungi; Myxomycetes and Phycomycetes. Prerequisite: Bot 311 or equivalent. One lecture; 2 three-hour laboratory periods.
- Bot 469, 470. **Microtechnique.** (g, G) 3 hours winter and spring.
First term: Principles and practices in preparation of permanent microscopic slides of plant materials. Prerequisite: Bot 201, 202. One lecture; 2 three-hour laboratory periods. Second term: Making slides for cytological study of reduction divisions. Two three-hour laboratory periods. Bot 470 offered alternate years. Not offered 1944-45. Assistant Professor Smith.
- Bot 471. **Plant Anatomy.** (G) 3 hours fall.
Microscopic structure and development of plant tissues. Prerequisite: Bot 201, 202, and two terms of upper division botany, or equivalent. One lecture; 2 three-hour laboratory periods. Assistant Professor Smith.

Bot 473. Plant Cytology. (G) 3 hours spring.

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. Assistant Professor Smith.

GRADUATE COURSES

Bot 501. Research. Terms and hours to be arranged.**Bot 503. Thesis.** Terms and hours to be arranged.**Bot 505. Reading and Conference.** Terms and hours to be arranged.**Bot 507. Seminar.** Terms and hours to be arranged.**Bot 541. Plant Formations.** 3 hours fall.

Vegetation areas of the world, especially of North America. Prerequisite: Bot 341, 441. Two lectures; 1 three-hour laboratory period. Offered alternate years. Offered 1944-45. Associate Professor Lawrence.

Bot 542. Structural and Experimental Ecology. 3 hours winter.

Adaptations of plant species with reference to ecological relations. Prerequisite: Bot 313, 331, 341, 442, 470. One lecture; 2 three-hour laboratory periods. Offered alternate years. Offered 1944-45. Associate Professor Lawrence.

Bot 543. Field Ecological Methods. 3 hours spring.

Field use of ecological instruments. Prerequisite: Bot 341, 443. One lecture; 2 three-hour laboratory periods. Offered alternate years. Offered 1944-45. Associate Professor Lawrence.

Bot 573. Cytogenetics. 3 hours spring.

Cytological basis of inheritance. Prerequisite: Bot 473 or Z 537; AI 315, FC 315, or Z 315. Two lectures; 1 two-hour laboratory period. Offered alternate years. Offered 1944-45. Assistant Professor Smith.

Chemistry

IN THE first three years of the chemistry curriculum provision is made for thorough grounding in fundamental chemistry and related sciences, as well as cultural subjects. Undergraduate students major in chemistry as a field of concentration for a liberal-arts degree or as preparation for professional work in the field of chemistry. Beginning with the fourth year numerous elective choices permit the student to begin more intensive study in one of the classical fields—analytical, inorganic, organic, and physical, or in some field of special interest such as agricultural chemistry, biochemistry, colloids, electrochemistry, or pulp and paper chemistry.

The Department of Chemistry thus aims to prepare its students for graduate work in pure or applied chemistry or for (1) governmental work under the Civil Service; (2) teaching positions in colleges, universities, junior colleges, and secondary schools; (3) positions as research chemists and technical experts in commercial testing laboratories of all sorts, and in chemical industries; (4) positions as chemists in laboratories of state agricultural experiment stations, or in industries specializing in the manufacture of food or agricultural products.

Additional training beyond the baccalaureate degree is highly advantageous in obtaining better positions in any field of chemical activity whether it be

teaching, governmental, or industrial work. The undergraduate curriculum serves well as a foundation for this specialization and qualified students are encouraged to continue toward the master's or doctor's degree involving research and original investigation.

Prerequisite to graduate work leading to an advanced degree with a major in chemistry is the completion of undergraduate work in chemistry, mathematics, and physics substantially equivalent to that required of undergraduate students in the chemistry curriculum.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Ch 101, 102, 103. **Elementary General Chemistry.** 3 or 4 hours each term.

For certain agriculture, engineering, and home economics students: one lecture; 1 recitation; 1 three-hour laboratory period (3 hours). For nursing education students: one lecture; 2 recitations; 1 three-hour laboratory period (4 hours).

Ch 130. **Descriptive General Chemistry.** 3 hours spring.

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. **Principles of Chemistry.** 4 hours each term.

A year sequence in general chemistry for students in chemical engineering. Fall and winter, 2 lectures, 1 recitation, 1 three-hour laboratory period; spring, 2 lectures, 2 three-hour laboratory periods.

Ch 204, 205, 206. **General Chemistry.** 5 hours each term.

For students planning to major in chemistry and others requiring extensive knowledge of the subject. Ch 206 laboratory includes elementary qualitative analysis. Two lectures; 1 recitation; and 2 three-hour laboratory periods.

Ch 208, 209. **General Chemistry.** 5 hours each term, winter and spring.

Designed to cover in two terms the same material as Ch 101, 102, 103, for students starting at the beginning of the winter term. Two lectures; 1 recitation; 2 three-hour laboratory periods.

Ch 226. **Organic Chemistry.** 4 or 5 hours.

Carbon compounds of the aliphatic series. Prerequisite: Ch 206 or Ch 103. For 4 hours credit: 2 lectures; 2 three-hour laboratory periods. For 5 hours credit: 2 lectures; 1 recitation; 2 three-hour laboratory periods.

Ch 227. **Organic Chemistry.** 5 hours winter.

An intensive study of the chemistry of the aromatic series. Prerequisite: Ch 226.

Ch 231. **Advanced Qualitative Analysis.** 4 or 5 hours fall.

Advanced theory of qualitative analysis and examination of commercial products. Prerequisite: Ch 206. Two lectures; 2 or 3 three-hour laboratory periods.

Ch 232, 233. **Quantitative Analysis.** 4 or 5 hours each term, winter and spring.

Fundamental principles and laboratory practice. Credit 4 hours for chemical-engineering students, 5 hours for chemistry majors. Prerequisite: Ch 206. Two lectures; 2 or 3 three-hour laboratory periods.

- Ch 234. Quantitative Analysis.** 5 hours spring.
Principles of gravimetric analysis, volumetric analysis, and H-ion concentration. Designed for pharmacy and premedical students. Prerequisite: Ch 103. Two lectures; 3 three-hour laboratory periods.
- Ch 250. Elements of Biochemistry.** 4 hours fall or winter.
Proteins, carbohydrates, fats, and other compounds having biochemical significance; fundamentals of analysis as applied in this work. Prerequisite: Ch 226 or equivalent. Two lectures; 2 three-hour laboratory periods.
- Ch 251, 252. Organic and Agricultural Biochemistry.** 5 hours fall, 3 hours winter.
Fundamental principles of organic chemistry and biochemistry, with applications in agriculture and related industries. Prerequisite: Ch 103. Three lectures, 2 three-hour laboratory periods, fall; 3 lectures, winter.
- Ch 253. Agricultural Biochemistry.** 2 hours winter.
Biochemical laboratory work to accompany Ch 252. Two three-hour laboratory periods.
- Ch 254. Quantitative Analysis for Agricultural Students.** 3 hours spring.
Fundamental training in quantitative procedure necessary for laboratory work in any phase of agricultural technology. Prerequisite: Ch 103. One lecture; 2 three-hour laboratory periods.

UPPER-DIVISION COURSES

- Ch 321, 322, 323. Metallurgical Chemistry.** 3 hours each term.
Analysis of limestone, iron ores, phosphorus in iron ores, determination of manganese, sulphur, copper, arsenic, etc. Prerequisite: Ch 233 or equivalent. Professor Fulton.
- Ch 330, 331. Physiological Chemistry.** 2 hours winter, 3 hours spring.
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. Associate Professor Pease.
- Ch 340. Elementary Physical Chemistry.** 3 hours.
Nonmathematical. Kinetic theory, atomic structure, molecular weights, classification of elements, solubility, ionization, colloids, hydrogen-ion measurements, electrochemistry. Prerequisite: Ch 203 or equivalent.
- Ch 350, 351, 352. Agricultural Chemical Technology.** 3 hours each term.
Fertilizers, insecticides, feeding stuffs, food industries products, irrigation and drainage waters, etc. Intensive reading; laboratory work. Prerequisite: Ch 233 or Ch 254. Three three-hour laboratory periods. Professor Jones.
- Ch 353. Dairy Chemistry.** 3 hours.
Chemistry of organic acids, fats, proteins, amino acids, carbohydrates, and vitamins applied to creamery products. Prerequisite: Ch 252, 254. Two four-hour or 3 three-hour laboratory periods. Professor Jones, Mr. Callaway.
- Ch 370, 371, 372. Glass Blowing.** 1 hours each term.
Practice in the manipulation of glass and assembling set-ups. Prerequisite: one year of laboratory science. Two two-hour laboratory periods. Professor Fulton.
- Ch 401. Research.** Terms and hours to be arranged.
- Ch 403. Thesis.** Terms and hours to be arranged.
- Ch 405. Reading and Conference.** Terms and hours to be arranged.

- Ch 407. **Seminar.** One hour each term.
- Ch 411, 412, 413. **Advanced Inorganic Chemistry.** (g) 2 hours each term.
Radioactivity, modern periodic table, atomic structure, inorganic isomerism, complex compounds, elementary metallurgy, geochemistry. Prerequisite: Ch 206, 233, or equivalent. Assistant Professor West.
- Ch 414, 415. **Inorganic Preparations.** (g) Terms and hours to be arranged.
Preparation and purification of typical inorganic compounds. Prerequisite: Ch 232, 233, or their equivalent. Assistant Professor West.
- Ch 418. **History of Chemistry.** (G) 3 hours.
Rise and development of chemical theories and laws. Prerequisite: three years of chemistry. Associate Professor Friedman.
- 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: Ch 231, 232, 233. One lecture; 2 three-hour laboratory periods. Associate Professor Mehlig.
- Ch 423. **Organic Quantitative Microanalysis.** (G) 3 hours.
Laboratory practice in methods of quantitative organic microanalysis. Prerequisite: Ch 233, 432. One lecture; 2 laboratory periods. Professor Christensen.
- Ch 425. **Chemical Microscopy.** (g) 3 hours spring.
Microscopic, qualitative, inorganic analysis. Prerequisite: Ch 232. One lecture; 2 three-hour laboratory periods. Professor Christensen.
- 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: Ch 231. One lecture; 2 three-hour laboratory periods. Professor Christensen.
- Ch 427, 428, 429. **Advanced Laboratory Methods.** (G) 3 hours each term.
Principles and practice in the use of special instrumental methods of analysis; physical and chemical methods of separation and purification. Polarography, chromatography, etc. Prerequisite: Ch 432, 442. One lecture; 2 laboratory periods. Professor Christensen.
- Ch 430, 431, 432. **Organic Chemistry.** (g) 4 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. Three lectures; 1 laboratory period.
- Ch 433. **Organic Combustion Analysis.** (G) 3 hours any term.
Quantitative analysis of organic compounds. Prerequisite: Ch 227, 233, 432. Three three-hour laboratory periods. Associate Professor Pease.
- Ch 434, 435, 436. **Organic Preparations.** (G) 1 or 2 hours each term.
Important methods of synthesis, such as Grignard, Friedel-Craft's, Perkins' reaction, and others. Prerequisite: Ch 432 or equivalent. One three-hour laboratory period per hour of credit. Associate Professor Pease.
- Ch 437, 438. **Organic Chemistry.** (G) 2 hours each term, fall and winter.
Continuation of Ch 432. Emphasis on the methods of synthesis, interpretation of reactions, and structure of organic compounds. Two lectures. Associate Professor Pease.

Ch 440, 441, 442. Physical Chemistry. (g) 4 hours each term.

Molecular weights, properties of solutions, chemical equilibrium, reaction kinetics and electrochemistry. Prerequisite: analytical chemistry; calculus. Two lectures; 2 three-hour laboratory periods. Professor Gilbert, Dr. Corruccini.

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. A knowledge of thermodynamics is desirable preparation. Prerequisite: Ch 442. Professor Gilbert.

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. Three lectures. Associate Professor Friedman.

Ch 450, 451, 452. Biochemistry. (G) 3 or 5 hours each term.

Proteins, carbohydrates, and fats in biological systems; digestion and metabolism of compounds important in nutrition; vitamins and hormones. Prerequisite: Organic chemistry. Three lectures; 2 laboratory periods. Assistant Professor van Wagtenonk.

Ch 453. Plant Physiological Chemistry. (G) 5 hours spring.

Prerequisite: Ch 451. Professor Jones.

Ch 454, 455, 456. Agricultural Biochemical Methods. (G) Hours to be arranged.

For students planning to enter research in plant or animal industries. Ch 455 and Ch 456 deal with plant and animal compounds and enzymes that accomplish transformations in living bodies. Prerequisite: quantitative analysis and organic chemistry. Professor Jones.

Ch 457, 458. Experimental Endocrinology. (G) 3 hours each term, winter and spring.

Chemistry of the endocrine glands; various ductless glands are extracted and the resulting solutions are assayed biologically. Prerequisite: organic chemistry, general zoology. One lecture; 2 three-hour laboratory periods.

Ch 459. Biochemistry of the Phenanthrene Nucleus. (G) 2 hours spring.

Chemistry and relationship of sex hormones, bile acids, adrenal and carcinogenic compounds, and their influence on the function of the organism. Prerequisite: Ch 430, 431, 432. Two lectures. Assistant Professor van Wagtenonk.

Ch 460, 461, 462. Pulp and Paper Chemistry. (G) 3 hours each term.

Chemistry of cellulose; fundamental chemical processes of the pulp and paper industry. Prerequisite: analytical and organic chemistry. Three lectures. Associate Professor Friedman.

Ch 465. Applied Electrochemistry. (G) 3 hours fall.

Testing and use of coulometers; characteristics of primary and secondary cells; electrodeposition in electroanalysis and electroplating. One lecture; 2 three-hour laboratory periods. Prerequisite: Ch 442. Assistant Professor West.

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. Assistant Professor West.

Ch 467, 468. Colloidal Chemistry Laboratory. (G) 1 hour each term.
Associate Professor Friedman.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

Ch 501. Research. Terms and hours to be arranged.**Ch 503. Thesis.** Terms and hours to be arranged.

Qualified students will have all the facilities of the laboratory at their disposal and will receive the advice and assistance of the department.

Ch 505. Reading and Conference. Terms and hours to be arranged.**Ch 507. Seminar.** 1 hour each term.

A reading knowledge of German and French is expected.

Ch 511, 512, 513. Advanced General Chemistry. 2 hours each term.

Theory and application; inorganic catalysts, double and complex compounds, geochemistry, metallurgical chemistry, and flotation of nonmetallics. Prerequisite: Ch 442. Assistant Professor West.

Ch 520, 521, 522. Advanced Analytical Chemistry. 3 hours each term.

Special analytical procedures adapted to those enrolling. Prerequisite: Ch 231, 232, 233. Associate Professor Mehlig.

Ch 530, 531, 532. Advanced Organic Chemistry. 2 hours each term.

Nitrogen compounds; carbohydrates; terpenes; valence, chemical reactivity, catalysis, etc., as related to particular groups of compounds. Prerequisite: Ch 432 or equivalent. Associate Professor Pease.

Ch 533, 534, 535. Advanced Organic Chemistry. 2 hours each term.

Molecular rearrangement, biphenyl isomerism, alicyclic compounds; organic synthetic methods of theoretical and practical importance; free radicals. Prerequisite: Ch 432 or equivalent. Associate Professor Cheldelin.

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 laboratory period, winter; 1 lecture, 2 laboratory periods spring. Associate Professor Pease.

Ch 540, 541, 542. Advanced Physical Chemistry. 2 hours each term.

Atomic structure from the chemical standpoint; kinetic theory of gases; newer theories of solutions; phase rule and its applications. Prerequisite: Ch 442. Offered alternate years. Dr. Corruccini.

Ch 543, 544, 545. Advanced Physical Chemistry. 2 hours each term.

Solubility; properties of liquids, surface tension, dielectric constant, vapor pressure; kinetics; newer theories of valence; photochemistry. Prerequisite: Ch 442. Offered alternate years. Professor Gilbert.

Ch 550, 551, 552. Selected Topics in Biochemistry. 3 hours each term.

A nonsequence group of courses designed to acquaint the student with recent advances in biochemistry and their applications to special fields of study. The topics covered are varied from year to year. 1944-45: Fall, Vitamin Technology, 1 lecture, 2 three-hour laboratory periods, prerequisite Ch 450 or equivalent; Winter, Chemotherapy, 3 lectures, prerequisite Ch 450 or PhP 493; Spring, Chemistry of Biochemical Processes, 3 lectures, prerequisite Ch 450, Bac 204, or equivalent. Associate Professor Cheldelin.

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 three fields: applied entomology, bee culture, and forest entomology.

Advanced courses are planned to equip students specializing in entomology with a fundamental ground work in the science sufficient to prepare them for effective service in applied entomology or for advanced research study.

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 COURSES

Ent 201, 202, 203. General Entomology. 3 hours each term.

For students planning to major or minor in entomology. Morphology, taxonomy, physiology, general technique, and biology of insects. Two lectures; 1 three-hour laboratory period. Associate Professor Scullen.

Ent 223. Elementary Entomology. 3 hours winter.

Insects and their habits; relation to human welfare; collection, preservation, classification, and rearing of living forms. Primarily for students preparing to teach biology in high schools. Two lectures; 1 three-hour laboratory period. Associate Professor Scullen.

UPPER-DIVISION COURSES

Ent 314. Principles of Economic Entomology. 3 hours fall or winter.

Primarily for agriculture students; typical economic insect forms; insect-pest control. Prerequisite: Z 130 or 203. Two recitations; 1 three-hour laboratory period. Associate Professor Scullen.

- Ent 321. **Principles of Forest Entomology.** 3 hours fall or spring.
For forestry students. Forest losses due to insects; the groups responsible; prevention and control. Prerequisite: one year of forestry, or Ent 314 or equivalent. Two lectures; 1 two-hour laboratory period.
- 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 335. **Practical Bee Culture.** 3 hours spring.
Habits and life history; management for honey production; and pollination of fruit and seed crops. Two lectures; 1 three-hour laboratory period. Associate 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: Ent 201 or 314. One lecture or recitation; 2 three-hour laboratory periods or field work. Professor Mote.
- Ent 351. **Historical Entomology.** 3 hours fall.
Insects of the ancients; early treatises; beginnings in America; introduced pests; Bureau of Entomology; early work in Oregon. Prerequisite: Ent 201 or equivalent. Associate Professor Scullen.
- Ent 352. **Entomological Nomenclature and Literature.** 3 hours winter.
Entomological nomenclature; International Code; sources of entomological literature; Bureau of Entomology; periodicals and books; bibliographies. Prerequisite: Ent 201 or equivalent. Associate Professor Scullen.
- Ent 373. **Entomological Technique.** 3 hours spring.
Rearing living insects; collecting and preserving; preparation of material for study. Prerequisite: Ent 201, or 314, or 223, or 321. One lecture; 2 three-hour laboratory periods. Associate Professor Scullen.
- Ent 401. **Research.** Approved problems carried on in library, laboratory, or field. Terms and hours to be arranged.
- Ent 403. **Thesis.** Terms and hours to be arranged.
- Ent 405. **Reading and Conference.** Terms and hours to be arranged.
- Ent 407. **Seminar.** 1 hour each term.
Reading, discussing, and abstracting the leading articles on entomological topics as they appear in current scientific literature.
- Ent 411. **Fruit Insects.** (G) 3 hours fall.
Major fruit insects and their control. Especially for students in horticulture and entomology. Prerequisite: Ent 314 or equivalent. Three two-hour laboratory periods. Professor Mote.
- Ent 412. **Medical Entomology.** (G) 3 hours winter.
Insects responsible for diseases of man; disease parasites, their carriers, and possible means of control. Prerequisite: Ent 411. Two lectures; 1 three-hour laboratory period. Professor Mote.
- Ent 413. **Field and Truck-Crop Insects.** (G) 3 hours spring.
Major field and truck-crop insects and their control. Especially for farm crops, vegetable crops, and entomology students. Prerequisite: Ent 314, 412 or equivalent. Three two-hour laboratory periods. Professor Mote.

- Ent 415. **Principles of Insect Control.** (G) 3 hours winter.
Fruit insects, truck-crop insects, insects affecting man and animals, greenhouse and field-crop insects; control. Prerequisite: Ent 314 or equivalent. Two lectures; 1 laboratory period. Professor Mote.
- Ent 423. **Advanced Forest Entomology.** (G) 4 hours.
An intensive study of the bark beetles injurious to forest trees. Prerequisite: Ent 323 or equivalent. Two lectures; 1 laboratory period. Associate Professor Chamberlin.
- Ent 431. **Biological Control.** (G) 3 hours spring.
Possibilities and limitations; artificial propagation of insects; examples of successes and failures; typical species. Prerequisite: Ent 352. Two lectures; 1 three-hour laboratory period. Associate Professor Scullen.
- Ent 451, 452, 453. **Insect Taxonomy.** (G) 3 hours each term.
The several orders; intensive study in selected groups; phylogenetic relationships and distribution. Prerequisite: Ent 203 or equivalent. Two recitations; 1 three-hour laboratory period. Associate Professor Scullen.
- Ent 471. **Insect Morphology.** (G) 5 hours fall.
Adaptation of parts to functions; histology, embryology, post-embryonic development and wing venation. Prerequisite: Ent 201, 202, 203. Three lectures; 2 three-hour laboratory periods. Associate Professor Scullen.
- Ent 472. **Insect Physiology.** (G) 5 hours winter.
Life processes of insects, including nutrition, respiration, circulation, excretion, and reproduction. Prerequisite: Ent 471, Z 411. Three lectures; 3 two-hour laboratory periods. Associate Professor Scullen.
- Ent 473. **Insect Ecology.** (G) 5 hours spring.
Environmental factors and their influence on insect development, distribution, and behavior. Prerequisite: Ent 203; plant ecology desirable. Three lectures; 2 three-hour laboratory periods. Associate Professor Scullen.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

- Ent 501. **Research.** Terms and hours to be arranged.
- Ent 503. **Thesis.** Terms and hours to be arranged.
- Ent 505. **Reading and Conference.** Terms and hours to be arranged.
- Ent 507. **Seminar.** Terms and hours to be arranged.

Geology

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 majors: one intended for students who are interested in geology as part of a liberal education; one professional in economic geology; and one professional in paleontology. The general major affords opportunity for the student to make wide electives in other fields. The department is equipped to offer graduate work in geology and paleontology.

LOWER-DIVISION COURSES

G 201, 202, 203. **Geology.** 3 hours each term.

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. Professor Allison.

G 204, 205, 206. **Geology Laboratory.** 1 hour each term.

Laboratory and field work to accompany G 201, 202, 203 for all students desiring a more intimate knowledge of geology.

UPPER-DIVISION COURSES

G 312, 313, 314. **Mineralogy.** 4 hours each term.

Physical and chemical methods useful in the recognition of materials of which the earth is composed. Prerequisite: chemistry. Two lectures; 2 laboratory periods. Professor Hodge.

G 321. **Structural Geology.** 4 hours spring.

Study of origin, interpretation, and mapping of minor rock structures and joints, faults, and folds. Prerequisite: G 201, 202. Three lectures; 1 laboratory or field period. Professor Allison.

G 322. **Physiography.** 4 hours winter.

Development of the surface features of the earth by erosion, deposition, earth movements, and volcanism. Prerequisite: general geology. Three lectures; 1 laboratory or field period. Professor Allison.

G 323. **Stratigraphy.** 4 hours fall.

Genesis and subsequent history of stratified rocks; geologic processes concerned with sedimentation and cementation. Prerequisite: G 201, 202, 203. Three lectures; 1 laboratory or field period. Professor Allison.

G 324. **Engineering Geology.** 3 hours winter.

The general field from the engineering standpoint. Open to other than engineering students. Professor Hodge.

G 330. **Life of the Past.** 3 hours fall.

History of life as recorded in the fossil record; invertebrates studied as illustrations of biological principles and relationships to higher animals. Prerequisite: one year of biology or geology. Professor Packard.

G 331. **Geologic History of Vertebrates.** 3 hours winter.

Rise and development of the vertebrates with special attention to certain groups of ancient animals that once lived on the Pacific Coast. Prerequisite: one year of biology or geology. Professor Packard.

G 332. **Geologic History of Man.** 3 hours spring.

Physical and cultural development of the ancient types of men, as shown by their fossil remains, their implements and art. Prerequisite: one year of biology or geology. Professor Packard.

G 340, 341. **Invertebrate Paleontology.** 4 hours each term.

Major fossil invertebrates; important West Coast genera. Prerequisite: general geology or one year of any biological science. Two class periods and 2 laboratory periods. (G 340, 341, 442 form a sequence.) Professor Packard.

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.

- 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, economics, world resources and strategy of petroleum, coal, metallic and nonmetallic minerals; ground water and water power; northwestern geological resources. Professor Hodge.
- G 380. Advanced Field Geology.** 9 hours.
Geologic mapping and surveying methods; intensive study of a small area. Conducted in a summer camp of four weeks; may be taken with credit for a series of summers. Prerequisite: one year of general geology.
- G 401. Research.** Terms and hours to be arranged.
- G 403. Thesis.** Terms and hours to be arranged.
- G 405. Reading and Conference.** Terms and hours to be arranged.
- G 407. Seminar.** Any term, 1 hour each term.
- G 412, 413. Petrography.** (g) 4 hours fall and winter.
Sedimentary, igneous and metamorphic rocks and ores studied megascopically and microscopically, to train in recognition, classification, and interpretation of earth materials. Prerequisite: G 312, 313, 314. Professor Hodge.
- G 414. Mineral Deposits.** (g) 4 hours spring.
Studies in the recognition, association, occurrence of minerals and the criteria for the recognition of origin, types, and properties of mineral deposits. Prerequisite: G 412, 413. Professor Hodge.
- G 424. Advanced Paleontology.** (G) Terms and hours to be arranged.
Special work assigned to meet the requirements of the advanced student. Prerequisite: G 340, 341. Professor Packard.
- G 431. Geologic History of North America.** (G) 4 hours.
The geologic development of the North American continent. Prerequisite: G 323. Professor Allison.
- 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. Professor Allison.
- 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 Sanborn.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

- G 501. Research.** Terms and hours to be arranged.
- G 503. Thesis.** Terms and hours to be arranged.
- G 505. Reading and Conference.** Terms and hours to be arranged.
- G 507. Seminar.** Terms and hours to be arranged.

G 512, 513, 514. **Microscopy.** Hours to be arranged.

Use and theory of the microscope in the recognition and determination of the properties of organic and inorganic materials. Professor Hodge.

G 520. **Advanced Economic Geology.** Terms and hours to be arranged.

Special work assigned to meet the requirements of advanced students in metallic and nonmetallic mineral deposits. Professor Hodge.

G 580. **Graduate Field Geology.** Terms and hours to be arranged.

Advanced field problems assigned to meet the requirements of the graduate student. Staff.

Mathematics

THE courses in mathematics are designed to provide for the general student the training in rigorous thinking and analytical processes that is a fundamental part of a well-balanced education; to supply the mathematical preparation desirable for students in professional schools; to prepare prospective teachers; and finally to give advanced and graduate work for those who specialize in mathematics or science.

Sequences Satisfying Group Requirements. The following constitute sequences satisfying group requirements: (1) Forestry students—Mth 100, 106, 109. (2) Business and Industry students—Mth 101, 102, 103. (3) Science students—Mth 100, 108, 109; Mth 100, 101, 102; Mth 101, 102, 103; Mth 201, 202, 203.

Statistics. The Department of Mathematics offers two types of courses in statistics: (a) The mathematical theory of statistics develops the theoretical foundations of applied statistics. It should be elected by prospective statistical analysts since only by a mastery of this background can they achieve the desired proficiency. It can profitably be elected by students majoring in mathematics who are interested in the pure mathematics involved. (b) Applied statistics emphasizes the use of the formulas and methods in the interpretation of statistical and experimental data. It gives the statistician practical experience in numerical computations.

Computational Service. The Department of Mathematics operates a computational service available to schools, departments, or staff members wishing assistance or advice in connection with mathematical problems, laborious calculations, or statistical analysis. Having calculating machines, mathematical tables, and other computational aids, as well as experience, the department can perform such work systematically and efficiently. The actual work is done by competent students in mathematics, who are paid for the service, and who incidentally obtain practical mathematical and statistical experience.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Mth 10. **Elementary Algebra.** 4 hours.

Mth 20. **Elementary Geometry.** 4 hours.

Mth 100. **Intermediate Algebra.** 4 hours.

Mth 101, 102, 103. Elementary Analysis. 4 hours each term.

Trigonometry, graphs, algebra, elements of calculus, and analytic geometry.

Mth 106. Trigonometry. 4 hours.

Mth 108. Mathematics of Finance. 4 hours.

Courses Mth 100, 108, 109, form a year sequence for students planning to major in business administration.

Mth 109. Elements of Statistics. 4 hours.

Courses Mth 100, 106, 109, form a year sequence for forestry freshmen.

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

Prerequisite: Elementary Analysis or equivalent.

Mth 230. Spherical Trigonometry and Rudiments of Navigation. 2 hours spring.

Prerequisite: Trigonometry or Mth 101.

UPPER-DIVISION COURSES

Mth 311. History of Mathematics. 3 hours.

Brief history of our oldest science; its beginnings in relation to social problems; reciprocal effect of mathematics on society. Professor Beaty.

Mth 341, 342. Applied Statistics. 3 hours each term.

Theory and technique of statistical methods with special reference to applications. Prerequisite: calculus or consent of instructor. Assistant Professor Hammer.

Mth 405. Reading and Conference. Terms and hours to be arranged.

Professor Milne.

***Mth 411. Theory of Equations and Determinants.** (G) 3 hours.

Properties and methods of solution of algebraic equations; brief study of determinants and their applications. Prerequisite: calculus. 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 417. Actuarial Mathematics. (g) 3 hours.

A course in algebra and probability. Recommended as preparation for actuarial examinations. Offered alternate years. Prerequisite: calculus. Assistant Professor Hammer.

* Mth 411, 415, 416 offered 1944-45; Mth 412, 413, 414 offered 1945-46.

- Mth 421, 422. Differential Equations.** (G) 3 hours each term.
Practical study of the solution of ordinary differential equations. Prerequisite: calculus. Professors Milne and Beaty, Assistant 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. Associate Professor Sobczyk.
- Mth 425. Vector Analysis.** (G) 3 hours.
Prerequisite: calculus. Assistant Professor Hostetter.
- Mth 426. Mathematical Theory of Probability.** (G) 3 hours.
Methods of calculating probabilities with applications to scientific problems. Offered when sufficient demand. Prerequisite: calculus. Assistant Professor Hammer.
- Mth 427. Applied Mathematics.** (G) 3 hours.
Applications of calculus, differential equations, and hyperbolic functions; mathematical formulation of practical problems. Prerequisite: differential equations or consent of the instructor. Professor Beaty.
- Mth 431, 432, 433. Advanced Calculus.** (G) 3 hours each term.
Aim is (1) to examine critically some of the results of the calculus, (2) to study the calculus of several variables. Prerequisite: elementary calculus. Professor Milne.
- Mth 435. Numerical Calculus.** (G) 3 hours.
Finite differences, interpolation, numerical differentiation and integration, and numerical solution of differential equations. Prerequisite: differential equations. Professor Milne.
- Mth 441, 442, 443. Mathematical Theory of Statistics.** (G) 3 hours each term.
Mathematical derivation of the various formulas used in statistical analysis and some application of these formulas to practical problems. Prerequisite: calculus. Assistant Professor Hammer.
- Mth 451, 452. Modern Algebra.** (G) 3 hours each term.
Recent theories showing the variety of possible mathematical systems; applications. Prerequisite: calculus and consent of instructor. Associate Professor Sobczyk.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

- Mth 501. Research.** Terms and hours to be arranged.
- Mth 503. Thesis.** Terms and hours to be arranged.
- Mth 505. Reading and Conference.** Terms and hours to be arranged.
- Mth 507. Seminar.** Terms and hours to be arranged.
- Mth 511, 512, 513. Functions of a Complex Variable.** 3 hours each term.
Introduction to analytic functions, fundamental for advanced study in mathematics. Professor Milne.

- Mth 514. Calculus of Variations.** 3 hours.
Offered on demand. Assistant Professor Hostetter.
- Mth 516. Potential Theory.** 3 hours.
Offered on demand. Professor Milne.
- Mth 521, 522, 523. Differential Equations of Mathematical Physics.** 3 hours each term.
Ordinary and partial linear differential equations and boundary value problems, with applications. Professor Milne.
- Mth 531, 532, 533. Advanced Analytical Mechanics.** 3 hours each term.
Generalized coordinates, Lagrange's equations, Hamilton's principle, Hamilton's canonical equations, statistical mechanics. Assistant Professor Hostetter.
- Mth 541, 542. Theory of Elasticity.** 3 hours each term.
Mathematical formulation of the problem of stress, strain, and deformation in elastic solids, with solutions in some cases of practical interest. Offered on demand.
- Mth 544, 545. Hydrodynamics.** 3 hours each term.
The mechanics of fluids, with special reference to liquids, but including also some applications to air and other gases. Offered on demand.
- Mth 551, 552, 553. Functions of Real Variables.** 3 hours each term.
Convergence, continuity, special functions, Riemann and Lebesgue integrals, Fourier series, theory of Hilbert space. Associate Professor Sobczyk.

Nursing Education

THE preparatory nursing education curriculum offered by the State College is devoted chiefly to general and basic subjects in preparation for professional work at the Medical School and affiliated hospitals. Two year sequences in the backgrounds of nursing, which ordinarily are required and are taught by a member of the nursing education faculty of the University of Oregon Medical School, are temporarily not offered.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- Nur 111, 112, 113. Backgrounds of Nursing.** 2 hours 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. Not offered 1944-45.
- Nur 211, 212, 213. Modern Nursing Problems.** 1 hour each term.
Continuation of Nur 111, 112, 113. Not offered 1944-45.

Physics

UNDERGRADUATE students may major in physics either as part of a liberal education or as preparation for professional service in physics and allied fields. 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 or French, or both. In special cases courses in closely related departments, involving considerable study of physical principles, may be accepted as part of a major in physics.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Ph 111, 112, 113. Engineering Physics. 3 hours each term.

Studies in general physics adapted to students in engineering. This sequence is started fall term and also winter term. One lecture; 2 recitations; 2 one-hour laboratory periods. Professor Weniger and others.

Ph 161. Rudiments of Photography. 2 hours any term.

For students not having the science prerequisites for Ph 361. Does not admit to Ph 362. One lecture; 1 two-hour laboratory period. Assistant Professor Garman and others.

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

Mechanics, sound, heat, light, electricity and magnetism. Two lectures; 2 recitations; 1 two-hour laboratory period. Assistant Professor Vinyard and others.

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

Descriptive rather than mathematical. Solar system; meteorology and physics of atmosphere; star types and groupings. Students may enter any term. Prerequisite: one year of college physics. Professor Anderson.

Ph 211, 212. Qualitative Physics. 3 hours each term, fall and winter.

The "how" and "why" of the most important applications of mechanics to heat, sound, light, and electricity and magnetism. Five periods a week devoted to demonstration lectures or informal discussions. Assistant Professor Morgan.

Ph 214. Household Physics. 4 hours spring.

Principles of physics with special attention to applications in the home. Four demonstration lectures; 2 discussion periods. Assistant Professor Morgan.

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 Weniger.

Ph 321, 322, 323. Physical Measurements. 3 hours each term.

Fall term: one lecture; 2 two-hour laboratory periods. Winter and spring terms: two lectures; 1 two-hour laboratory period. Student may enter fall or spring. Prerequisite: college physics; calculus. Associate Professor Varner.

Ph 330. Fundamentals of Radio. 3 hours spring.

Underlying physical principles; radio circuits; construction and use of transmitting and receiving equipment. Prerequisite: one year of college physics. One lecture; 2 two-hour laboratory periods. Assistant Professor Vinyard.

Ph 331, 332, 333. Radio Communication. 3 hours each term.

Theory; vacuum tubes; radio and audio frequency measurements; special problems.* Prerequisite: general or engineering physics, a second year of physics or electrical engineering or equivalent. Two lectures or recitations; 1 two-hour laboratory period. Assistant Professor Vinyard.

Ph 343. Acoustics. 3 hours.

The acoustics of buildings. Three lectures; occasional laboratory. Prerequisite: one year of college physics. Assistant Professor Morgan.

Ph 361. Photography. 3 hours any term.

The hand camera, developing, printing, toning, enlarging, slides. Prerequisite: college chemistry or physics or previous photographic experience, with consent of instructor. One lecture; 2 two-hour laboratory periods. Assistant Professor Garman and others.

Ph 362. Photography. 3 hours winter.

Commercial phases of photography: view cameras, copying, flashlights, indoor lighting, color correction, distant views, etc. Prerequisite: Ph 361. One lecture; 2 two-hour laboratory periods. Assistant Professor Garman.

Ph 363. Photography. 3 hours spring.

The making of pleasing pictures: composition, carbon and carbro printing, paper negatives, diffusion, enlarging negatives, etc. Prerequisite: Ph 361. One lecture; 2 two-hour laboratory periods. Assistant Professor Garman.

Ph 380. Laboratory Arts. Terms and hours to be arranged.

Construction, repair, and adjustment of physical apparatus; laboratory techniques. Prerequisite: one year of college physics. Lectures, assigned readings, and laboratory. Associate Professor Varner.

Ph 396. Practical Astronomy. 3 hours.

Determination of time, latitude, longitude, and azimuth by astronomical methods. Prerequisite: Ph 206 and trigonometry. One lecture; 2 observation periods. Professor Anderson.

Ph 401. Research. Terms and hours to be arranged.

Ph 403. Thesis. Terms and hours to be arranged.

Ph 405. Reading and Conference. Terms and hours to be arranged.

Ph 407. Seminar. One hour each term.

Ph 461, 462, 463. Advanced Photography. (G) 3 hours each term.

Color photography, photomicrography, microscopic motion pictures, miniature camera technique, etc. Student may enter any term. Prerequisite: Ph 362. One lecture; 2 two-hour laboratory periods. Assistant Professor Garman.

Ph 464. The Physics of Light Production. (G) 3 hours.

Radiation and the development of modern illuminants. Prerequisite: Ph 466 or EE 431. Two lectures; 1 two-hour laboratory period. Professor Weniger.

Ph 465, 466. Light. 3 hours winter and spring.

Geometric and physical optics. Prerequisite: Ph 321 and calculus. Two lectures; 1 two-hour laboratory period. Professor Weniger.

* Students desiring a course in high-frequency measurements may register for Ph 332 only; a special laboratory section will be provided.

GRADUATE COURSES

Courses at the graduate level are given when warranted by demand. An appended date indicates that the course is offered only in alternate years.

Ph 501. **Research.** Terms and hours to be arranged.

Ph 503. **Thesis.** Terms and hours to be arranged.

Ph 505. **Reading and Conference.** Terms and hours to be arranged.

Ph 507. **Seminar.** Terms and hours to be arranged.

Ph 521, 522, 523. **Introduction to Theoretical Physics.** 3 hours each term.

A mathematical treatment of the theories of classical physics. Required of all physics majors for the master's degree. Prerequisite: two years of physics; differential equations. Assistant Professor Morgan.

Ph 524, 525, 526. **Advanced Mathematical Physics.** Hours to be arranged.

Lectures and assigned readings. The topics treated are varied from year to year to suit the needs of the students. Prerequisite: graduate standing and consent of instructor. Assistant Professor Morgan.

Ph 531, 532, 533. **Advanced Electrical Theory.** 3 hours each term.

A mathematical discussion of the classical and modern theories of electricity. Prerequisite: Ph 322; differential equations. Offered 1944-45. Associate Professor Varner.

Ph 537, 538, 539. **Conduction of Electricity Through Gases.** 3 hours each term.

Processes taking place at electrodes, in the gas, and at walls of tube; glow, arc, and spark discharges. Prerequisite: Ph 312, 313, 332. Two lectures; 1 three-hour laboratory period. Offered 1944-45. Professor Weniger.

Ph 551, 552, 553. **Theory of Heat.** 3 hours each term.

Thermodynamics and the kinetic theory. Prerequisite: Ph 323; differential equations. Not offered 1944-45. Associate Professor Varner.

Ph 561, 562, 563. **Optics.** 3 hours each term.

Physical optics; theory of optical instruments; spectroscopy. Prerequisite: Ph 466. Two lectures; 1 three-hour laboratory period. Offered 1944-45. Professor Weniger.

Ph 571, 572, 573. **Modern Physical Theories.** 3 hours each term.

Electron theory, relativity, the quantum theory, wave mechanics. Prerequisite: Ph 523. Offered 1944-45. Assistant Professor Morgan.

Ph 576. **Quantum Mechanics.** 3 hours.

Modern theories based on matrices, tensors, Schroedinger's equation, Heisenberg's principle, and Dirac's transformation theory. Prerequisite: Ph 573. Not offered 1944-45. Assistant Professor Morgan.

Ph 582. **History and Philosophy of Physics.** 3 hours winter.

Prerequisite: four years of physics. Physics staff.

Ph 591. **Meteorology.** 3 hours.

Air mass movements. Prerequisite: Ph 205 and calculus. Not offered 1944-45.

Ph 592. **Astrophysics.** 3 hours.

Stellar spectroscopy, photometry, and radiometry. Prerequisite: Ph 204, 206, 466. Not offered 1944-45.

Ph 593. **Geophysics.** 3 hours.

Prerequisite: G 321, Ph 321, and differential equations. Not offered 1944-45.

Science Education

PROFESSIONAL preparation for prospective teachers of science and mathematics is afforded by the Department of Science Education, which is a joint department within the School of Education and the School of Science. For information regarding specific requirements for the High School Teacher's Certificate, see pages 245-247.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

SEd 401. **Research.** Terms and hours to be arranged.

SEd 403. **Thesis.** Terms and hours to be arranged.

SEd 405. **Reading and Conference.** Terms and hours to be arranged.

SEd 407. **Seminar.** Terms and hours to be arranged.

Ed 408b, f, g. **Methods and Materials.** (See Ed 408, page 256.)

GRADUATE COURSES

SEd 501. **Research.** Terms and hours to be arranged.

SEd 503. **Thesis.** Terms and hours to be arranged.

SEd 505. **Reading and Conference.** Terms and hours to be arranged.

SEd 507. **Seminar.** Terms and hours to be arranged.

Zoology

UNDERGRADUATE students may major in zoology for a liberal-arts degree or as preparation for professional service in the field of biology.

In the lower-division courses the purpose is to furnish the student with effective grounding in the principles of animal biology and in laboratory methods. These courses also form the basis for professional work in the applied fields of zoology. The upper-division courses provide for training in the special fields of the science, particularly the general and experimental phases of anatomy, physiology, parasitology, and pathology. Advanced study courses and seminars introduce the student to research and give opportunity for advanced work in selected subjects. For the master's degree, a summer at the Institute of Marine Biology is recommended, and for the doctor's degree it is required. Teacher's Certificate, see pages 245-247.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- Z 130. Principles of Zoology.** 3 hours spring.
Distribution, habits, and functions of animals with reference to their economic importance. Two lectures; 1 three-hour laboratory period. Professor Fasten and staff.
- Z 201, 202, 203. General Zoology.** 3 hours each term.
For premedical, prenursing, pharmacy, physical education, psychology, fish and game management students, and others. Two lectures; 1 three-hour laboratory period. Professor Fasten and staff.
- Z 204, 205, 206. Vertebrate Zoology.** 4 hours each term.
Elements of comparative anatomy, gross and microscopic, and of vertebrate embryology. Prerequisite: Z 201, 202, 203. Two lectures; 6 hours laboratory. Assistant Professor Osborn.
- Z 208, 209. Elementary Human Anatomy.** 3 hours each term, fall and winter.
For physical education, prenursing, and other students. Prerequisite: Z 201, 202, 203. Two lectures; 1 laboratory period. Assistant Professor Osborn.
- Z 210. Elementary Human Anatomy.** 3 hours, spring.
The applied phases of anatomy are considered. Designed especially for physical education students. Prerequisite: Z 208, 209. Two lectures; 1 laboratory period. Associate Professor Allman.
- Z 211. Elementary Human Physiology.** 5 hours spring.
For students in home economics, physical education, nursing education, and others desiring a general course in the principles of human physiology. Three lectures; 2 laboratory periods. Associate Professor Wulzen.

UPPER-DIVISION COURSES

- Z 306, 307. Physiology.** 3 hours each term, fall and winter.
Especially for students in home economics, pharmacy, and physical education; satisfies home economics requirements. Prerequisite: general zoology or consent of instructor. Two lectures; 1 laboratory period. Associate Professor Wulzen.
- Z 308. Physiology.** 3 hours spring.
The applied phases of physiology are considered. Designed especially for physical education students. Prerequisite: Z 306, 307. Two lectures; 1 laboratory period. Associate Professor Allman.
- Z 313. Field Zoology.** 3 hours spring.
The local vertebrates, their taxonomic arrangement, habits, and distribution. Prerequisite: Z 201, 202, 203. Two lectures; 3 hours of laboratory or field work. Associate Professor Gordon.
- Z 314. Evolution and Eugenics.** 3 hours fall.
The various ideas concerning the origin, development, and relation of organisms, with emphasis on human welfare. Prerequisite: Z 201, 202, 203, or consent of instructor. Professor Fasten.
- Z 315. Genetics.** 3 hours winter.
Heredity and variation in plants and animals; special topics; newer developments; heredity in man. Prerequisite: Z 201, 202, 203, or consent of instructor. Professor Fasten.

- Z 321. Economic Ornithology.** 3 hours fall.
Northwestern birds; special attention to game and predatory birds. Prerequisite: Z 201, 202, 203, or consent of instructor. Two lectures; 1 three-hour laboratory period. Associate Professor Gordon.
- Z 322. Economic Mammalogy.** 3 hours winter.
Classification, distribution, life histories, and economic relationships of game, fur-bearing, and destructive mammals. Prerequisite: Z 201, 202, 203. Two lectures; 1 laboratory period. Associate Professor Gordon.
- Z 323. Biology of Fishes.** 3 hours spring.
General consideration of the morphology, taxonomy, physiology, development, and evolution of fishes. Two lectures; 1 laboratory period.
- Z 401. Research.** Terms and hours to be arranged.
- Z 403. Thesis.** Terms and hours to be arranged.
- Z 405. Reading and Conference.** Terms and hours to be arranged.
Readings and reports on special topics.
- Z 407. Seminar.** Any term, 1 hour each term. Professor Fasten.
- Z 410. Animal Ecology.** (G) 3 hours spring.
Living animals in relation to their environment. Prerequisite: two years of biology, or consent of instructor. Offered alternate years. Offered 1944-45. Two lectures; 1 laboratory period. Associate Professor Gordon.
- Z 411, 412, 413. Problems in Physiology.** (G) 3 hours each term.
The principles of physiology and their application to life processes. Prerequisite: general zoology, general chemistry, elementary human physiology; or consent of instructor. Two lectures; 1 three-hour laboratory period. Associate Professor Wulzen.
- Z 414. Endocrinology.** (G) 3 hours fall.
A brief survey of the endocrine glands, with special emphasis on their role in reproduction, metabolism, and development. Prerequisite: Two years of zoology and general chemistry.
- Z 431, 432. Invertebrate Zoology.** (G) 4 hours each term, fall and winter.
The structure, classification, distribution, and life histories of the invertebrates. Two lectures; 2 laboratory periods. Prerequisite: two years of zoology. Associate Professor Gordon.
- Z 475. Histology.** (G) 3 hours fall.
Comparative study of the tissues of vertebrates. Prerequisite: Z 204, 205, 206, or consent of instructor. One lecture; 6 hours laboratory. Assistant Professor Dornfeld.
- Z 476. Microtechnique.** (g) 3 hours winter.
Study and practice in the principal methods of preparing animal tissues for microscopic study. Prerequisite: two years of biology. One lecture; 6 hours laboratory. Assistant Professor Dornfeld.
- Z 477. Experimental Embryology.** (G) 3 hours spring.
Fundamental nature and causes of development. Prerequisite: Z 204, 205, 206, or consent of instructor. One lecture; 6 hours laboratory work. Assistant Professor Dornfeld.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

Z 501. **Research.** Terms and hours to be arranged.

Z 503. **Thesis.** Terms and hours to be arranged.

Z 505. **Reading and Conference.** Terms and hours to be arranged.

Z 507. **Seminar.** Terms and hours to be arranged. Professor Fasten.

Z 536. **Parasitology.** 3 hours.

The role played by animals in the production of disease. Prerequisite:
Z 431, 432, or equivalent. Offered alternate years. Not offered 1944-45.
Associate Professor Gordon.

Z 537. **Cytology.** 3 hours.

Structure and function of the cell with special reference to the behavior and
distribution of chromosomes. Prerequisite: Z 475, 476, 477. Assistant
Professor Dornfeld.

School of Agriculture

Faculty

WILLIAM ALFRED SCHOENFELD, M.B.A., Dean of the School of Agriculture.

FREDERICK EARL PRICE, B.S., Assistant Dean of Agriculture.

ESTHER MCKINNEY, Accountant.

Division of Agricultural Economics

ERMINE LAWRENCE POTTER, M.S., In Charge, Division of Agricultural Economics.

Agricultural Economics

PROFESSORS POTTER, DeLOACH.

Farm Management

PROFESSORS MUMFORD (department head), SCUDDER.

ASSOCIATE PROFESSOR KUHLMAN.

Division of Animal Industries

PHILIP MARTIN BRANDT, A.M., In Charge, Division of Animal Industries.

Animal Husbandry

PROFESSORS JOHNSON (department head), NELSON.

ASSOCIATE PROFESSOR OLIVER.

Dairy Husbandry (including Dairy Manufacturing)

PROFESSORS BRANDT (department head), WILSTER, JONES.

ASSISTANT PROFESSORS COLMAN, EWALT.

Fish and Game Management

PROFESSOR DIMICK (department head).

ASSISTANT PROFESSOR LONG.*

Poultry Husbandry

PROFESSOR COSBY (department head).

ASSOCIATE PROFESSOR HOLMES.

ASSISTANT PROFESSOR COONEY.*

INSTRUCTOR HARPER.

* On leave for military or civilian war service.

Veterinary Medicine

PROFESSORS SHAW (department head), DICKINSON.
ASSISTANT PROFESSOR DOUGHERTY.*
INSTRUCTOR CHAPMAN.*

Division of Plant Industries

WILLIAM ALFRED SCHOENFELD, M.B.A., In Charge, Division of Plant Industries.

Farm Crops

PROFESSORS HILL (department head), FORE.
ASSISTANT PROFESSORS FINNELL, KANIPE.
INSTRUCTOR HANSEN.*

Food Industries

PROFESSOR WIEGAND (department head).
ASSOCIATE PROFESSOR ONSDORFF.
INSTRUCTOR LITWILLER.

Horticulture

PROFESSORS HARTMAN (department head), DURUZ*, BOUQUET.
INSTRUCTOR ROBERTS.

Soils

PROFESSORS POWERS (department head), RUZEK (acting department head), STEPHENSON.
ASSOCIATE PROFESSOR TORGERSON.
INSTRUCTOR WOOD.

*Agricultural Education, Engineering, and Extension Methods**Agricultural Education*

PROFESSOR GIBSON (department head).
INSTRUCTOR GREEN.

Agricultural Engineering

PROFESSORS GILMORE (department head), PRICE.
ASSOCIATE PROFESSORS WALKER, SINNARD.*
ASSISTANT PROFESSOR LUNDE.
INSTRUCTOR KIRK.

Extension Methods

PROFESSORS TEUTSCH, SAGER.

* On leave for military or civilian war service.

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 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, ornamental nursery-stock industry, teaching the practical phases of ornamental gardening, maintenance of golf courses, contracting and construction on new properties, and in other similar occupations.

The curriculum in agricultural engineering prepares for college extension, experiment station, and government work in agricultural engineering; sales and development work with manufacturers of implements such as tractors and farm equipment; agricultural specialists with building materials and equipment companies; the commercial field, including the farm implement and lumber retail business; teaching of vocational agriculture; service as managers or operators of farms where the knowledge of drainage, farm structures, and machinery and power equipment is important.

In the food industries curriculum the aim is to train students in the fields of canning, preserving, fruit juice and vinegar making, carbonated-beverage manufacturing, pickling, dehydrating, and the byproducts of these industries; and for service as buyers of raw materials, salesmen, food brokers, food inspectors, food chemists, food bacteriologists, food research workers, and instructors in foods.

The curriculum in agricultural technology leads to technical work in the industries handling agricultural and related products and to specialized lines in state or Federal research and regulatory work; to service as dairy or milling chemists, dairy or agricultural bacteriologists, insecticide, fertilizer, or seed analysts, transportation or refrigeration specialists, specialists in processing of agricultural products, nursery and quarantine inspectors, managers of warehouses or elevators, and plant explorers.

The Bachelor's Degree. The degree of Bachelor of Science or Bachelor of Agriculture is granted on the completion of any of the four-year curricula, which include a total of 192 term hours of credit (see pages 71-72 for complete information). In most of the curricula the student during his first year pursues a program of basic and introductory work called the common freshman year. In some curricula a common sophomore year is provided.

The several curricula, each leading to the bachelor's degree, are outlined as follows:

GENERAL AGRICULTURE

A four-year curriculum providing liberal opportunity for students to major in agriculture and carry a minor in some other field, such as business administration, social science, or education.....Page 181

AGRICULTURAL ECONOMICS

A four-year curriculum—common freshman and sophomore years; differentiated junior and senior curricula in AGRICULTURAL ECONOMICS and in FARM MANAGEMENT.....Page 181-183

ANIMAL INDUSTRIES

Four-year curricula—common freshman and sophomore years; basic junior and senior curriculum, providing opportunity to major in ANIMAL HUSBANDRY, DAIRY PRODUCTION, or POULTRY HUSBANDRY, with an option in RANGE AND RANGE LIVESTOCK MANAGEMENT.....Pages 183-188

A four-year curriculum in DAIRY MANUFACTURING.....Page 185

A four-year curriculum in FISH AND GAME MANAGEMENT.....Pages 186-187

A four-year curriculum in FISHERIES.....Pages 187-188

PLANT INDUSTRIES

Four-year curricula—common freshman and sophomore years; differentiated junior and senior curricula in FARM CROPS and in SOILS, with an option in SOIL CONSERVATION; and in HORTICULTURE (FRUIT AND VEGETABLE PRODUCTION AND DISTRIBUTION).....Pages 188-192

A four-year curriculum in FOOD INDUSTRIES.....Pages 190-191

A four-year curriculum in LANDSCAPE CONSTRUCTION AND MAINTENANCE.....Pages 191-192

AGRICULTURAL EDUCATION

A four-year curriculum preparing students to teach agriculture....Pages 192-193

AGRICULTURAL ENGINEERING

A four-year curriculum in AGRICULTURAL ENGINEERING, with PROFESSIONAL and VOCATIONAL options.....Pages 193-194

AGRICULTURAL TECHNOLOGY

A four-year curriculum combining a major in agriculture and a minor in sciencePage 195

Pretheological Major in Agriculture. In cooperation with the Conference on Relationships Between Colleges of Agriculture and Theological Seminaries, the School of Agriculture affords opportunity for students who are preparing to enter the rural "town and country" ministry to complete a major in agriculture before entering theological seminary. Such students may pursue the curriculum in General Agriculture, or any of the other curricula offered in the School of Agriculture, including in their program any specific requirements that may be made by the particular seminary that the student expects to enter after completing his undergraduate work. At least one basic course should be taken in each of the following fields: agricultural economics, economics, English literature, history and government, philosophy, speech, psychology, rural sociology, and sociology. Some of these subjects are required in the agriculture curricula; others may be chosen as electives.

Two-Year Curriculum. The School of Agriculture offers a two-year curriculum leading to a Certificate in Agriculture (see pages 195-196). The purpose is to provide training for students who are farming or planning to engage in farming or in nontechnical phases of agriculture, who are unable to take a four-year curriculum. Students who have maintained a good scholarship standing through the two-year curriculum are in a good position to continue for two additional years and obtain the bachelor's degree.

Advanced Degrees. Opportunities are provided in all the departments of the School of Agriculture for graduates of the State College or other accredited colleges or universities to do graduate work leading to the degree of Master of Science. The degree of Doctor of Philosophy is offered in the Division of

Agricultural Economics, the Division of Animal Industries, and the Division of Plant Industries. The requirements for advanced degrees are printed under GRADUATE DIVISION.

Annual Cannery and Frozen Food Packers' School. The annual two-week Cannery 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, Dairy Building, Food Industries 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
English Composition (Eng 111, 112, 113).....	3	3	3
Elementary General Chemistry (Ch 101, 102, 103).....	3	3	3
General Botany (Bot 201, 202).....	3	3	3
Principles of Zoology (Z 130).....	3	3	3
Elements of Agronomy (FC 111).....	3	3	3
Elements of Horticulture (Hrt 111).....	3	3	3
¹ Introduction to Animal Husbandry (AI 121).....	(3)	or (3)	or 3
¹ Introduction to Poultry Husbandry (AI 123).....	(3)	or 3	3
Agricultural Resources (AEc 111).....	3	3	3
Agricultural Engineering (AE 111).....	(3)	or 3	3
² Physical Education.....	1	1	1
Military Science.....	1	1	1
	17	17	17

¹Stock Judging I (AI 111) may be substituted for AI 121 or AI 123 by students who will major in animal industries who wish to qualify for the stock judging team. AI 121 and AI 123 must be taken in the sophomore year if not taken in the freshman year.

²General Hygiene (FE 150), 2 term hours, is taken one term in place of physical education. Women take Social Ethics (FE 131) one term.

Curriculum in General Agriculture

B.S. Degree

(See Common Freshman Year, page 180.)

	Term hours		
	F	W	S
Sophomore Year			
Principles of Economics (Ec 201, 202, 203)	3	3	3
Soils (Sls 211, 212)	3	3	....
Soil Drainage and Irrigation (Sls 213) .....	....	....	3
Principles of Farm Management (FM 211) .....	....	....	3
Forage and Root Crop Production (FC 211)	3	.... or (3)	....
General Bacteriology (Bac 204) .....	....	3	....
Introduction to Dairy Husbandry (AI 122) .....	....	3	....
Military Science	1	1	1
Physical Education	1	1	1
Electives	6	3	6
	17	17	17

Junior Year

Principles of Economic Entomology (Ent 314)	(3) or 3	....	....
Elementary Journalism (J 111) .....	....	3	....
Extempore Speaking (Sp 111)	3	....	....
Electives	12	9	14
	15	15	14

Senior Year

*Technical Writing (J 314) .....	....	3	....
American National Government (PS 212)	3	....	....
Electives	12	12	14
	15	15	14

Curricula in Agricultural Economics

B.S., B.Agr. Degrees^a

Agricultural Economics Farm Management

(See Common Freshman Year, page 180)

	Term hours		
	F	W	S
Sophomore Year			
Principles of Economics (Ec 201, 202, 203)	3	3	3
Agricultural Statistics (AEc 221) .....	....	3	....
Agricultural Economics (AEc 211) .....	....	....	3
Principles of Farm Management (FM 211) .....	....	....	3
Soils (Sls 211, 212)	3	3	....
Soil Drainage and Irrigation (Sls 213) .....	....	....	3
Forage and Root Crop Production (FC 211)	3	....	....
Introduction to Dairy Husbandry (AI 122) .....	....	3	....
General Bacteriology (Bac 204) .....	....	3	....
Elementary Journalism (J 111) .....	....	3	....
Military Science	1	1	1
Physical Education	1	1	1
Electives	3	....	3
	17	17	17

^aElectives 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.

^bStudents desiring exemption from J 314 may apply to the Dean of Agriculture, whereupon arrangements will be made for a special examination.

^cFor the B.S. degree students must take a total of at least 36 term hours in science or 36 term hours in social science or 45 term hours in science and social science.

AGRICULTURAL ECONOMICS¹, AGRICULTURAL MARKETING²

	Junior Year	Term hours		
		F	W	S
Principles of Agricultural Marketing (AEc 441)		4	.....	.....
*Agricultural Prices (AEc 451)	3
Farm Organization (FM 312)		3	.....	.....
Animal Nutrition (AI 411)	4	.....
Fruit Production (Pom 415)	4
Economic Development of the United States (Ec 214)	4	.....
Money and Banking (Ec 413)	4
Extempore Speaking (Sp 111)		3	.....	.....
Technical Writing (J 314)		3	.....	.....
Accounting for Technical Students (BA 385, 386)	3	3
Seminar (AEc 407)	1	.....
Military Science or other electives		3	3	3
		16	15	17

Senior Year

*Marketing Organizations (AEc 442) .....	.....	.....	3
Market Milk and Related Products (DH 410)	3	.....	.....
Milk Marketing (AEc 444) .....	.....	3	.....
Farm Credits (AEc 431) .....	.....	3	.....
Public Land Policies (AEc 461)	3	.....	.....
Agricultural Land Use Planning (FM 418) .....	.....	.....	2
Cereal Production Lectures (FC 322)	3	.....	.....
Public Finance (Ec 418) .....	.....	4	.....
Business Law (BA 256, 257)	3	3	.....
American National Government (PS 212) .....	.....	.....	3
General Sociology (Soc 211) .....	.....	.....	4
*Military Science or other electives	4	3	4
	16	16	16

FARM MANAGEMENT

Junior Year

Farm Organization (FM 312)	3	.....	.....
Operation Efficiency (FM 313) or Animal Breeding (AI 315) .....	.....	3	.....
Enterprise Costs and Profits (FM 414) .....	.....	3	.....
Rural Sociology (Soc 364) or International Trade (Ec 440)	3 or 4	.....	.....
Economic Development of the United States (Ec 214) .....	.....	4	.....
Seed Production (FC 414) or Soil Physics (Sls 421)	3	.....	.....
Animal Nutrition (AI 411) .....	.....	4	.....
*Technical Writing (J 314) .....	.....	.....	3
Geology of Oregon (G 352) or Physical Science Survey (GS 106) .....	.....	.....	3 or 4
Extempore Speaking (Sp 111) .....	.....	.....	3
Electives	7	3	7
	16	17	16

¹The curriculum outlined is intended as a suggestion rather than as a requirement and is modified to fit the needs and previous training of the individual student. Especial modifications are made for students desiring more intensive training in rural finance, marketing, cooperation, or land economics.

²The curriculum for students majoring in the marketing of agricultural products is given in cooperation with the production departments concerned. In general, students follow the curriculum outlined for agricultural economics, including courses in the handling, grading, and storage given in the production departments, and courses in accounting and advertising given in the Department of Business Administration. Students may major in marketing of fruits, vegetables, dairy products, poultry, livestock, or farm crops, with the approval of the production departments concerned.

³AEc 442 and AEc 451 are offered in alternate years, AEc 442 in even-numbered years and AEc 451 in odd-numbered years.

⁴Electives leading to specific objectives are chosen in conference with the head of the department and must include a minimum of 36 hours in agriculture.

⁵Students desiring exemption from J 314 may apply to the Dean of Agriculture, whereupon arrangements will be made for a special examination.

	Term hours		
	F	W	S
Senior Year			
Farm Accounting (FM 311)	2	3	.....
Enterprise Costs and Profits (FM 415)	3	3	.....
Applied Farm Management (FM 411, 412) .....	.....	.....	2
Agricultural Land Use Planning (FM 418) .....	.....	3	.....
Agricultural Land Economics (FM 420) .....	.....	.....	3
Agricultural Appraisal (FM 425) .....	.....	3	.....
Farm Credits (AEc 431) .....	.....	.....	4
Money and Banking (Ec 413)	4	.....	.....
Principles of Agricultural Marketing (AEc 441)	3	.....	.....
American National Government (PS 212)	3	3	6
Electives	15	15	15

Curricula in Animal Industries¹

B.S. Degree

Dairy Manufacturing *Animal Husbandry*
Dairy Production *Poultry Husbandry*
Fish and Game Management
Fisheries

(See Common Freshman Year, page 180, taken by all students in animal industries except those in dairy manufacturing, fish and game management, and fisheries. For the freshman and sophomore curriculum in dairy manufacturing see page 185 and in fish and game management see pages 186-187.)

Sophomore Year²

	Term hours		
	F	W	S
Principles of Economics (Ec 201, 202, 203)	3	3	3
Organic and Agricultural Biochemistry (Ch 251)	5	.....	.....
General Bacteriology (Bac 204)	(3)	3	.....
Principles of Farm Management (FM 211) .....	.....	.....	3
Soils (Sls 211, 212)	3	3	.....
³ Anatomy of Domestic Animals (VM 211), Physiology of Domestic Animals (VM 221, 222)	3	3	3
Introduction to Dairy Husbandry (AI 122) .....	.....	(3)	3
Stock Judging I (AI 111) .....	.....	3	.....
Physical Education	1	1	1
Military Science	1	1	1
⁴ Electives .....	.....	.....	3
	16	17	17

¹At the graduate level major work is also offered in veterinary medicine.

²Students who will specialize in (1) the science phases of animal industries, or (2) range and range-livestock management may make certain substitutions in the curriculum in consultation with the head of the Division of Animal Industries.

³Students who intend to major in poultry husbandry should take Anatomy of the Fowl (VM 311) in place of VM 211.

⁴Animal husbandry majors will take Breeds of Livestock (AH 316), and dairy production majors will take Dairy Breed Types (DH 321).

ANIMAL HUSBANDRY

	Term hours		
	F	W	S
Junior Year¹			
Forage and Root Crop Production (FC 211)	3	....	....
Livestock Breed Types (AH 211) .....	....	....	3
Animal Nutrition (AI 411)	4	....	....
Animal Breeding (AI 315) .....	....	3	....
Elementary Journalism (J 111) .....	....	3	....
Farm Livestock Management (AH 330, 331) .....	....	3	3
American National Government (PS 212)	3	....	....
Business Law (BA 256) .....	....	....	4
Extempore Speaking (Sp 111)	3	....	....
Farm Accounting (FM 311) .....	....	3	....
*Technical Writing (J 314) .....	....	....	3
Electives	3	3	3
	16	15	16
Senior Year¹			
Livestock Feeding (AH 412), Reproduction Problems (AH 423), Livestock Economics (AH 424)	3	3	3
Diseases of Livestock (VM 441, 442, 443)	3	3	3
Range Livestock Management (AH 419) .....	....	3	....
Seminar (AH 407)	1	1	1
Electives	8	5	8
	15	15	15

OPTIONS

Students specializing in *range and range-livestock management* are required to take the following courses.

	Term hours		
	F	W	S
Freshman Year			
General Botany (Bot 203) .....	....	....	3
Junior Year			
Systematic Botany (Bot 313), Range and Pasture Botany (Bot 314)	4	....	3
Fish and Game Management (FG 351, 352)	3	3	....
General Forestry (F 211), Forest Administration (F 212)	3	3	....
Principles of Plant Ecology (Bot 341) .....	....	....	4
Senior Year			
Public Land Policies (AEc 461)	3	....	....
Range Livestock Management (AH 419, 420) .....	....	3	3
Range Survey Methods (AH 333) .....	....	....	3
Range Improvement and Maintenance (FC 319) .....	....	3	....

DAIRY PRODUCTION²

Junior Year			
Dairy Herd Management (DH 322) .....	....	3	....
Dairy Breed Types (DH 321) .....	....	....	3
Dairy Products Standards (DH 315) .....	....	....	1
Animal Nutrition (AI 411)	4	....	....
Animal Breeding (AI 315) .....	....	3	....
Farm Accounting (FM 311) .....	....	3	....
Forage and Root Crop Production (FC 211)	3	....	....
Elementary Journalism (J 111)	3	....	....
Extempore Speaking (Sp 111)	3	....	....
Business Law (BA 256) .....	....	....	4
Farm Livestock Management (AH 330, 331) .....	....	3	3
Electives	3	3	6
	16	15	17

¹Students who will specialize in (1) the science phases of animal industries, or (2) range and range-livestock management may make certain substitutions in the curriculum in consultation with the head of the Division of Animal Industries.

²Students desiring exemption from J 314 may apply to the Dean of Agriculture, whereupon arrangements will be made for a special examination.

³Elective courses leading to production, agricultural teaching, research, extension, or commercial careers are chosen in conference with the head of the department. Certain substitutions for required courses may be requested.

	Senior Year		
	Term hours		
	F	W	S
Market Milk and Related Products (DH 410)	3	---	---
Breeding Dairy Cattle (DH 421), Dairy Cattle Feeding (DH 422)	---	3	3
Milk Marketing (AEc 444)	---	3	---
Seminar (DH 407)	1	1	1
Utilization of Dairy Products (DH 430)	---	---	3
Diseases of Livestock (VM 441, 442, 443)	3	3	3
American National Government (PS 212)	---	---	---
*Technical Writing (J 314)	---	3	---
Electives	6	3	6
	16	16	16

DAIRY MANUFACTURING

Freshman Year

English Composition (Eng 111, 112, 113)	3	3	3
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
Intermediate Algebra (Mth 100), Elementary Analysis (Mth 101, 102)	4	4	4
Agricultural Resources (AEc 111)	3	---	---
Introduction to Dairy Husbandry (AI 122)	---	---	3
Stock Judging I (AI 111)	---	3	---
*Physical Education	1	1	1
Military Science	1	1	1
	15	15	15

Sophomore Year

General Physics (Ph 201, 202, 203)	4	4	4
Principles of Economics (Ec 201, 202, 203)	3	3	3
Organic and Agricultural Biochemistry (Ch 251)	5	---	---
Quantitative Analysis for Agricultural Students (Ch 254)	---	---	3
General Bacteriology (Bac 204)	---	3	---
Introduction to Poultry Husbandry (AI 123)	3	---	---
Extempore Speaking (Sp 111)	---	3	3
Elementary Journalism (J 111)	---	---	---
Business English (Eng 217)	---	3	---
Dairy Products Standards (DH 315)	---	---	1
General Hygiene (PE 150)	---	---	2
Physical Education	1	1	1
Military Science	1	1	1
	17	18	18

Junior Year

Dairy Products Manufacturing (DH 312, 313, 314)	4	4	4
Dairy Bacteriology (Bac 411)	3	---	---
Dairy Chemistry (Ch 353)	---	---	3
Dairy Herd Management (DH 322)	---	3	---
Refrigeration and Cold Storage (ME 363)	---	---	3
Accounting for Technical Students (BA 385, 386)	3	3	---
American National Government (PS 212)	---	3	---
Business Law (BA 256)	3	---	---
Dairy Breed Types (DH 321)	---	---	3
Electives	3	3	3
	16	16	16

Senior Year

Market Milk and Related Products (DH 410)	3	---	---
Milk Marketing (AEc 444)	---	3	---
Utilization of Dairy Products (DH 430)	---	---	3
Dairy Technology (DH 412, 413)	---	3	3
Seminar (DH 407)	1	1	1
Dairy Cattle Feeding (DH 422)	---	---	3
Principles of Agricultural Marketing (AEc 441)	4	---	---
Technical Writing (J 314)	3	---	---
Electives	6	9	6
	17	16	16

*Students desiring exemption from J 314 may apply to the Dean of Agriculture, whereupon arrangements will be made for a special examination.

*General Hygiene (PE 150), 2 term hours, is taken one term in place of Physical Education. Women take Social Ethics (PE 131) one term.

Recommended Electives

	Term	hours
Marketing Organizations (AEc 442)	3	3
General Advertising (SS 439)	3	3
Business Statistics (BA 470)	3	3
Dairy Bacteriology (Bac 412)	3	3
Research (DH 401)	3	3
Farm Credits (AEc 431)	3	3
Analysis of Financial Statements (BA 218)	3	3
Elementary Psychology (Psy 201)	3	3
Money and Banking (Ec 413)	4	4
General Sociology (Soc 211)	4	4
Animal Nutrition (AI 411)	4	4
Interpretation I (Sp 121)	3	3

POULTRY HUSBANDRY

Junior Year

	Term hours		
	F	W	S
Poultry Housing (PH 331), Poultry Judging (PH 341), Incubation and Brooding (PH 321)	3	2	4
Diseases of Poultry (VM 351)	---	---	4
Extempore Speaking (Sp 111)	---	---	3
Animal Nutrition (AI 411)	4	---	---
Animal Breeding (AI 315)	---	3	---
Farm Accounting (FM 311)	---	3	---
Anatomy of the Fowl (VM 311)	---	3	---
Forage and Root Crop Production (FC 211)	3	---	---
Turkey Management (PH 351)	3	---	---
Elementary Journalism (J 111)	---	3	---
Electives	3	3	5
	16	17	16

Senior Year

Marketing Poultry Products (PH 421), Poultry Feeding (PH 411), Poultry Plant Management (PH 431)	4	4	4
Poultry Breeding (PH 441)	---	---	4
Seminar (PH 407)	1	1	1
American National Government (PS 212)	---	3	---
*Technical Writing (J 314)	3	---	---
Electives	7	6	5
	15	14	14

FISH AND GAME MANAGEMENT

Freshman Year

English Composition (Eng 111, 112, 113)	3	3	3
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
General Zoology (Z 201, 202, 203)	3	3	3
Wildlife Conservation (FG 251)	3	---	---
Elements of Agronomy (FC 111)	---	3	---
Introduction to Animal Husbandry (AI 121)	---	---	3
General Forestry (F 211)	3	---	---
Forest Administration (F 212)	---	3	---
Agricultural Engineering (AE 111)	---	---	3
*Physical Education	1	1	1
Military Science	1	1	1
	17	17	17

Students desiring exemption from J 314 may apply to the Dean of Agriculture, where-upon arrangements will be made for a special examination.

*General Hygiene (PE 150), 2 term hours, is taken one term in place of Physical Education.

Sophomore Year

	Term hours		
	F	W	S
Economics and Social Science	3	3	3
General Botany (Bot 201, 202, 203)	3	3	3
Economic Ornithology (Z 321), Economic Mammalogy (Z 322), Biology of Fishes (Z 323)	3	3	3
General Bacteriology (Bac 204, 205)	3	3	---
Anatomy of Domestic Animals (VM 211), Physiology of Domestic Ani- mals (VM 221, 222)	3	3	3
Physical Education	1	1	1
Military Science	1	1	1
Electives	---	---	3
	17	17	17

Junior Year

Range and Pasture Botany (Bot 314)	---	---	3
Principles of Plant Ecology (Bot 341)	---	4	---
Elementary Journalism (J 111)	3	---	---
Nutrition of Fish and Game (AI 410)	---	---	4
Extempore Speaking (Sp 111)	3	---	---
Fish and Game Management (FG 351, 352, 353)	3	3	3
Anatomy of the Fowl (VM 311), Diseases of Game Birds (VM 355)	---	3	3
Parasitic Diseases of Domestic and Game Animals (VM 361)	---	4	---
Principles of Economic Entomology (Ent 314)	3	---	---
Electives	3	3	3
	15	17	16

Senior Year

Wildlife Food Crops (FC 318)	3	---	---
Range Livestock Management (AH 419, 420)	---	3	3
Management of Game Birds (FG 451)	3	---	---
Management of Game Fish (FG 454)	---	3	---
Management of Big Game (FG 457)	---	3	---
Management of Fur Bearers (FG 460)	3	---	---
Animal Breeding (AI 315)	---	3	---
American National Government (PS 212)	---	---	3
Seminar (FG 407)	1	1	1
Technical Writing (J 314)	3	---	---
Electives	3	3	5
	16	16	12

FISHERIES

Freshman Year

English Composition (Eng 111, 112, 113)	3	3	3
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
General Zoology (Z 201, 202, 203)	3	3	3
Wildlife Conservation (FG 251)	3	---	---
Extempore Speaking (Sp 111)	---	3	---
Elementary Journalism (J 111)	---	---	3
Agricultural Engineering (AE 111)	---	---	3
Military Science and Tactics	1	1	1
*Physical Education	1	1	1
	14	14	17

Sophomore Year

Principles of Economics (Ec 201, 202, 203)	3	3	3
Organic and Agricultural Biochemistry (Ch 251, 252)	5	3	---
Biology of Fishes (Z 323)	---	---	3
General Botany (Bot 201, 202, 203)	3	3	3
Vertebrate Zoology (Z 204, 205, 206)	4	4	4
Military Science and Tactics	1	1	1
Physical Education	1	1	1
	17	15	15

*Students desiring exemption from J 314 may apply to the Dean of Agriculture, whereupon arrangements will be made for a special examination.

*General Hygiene (PE 150), 2 term hours, is taken one term in place of Physical Education.

	Junior Year		
	Term hours		
	F	W	S
General Bacteriology (Bac 204, 205) .....	.....	3	3
Fish and Game Management (FG 351, 352, 353)	3	3	3
Invertebrate Zoology (Z 431, 432)	4	4	.....
Nutrition of Fish and Game (AI 410) .....	.....	.....	4
Aquatic Plants (Bot 321)	3	.....	.....
Commercial Fisheries (FG 464, 465, 466)	3	3	3
Electives	3	3	3
	16	16	16

Senior Year			
Principles of Food Preservation (FI 250)	3	.....	.....
Canning of Fish and Fish Products (FI 254, 255) .....	.....	3	3
Management of Game Fish (FG 454, 455) .....	.....	3	3
Histology (Z 475)	3	.....	.....
Physiology (Z 306, 307, 308)	3	3	3
Applied Statistics (Mth 341, 342) .....	.....	3	3
Applied Fish and Game Ecology (FG 360) .....	.....	3	.....
Technical Writing (I 314)	3	.....	.....
Photography (Ph 361)	3	.....	.....
Electives	3	3	3
	18	18	15

Curricula in Plant Industries¹

B.S. Degree

Farm Crops
Soils
Food Industries

Horticulture:
Fruit and Vegetable Production and
Distribution
Landscape Construction and Maintenance

(See Common Freshman Year, page 180, taken by all students in plant industries except those in food industries and in landscape construction and maintenance. For the freshman and sophomore curriculum in food industries see page 190. For the freshman and sophomore curriculum in landscape construction and maintenance see pages 191-192.)

	Sophomore Year		
	Term hours		
	F	W	S
Soils (Sls 211, 212)	3	3	.....
Soil Drainage and Irrigation (Sls 213) .....	.....	.....	3
Forage and Root Crop Production (FC 211)	3	.....	.....
Plant Propagation (Hrt 311) .....	.....	3	.....
Agricultural Engineering (AE 112) .....	.....	.....	3
Principles of Farm Management (FM 211) .....	.....	.....	3
Introduction to Dairy Husbandry (AI 122) .....	.....	3	.....
Organic and Agricultural Biochemistry (Ch 251)	5	.....	.....
Principles of Plant Physiology (Bot 331) .....	.....	.....	4
General Bacteriology (Bac 204) .....	.....	3	.....
Principles of Economics (Ec 201, 202, 203)	3	3	3
Military Science	1	1	1
Physical Education	1	1	1
	16	17	18

¹The recommended curricula of the various departments of Plant Industries may be modified, with the permission of department heads, to meet the needs of students desiring specialization in any phase of work of the respective departments.

FARM CROPS

	Junior Year	Term hours		
		F	W	S
Principles of Agricultural Breeding (FC 315)		3	---	---
Cereal Production Lectures (FC 322)		3	---	---
Cereal Morphology (FC 323)		2	---	---
Forage and Related Crops (FC 324)		---	---	3
Specialty Crops (FC 327)		---	3	---
Farm Accounting (FM 311)		---	3	---
Principles of Plant Pathology (Bot 351)		4	---	---
Principles of Economic Entomology (Ent 314)		---	3	---
Extempore Speaking (Sp 111)		---	---	3
Elementary Journalism (J 111)		---	3	---
*Electives		3	3	9
		15	15	15

Senior Year

Seminar (FC 407)	1	1	1
Crop Inspection (FC 411)	---	4	---
Seed Production (FC 414)	3	---	---
Plant Breeding (FC 415)	---	---	3
Crop Efficiency (FC 421)	---	---	3
Soil Physics Lectures (Sls 421)	3	---	---
Soil Fertility Lectures (Sls 424)	---	3	---
Animal Nutrition (AI 411)	4	---	---
Transportation (Ec 435)	---	4	---
Business Law (BA 256)	---	---	4
American National Government (PS 212)	---	---	3
*Technical Writing (J 314)	3	---	---
*Electives	1	3	3
	15	15	17

SOILS

Junior Year

Extempore Speaking (Sp 111)	3	---	---
Principles of Agricultural Breeding (FC 315)	3	---	---
Animal Nutrition (AI 411) or Fruit Production (Pom 415)	---	4	(4)
Farm Accounting (FM 311)	---	3	---
Farm Motors and Tractors (AE 311)	---	---	3
Irrigation Farming (Sls 311), Western Land and Water Laws (Sls 411), Soil Survey (Sls 432)	3	3	3
Soil Bacteriology (Bac 421)	---	---	4
Agricultural Land Economics (FM 420)	---	3	---
Principles of Economic Entomology (Ent 314)	---	3	---
Elementary Journalism (J 111)	3	---	---
Electives	3	---	6
	15	16	16

Senior Year

American National Government (PS 212)	---	3	---
Soil Physics Lectures (Sls 421)	3	---	---
Soil Physics Laboratory (Sls 422)	2	---	---
Soil Fertility Lectures (Sls 424)	---	3	---
Soil Fertility Laboratory (Sls 425)	---	2	---
Soil Management (Sls 428)	---	---	5
Irrigation Investigations (Sls 414)	3	---	---
Seminar (Sls 407)	1	1	1
*Technical Writing (J 314)	---	3	---
*Electives	6	3	9
	15	15	15

*Electives leading to production, agricultural teaching, research, extension, or commercial careers are chosen in conference with the head of the department.

*Students desiring exemption from J 314 may apply to the Dean of Agriculture, whereupon arrangements will be made for a special examination.

OPTION

Students majoring in agronomy or soils who desire to prepare for *soil-conservation* service should take the following courses.

	Term hours		
	F	W	S
<i>Junior Year</i>			
Cover Crop and Soil-Erosion Prevention Plants (FC 320) .....	.....	2	.....
Climatology (Sls 319) .....	.....	.....	2
Geology (G 201, 202)	3	3	.....
General Forestry (F 111)	3	.....	.....
Range Improvement and Maintenance (FC 319) .....	.....	3	.....
Soil Survey (Sls 432) .....	.....	.....	3
Principles of Plant Ecology (Bot 341) .....	.....	4	.....
Plane Surveying (CE 221)	3	.....	.....
<i>Senior Year</i>			
Range and Pasture Botany (Bot 314) .....	.....	.....	3
Agricultural Land Economics (FM 420) .....	.....	3	.....
Agricultural Appraisal (FM 425) .....	.....	.....	3
Silviculture: Forestation (F 343) .....	.....	.....	4
Soil Physics Lectures (Sls 421)	3	.....	.....
Soil Physics Laboratory (Sls 422)	2	.....	.....
Soil Conservation (Sls 413) .....	.....	3	.....
Soil Conservation Engineering (AE 471)	3	.....	.....
Economic Plant Adaptation (FC 418) .....	.....	.....	3
Field-Plot Technique (FC 416) .....	.....	.....	3

FOOD INDUSTRIES

<i>Freshman Year</i>			
English Composition (Eng 111, 112, 113)	3	3	3
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
General Botany (Bot 201, 202) .....	.....	3	3
General Physics (Ph 201, 202, 203)	4	4	4
Agricultural Resources (AEc 111)	3	.....	.....
Elements of Horticulture (Hrt 111) .....	.....	.....	3
Military Science	1	1	1
*Physical Education	1	1	1
	15	15	18

Sophomore Year

Principles of Food Preservation (FI 250)	3	.....	.....
Principles of Canning Fruits (FI 251) .....	.....	3	.....
Principles of Canning Vegetables (FI 252) .....	.....	.....	3
Principles of Plant Physiology (Bot 331) .....	.....	.....	4
Organic and Agricultural Biochemistry (Ch 251, 252)	5	3	.....
General Bacteriology (Bac 204, 205, 206)	3	3	3
Principles of Economics (Ec 201, 202, 203)	3	3	3
Extempore Speaking (Sp 111) .....	.....	3	.....
Military Science	1	1	1
Physical Education	1	1	1
	16	17	15

Junior Year

Dehydration of Fruits and Vegetables (FI 331)	3	.....	.....
Food Technology (FI 321) .....	.....	.....	2
Pickles, Relishes, and Condiments (FI 341)	3	.....	.....
Vegetable Crops for Manufacturing (VC 322) .....	.....	3	.....
Fruit Production (Pom 415) .....	.....	.....	4
Refrigeration and Cold Storage (ME 363) .....	.....	.....	3
Principles of Plant Pathology (Bot 351)	4	.....	.....
Business Law (BA 256, 257) .....	.....	4	4
Industrial Organization and Operation (BA 221)	4	.....	.....
Elementary Journalism (J 111) .....	.....	3	.....
American National Government (PS 212) .....	.....	3	.....
Electives	3	3	3
	17	16	16

*General Hygiene (PE 150), 2 term hours, is taken one term in place of Physical Education.

	Senior Year		
	Term hours		
	F	W	S
Food Products Manufacture (FI 411)	3	....	....
Fruit Juice and Vinegar Manufacture (FI 351), Commercial Jam and Jelly Manufacture (FI 352), Preserves, Glacéd Fruit and Candied Fruits (FI 361)	3	3	3
Frozen Foods (FI 412, 413) .....	....	3	3
Commercial Pomology (Pom 313)	3	....	....
² Technical Writing (J 314)	3	....	....
Transportation (Ec 435) .....	....	4	....
Accounting for Technical Students (BA 385) .....	....	....	3
Thesis (FI 403) .....	....	....	3
Seminar (FI 407)	1	1	1
Electives	3	5	3
	16	16	16

HORTICULTURE: FRUIT AND VEGETABLE PRODUCTION AND DISTRIBUTION²

	Junior Year		
	Term hours		
	F	W	S
Commercial Pomology (Pom 313)	3	....	....
Fruit Production (Pom 415) .....	....	....	4
Vegetable Production (VC 321) .....	....	3	....
Dehydration of Fruits and Vegetables (FI 331)	3	....	....
Principles of Plant Pathology (Bot 351)	4	....	....
Principles of Economic Entomology (Ent 314) .....	....	3	....
Principles of Agricultural Marketing (AEc 441)	4	....	....
² Marketing Organizations (AEc 442) .....	....	....	3
Elementary Journalism (J 111) .....	....	3	....
Accounting for Technical Students (BA 385) .....	....	3	....
Extempore Speaking (Sp 111)	3	3	3
Electives	3	3	6
	17	15	16

Senior Year			
American National Government (PS 212) .....	....	3	....
Systematic Pomology (Pom 417), Pruning (Pom 431), Spraying (Pom 419)	4	3	3
Vegetable Varieties (VC 423)	2	....	....
Vegetable Marketing (VC 424)	3	....	....
Handling and Distribution of Fruits (Pom 413) .....	....	3	....
Business Law (BA 256, 258)	4	....	4
Money and Banking (Ec 413) .....	....	....	4
Seminar (Hrt 407)	1	1	1
² Technical Writing (J 314) .....	....	3	....
Electives	3	3	4
	17	16	16

HORTICULTURE: LANDSCAPE CONSTRUCTION AND MAINTENANCE⁴

	Freshman Year		
	Term hours		
	F	W	S
General Botany (Bot 201, 202, 203)	3	3	3
Home Ground Planning (LA 279) .....	....	3	....
History and Literature of Landscape Architecture (LA 356, 357, 358)	2	2	2
English Composition (Eng 111, 112, 113)	3	3	3
Construction (AA 120) .....	....	....	1
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
Trigonometry (Mth 106)	4	....	....
Elements of Horticulture (Hrt 111) .....	....	....	3
⁵ Physical Education	1	1	1
Military Science	1	1	1
	17	16	17

¹Students desiring exemption from J 314 may apply to the Dean of Agriculture, where-upon arrangements will be made for a special examination.

²Other horticultural subjects may be chosen after reading the descriptions of these courses on pages 216-219, subject to the approval of the head of the department.

³May be taken in either the junior or senior year. Given alternate years.

⁴The student is required to have one or more summers of practical experience in some one of the following or related fields: ornamental nursery; florist establishment; national, state, or municipal parks; roadway beautification; or large private grounds. Students desiring a degree in landscape architecture may qualify by taking additional work in the School of Architecture and Allied Arts at the University of Oregon or in some other institution where this degree is granted.

⁵General Hygiene (PE 150), 2 term hours, is taken one term in place of Physical Education.

	Sophomore Year		
	F	W	S
Lower-Division Architectural Design (AA 297)	1	1	1
Lower-Division Landscape Design (LA 290)	2	2	2
Plane Surveying (CE 226, 223)	3	.....	3
Principles of Economic Entomology (Ent 314) .....	.....	3	.....
Soils (Sls 211, 212) Soil Drainage and Irrigation (Sls 213)	3	3	3
Principles of Economics (Ec 201, 202, 203)	3	3	3
House Planning and Architectural Drawing (AA 178, 179, 180)	3	3	3
Physical Education	1	1	1
Military Science	1	1	1
	17	17	17

Junior Year			
Plant Materials (LA 326, 327, 328)	3	3	3
Lower Division Architectural Design (AA 297)	1	.....	2
Intermediate Landscape Design (LA 390)	3	or 3	or 3
Maintenance and Construction (LA 359, 360, 361)	3	3	3
Principles of Plant Pathology (Bot 351)	4	.....	.....
Plant Propagation (Hrt 311) .....	.....	3	.....
Principles of Plant Physiology (Bot 331) .....	.....	.....	4
Extempore Speaking (Sp 111)	3	.....	.....
Elementary Journalism (J 111) .....	.....	3	.....
Electives in Agriculture .....	.....	2	2
	17	17	17

Senior Year			
Pruning (Pom 431), Spraying (Pom 419) .....	.....	3	3
Planting Plans (LA 392, 393, 394)	2	2	2
Layout of Small Properties (LA 382, 383, 384)	2	2	2
American National Government (PS 212)	3	.....	.....
Lawns and Turfs (FC 313)	2	.....	.....
Technical Writing (J 314) .....	.....	3	.....
General Floriculture (Hrt 316), Greenhouse Crops (Hrt 313), Nursery Management (Hrt 320)	3	3	3
Electives	3	3	6
	15	16	16

Curriculum in Agricultural Education¹

B.S. Degree

(See Common Freshman Year, page 180)

	Sophomore Year		
	F	W	S
Principles of Economics (Ec 201, 202, 203)	3	3	3
Organic and Agricultural Biochemistry (Ch 251)	5	.....	.....
Introduction to Dairy Husbandry (AI 122)	3	.....	.....
General Bacteriology (Bac 204) .....	.....	3	.....
Principles of Farm Management (FM 211) .....	.....	.....	3
Farm Motors and Tractors (AE 311) or Automobile Mechanics (AE 312) .....	.....	3	.....
Forage and Root Crop Production (FC 211) .....	.....	.....	3
Soils (Sls 211, 212)	3	3	.....
Military Science	1	1	1
Physical Education	1	1	1
Electives .....	.....	.....	6
	16	14	17

¹Students who have had Smith-Hughes agriculture in high school may have greater freedom in choice of electives and, on the approval of the Dean of Agriculture, may be excused from certain introductory courses in agriculture ordinarily required in order to take advanced and additional work in the various departments.

	Term hours		
	F	W	S
Elementary Journalism (J 111) .....	.....	3	.....
Extempore Speaking (Sp 111) .....	.....	.....	3
Outlines of Psychology (Psy 221, 222)	3	3	.....
Educational Psychology (Ed 312) .....	.....	.....	3
Animal Nutrition (AI 411)	4	.....	.....
Diseases of Livestock (VM 341)	4	.....	.....
Blacksmithing (IA 352) .....	.....	.....	3
Electives	4	9	6
	15	15	15

Suggested Electives

Soil Physics Lectures (Sls 421)	3	.....	.....
Soil Fertility Lectures (Sls 424) .....	.....	3	.....
Seed Production (FC 414)	3	.....	.....
Principles of Agricultural Breeding (FC 315)	3	.....	.....
Range Livestock Management (AH 419, 420) .....	.....	3	3
Livestock Economics (AH 424) .....	.....	.....	3
Dairy Herd Management (DH 322) .....	.....	3	.....
Poultry Feeding (PH 411) .....	.....	4	.....
Vegetable Growing Practices (VC 323) .....	.....	.....	3

Senior Year

Principles of Teaching (Ed 313)	3	.....	(3)
Methods and Materials (Ed 408)	3	.....	(3)
Supervised Teaching (Ed 415)	(6)	6	(6)
The Agriculture Curriculum (AE 417) .....	.....	(3)	3
Adult Education in Agriculture (AE 418) .....	.....	3	.....
Rural Survey Methods (AE 533) .....	.....	.....	3
Farm Organization (FM 312)	3	.....	.....
Enterprise Costs and Profits (FM 414) .....	.....	3	.....
Farm Mechanics (AE 221)	3	.....	.....
American National Government (PS 212) .....	.....	.....	3
*Technical Writing (J 314) .....	.....	.....	3
Electives	3	4	6
	15	16	18

Suggested Electives

Applied Farm Management (FM 412)	3	.....	.....
Agricultural Appraisal (FM 425) .....	.....	.....	3
Farm Mechanics (AE 222) .....	.....	3	.....
Pruning (Pom 431) .....	.....	3	.....
Turkey Management (PH 351)	3	.....	.....
Marketing Poultry Products (PH 421)	4	.....	.....
Principles of Agricultural Marketing (AE 441)	4	.....	.....
Rural Electrification (AE 331) .....	.....	3	.....
Forage and Related Crops (FC 324) .....	.....	.....	3

Curriculum in Agricultural Engineering*B.S. Degree**Freshman Year*

	Term hours		
	F	W	S
English Composition (Eng 111, 112, 113)	3	3	3
Elementary Analysis (Mch 101, 102, 103)	4	4	4
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
Agricultural Engineering Survey (AE 101)	2	.....	.....
Forging and Welding (IA 250)	2	.....	.....
Farm Mechanics (AE 221, 222) .....	.....	3	3
Military Science	1	1	1
*Physical Education	1	1	1
	16	15	15

¹Students desiring exemption from J 314 may apply to the Dean of Agriculture, whereupon arrangements will be made for a special examination.

²General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education.

	Term hours		
	F	W	S
Sophomore Year			
Outlines of Economics (Ec 212)	3	.....	.....
General Sociology (Soc 212) .....	.....	3	.....
American National Government (PS 212) .....	.....	.....	3
Engineering Drawing (GE 111, 112)	2	2	.....
House Planning and Architectural Drawing (AA 178) .....	.....	.....	2
Engineering Problems (GE 101, 102, 103)	2	2	2
Engineering Physics (Ph 111, 112, 113)	3	3	3
Farm Motors and Tractors (AE 311)	3	.....	.....
Automobile Mechanics (AE 313) .....	.....	3	.....
Farm Implements (AE 231) .....	.....	.....	3
Machine Shop Practice (IA 260) .....	.....	.....	2
Military Science	1	1	1
Physical Education	1	1	1
	15	15	17
Junior Year			
NORM			
Plane Surveying (CE 226)	3	.....	.....
Principles of Farm Management (FM 211) .....	.....	.....	3
Rural Electrification (AE 331) .....	.....	3	.....
Pumps and Irrigation Equipment (AE 321) .....	.....	.....	3
Soils (Sls 211, 212)	3	3	.....
Electives	4	4	4
	10	10	10
PROFESSIONAL OPTION			
Junior-Year Norm	10	10	10
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
Descriptive Geometry (ME 211)	3	.....	.....
Mechanics (ME 212, 213) .....	.....	3	3
	17	17	17
VOCATIONAL OPTION			
Junior-Year Norm	10	10	10
Agricultural Resources (AEc 111)	3	.....	.....
Introduction to Dairy Husbandry (AI 122) .....	.....	3	.....
Elements of Agronomy (FC 111) .....	.....	.....	3
Electives	4	4	4
	17	17	17
Senior Year			
NORM			
Accounting for Technical Students (BA 385)	3	.....	.....
Business Law (BA 256) .....	.....	.....	4
Elementary Journalism (J 111) .....	.....	3	.....
Extempore Speaking (Sp 111)	3	.....	.....
Technical Writing (J 314) .....	.....	.....	3
Elementary Hydraulics (CE 322) .....	.....	3	.....
Farm Structures (AE 461, 462)	3	3	.....
Seminar (AE 407)	1	1	1
Electives	3	3	3
	13	13	11
PROFESSIONAL OPTION			
Senior-Year Norm	13	13	11
Steam, Air, and Gas Power (ME 346) .....	.....	.....	3
Industrial Electricity (EE 356)	3	.....	.....
Electives .....	.....	4	1
	16	17	15
VOCATIONAL OPTION			
Senior-Year Norm	13	13	11
Forage and Root Crop Production (FC 211)	3	.....	.....
Soil Drainage and Irrigation (Sls 213) .....	.....	.....	3
Electives .....	.....	4	1
	16	17	15

¹Students desiring exemption from J 314 may apply to the Dean of Agriculture, whereupon arrangements will be made for a special examination.

Curriculum in Agricultural Technology

B.S. Degree

Freshman Year

	Term hours		
	F	W	S
English Composition (Eng 111, 112, 113)	3	3	3
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
General Zoology (Z 201, 202, 203) or General Botany (Bot 201, 202, 203) ..	3	3	3
Elementary Analysis (Mth 101, 102, 103) or Lower-division agriculture courses	4	4	4
¹ Physical Education	1	1	1
Military Science	1	1	1
Electives (Lower-division agriculture courses)	2	2	2
	17	17	17

Sophomore Year

Principles of Economics (Ec 201, 202, 203)	3	3	3
Principles of Agricultural Breeding (FC 315) or Animal Breeding (AI 315)	(3)	or 3	---
General Bacteriology (Bac 204)	3	3	---
Lower-division science elective (sequence courses)	3	3-5	3-8
Agriculture electives from courses numbered 211 to 299	---	4-6	4-9
Military Science	1	1	1
Physical Education	1	1	1
Electives	8	---	---
	16	16	16

Junior and Senior Years

Extempore Speaking (Sp 111)	3	---	---
Elementary Journalism (J 111)	---	3	---
American National Government (PS 212)	3	---	---
² Technical Writing (J 314)	---	3	---
³ Electives	25	25	30
	31	31	30

Two-Year Curriculum in Agriculture

Certificate in Agriculture

First Year

	Term hours		
	F	W	S
English Composition (Eng 111, 112, 113)	3	3	3
⁴ Science	3	3	3
Elements of Agronomy (FC 111)	3	---	---
Elements of Horticulture (Hrt 111)	---	---	3
Introduction to Animal Husbandry (AI 121)	3	---	---
⁵ Introduction to Poultry Husbandry (AI 123)	---	3	---
Current Affairs (PS 232)	---	2	---
Agricultural Engineering (AE 111)	3	---	---
Military Science	1	1	1
⁶ Physical Education	1	1	1
Electives	---	4	6
	17	17	17

¹General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education.

²Students desiring exemption from J 314 may apply to the Dean of Agriculture, where-upon arrangements will be made for a special examination.

³Not less than 24 hours of upper-division courses in agriculture including 3 hours of Seminar.

⁴Courses in the basic sciences may be selected from the following: Biological Science Survey, Physical Science Survey, Chemistry, Botany, Zoology, Entomology.

⁵Students 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.

	Second Year			Term hours		
	F	W	S	F	W	S
Principles of Farm Management (FM 211)	3	3	3	3	3	3
Soils (Sls 211, 212)	3	3	3	3	3	3
Plant Propagation (Hrt 311)	3	3	3	3	3	3
Forage and Root Crop Production (FC 211)	3	3	3	3	3	3
Introduction to Dairy Husbandry (AI 122)	3	3	3	3	3	3
Agricultural Resources (AEc 111)	4	4	4	4	4	4
Diseases of Livestock (VM 341)	3	3	3	3	3	3
Farm Structures (AE 461) or House Planning and Architectural Drawing (AA 178)	3	3	3	3	3	3
American National Government (PS 212)	1	1	1	1	1	1
Public Speaking	1	1	1	1	1	1
Military Science	1	1	1	1	1	1
Physical Education	2	2	2	2	2	2
Electives	17	17	17	17	17	17

Division of Agricultural Economics

OFFICES of the Division of Agricultural Economics are located in the Dairy Building. This division deals with the business, financial, and managerial phases of agriculture and agricultural business. The Department of Farm Management deals largely with the individual farm. The Department of Agricultural Economics deals with the broader economic phases of agriculture. No sharp line of distinction is drawn, however, between farm management and agricultural economics. Every effort is made, moreover, to coordinate the work in agricultural economics and farm management with that of the Plant Industries and Animal Industries divisions.

Agricultural Economics--Agricultural Marketing

THE Department of Agricultural Economics, including Agricultural Marketing, aims primarily to meet the needs of students interested in the business side of agriculture and its broader economic relationships, together with sufficient work in agricultural science and technique to give the student a scientific concept of the industry.

The increasing economic, financial, and marketing problems accompanying the growth of agriculture into a vast commercial industry are opening up attractive opportunities to well-trained students in agricultural economics. The curriculum (pages 181-182) not only affords excellent preparation for those who intend to farm and assume positions of business, educational, and community leadership, but also gives the basic training needed for professional careers as teachers, research workers, and extension specialists. It lays a foundation for a business career in connection with farmers' buying and selling associations, real-estate and farm-mortgage companies, banks, brokerage, jobbing, wholesale and retail houses, and expert business service for the agricultural field. It gives valuable training for positions in county agricultural extension work, both professional and commercial; chamber of commerce work; or professional work as adviser to business houses or railway companies where aggressive qualities of leadership and an intimate knowledge of town and country relations are required.

¹Students 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.

In order that the student may have ample opportunity to acquire the broad and liberal training requisite for entry into many of these occupations, ample electives are provided for in the junior and senior years.

The practical character of the instruction in agricultural economics is enhanced by the extension and research activities conducted by this department. Through the Agricultural Experiment Station investigations dealing with (a) rural taxation, (b) marketing, (c) transportation, and (d) economic trends and the market situation and outlook for Oregon's leading agricultural commodities are being conducted.

Through the Extension Service, market news and agricultural situation and outlook material are disseminated to farmers and others. Special attention is given also to the marketing, processing, and handling of agricultural commodities through both cooperative and private agencies. The department has leased-wire connections with the leading markets of the country, through which daily and even hourly market reports are received.

All of the work in agricultural economics is very closely coordinated with the work in agricultural production in the various other departments of the State College.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

AEc 111. Agricultural Resources. 3 hours fall or winter.

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 problems.

AEc 211. Agricultural Economics. 3 hours spring.

Supply, demand, and foreign-trade problems of American agriculture; underlying economic principles; economics of controlled production and controlled foreign trade. Prerequisite: two terms of Principles of Economics.

AEc 221. Agricultural Statistics. 3 hours winter.

Methods of analyzing, simplifying, and presenting statistical material; sources of business and agricultural statistics; study of statistical devices used in the fields of business and agriculture.

UPPER-DIVISION COURSES

AEc 312. Agrarian Movements. 3 hours spring.

Fundamentals of cooperation; agrarian organizations such as the Grange, Farmers' Union, American Society of Equity, the Gleaners, Farm Bureau, Non-Partisan League, and cooperative organizations. Prerequisite: AEc 211.

AEc 331. Economic Development of Agriculture. 3 hours spring.

History of the development of agriculture, of political economy as applied to agriculture, and of present-day agricultural problems. Prerequisite: Ec 203. Professor Potter.

AEc 405. Reading and Conference. Terms and hours to be arranged.

AEc 407. Seminar. 1 hour each term.

AEc 431. Farm Credits. (G) 3 hours winter.

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. Professor Potter.

- AEc 441. Principles of Agricultural Marketing.** (G) 4 hours fall.
Marketing staple, semistaple, and perishable products; producing areas; routes; middlemen; cooperative marketing associations; costs; standardization; prices; marketing system. Prerequisite: Ec 203. Professor Nelson.
- AEc 442. Marketing Organizations.** (g) 3 hours spring.
Organization, management, and operation of cooperative marketing associations; policies; membership relations; sales; public relations. Offered even-numbered years. Prerequisite: AEc 441. Professor Nelson.
- AEc 443. Commodity Marketing.** (G) 3 hours winter.
Supply of agricultural commodities; demand; channels of distribution; functions of middlemen; practices and policies. Prerequisite: AEc 441, BA 223, or equivalent. One lecture; other hours by arrangement. Professor DeLoach.
- 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 441, DH 410, or consent of instructor. Professor DeLoach.
- AEc 451. Agricultural Prices.** (G) 3 hours spring.
Price trends; prices of agricultural and nonagricultural products; prices in relation to production and marketing programs; agricultural situation and outlook. Offered odd-numbered years. Prerequisite: Ec 203 or 211, AEc 441. Professor Nelson.
- AEc 461. Public Land Policies.** (G) 3 hours fall.
Economic, legislative, and historical background of present public-land and range problems; public-land legislation and administration; relation to land-use and nonland-use factors. Professor Potter.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

- AEc 501. Research.** Terms and hours to be arranged.
- AEc 503. Thesis.** Terms and hours to be arranged.
- AEc 505. Reading and Conference.** Terms and hours to be arranged.
- AEc 507. Seminar.** 1 hour each term.
- AEc 571. Marketing Finance.** 4 hours spring.
Financing agricultural marketing and marketing organizations; financial statements; cooperative and noncooperative marketing. Prerequisite: money and banking, rural finance, accounting. Professor DeLoach.
- AEc 572. Marketing Problems.** 3 or 5 hours spring.
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. Professor DeLoach.

Farm Management

FARM management deals with (1) the organization, equipment, and operation of the farm as a business enterprise; (2) the cost of production; and (3) agricultural land economics and appraisal. Its aim is to correlate and synchronize the operations in the various phases of production on the farm in

such a way as to result in a smoothly running, efficient plant from which continuous maximum returns may be obtained. The curriculum in farm management (pages 182-183) is designed to give the student a broad, well-rounded training in all the phases of agriculture that will prepare him for successful production, with emphasis on those studies that will best fit him for successful management of the farm. The work also prepares students for professional work as farm managers and supervisors, county agriculturists, rural rehabilitation supervisors, extension specialists, Smith-Hughes teachers, farm appraisers, soil conservationists, agricultural statisticians, bank and railroad agriculturists, United States Department of Agriculture civil-service candidates, college instructors, and experiment-station research men.

Opportunity for graduate work leading toward the master's and doctor's degrees is well provided for in the upper-division and graduate courses offered by this department combined with the offerings of other departments appropriate for minors.

Candidates for the doctorate should be, of course, more fully qualified in advanced study in economics and related fields.

Equipment. The farm-management laboratory and seminar room is provided with drafting tables and instruments, surveying instruments, original data and record sheets, lantern slides and charts, and a periodical and bulletin reference library. Investigational work carried on in many different parts of the state affords the advanced student excellent opportunities for field work or thesis study.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSE

FM 211. Principles of Farm Management. 3 hours fall or spring.

Selecting a farm; capital; size, quality, and diversity of business; leases; labor and equipment efficiency; layout; cropping systems; cost of production; farm records.

UPPER-DIVISION COURSES

FM 311. Farm Accounting. 3 hours winter.

Inventories; financial statements; operating statements; enterprise analyses; income tax reports. One lecture; 1 recitation; 1 two-hour laboratory period. Prerequisite: FM 211. Associate Professor Kuhlman.

FM 312. Farm Organizations. 3 hours fall.

Application of farm management principles; trips to scientifically organized farms; organization plan for a selected farm. Prerequisite: FM 211. Two lectures; 1 three-hour laboratory period.

FM 313. Operation Efficiency. 3 hours winter.

Use of labor and machinery; farm buildings on farms of different types and sizes; use of outlook and other economic information. Two lectures; one 2-hour laboratory period. Prerequisite: FM 211. Associate Professor Kuhlman.

FM 401. Research. Terms and hours to be arranged.

FM 405. Reading and Conference. Terms and hours to be arranged.

FM 407. Seminar. 1 hour each term.

FM 411, 412, 413. Applied Farm Management. (G) Hours to be arranged.

Organization and management plan for a specific farm, applying student's knowledge of production and management. Field trips, laboratory periods, and weekly round table. Prerequisite: FM 211, 312, or equivalent.

- FM 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: FM 211, 311, or equivalent.
- FM 415. Enterprise Costs and Profits.** (g) 2 hours fall.
Similar to FM 414 but covering other enterprises not discussed in FM 414. Two lectures.
- FM 418. Agricultural Land Use Planning.** (G) 2 hours spring.
AAA, FSA, SCS, BAE, and county and state land use planning committees; probable effects on operation of Oregon farms. Prerequisite: Ec 203, FM 211, or equivalent. Professor Mumford.
- FM 420. Agricultural Land Economics.** (G) 3 hours winter.
Agricultural land resources; agricultural land classification, utilization, and disposal; reclamation; settlement plans and results; land tenure and conservation; valuation. Prerequisite: Ec 203; FM 211, 312, or equivalent.
- FM 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. Weekly field trips. Prerequisite: FM 414, 420, SIs 212, 213, or equivalent. Associate Professor Kuhlman.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

- FM 501. Research.** Terms and hours to be arranged.
- FM 503. Thesis.** Terms and hours to be arranged.
- FM 505. Reading and Conference.** Terms and hours to be arranged.
- FM 507. Seminar.** 1 hour each term.
- FM 511. Types and Systems of Farming.** Term and hours to be arranged.
Farming types and systems; land and other capital requirements; labor program; land utilization. Prerequisite: Ec 203, AEc 211, 221, 441; FM 312, 414, or equivalent.
- FM 512. Farm Tenure and Administration.** Terms and hours to be arranged.
Effect of forms of tenure on operator's income, living standard, and opportunity; administrative problems. Prerequisite: Ec 203; FM 211, 312, or equivalent. Associate Professor Kuhlman.
- FM 514. Advanced Agricultural Appraisal.** Term and hours to be arranged.
Appraising farm buildings, reclamation district lands, and western range and submarginal lands; field work. Prerequisite: FM 418, 425, or equivalent.
- FM 518. Farm Management Research Methodology.** Terms and hours to be arranged.
Methods of obtaining and determining costs of agricultural products, including the survey method; assembling; cost record forms. Prerequisite: FM 311, 312, Ec 203, AEc 221, or equivalent. Associate Professor Kuhlman.

Division of Animal Industries

IN THE Division of Animal Industries are included the departments of Animal Husbandry, Dairy Husbandry (includes Dairy Manufacturing), Fish and Game Management, Poultry Husbandry, and Veterinary Medicine. Training for dairy manufacturing and for range and range-livestock management is also given through the curricula in this division.

The specialized producer of livestock products can no longer ignore relationship of competitive livestock industries to his own in the modern business scheme. One livestock product is easily substituted for another, and consumer demands are quick to reflect change in prices of livestock commodities.

The instruction in animal industries is arranged not only to train students in their fields of special interest, but to make them sufficiently familiar with other types of livestock production to appreciate the importance of proper adjustment of production and marketing operations to competitive conditions. Liberal opportunity is provided for fundamental training in the several phases of agricultural economics—the technique of farm management, agricultural credits, rural finance, and agricultural trade, both international and domestic. Present economic conditions in agriculture demand such training. Business involving the distribution of livestock products or the financing of livestock operations affords one of the greatest opportunities to the student of today. The intricate problems of marketing and distribution require more and more fundamental training in methods of production.

Courses in Animal Industries

BASIC and supplementary to the work of the several departments in the division, the 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

LOWER-DIVISION COURSES

AI 111. Stock Judging I. 3 hours 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, dairy cattle, sheep, swine, and horses studied.

AI 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. Two lectures; 1 two-hour lecture-demonstration period.

AI 122. Introduction to Dairy Husbandry. 3 hours any term.

Economic importance and geographical distribution of dairy cattle; management practices. By arrangement student may learn operation of Babcock test. Two lectures; 1 two-hour lecture-demonstration period.

AI 123. Introduction to Poultry Husbandry. 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.

UPPER-DIVISION COURSES

AI 315. Animal Breeding. 3 hours winter.

Principles of heredity as applied to the breeding of domestic animals and fowls. Associate Professor Holmes.

AI 410. Nutrition of Fish and Game. 4 hours spring.

Principles of nutrition of game and fur-bearing animals; function of the various nutrients in the animal body; chemical composition of feeds, energy values, and adaptability. Professor Nelson.

AI 411. Animal Nutrition. (g) 4 hours fall or winter.

Nutrition principles; function of nutrients in animal body; nutritive ratios; feeding standards; compounding ratios; chemical composition, energy values, and general adaptability of feeds. Prerequisite: Ch 251. Professor Nelson.

GRADUATE COURSES

Course AI 411 may be taken for graduate credit. Courses in animal husbandry, dairy husbandry (includes dairy manufacturing), fish and game management, and veterinary medicine numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

AI 501. Research. Terms and hours to be arranged.**AI 503. Thesis.** Terms and hours to be arranged.**AI 505. Reading and Conference.** Terms and hours to be arranged.**AI 507. Seminar.** Terms and hours to be arranged.**AI 511. Animal Nutrition.** 5 hours winter.

Nutritional research methods; energy concepts; protein metabolism; mineral and vitamin requirements; dietary deficiency disorders. Prerequisite: Ch 251, AI 411 or their equivalent. Professor Haag.

Animal Husbandry

COURSES in animal husbandry are planned to fit the student to produce the highest grade of livestock in the most economical and businesslike manner. The student is thoroughly grounded in the underlying principles in order that he may successfully continue his study after leaving college, but the practical details are also thoroughly treated and a special effort is made to keep him in close touch with the financial phases of the industry. Students who take this work as their specialty are expected not to devote their entire time to livestock; but, on the contrary, to familiarize themselves with veterinary science, crop production, soil fertility, range botany, and other phases of agriculture as well as general education subjects. Much work in economics and marketing is also expected.

Students majoring in animal husbandry (see curriculum, page 184) are given a very free range of electives so that they may fit their programs to their own particular needs. Special opportunity is afforded in this department in range and range-livestock management for students who wish to qualify as grazing specialists for Federal or other official positions, or who desire to engage in the operation of a range-livestock business.

Students not majoring in animal husbandry but desiring to elect some work in the department will be given careful attention to see that they get the work fitted to their individual needs.

Equipment. The stables and barns are located in the western part of the campus. All recent barns have been built west of the Mall. The barns and farm service buildings are arranged in groups according to their use—horse, beef-cattle, hog, and sheep barns. Located on the farm proper, close to the land that the livestock use, is the hog barn south and west of the older barn group. Recently acquired pasture land materially increases the facilities of the Department of Animal Husbandry. Demonstration work with livestock is carried on in the Stock Judging Pavilion.

The equipment of the department consists essentially of livestock, barns, and the State College stock farms. The department maintains good representatives of all the leading breeds. The department has adequate equipment for the conduct of laboratory, lecture, and recitation work. Attention is called to courses and equipment in veterinary medicine (pages 209-210).

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

AH 211. Livestock Breed Types. 3 hours spring.

Judging of all kinds of livestock, particularly market types. Prerequisite: AI 111. Three two-hour laboratory periods.

AH 220. Range and Range Livestock Management. 3 hours fall.

General survey of the field of range and range livestock management primarily for forestry students who do not intend to major or minor in the field. Professor Johnson.

UPPER-DIVISION COURSES

AH 312. Stock Judging II. 4 hours fall.

Practical judging of all kinds of livestock, with trips to fairs and stock farms. Prerequisite: at least three credits in stock judging. Four two-hour laboratory periods.

AH 316. Breeds of Livestock. 3 hours spring.

Breeds of sheep, swine, horses, and beef cattle; their development, breeding, types, and best uses. Prerequisite: AI 111, AI 315, or FC 315. Two recitations; 1 two-hour laboratory period.

AH 319. Livestock Practice. 1 hour fall.

Dipping, dehorning, hoof trimming, shearing, horse training, and other operations. (Department may limit number of students in course.) One three-hour laboratory period. Professor Nelson, Associate Professor Oliver.

AH 320. Livestock Practice. 2 hours spring.

A continuation of AH 319. Two three-hour laboratory periods. Professor Nelson, Associate Professor Oliver.

AH 326. Meats. 3 hours winter or spring.

Meats of all meat animals; butchering; cuts; judging meat; production economics; sanitation and inspection; abattoirs, packing houses, retail markets. One lecture; 2 three-hour laboratory periods. Associate Professor Oliver.

AH 330, 331. Farm Livestock Management. 3 hours winter and spring.

Land use with adapted species and available markets; feeding for maintenance and fattening; selection of feeders. Prerequisite: AI 411. Two lectures; laboratory work to be arranged. Associate Professor Oliver.

- AH 333. **Range Survey Methods.** 3 hours spring.
Range-forage appraisal methods. Two lectures and 1 three-hour Saturday laboratory period. One-week field trip. Prerequisite: AE 111, Bot 203, or their equivalent. Professor Johnson.
- AH 401. **Research.** Terms and hours to be arranged.
- AH 405. **Reading and Conference.** Terms and hours to be arranged.
- AH 407. **Seminar.** Terms and hours to be arranged.
- AH 412. **Livestock Feeding.** (G) 3 hours fall.
Practices of best stockmen; investigations carried on by experiment stations. Students may take parts of course related to certain kinds of livestock by arrangement with department head. Prerequisite: AI 411. Professor Nelson.
- AH 418. **Wool and Mohair.** (G) 3 hours.
Commercial value; physical and chemical structure; preparation and marketing; judging; sorting; grading; scouring; manufacture. Prerequisite: AH 316. Two lectures; 1 two-hour laboratory period. Professor Nelson.
- AH 419, 420. **Range Livestock Management.** (G) 3 hours each term, winter and spring.
Control of numbers; distribution; salting, watering, breeding, branding; control of losses caused by poisonous plants and predatory animals; winter husbandry. Prerequisite: AI 410 or 411 and Bot 314 or their equivalent. Professor Johnson.
- AH 421. **Pedigree Study.** (g) Hours to be arranged, spring.
Laboratory study of blood lines of the breeds of livestock. Each student selects one or two breeds for special study.
- AH 423. **Reproduction Problems.** (G) 3 hours winter.
Breeding efficiency of livestock; effect of nutritional, genetic, and physiological factors; care and management of young and breeding animals. Prerequisite: AI 315, 411.
- AH 424. **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: AH 412.

GRADUATE COURSES

SEE ANIMAL INDUSTRIES, pages 201-202.

Dairy Husbandry

APPROXIMATELY 26,000,000 dairy cows in the United States return about one-fourth the gross national farm income. Of the one and one-third billion pounds of milk produced annually in Oregon, about 50 per cent is used for the manufacture of butter; about 15 per cent for cheese; and the remainder for fluid milk, ice cream, condensed milk, and other products. Since about one-third of the butter and three-fourths of the cheese manufactured are sold outside the state, it is necessary to employ high standards in producing milk and to manufacture and market the products efficiently.

The student who plans to major in dairy husbandry may elect either dairy production (pages 184-185) or dairy manufacturing (pages 185-186). The curriculum in dairy production is planned to give the student a broad education with emphasis on the basic sciences, the selection, care, feeding, breeding, and management of dairy cattle, and the production and marketing of dairy products. The curriculum is planned so that students may qualify for agricultural extension, Smith-Hughes teaching, as fieldmen or operators of testing associations, cooperative associations, and feed mills, and managers of state, federal, and privately owned dairy herds. The object of the four-year dairy manufacturing curriculum is to train students to become operators and technicians in dairy manufacturing plants, supervisors and inspectors, teachers or research workers in colleges and experiment stations. The freshman and sophomore years provide for a broad knowledge of chemistry, bacteriology, physics, and economics; the junior and senior years emphasize theory and practice of dairy science, accounting and business methods, and marketing.

Equipment. The department has a herd of more than 100 head of purebred dairy cattle representing three major dairy breeds. The animals are available for both instructional and experimental purposes and each year are used in teaching judging. The herd is being developed in such a way as to be of unusual value in illustrating the important points in breeding and handling dairy cattle. The herd is free from both tuberculosis and infectious abortion. The dairy barn is equipped with modern facilities for dairy-herd operations and for the production and handling of high-quality milk. The dairy farm includes about 50 acres of irrigated pasture, important in dairy-herd operations.

The department has a well-equipped manufacturing laboratory. The manufacture of butter, ice cream, and cheese, and the handling of market milk, are carried on continuously on a commercial scale. The student thus has opportunity to see this work done under practical conditions, and he receives his systematic instruction under the same conditions.

The Dairy Building, similar in outside and inside architecture to Agriculture Hall, is 54 by 141 feet, three stories high.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

DH 312, 313, 314. Dairy Products Manufacturing. 4 hours each term.

Commercial manufacture of butter, cheese, casein, ice cream, and concentrated milk products. Two lectures; 1 five-hour and 1 three-hour laboratory period. Prerequisite: AI 122. Professor Wilster.

DH 315. Dairy Products Standards. 1 hour.

Critical study of butter, cheese, milk, and ice cream with score cards; discussion of defects and reasons therefor. One two-hour lecture and laboratory period. Professor Wilster.

DH 320. Herd Record Systems. 3 hours winter.

Dairy herd improvement associations; official breed production records. Designed to train for operation of herd improvement associations and related record keeping systems. Prerequisite: AI 122. Assistant Professor Colman.

DH 321. Dairy Breed Types. 3 hours spring.

Correlation of form with milk production; gross breed characteristics; comparative judging; show ring terminology; fitting for show. Prerequisite: AI 111. Three two-hour laboratory periods. Assistant Professor Ewalt.

DH 322. Dairy Herd Management. 3 hours winter.

Breed characteristics, adaptability, and selection; foundation animals; factors affecting growth and development; factors influencing quality and quantity of milk; records; cost of production. Prerequisite: AI 411. Professor Jones.

DH 401. Research. Terms and hours to be arranged.**DH 405. Reading and Conference.** Terms and hours to be arranged.**DH 407. Seminar.** 1 hour each term.**DH 410. Market Milk and Related Products.** (G) 3 hours fall.

Legal requirements for producing, handling, and processing milk and related products; approved production methods; quality tests; processing operations; plant sanitation and efficiency. Prerequisite: DH 312, 313, 314, 322.

DH 412, 413. Dairy Technology. (G) 3 hours, winter and spring.

Analysis of dairy products; technical control of plant operation; management; laws and regulations; plant construction; cost of manufacture. Prerequisite: Ch 254, DH 410. One lecture; 1 recitation; 1 three-hour laboratory period.

DH 421. Breeding Dairy Cattle. (G) 3 hours winter.

Origin and development of dairy cattle; systems of breeding; study of inherited characteristics; pedigree study and analysis; progeny tests; planning the breeding program. Prerequisite: AI 315. Professor Jones.

DH 422. Dairy Cattle Feeding. (G) 3 hours spring.

Feeding standards and feedstuffs for dairy cattle, calves and heifers, herd sire; feeding for milk production and reproduction; investigational technique. Prerequisite: AI 411. Professor Jones.

DH 430. Utilization of Dairy Products. (G) 3 hours spring. (Alternate years.)

Importance of dairy products in human and animal nutrition; utilization in industry; physical properties; chemical composition. Prerequisite: senior standing and consent of instructor. Professors Wilster and Jones.

GRADUATE COURSES

SEE ANIMAL INDUSTRIES, pages 201-202.

Fish and Game Management

THE four-year curriculum in fish and game management, including those subjects having direct and practical application in wildlife conservation, together with basic and general studies, is designed to prepare students for any of the following and other fields of wildlife conservation: state and federal service; land-using industries; management of fish and game for estates and for game and fish clubs; private fur and game farming. A special four-year curriculum is offered for students planning to enter the field of fisheries.

Many of the courses are valuable to students in allied fields who wish the practical aspects of wildlife conservation, especially in its correlation with the livestock industry and with public land-use problems.

Strategically located for the study of wildlife, Oregon State College has within easy access state fish hatcheries, game farms and refuges, and fur farms.

Most forms of Oregon's varied wildlife are within a few hours travel from Corvallis. Research work by the United States Fish and Wildlife Service and the Oregon State Game Commission conducted at the State College in cooperation with the Agricultural Experiment Station is of basic value to the instruction offered in this field.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

FG 251. Wildlife Conservation. 3 hours fall.

Wildlife as a valuable economic and social resource; the need of its conservation through scientific administration and manipulation.

FG 261. Wildlife Technique. 3 hours spring.

Techniques in collecting and preserving specimens; guns and elementary ballistics; bait and fly casting; hunting dogs; dressing and caring for flesh of game and fish. Two lectures or recitations; 1 three-hour laboratory period.

FG 271, 272. Fur Farming. 3 hours each term, fall and winter.

Important fur-bearing mammals raised on fur farms; breeding, feeding, and sanitation; construction; marketing; judging pelts and animals; business principles. Not offered 1943-44.

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.

FG 320. Rodent Control Methods. 3 hours winter or spring.

Classification, life histories, and control of rodents important in human disease transmission and in destruction of agricultural crops. Professor Dimick.

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.

FG 351, 352, 353. Fish and Game Management. 3 hours each term.

Measurement of game and fish populations and productivity; game refuges; parasite and predatory control; other techniques. Prerequisite: Z 203. Two lectures or recitations; 1 three-hour laboratory period. Professor Dimick.

FG 360. Applied Fish and Game Ecology. 3 hours winter.

Techniques used in investigating ecological factors affecting birds, mammals, and fish. Two lectures; 1 three-hour laboratory period. Offered in alternate years. Not offered 1943-44. Professor Dimick.

FG 401. Research. Terms and hours to be arranged.

FG 405. Reading and Conference. Terms and hours to be arranged.

FG 407. Seminar. Terms and hours to be arranged.

FG 451, 452. Management of Game Birds. (G) 3 hours each term, fall and spring.

Propagation on game farms and under natural conditions; management in forest, wildlife refuge, submarginal, and agricultural areas. Prerequisite: Z 321, FG 352. Two lectures; 1 three-hour laboratory or field period. Assistant Professor Long.

- FG 454, 455. **Management of Game Fish.** (G) 3 hours each term, winter and spring.
Fish-hatchery and natural propagation; methods of liberation; laboratory work at Alsea Fish Hatchery. Prerequisite: Z 323, FG 353. Two lectures; 1 three-hour laboratory period or field work. Professor Dimick.
- FG 457, 458. **Management of Big Game.** (G) 3 hours each term.
Species of game mammals; habits, distribution, management under natural conditions; values; laws. Prerequisite: Z 322, FG 352. Two lectures; 1 three-hour laboratory period or field work. Professor Johnson.
- FG 460. **Management of Fur Bearers.** (G) 3 hours fall.
Management in forest areas, submarginal lands, and agricultural lands. Prerequisite: Z 322, FG 352. Two lectures or recitations; 1 three-hour laboratory or field period.
- FG 464, 465, 466. **Commercial Fisheries.** 3 hours each term.
Commercial fisheries; biologies of important species; values; harvesting; regulating fisheries resources. Prerequisite: FG 353. Two lectures; 1 three-hour laboratory or field trip. Offered in alternate years. Not offered 1943-44. Professor Dimick.

GRADUATE COURSES

SEE ANIMAL INDUSTRIES, pages 201-202.

Poultry Husbandry

POULTRY keeping as a specialized business has developed rapidly throughout the Northwest and especially in western Oregon. Climatic conditions throughout the state are particularly adapted to successful breeding and raising of poultry. With this development has come a demand for young men trained in the various fields of the poultry industry. Besides the opportunities afforded in the actual work of poultry farming there is an increasing demand for properly qualified men for positions as government and experiment-station workers, as field men and poultry-feed specialists with the larger feed companies, and for positions with packing houses and cooperative marketing associations.

In the major curriculum (page 186) poultry courses and elective subjects are so arranged that the student may receive training that will fit him for any of the lines of work mentioned.

Equipment. The Poultry Building contains well-equipped laboratories for incubation, judging, killing, and egg candling, in addition to modern refrigeration facilities for study of marketing problems. Different makes of incubators, including three mammoth machines, are available for student instruction as are also sets of charts, lantern slides, motion pictures, and photographs that are used to illustrate the rarer breeds of fowls, types of poultry houses and equipment. Large flocks of White Leghorns and representatives of other common breeds are kept on a plant adjacent to the Poultry Building. This plant contains modern laying houses, an eight-room stationary brooder house, a ten-room breeder house, a granary equipped with feed-mixing machinery, and much other equipment suitable for use on practical poultry farms, all of which is available for instruction and experimentation.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

- PH 321. **Incubation and Brooding.** 4 hours spring.
Natural and artificial incubation and brooding; egg and its development. Students may work out some definite problem. Prerequisite: AI 123. Two recitations; 2 two-hour laboratory periods. Associate Professor Holmes.
- PH 331. **Poultry Housing.** 3 hours fall.
Poultry-house types and housing problems; field trips to neighboring poultry farms. Prerequisite: AI 123. Two lectures; 1 three-hour laboratory period. Associate Professor Holmes.
- PH 341. **Poultry Judging.** 2 hours winter.
Judging of kinds of poultry. Intercollegiate judging teams are chosen largely from members of this class. Prerequisite: AI 123. Two two-hour laboratory periods. Offered alternate years. Professor Cosby.
- PH 351. **Turkey Management.** 3 hours fall.
Practical details in the breeding, feeding, rearing, and marketing of turkeys. Prerequisite: AI 123. Two recitations; 1 two-hour laboratory period. Offered alternate years. Professor Cosby.
- PH 403. **Thesis.** Terms and hours to be arranged.
- PH 405. **Reading and Conference.** Terms and hours to be arranged.
- PH 407. **Seminar.** 1 hour each term.
- PH 411. **Poultry Feeding.** (g) 4 hours winter.
Poultry feeds; feeding breeding stock, feeding for egg production; fattening for market; feeding appliances; compounding of rations. Prerequisite: AI 123, 411. Two recitations; 2 two-hour laboratory periods. Mr. Harper.
- PH 421. **Marketing Poultry Products.** (g) 4 hours fall.
Preparation of poultry and eggs for market. Prerequisite: AI 123. Two recitations; 2 two-hour laboratory periods. Mr. Harper.
- PH 431. **Poultry Plant Management.** (g) 4 hours spring.
Location, layout, and arrangement of buildings; records. Student works out layout and management of commercial enterprise. Prerequisite: PH 321, 331, 411, 421. Two recitations; 2 two-hour laboratory periods. Mr. Harper.
- PH 441. **Poultry Breeding.** (G) 4 hours spring.
History of poultry breeds; breeding; modes of inheritance of egg production; egg size, hatchability. Prerequisite: AI 123, 315. Three lectures; 1 two-hour laboratory period. Associate Professor Holmes.

GRADUATE COURSES

SEE ANIMAL INDUSTRIES, pages 201-202.

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 Building. The Veterinary Clinic building is equipped for dissection, autopsies, and clinics.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

VM 211. Anatomy of Domestic Animals. 3 hours fall.

Foot, teeth, muscles of locomotion of horse; digestive, urinary, genital and respiratory systems; circulatory, muscular, and nervous systems. Prerequisite: Z 130 or equivalent. Three two-hour laboratory periods.

VM 221, 222. Physiology of Domestic Animals. 3 hours each term, winter and spring.

Functions of the body; physiological processes of all domestic animals with emphasis on horse and cow. Prerequisite: VM 211. Two lectures; 1 two-hour laboratory period.

UPPER-DIVISION COURSES

VM 311. Anatomy of the Fowl. 3 hours winter.

Structure of body of fowl. Two lectures; 1 two-hour laboratory period. Professor Dickinson.

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.

Parasitic, infectious, and noninfectious diseases of poultry; prevention and control of parasitic and infectious diseases; autopsies; diagnosis; treatment. Three lectures; 1 two-hour laboratory period. Professor Dickinson.

VM 355. Diseases of Game Birds. 3 hours spring.

Similar to VM 351, but concerned with game birds. Two lectures; 1 two-hour laboratory period. Professor Dickinson.

VM 361. Parasitic Diseases of Domestic and Game Animals. 4 hours winter.

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 221, 222, or equivalent. Two recitations; 1 two-hour laboratory period. Professor Shaw.

GRADUATE COURSES

SEE ANIMAL INDUSTRIES, pages 201-202.

Division of Plant Industries

THE Division of Plant Industries deals with the nation's major agricultural resources, the soils and their crops. The research, resident instruction, and extension work in plant industries is basic to practically all phases of general and specialized agriculture. It covers the nation's water and soil resources, their mapping, use, management, storage, processing, and preservation; and the plant resources that include the major basic food, forage, and clothing commodities and the food luxuries of the world's diet.

Educational work conducted in this division is broad, covering ecological relationship, production, management, grading, preservation, manufacture, storage, transportation, and marketing of food, forage, textile, and seed crops. Cereals, fruits, nuts, vegetables, ornamental plants, and plant and soil phases of pasture, range, soil conservation, and wildlife work are given attention. Liberal opportunity is provided for students to elect courses of their own choice with the guidance of the faculty. Special curricula are developed to suit the needs of those more mature students who have a definite objective in view. Students are encouraged to undertake individual work in connection with training for special state, Federal, or private positions.

Farm Crops

PROBLEMS of production, improvement, marketing, manufacture, and uses of each of the field crops produced for food, forage, textile, and special purposes are dealt with by this department. The purpose of the major curriculum (page 189) is primarily to teach students scientific, practical, and economical methods of crop production, marketing, and improvement that may be put into actual use on the farm. In addition the courses are so arranged that men may fit themselves for business positions in connection with the marketing of seeds and other farm crops; for civil service positions in agronomy, forage crops, soil conservation, range management, grain standardization, plant breeding, and crop marketing; and for experiment station, extension, and teaching work. The object is to develop men with broad training for leadership along agricultural and general lines and to provide scientific training such that graduates may succeed in the professional and technical agricultural fields. Considerable flexibility in electives together with the study of original problems is encouraged in order to meet special needs of individual students.

Farm-crops graduates occupy technical, commercial, and teaching positions involving considerable responsibility and are successful in farm operation. They are in Federal and state experimental and regulatory positions, several are county agents, others are in the seed and grain business, and some are in graduate study and teaching positions. The field is a large one and deals principally with well-known and staple crops that are constantly in use and in demand. Farm-crops work is closely related to six important fields: (1) the daily food supply of our human population, (2) the feed requirements of all classes of farm animals, (3) the growth of plants for textiles, (4) seed and special crops, such as drug plants, (5) plant problems of soil conservation, and (6) the range and wildlife food crops. Crops courses make practical application of scientific principles from such fields as soils, physics, chemistry, bacteriology, plant pathology, and plant physiology.

Equipment. The department has excellent recitation rooms, greenhouses, and well-equipped laboratories. The Experiment Station plots and farm fields afford superior opportunities for field study and make possible extensive collection of valuable material for class work. Federal cooperative investigations in seed testing, forage crop, fiber flax, cereals, and hops form a distinct instructional asset. A large collection of the best books, periodicals, 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.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

FC 111. Elements of Agronomy. 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 students. Prerequisite to all farm-crops courses except FC 211, 311, 317, and 324. One lecture; 1 recitation; 1 two-hour laboratory period.

FC 211. Forage and Root Crop Production. 3 hours fall or spring.

Economic production, rotation, storage, costs, marketing, uses, and improvement of the important forage and pasture crops and their seeds, and the root crops. Two lectures; 1 two-hour laboratory period.

UPPER-DIVISION COURSES

FC 311. Potato Growing. 3 hours winter.

Production; improvement; storage; cost; marketing; distribution; uses; experimental work; varietal studies; identification, judging, and scoring. One recitation; 1 two-hour laboratory period. Assistant Professor Finnell.

FC 313. Lawns and Turfs. 2 hours fall.

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. Assistant Professor Finnell.

FC 315. Principles of Agricultural Breeding. 3 hours fall.

Practical application of modern conceptions of breeding. Two lectures; 1 two-hour laboratory period. Associate Professor Fore.

FC 317. Weed Eradication. 3 hours spring.

Weed types; habits of growth; legislation; prevention, control, and eradication; noxious, persistent, perennial, and poisonous weeds of ranch and range. Two lectures; 1 two-hour laboratory period. Assistant Professor Finnell.

FC 318. Wildlife Food Crops. 3 hours fall.

Native and introduced food, forage, and cover plants for wildlife and game refuges, breeding areas, fur and game farms; seed and plant supplies and markets. One lecture; 1 two-hour laboratory period.

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.

- FC 320. Cover Crop and Soil-Erosion Prevention Plants.** 2 hours winter.
Production, development, and maintenance of plants suited to soil, dike, and bank protection, cover-cropping purposes, and building up organic control. One lecture; 1 two-hour laboratory period. Assistant Professor Finnell.
- FC 322. Cereal Production Lectures.** 3 hours fall.
Cereals and allied grains; distribution; adaptability; ecological relationship; seed treatment; markets; manufacture and movement in commerce. Prerequisite: FC 111, Bot 202, or equivalent. Professor Hill.
- FC 323. Cereal Morphology.** 2 hours fall.
Morphological and taxonomic characters of common cereals; identification; seed structure in relation to cereal manufacturing processes. Two two-hour laboratory or field periods. Professor Hill.
- FC 324. Forage and Related Crops.** 3 hours spring.
Pasture management in humid areas and with irrigation; hay making, storage, transportation, and marketing; use and cost of forage crops. Prerequisite: FC 211. Two lectures; 1 two-hour laboratory period.
- FC 327. Specialty Crops.** 3 hours winter.
Production, harvest, storage, distribution, marketing, and costs of hops, pyrethrum, drug, oil, related plants. Prerequisite: Bot 203 or equivalent. Two lectures; 1 two-hour laboratory period. Assistant Professor Finnell.
- FC 401. Research.** Terms and hours to be arranged.
- FC 403. Thesis.** Terms and hours to be arranged.
- FC 405. Reading and Conference.** Terms and hours to be arranged.
- FC 407. Seminar.** 1 hour each term.
- FC 411. Crop Inspection.** (G) 4 hours winter.
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, 322, 323. Two lectures; 1 two-hour laboratory period. Assistant Professor Finnell.
- FC 415. Plant Breeding.** (G) 3 hours spring.
Practical application of genetics to improvement of field and horticultural plants. Prerequisite: senior standing and consent of instructor. Two lectures; 1 two-hour laboratory period. Associate Professor Fore.
- FC 416. Field-Plot Technique.** (G) 3 hours spring.
Methods, theory, and technique of plot experiments and demonstrations with plants. Prerequisite: senior standing, consent of instructor. Two lectures; 1 two-hour laboratory period. Professor Hill, Associate Professor Fore.
- FC 417. Plant Genetics.** (G) 3 hours winter.
The theory and technique of plant-inheritance studies. Prerequisite: FC 111, 211; Bot 202, 331; FC 315; or equivalents. Two lectures; 1 two-hour laboratory period. Associate Professor Fore.
- FC 418. Economic Plant Adaptation.** 3 hours spring.
Relation of environment for strains, varieties, and species to production conditions. Prerequisite: FC 111, 211, 322, or 324; Bot 202, 331, 341; or equivalents. Two lectures; 1 two-hour laboratory period.

FC 421. **Crop Efficiency.** (G) 3 hours spring.

Production, conditioning, storage, and marketing of farm crops; specialization; warehousing; grades and standards; export and import regulations; byproducts. Prerequisite: FC 322, 323, 414, or equivalents.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

FC 501. **Research.** Terms and hours to be arranged.

FC 503. **Thesis.** Terms and hours to be arranged.

FC 505. **Reading and Conference.** Terms and hours to be arranged.

FC 507. **Seminar.** 1 hour each term.

Food Industries

THE curriculum in food industries (pages 190-191) is designed to prepare the student to enter the fields of food technology and commercial food preservation and manufacturing, such as: canning; dehydration; preserving; pickling; maraschino cherry, fruit and vegetable juice, and vinegar manufacture; and the byproducts utilization of agricultural and marine crops. Students are also trained for positions as food buyers; manufacturers, brokers, food inspectors, and food-research workers; and as instructors in food preservation and manufacture. The laboratory work is conducted on a scientific as well as a commercial scale, and the student is trained to operate and repair machinery and equipment used in food and byproducts manufacture.

Instruction includes lectures, laboratory exercises, visits to food plants, reading assignments, and problems. Special opportunity is afforded students of ability who wish to do research work on problems in food technology.

The annual Canners' and Frozen Food Packers' School affords an opportunity for students to hear and become acquainted with men who rank high in the food-preservation field. At this time and throughout the academic year representatives of associated industries contribute valuable discussions and material for food-industries students.

Special courses covering preservation and utilization of fish and other marine products are offered. These courses are designed particularly for students majoring in fish and game management.

Equipment. The Food Industries Building is equipped for study, research, and manufacture of canned fruits, vegetables, meats and fish, fruit juices, concentrates, carbonated beverages, vinegar, preserves, jams, jellies, condiments, sirups, vegetable oils, and byproducts of agricultural crops. The laboratories have complete commercial-canning equipment, fruit-juice presses, filters, pasteurizers, carbonating and bottling equipment, preserving, dehydration, and preparation machinery.

The scientific laboratories are equipped with all necessary instruments to make complete examinations and analyses of all food products. Specialized instruments for food sterilization with ultraviolet light are available.

Sea Foods Laboratory. The Sea Foods Laboratory at Astoria is a recently established branch research laboratory of the Department of Food Industries for the purpose of studying various problems in the preservation of marine and plant forms of foodstuffs. Studies conducted include those on high-vitamin oils and new products from fish of all kinds.

This building, approximately 50 by 80 feet, is a one-story tile and concrete structure with full, well-lighted basement and white enameled interior. It contains a large canning room, an analytical laboratory, a smoke house, a large preparation and examination room, two freezing rooms, a work shop, and offices.

Opportunity is given for research by undergraduate and graduate students majoring in food industries. A complete apartment in the building provides living accommodations for graduate students in the Astoria laboratory.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

FI 250. Principles of Food Preservation. 3 hours fall.

Freezing, drying, concentrating, salting, smoking, fermenting, carbonating, and use of heat, electricity, and chemical preservatives for food preservation. Two lectures; 1 two-hour laboratory period.

FI 251. Principles of Canning Fruits. 3 hours winter.

Varieties; buying; grading; preparation; blanching; siruping; water and steam exhausting; sealing; cooking; cooling; storage; marketing. Prerequisite: FI 250. Two lectures; 1 three-hour laboratory period.

FI 252. Principles of Canning Vegetables. 3 hours spring.

Retort installation, operation, control; handling methods; heat penetration; thermal death points; different methods compared; commercial plants visited. Prerequisite: FI 250, 251. Two lectures; 1 three-hour laboratory period.

FI 254, 255. Canning of Fish and Fish Products. 3 hours each term, winter and spring.

Fundamental principles, thermal death points; effect of acidity, vacuum, can fill, grading, seaming, cooking, storage, corrosion. Prerequisite: FI 250, Bac 204. Two lectures; 1 two-hour laboratory period.

UPPER-DIVISION COURSES

FI 311. The Canning Plant and Its Equipment. 3 hours spring.

Location, construction; equipment; operation; designing plants and estimating costs; canning machinery; field trips to canneries. Two lectures; 1 three-hour laboratory period. Associate Professor Onsdorff.

FI 321. Food Technology. 2 hours spring.

Commercial manufacture of fruit and vegetable byproducts, spices, condiments, flavoring extracts, sirups, leavening agents, animal foods. Prerequisite: Ch 201, 202, 203. Professor Wiegand.

FI 331. Dehydration of Fruits and Vegetables. 3 hours fall.

Actual drying of fruits and vegetables; types of driers and principles of dehydration; testing for moisture and adulteration. Two lectures; 1 three-hour laboratory period. Professor Wiegand, Mr. Litwiller.

FI 341. Pickles, Relishes, and Condiments. 3 hours fall.

Principles and practice in vinegar and salt pickling; causes of spoilage and testing methods emphasized. Prerequisite: Ch 251. Two lectures; 1 three-hour laboratory period. Associate Professor Onsdorff, Dr. Harvey.

FI 351. Fruit Juice and Vinegar Manufacture. 3 hours fall.

Handling of fruit juices; filtration, sterilization, and bottling. Prerequisite: Bac 204, 205, 206; Ch 251; FI 252. Two lectures; 1 three-hour laboratory period. Professor Wiegand, Associate Professor Onsdorff, Mr. Litwiller.

- FI 352. **Commercial Jam and Jelly Manufacture.** 3 hours winter.
Use of fresh and frozen fruits; testing yield, moisture content, pectin requirement, acidity, sugar. Prerequisite: Ch 251; Bac 204, 205, 206; FI 252. Two lectures; 1 three-hour laboratory period. Associate Professor Onsdorff.
- FI 361. **Preserves, Glacéd Fruits, and Candied Fruits.** 3 hours spring.
Manufacture of preserves, marmalades, conserves, maraschino cherries, glacéd and candied fruits. Prerequisite: Ch 251; Bac 204, 205, 206; FI 252, 352. Two lectures; 1 three-hour laboratory period. Professor Wiegand, Mr. Litwiller.
- FI 401. **Research.** Terms and hours to be arranged.
- FI 403. **Thesis.** Terms and hours to be arranged.
- FI 405. **Reading and Conference.** Terms and hours to be arranged.
- FI 407. **Seminar.** Terms and hours to be arranged.
- FI 411. **Food Products Manufacture.** (G) 3 hours fall.
Principles involved in the preparation, preservation, and examination of fruit, vegetable, and food products. Prerequisite: Bac 206, Ch 252. One lecture; 2 two-hour laboratory periods. Professor Wiegand, Mr. Litwiller.
- FI 412, 413. **Frozen Foods.** (G) 3 hours winter and spring.
Changes before, during, and after freezing; processing, storage, transportation, distribution. Prerequisite: Ch 251; Bac 204, 205, 206, or equivalents. Two lectures; 1 two-hour laboratory period. Professor Wiegand, Associate Professor Onsdorff.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

- FI 501. **Research.** Terms and hours to be arranged.
- FI 503. **Thesis.** Terms and hours to be arranged.
- FI 505. **Reading and Conference.** Terms and hours to be arranged.
- FI 507. **Seminar.** Terms and hours to be arranged.

Horticulture

INSTRUCTIONAL work in horticulture covers the broad fields of production and marketing of fruits and vegetables. It is designed to train students to be fruit farmers, fruit handlers and shippers, state and federal inspectors, teachers in high schools and colleges, and investigators in fields of research.

The work in landscape maintenance lays the foundation for professional careers in laying out, planting, and superintending country and city homes, parks, and playgrounds, in nursery management, and in floriculture.

The courses cover general horticulture, pomology, vegetable crops, floriculture, and research. Much stress is placed upon practical phases; students are given field and laboratory exercises in all such operations as planting, seeding, budding, grafting, cultivating, thinning, spraying, harvesting, grading, and packing.

Equipment. The Horticulture wing of Agriculture Hall, modern greenhouses, orchards, and gardens, the large campus containing good plant material,

and an excellent library are at the service of the department. The laboratories are well equipped for giving instruction in spraying, plant propagation, fruit packing, vegetable grading and crating, and systematic pomology. There are large lecture rooms, and a photography room.

NOTE: The courses in horticulture include the following groups, under each of which the respective courses are listed in numerical order: General Horticulture (including graduate and research courses), Pomology, Vegetable Crops. Descriptions of the principal courses in Landscape Construction and Maintenance are under Art and Architecture and Landscape Architecture, pages 122-125.

COURSES IN GENERAL HORTICULTURE

LOWER-DIVISION COURSE

Hrt 111. Elements of Horticulture. 3 hours fall or spring.

Farm and commercial fruit growing; home vegetable growing and important truck crops; food preservation, including drying, and cider and vinegar manufacture. Two lectures; 1 three-hour laboratory period.

UPPER-DIVISION COURSES

Hrt 311. Plant Propagation. 3 hours winter.

Methods of propagating plants by seeds, cuttings, bulbs, tubers, budding and grafting. Students grow plants in greenhouse, nursery, and orchard and keep records. One lecture; 2 two-hour practicums. Mr. Roberts.

Hrt 312. Greenhouse Construction and Management. 3 hours fall.

Principles of greenhouse design and operation; materials, equipment, heating, ventilation, watering, soils, soil sterilization, insecticides, and fumigation. Two lectures; 1 two-hour laboratory period. Professor Bouquet.

Hrt 313. Greenhouse Crops. 3 hours winter.

Propagation in greenhouse; culture; soils; ventilation; watering; heating; growing of plants used in florist trade. Prerequisite: Hrt 311. One lecture; 2 three-hour laboratory periods. Professor Bouquet.

Hrt 316. General Floriculture. 3 hours fall.

Studies of annual, biennial, and perennial flowers with particular reference to their culture in city and rural home gardens. Two lectures; 1 two-hour laboratory period. Professor Bouquet.

Hrt 320. Nursery Management. 3 hours spring.

Organization, management, equipment, plants, planting, storage, protection, shipping, diseases and insects, quarantine regulations; trips to nurseries. Prerequisite: Hrt 311. Two lectures; 1 laboratory period. Mr. Roberts.

Hrt 401. Research. Terms and hours to be arranged.

Hrt 403. Thesis. Terms and hours to be arranged.

Hrt 405. Reading and Conference. Terms and hours to be arranged.

Hrt 407. Seminar. Any term, 1 hour.

Hrt 411. Methods of Research. (G) 3 hours winter.

Procedures in investigative work; experimental design; statistical methods; analysis of problems; reasoning and weighing of evidence; briefs and outlines; preparation of manuscripts. Professor Hartman.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

- Hrt 501. **Research.** Terms and hours to be arranged.
Hrt 503. **Thesis.** Terms and hours to be arranged.
Hrt 505. **Reading and Conference.** Terms and hours to be arranged.
Hrt 507. **Seminar.** Three terms, 1 hour each term.

COURSES IN POMOLOGY

UPPER-DIVISION COURSES

- Pom 312. **History and Literature of Horticulture.** 3 hours winter.
History of horticulture; systematic survey of the literature of horticulture, acquainting the student with the various sources of horticultural knowledge. Mr. Roberts.
- Pom 313. **Commercial Pomology.** 3 hours fall.
Physiology of ripening; maturity tests; picking, cleaning, packing, standardization, certification; domestic and export loading. Two lectures; 1 two-hour laboratory period. Prerequisite: Hrt 111; Ec 201, 202, 203. Mr. Roberts.
- Pom 321. **Fruits and Nuts of the World.** 3 hours winter.
Fruits and nuts of economic importance not commonly grown in Oregon; botanical relationships, culture, history, present trade status, possibilities in United States. Prerequisite: Hrt 111. Mr. Roberts.
- Pom 341. **Small Fruits and Grapes.** 3 hours winter.
Problems connected with the soils and slopes, pruning, training, harvesting, packing, and marketing of small fruits and grapes. Mr. Roberts.
- Pom 413. **Handling and Distribution of Fruits.** 3 hours winter.
Problems of transportation, distribution, marketing methods, storage and storage plant operation. Prerequisite: Pom 313. Professor Hartman.
- Pom 415. **Fruit Production.** (G) 4 hours spring.
Fruit and nut growing as related to climate, soil, and water requirements; varieties, root stocks, planting systems, pollination, thinning, frost, pest control. Prerequisite: Hrt 111. Three lectures; 1 three-hour laboratory period.
- Pom 417. **Systematic Pomology.** (G) 4 hours fall.
Descriptions, nomenclature, and classifications of fruits and nuts. Student becomes acquainted with more important groups, species, and varieties. One lecture; 1 recitation; 2 two-hour laboratory periods. Mr. Roberts.
- Pom 419. **Spraying.** (g) 3 hours spring.
Insect and disease control; sprays and their mixing; spray pumps, gas engines, and electric motors; accessories; practice in spraying. Prerequisite: Hrt 111. One recitation; 2 two-hour laboratory periods. Mr. Roberts.
- Pom 431. **Pruning.** (g) 3 hours winter.
The fundamental principles underlying pruning, including bud studies, tree building, maintaining vigor of the tree, rejuvenation. Prerequisite: Hrt 111. Two lectures; 1 three-hour laboratory period.

UPPER-DIVISION COURSES

- VC 321. **Vegetable Production.** 3 hours fall or winter.
Soils, fertilization, varieties, seeds, plant growing, distribution of crops, succession cropping, irrigation, pest control, planting, cultivating. Prerequisite: Hrt 111. Two lectures; 1 two-hour laboratory period. Professor Bouquet.
- VC 322. **Vegetable Crops for Manufacturing.** 3 hours winter.
Production and handling of vegetables for canning and freezing; crops of special importance in the Northwest. Two lectures; 1 two-hour laboratory period. Professor Bouquet.
- VC 323. **Vegetable Growing Practices.** 3 hours spring.
Growing and management methods in production of vegetables for market. Prerequisite: Hrt 111. Two lectures; 1 two-hour laboratory period. Professor Bouquet.
- VC 325. **Vegetable Forcing.** 3 hours spring.
Commercial vegetable growing; plants under glass; greenhouse operations. Prerequisite: Hrt 111. Two lectures; 1 two-hour laboratory period. Professor Bouquet.
- VC 423. **Vegetable Varieties.** (G) 2 hours fall.
Descriptions, nomenclature, and classifications of vegetables; varieties; exercises in displaying and judging vegetables. Prerequisite: Hrt 111. Two two-hour laboratory periods. Professor Bouquet.
- VC 424. **Vegetable Marketing.** (g) 3 hours fall.
Commercial harvesting, grading, and packing; car loading; mixed cars; transportation; distribution of truck crops; field work. Prerequisite: Hrt 111. Two lectures; 1 two-hour laboratory period. Professor Bouquet.

Soils

COURSES in soils include soil physics, soil drainage, irrigation, farming, soil fertility, soil surveying, soil biology, soil conservation, and soil management and utilization. The purpose of the major curriculum in soils (pages 189-190) 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 experiment fields, greenhouses, laboratories, and 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.

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.

Sls 214. Forest Soils. 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.

Sls 215. Soils Improvement. 2 hours fall.

Soil-fertility gains and losses, maintenance, and improvement; effect of manures, fertilizers, and crop rotations on soil productiveness. Required of students in landscape architecture.

UPPER-DIVISION COURSES

Sls 311. Irrigation Farming. 3 hours fall.

Obtaining, distributing, and conserving irrigation waters; different crops under irrigation; costs and profits; duty of water; water rights; field studies. Two lectures; 1 three-hour laboratory period. Professor Powers.

- 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. Associate Professor Torgerson.
- 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. Associate Professor Torgerson.
- 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, 213. Professor Stephenson.
- Sls 422. **Soil Physics Laboratory.** (g) 2 hours fall.
Determination and comparison of physical properties of soil types; physical effects of mulches, rotations, and cropping; sampling and judging; mechanical analysis. Two three-hour laboratory periods. Professor Stephenson.
- Sls 424. **Soil Fertility Lectures.** (g) 3 hours winter.
Composition and values of fertilizers and barnyard and green manures; maintenance and improvement of fertility; effect of the various crops and farming systems; rotations. Prerequisite: Sls 421. Professor Ruzek.
- Sls 425. **Soil Fertility Laboratory.** (g) 2 hours winter.
Laboratory work accompanying Sls 424. Two three-hour laboratory periods. Professor Ruzek.
- Sls 428. **Soil Management.** (G) 5 hours spring.
Occurrence, composition, productivity, plant-food requirements, comparative values, management of different soil types. Prerequisite: Sls 424. Two recitations; 3 three-hour laboratory periods. Professor Powers.
- Sls 431. **Soils of Oregon.** (g) 2 hours winter.
Distinguishing characteristics of the various soil types of Oregon. Prerequisite: Sls 212. Associate Professor Torgerson.
- 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. One recitation; 2 three-hour laboratory periods. Associate Professor Torgerson.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

- Sls 501. **Research.** Terms and hours to be arranged.
- Sls 503. **Thesis.** Terms and hours to be arranged.
- Sls 505. **Reading and Conference.** Terms and hours to be arranged.
- Sls 507. **Seminar.** 1 hour each term.
- Sls 511. **Pedology.** 3 hours spring.
Advanced soil classification and morphology; soil-forming processes; evolution of soil profiles; 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.

Agricultural Education, Engineering, Extension Methods

THE departments of Agricultural Education, Agricultural Engineering, and Extension Methods are administered in close relation to the three divisions of the School of Agriculture. Preparation for professional service as agricultural educator, agricultural engineer, or agricultural extension worker involves fundamental training in agricultural economics, animal industries, and plant industries, supplemented by special preparation in the particular field of professional specialization.

Agricultural Education

THE Department of Agricultural Education is responsible for the training of teachers and supervisors of agriculture in secondary schools, for all-day, part-time, and evening schools for both young and adult farmers, and the training for leadership in rural life and education. Special attention is given to the preparation of teachers, directors, supervisors, and teacher trainers as provided for by the Federal laws for vocational education commonly known as the Smith-Hughes Act and the George-Deen Act. Included within the scope of this department's work are certain field, research, and extension activities in-

volving the preparation of instructional material for the use of agriculture instructors in cooperation with staff members of the School of Agriculture.

The Department of Agricultural Education is a joint department within both the School of Agriculture and the School of Education.

Requirements for Teaching Agriculture. Teachers of agriculture need to have a fundamental knowledge and a high level of doing ability in most of the departmental fields of the School of Agriculture. At the beginning of his college course the prospective teacher should advise with the head of the Department of Agricultural Education regarding the courses he should select in each of the fields of agriculture. Certain qualifications essential in teaching vocational agriculture should be considered by the student in conference with the head of this department when applying for admission into this field of teaching. Students interested in Smith-Hughes agriculture see footnote on page 192.

Requirements in Agriculture:

- (1) Graduation from a college of agriculture of standard rank.
- (2) The course requirements in agriculture and education (for Smith-Hughes teaching) can be met in either of two ways: first, by majoring in the Agricultural Education curriculum (pages 192-193), which includes requirements in both agriculture and education; or, second, by pursuing one of the three other curricula in agriculture in the sophomore year and one of the major curricula in General Agriculture, Agricultural Economics, Animal Industries, or Plant Industries during the junior and senior years. The latter plan will be approved, provided sufficient electives are available for meeting the course requirements in agriculture as outlined in the Agricultural Education curriculum on pages 192-193, as well as the requirements in education.
- (3) 80 to 90 term hours of special work in agriculture are required. The student's choice of courses should depend somewhat on his previous training and experience and the recommendations of the head of the department. The suggested sequence and distribution of courses are given in the major curriculum on pages 192-193. Regardless of the department in which the student majors he should have a minimum of term hours in the respective departments distributed as follows: Animal Husbandry, 10; Dairy Husbandry, 6; Poultry Husbandry, 6; Veterinary Medicine, 4; Soils, 9; Farm Crops, 12; Horticulture, 6; Agricultural Economics and Marketing, 6; Farm Management, 12; Agricultural Engineering, 18.
- (4) Requirements for certification of agricultural instructors:
 - (a) Vocational certificate. The four-year curriculum in Agricultural Education, pages 192-193, is designed to fulfill the requirements for this certificate.
 - (b) Secondary school certificate. The requirements for this certificate are given on pages 245-247.

For more specific information regarding the methods of meeting the requirements for both types of teaching certificates in the field of agricultural education, confer with head of the department.

Graduate Study and Apprentice Training. As the demands on teachers of agriculture the country over are becoming more exacting each year additional work after graduation in the fields of agriculture and education is desirable, and in certain states, including Oregon, Washington, and California, is

required for the secondary school certificate. To meet this demand, a fifth year of graduate work including apprentice teaching is available for a limited number of graduates of approved standing. The plan provides for the location of apprentice teachers in high-school centers near Corvallis where they may acquire credit, both by work at the College and in the field, toward a master's degree.

General Electives. Certain courses are open to all students in agriculture and others who are interested in training for leadership in rural life. Special attention is called to Ed 341, Rural Education.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

Ed 341. Rural Education. 3 hours winter.

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. Professor Gibson.

AEd 401. Research. Terms and hours to be arranged.

AEd 403. Thesis. Terms and hours to be arranged.

AEd 405. Reading and Conference. Terms and hours to be arranged.

AEd 407. Seminar. Hours to be arranged, two terms.

Ed 408a. Methods and Materials. 3 hours any term.

AEd 417. The Agriculture Curriculum. (G) 3 hours winter or spring.

Determining course content and evaluating types of course organization with reference to the objectives to be attained in the field of agriculture in secondary schools. Prerequisite: Ed 313. Professor Gibson.

AEd 418. Adult Education in Agriculture. (G) 3 hours winter.

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. Professor Gibson.

GRADUATE COURSES

AEd 501. Research. Terms and hours to be arranged.

AEd 503. Thesis. Terms and hours to be arranged.

AEd 505. Reading and Conference. Terms and hours to be arranged.

AEd 507. Seminar. Terms and hours to be arranged.

AEd 516. Extension Course in Teacher Training. Hours to be arranged, any term.

Enables agriculture teachers in service to continue their professional improvement; conferences, follow-up instruction, supervision, correspondence, reports. Prerequisite: Ed 311, 312, 313. Professor Gibson.

AEd 533. Rural Survey Methods. 3 hours spring.

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. Professor Gibson.

Agricultural Engineering

THE Department of Agricultural Engineering offers two types of instruction: (1) a major curriculum in agricultural engineering (pages 193-194) and (2) service courses for students majoring in other departments. The major curriculum offers the student two options. The professional option provides training for the student planning to qualify for civil service examinations, or other fields where extensive technical training is needed. The vocational option is designed to train the student who is interested in farming, extension work, Smith-Hughes vocational agriculture teaching, farm implement sales, lumber and building materials retailing in rural communities, or other work requiring a wider knowledge of agriculture, with less emphasis on the technical phases of engineering. In both options the sciences fundamental to engineering and agriculture, including mathematics, physics, chemistry, and economics, serve as a basis for practical work in agriculture and agricultural engineering. Opportunity is given to elect nontechnical work of cultural value.

The increasing importance of modern machinery and equipment in reducing cost of production, together with the improvement of rural living conditions, demands, in any branch of agriculture, a more complete and effective grasp of agricultural engineering. Students majoring in other departments who recognize the need for a knowledge of farm mechanics, implements, tractor, and automobile mechanics, building materials and structures, and modern home conveniences may elect courses pertaining to these subjects.

Equipment. The Agricultural Engineering Building is built of brick and reinforced concrete, two stories high, and consists of a main unit 50 by 120 feet with a wing 40 by 50 feet. Facilities are provided for teaching and experimental work dealing with farm power, farm machinery, farm water supply and irrigation equipment, farm shop, farm building, automobile mechanics, and rural electrification.

The farm motors laboratory contains several makes and types of stationary gas engines, cut-away automobile and tractor motors, and accessories, such as carburetors, magnetos, and air cleaners. A Prony brake for determining the horsepower output of stationary engines and sectionized automobile chassis parts are also included. Up-to-date equipment and demonstration material is loaned to the institution by the leading manufacturers and distributors of the Northwest for study and operation by the students.

The tractors and automobile repair laboratory is well equipped with modern tools and testing equipment for complete instruction in repair work of all kinds. A number of tractors, of both wheel and crawler types, are loaned annually to the department for instruction purposes.

A well-lighted drafting room with modern equipment is available for students studying farm structures. A number of model farm buildings and various samples of building materials are used to supplement the study of actual buildings on the college and neighboring farms.

Courses in farm construction and general farm repairs are taught in laboratories equipped for the purpose. Farm water systems, centrifugal and turbine pumps for irrigation pumping, spray pumps, and similar equipment are available for instruction purposes.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- AE 101. Agricultural Engineering Survey.** 2 hours fall.
Orientation course for freshmen majoring in agricultural engineering; fields of agricultural engineering; requirements; ability and training best suited for each. Two two-hour periods.
- AE 111, 112. Agricultural Engineering.** 3 hours each term.
Principles of mechanics, hydraulics, and electricity 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.
- AE 221, 222. Farm Mechanics.** 3 hours two terms.
Drawing; reading blueprints; estimating materials and costs; construction of wood and metal farm appliances; equipment repairs. Prerequisite: IA 250 or equivalent. One recitation; 2 three-hour laboratory periods.
- AE 231. Farm Implements.** 3 hours spring.
Plows and their adjustments and hitches; machines for cultivating, seeding and planting, cutting hay and grain; manure spreaders; adjustment of machines. One recitation; 2 two-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. Assistant Professor Lunde.
- AE 312. Automobile Mechanics.** 3 hours any term.
The automobile and its parts; their functions, adjustment and simple repairs; latest developments. In the fall term a *special section of this course carrying 2 hours credit* is offered for women students (1 recitation, 1 two-hour laboratory period). Two recitations; 1 three-hour laboratory period. Assistant Professor Lunde.
- AE 313. Automobile Mechanics.** 3 hours any term.
Practical overhauling and repairing of automobiles, tractors, and trucks; locating troubles; replacements and repairs. Prerequisite: AE 311 or 312. One recitation; 2 three-hour laboratory periods. Assistant Professor Lunde.
- AE 314. Automobile Mechanics.** 3 hours spring.
Automobile repairing and overhauling, especially for those intending to teach automobile mechanics. Prerequisite: AE 313. Two recitations; 1 three-hour laboratory period. Assistant Professor Lunde.
- AE 321. Pumps and Irrigation Equipment.** 3 hours spring.
Operation and testing of pumps, irrigation equipment, farm water systems, spray equipment. Prerequisite: AE 111 or equivalent. Two recitations; 1 three-hour laboratory period. Associate Professor Walker.
- AE 331. Rural Electrification.** 3 hours winter.
Farm electric plants; rural line extension policies; wiring; electric motors; water heaters, cooling, sterilizing, and refrigerating equipment. Prerequisite: AE 111 or equivalent. Two lectures; 1 three-hour laboratory period. Associate Professor Walker.
- AE 341. Use of Explosives.** 2 hours winter.
Use of explosives in removing stumps and boulders; stump burning and char-pitting; use in ditch and rock blasting. Taught jointly by Agricultural En-

ineering, Civil Engineering, and Logging Engineering departments. One recitation; 30 hours laboratory and field work arranged during term. Professors Gilmore, Glenn, and Patterson.

- AE 401. **Research.** Terms and hours to be arranged.
- AE 405. **Reading and Conference.** Terms and hours to be arranged.
- AE 407. **Seminar.** Terms and hours to be arranged.
Prerequisite: fourteen term hours in agricultural engineering or equivalent.
- AE 461, 462, 463. **Farm Structures.** 3 hours each term.
Organization, layout, and construction of farm buildings; materials; types of construction; lighting, ventilating, heating, equipment; estimating costs. One lecture; 2 three-hour laboratory periods.
- AE 471. **Soil Conservation Engineering.** 3 hours fall.
Agricultural-engineering phases of soil-erosion control; dams and terraces; terracing machinery; mapping; measurement of run-off. One lecture; 1 recitation; 1 three-hour laboratory period. Associate Professor Walker.

GRADUATE COURSES

- AE 501. **Research.** Terms and hours to be arranged.
- AE 503. **Thesis.** Terms and hours to be arranged.
- AE 505. **Reading and Conference.** Terms and hours to be arranged.
- AE 507. **Seminar.** Terms and hours to be arranged.

Extension Methods

INSTRUCTION in the Department of Extension Methods is intended to supplement that of the subject matter departments in the training of students for positions as county agents, home demonstration agents, 4-H club agents, extension specialists, and for similar types of work in which extension methods are commonly used.

The extension worker must be well trained not only in the subject matter of his field but also in the methods by which extension work is successfully carried on. He must be able to give or know how to obtain authoritative advice for his community or county on any problems that may arise related to his field of service. He must know and practice the technique of platform speaking and demonstration, radio speaking, how to conduct discussions, and how to support the extension program by effective publicity. Excellent opportunities for combining a major in agriculture or home economics with training in journalism, speech and dramatics, economics, sociology, and other departments, supplemented by work in extension methods, should materially assist in meeting the need for better training on the part of extension workers.

This department is a joint department within both the School of Agriculture and the School of Home Economics.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

- EM 405. **Reading and Conference.** 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. Professor Teutsch.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

Division of Business and Industry

Faculty

CLIFFORD ELGES MASER, Ph.D., Head of the Division of Business and Industry.
GERTRUDE FULKERSON, Secretary to the Head of the Division.

Business Administration

PROFESSORS MASER (department head), NELSON, DREESSEN, LEMASTER.
ASSOCIATE PROFESSOR ROBINSON (emeritus).
ASSISTANT PROFESSOR KLEINSORGE.*
INSTRUCTOR DEHNER.*

Commercial Education

ASSOCIATE PROFESSORS STUTZ, FRICK.

Secretarial Science

PROFESSOR YERIAN (department head).
ASSOCIATE PROFESSORS STUTZ, FRICK, LARSE.
ASSISTANT PROFESSORS CALLARMAN, ORNER, VIETTI.

General Statement

A DEGREE-GRANTING division to be known as the Division of Business and Industry was authorized by the State Board of Higher Education June 15, 1943. The scope and professional objectives of the division had been defined by action of the Board the previous year.

On April 28, 1942, the Board authorized at Oregon State College a major in business and industry to enable the College to meet more adequately the needs of students primarily interested in business as related to the industrial courses distinctive of the land-grant type of institution. The objectives of the new curriculum were stated to be: (1) to liberalize the curricula of the entire institution to meet the needs of modern citizenship training; (2) to meet more adequately the needs of industry for young men and women trained in combined business and industrial courses; and (3) to provide an economical curriculum involving the fundamental courses in business, technology, and science, yet sufficiently liberal to train future civic and business leaders in the fields related to the specific work assigned to Oregon State College under the unified system of higher education.

The Division of Business and Industry includes the departments of Business Administration, Commercial Education (a joint department with the School of Education), and Secretarial Science.

* On leave of absence for military service.

Baccalaureate Degrees. For the degrees of Bachelor of Arts, Bachelor of Science, and Bachelor of Secretarial Science students must complete all State College requirements for these degrees (see pages 71-72), including major requirements. For the Bachelor of Arts degree students must complete 36 hours of arts and letters including two years of work in a foreign language. For the Bachelor of Science degree students must complete 36 hours of either science or social science, or 45 hours in the two fields.

Business and Industry. The Board has approved the following minimum requirements for students in the business and industry major:

- (a) Business and Economics: 54 term hours of fundamental courses in business and economics.
- (b) Technology and/or Science: 45 term hours, including prerequisites, with at least two year-sequences in one field. These offerings may be expanded in the technical fields to the full extent of the electives available or to give emphasis to management in industry, finance, or marketing.
- (c) Liberal Arts: 36 term hours, or the equivalent of at least one three-hour course per term throughout the four years, in the liberalizing fields, including a two-year sequence in English language and literature and at least six term hours in American history and government.

The student majoring in business and industry must meet the requirements for a Junior Certificate (page 70) and for a bachelor's degree (page 71). The student is expected to make an early selection of a definite professional objective in business and industry and the curriculum (pages 231-234) is outlined on a flexible plan to permit a variety of individual student programs within the specified requirements. Assistance is given to students in all of the broad fields of the curriculum: business and economics, technology, science, and the liberal arts.

All students in the business and industry major follow a common lower-division curriculum in the freshman and sophomore years. The completion of the lower-division curriculum meets all the requirements for the Junior Certificate as well as providing for the completion of such courses as are required by the student's major department.

In the junior and senior years the division offers upper-division curricula for specialized preparation in the following fields of business and industry: General Business and Industry, Industrial Organization and Operation, Industrial Finance, Industrial Accounting and Cost Control, Industrial Marketing and Selling, and Industrial Relations and Personnel Management.

Basically, the student should determine the answers to two questions as early in his college career as possible. Having reached that determination, he should choose from among the several suggested combinations of courses within the fields of business and economics, technology and/or science, and the liberal arts those that best meet his requirements and desires. The two questions to be answered are:

- (1) In what aspect of industry's business is the student interested?
- (2) In what type of industry or technical aspect of industry is the student interested?

The answer to the first question should be found among the fields of major emphasis suggested in the upper-division curricula (pages 232-234).

The answer to the second question should be found among the fields of technology and science that are offered by the various cooperating schools of

Oregon State College. The purpose of this aspect of the major work is to acquaint the student with some of the fundamental techniques involved in industry rather than to prepare him for active participation in the use of such specialized techniques. The fields of technology and science include:

- (a) General Technology and/or Science.
- (b) Agriculture (General; Agricultural Engineering; Animal Husbandry; Dairy Production; Dairy Manufacturing; Poultry Husbandry; Farm Crops; Fisheries; Horticulture; Food Industries).
- (c) Engineering (General; Chemical; Civil; Electrical; Mechanical; Mining; Industrial Arts).
- (d) Forestry (General; Logging Engineering; Wood Products).
- (e) Home Economics (General; Clothing, Textiles, and Related Arts; Foods and Nutrition; Household Administration; Institution Economics).
- (f) Science (General; Chemistry; Geology; Physics).

Commercial Education. Students preparing to teach commercial education in secondary schools may follow a major curriculum in the Division of Business and Industry and meet the requirements for a State Teacher's Certificate. Under SCHOOL OF EDUCATION are printed the state certification requirements, together with approved teaching majors and minors. Advanced work in commercial education may be obtained by taking courses in the Department of Commercial Education for an M.A. or M.S. degree.

Secretarial Science. The secretarial science four-year curriculum 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.

A four-year degree curriculum in secretarial science was offered at the College from 1916 to 1932, though instruction in secretarial subjects had been offered for many years before that time. In the 1932 allocations of major curricula in the State System of Higher Education, secretarial science was assigned to the State College. The next year the work in secretarial science was organized by authority of the State Board of Higher Education into a four-year degree curriculum. When the Division of Business and Industry was established, the Department of Secretarial Science was made an integral part of the division.

For a degree in secretarial science students must satisfy all the general requirements and in addition must follow a prescribed curriculum including the first two years of shorthand and typing, Business English, one year of accounting, one year of Principles of Economics, Elements of Finance (BA 222), Elements of Marketing (BA 223), one year of Business Law, Office Procedure (SS 311, 312), and one year of psychology.

Facilities. The classrooms and laboratories of the Division of Business and Industry are located in Commerce Hall. Special facilities include the latest office appliances and fixtures, the standard types of typewriters, duplicators, Mimeographs, Dictaphones, Mimeoscopes, filing cabinets, adding machines, bookkeeping machines, and accounting machines. All appliances and equipment are kept in constant repair. Students are taught how to keep in repair the appliances they use.

Curricula in Business and Industry

B.A., B.S. degrees

LOWER-DIVISION CURRICULUM

	Freshman Year			Term hours		
	F	W	S	F	W	S
Introduction to Business and Industry (BA 115)	4	...	...	4	...	...
Economic Geography (Ec 114) .....	...	4	...	...	4	...
Survey of Modern Industry (BA 116) .....	...	...	4	...	...	4
Principles of Accounting (BA 111, 112, 113)	4	4	4	4	4	4
Intermediate Algebra (Mth 100)	4	...	...	4	...	...
Elements of Statistics (Mth 109) .....	...	4	...	...	4	...
American National Government (PS 212) .....	...	...	3	...	...	3
English Composition (Eng 111, 112, 113)	3	3	3	3	3	3
Military Science and Tactics (Men)	1	1	1	1	1	1
¹ Physical Education	1	1	...	1	1	...
General Hygiene (PE 150)	(2)	(2)	2	(2)	(2)	2
	17	17	17	17	17	17
	Sophomore Year					
	F	W	S	F	W	S
Industrial Organization and Operation (BA 221)	4	...	...	4	...	...
Elements of Finance (BA 222) .....	...	4	...	...	4	...
Elements of Marketing (BA 223) .....	...	...	4	...	...	4
Principles of Cost Accounting (BA 211)	3	...	...	3	...	...
Principles of Economics (Ec 213, 214) .....	...	4	4	...	4	4
² Elementary Chemistry or Mathematics or other Science prerequisite	4	4	4	4	4	4
² Technical and/or science courses	3	3	3	3	3	3
Military Science and Tactics (Men)	1	1	1	1	1	1
Physical Education	1	1	1	1	1	1
	16	17	17	16	17	17

UPPER-DIVISION CURRICULA

GENERAL BUSINESS AND INDUSTRY

Junior Year						
Business Law (BA 256, 257)	4	4	...	4	4	...
Money and Banking (Ec 413) .....	...	...	4	...	...	4
Business Statistics (BA 470)	3	...	...	3	...	...
Principles of Personnel Management (BA 414) .....	...	3	...	...	3	...
General Insurance (BA 377) .....	...	...	3	...	...	3
Business English (Eng 217)	3	...	...	3	...	...
³ Business and economics courses .....	...	3	3	...	3	3
² Technical and/or science courses	3	3	3	3	3	3
Electives	3	3	3	3	3	3
Physical Education	1	1	1	1	1	1
	17	17	17	17	17	17
Senior Year						
Business and Industrial Policy (BA 473) .....	...	...	3	...	...	3
³ Business and Economics Courses	6	6	6	6	6	6
English Language and Literature	3	3	...	3	3	...
² Technical and/or science courses	3	3	3	3	3	3
Electives	3	3	3	3	3	3
Physical Education	1	1	1	1	1	1
	16	16	16	16	16	16

¹General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education. Women take Social Ethics (PE 131) one term.

²Selection of courses to fulfill the technical and/or science prerequisites, requirements, and electives must be made in accordance with a specific objective and in consultation with the student's adviser.

³Selection of courses in Business and Industry or Economics must be made in consultation with the student's adviser.

INDUSTRIAL ORGANIZATION AND OPERATION

	Junior Year	Term hours		
		F	W	S
Business Law (BA 256, 257)	4	4	---	---
Money and Banking (Ec 413)	---	---	---	4
Business English (Eng 217)	3	---	---	---
Principles of Personnel Management (BA 414)	---	3	---	---
General Insurance (BA 377)	---	---	---	3
Advanced Cost Accounting (BA 421)	3	---	---	---
Budgetary Control (BA 418)	---	3	---	---
Industrial Psychology (Psy 215)	---	---	3	3
*Technical and/or science courses	3	3	3	3
Electives	3	3	3	3
Physical Education	1	1	1	1
	17	17	17	17

Senior Year

Labor Problems (Ec 425)	4	---	---	---
Transportation (Ec 435)	---	4	---	---
Production Management (BA 413)	---	---	---	4
Methods and Motion Study (IA 366)	3	---	---	---
Time Study (IA 367)	---	3	---	---
Production Planning and Control (IA 368)	---	---	---	3
Business and Industrial Policy (BA 473)	---	---	---	3
English Language and Literature	3	3	---	---
*Technical and/or science courses	3	3	3	3
Electives	3	3	3	3
Physical Education	1	1	1	1
	17	17	17	17

INDUSTRIAL ACCOUNTING AND COST CONTROL

Junior Year

Business Law (BA 256, 257)	4	4	---	---
Money and Banking (Ec 413)	---	---	---	4
Business English (Eng 217)	3	---	---	---
Principles of Personnel Management (BA 414)	---	3	---	---
General Insurance (BA 377)	---	---	---	3
Advanced Cost Accounting (BA 421)	3	---	---	---
Budgetary Control (BA 418)	---	3	---	---
Business Combinations (Ec 420)	---	---	---	4
*Technical and/or science courses	3	3	3	3
Electives	3	3	3	3
Physical Education	1	1	1	1
	17	17	17	18

Senior Year

Advanced Accounting (BA 212, 213, 214)	3	3	3	---
Business Fluctuations (Ec 421)	4	---	---	---
Analysis of Financial Statements (BA 218)	---	3	---	---
Income Tax Procedure (BA 423)	---	---	---	3
Business and Industrial Policy (BA 473)	---	---	---	3
English Language and Literature	3	3	---	---
*Technical and/or science courses	3	3	3	3
Electives	3	3	3	3
Physical Education	1	1	1	1
	17	16	16	16

*Selection of courses to fulfill the technical and/or science prerequisites, requirements, and electives must be made in accordance with a specific objective and in consultation with the student's adviser.

INDUSTRIAL FINANCE

	Term hours		
	F	W	S
Junior Year			
Business Law (BA 256, 257)	4	4	.....
Money and Banking (Ec 413) .....	.....	.....	4
Business Statistics (BA 470)	3	.....	.....
Principles of Personnel Management (BA 414) .....	.....	3	.....
General Insurance (BA 377) .....	.....	.....	3
Business English (Eng 217)	3	.....	.....
Budgetary Control (BA 418) .....	.....	3	.....
Credits and Collections (BA 412) .....	.....	.....	3
*Technical and/or science courses	3	3	3
Electives	3	3	3
Physical Education	1	1	1
	17	17	17

Senior Year

Investments (BA 463)	3	.....	.....
Analysis of Financial Statements (BA 218) .....	.....	3	.....
Applied Business Finance (BA 431) .....	.....	.....	3
Business Fluctuations (Ec 421)	4	.....	.....
Public Finance (Ec 418) .....	.....	4	.....
Income Tax Procedure (BA 423) .....	.....	.....	3
Business and Industrial Policy (BA 473) .....	.....	.....	3
English Language and Literature	3	3	.....
*Technical and/or science courses	3	3	3
Electives	3	3	3
Physical Education	1	1	1
	17	17	16

INDUSTRIAL MARKETING AND SELLING

Junior Year

Business Law (BA 256, 257)	4	4	.....
Money and Banking (Ec 413) .....	.....	.....	4
Business Statistics (BA 470)	3	.....	.....
Principles of Personnel Management (BA 414) .....	.....	3	.....
General Insurance (BA 377) .....	.....	.....	3
Business English (Eng 217)	3	.....	.....
Transportation (Ec 435) .....	.....	4	.....
Credits and Collections (BA 412) .....	.....	.....	3
*Technical and/or science courses	3	3	3
Electives	3	3	3
Physical Education	1	1	1
	17	18	17

Senior Year

International Trade (Ec 440)	4	.....	.....
Industrial Purchasing (BA 374) .....	.....	3	.....
Marketing Problems (BA 411) .....	.....	.....	3
Principles of Advertising (BA 438)	3	.....	.....
Effective Selling and Promotion (BA 439) .....	.....	3	.....
Sales Management (BA 372) .....	.....	.....	4
Business and Industrial Policy (BA 473) .....	.....	.....	3
English Language and Literature	3	3	.....
*Technical and/or science courses	3	3	3
Electives	3	3	3
Physical Education	1	1	1
	17	16	17

*Selection of courses to fulfill the technical and/or science prerequisites, requirements, and electives must be made in accordance with a specific objective and in consultation with the student's adviser.

INDUSTRIAL RELATIONS AND PERSONNEL MANAGEMENT

	Junior Year	Term hours ¹		
		F	W	S
Business Law (BA 256, 257)		4	4	---
Money and Banking (Ec 413)		---	---	4
Business Statistics (BA 470)		3	---	---
Principles of Personnel Management (BA 414)		---	3	---
General Insurance (BA 377)		---	---	3
Business English (Eng 217)		3	---	---
Outlines of Psychology (Psy 221, 222)		---	3	3
¹ Technical and/or science courses		3	3	3
Electives		3	3	3
Physical Education		1	1	1
		17	17	17

Senior Year

Labor Problems (Ec 425)	4	---	---
Practical Personnel Procedure (BA 415)	---	3	---
Case Problems in Personnel Management (BA 416)	---	---	3
Industrial Psychology (Psy 215)	---	3	---
Methods and Motion Study (IA 366)	3	---	---
Collective Bargaining and Labor Legislation (Ec 426)	---	---	3
Business and Industrial Policy (BA 473)	---	---	3
English Language and Literature	3	3	---
¹ Technical and/or science courses	3	3	3
Electives	3	3	3
Physical Education	1	1	1
	17	16	16

Curriculum in Secretarial Science

B.A., B.S., B.S.S. Degrees

Freshman Year

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
Military Science and Tactics	1	1	1
² Physical Education	1	1	1
³ Electives	3	3	3
	16	16	16

Sophomore Year

Applied Stenography (SS 211, 212, 213)	3	3	3
Principles of Economics (Ec 201, 202, 203)	3	3	3
Principles of Accounting (BA 111, 112, 113)	4	4	4
Elementary Psychology (Psy 201, 202, 203)	3	3	3
Business English (Eng 217)	---	---	3
Military Science and Tactics	1	1	1
Physical Education	1	1	1
³ Electives	3	3	---
	18	18	18

¹Selection of courses to fulfill the technical and/or science prerequisites, requirements, and electives must be made in accordance with a specific objective and in consultation with the student's adviser.

²General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education. Women take Social Ethics (PE 131), one term.

³Ninety of the hours taken for a baccalaureate degree must be in liberalizing courses.

	Junior Year			Term hours		
	F	W	S	F	W	S
Office Procedure (SS 311, 312)	5	5	...	5	5	...
Office Organization and Management (SS 313)	3	...	...	3	...	...
Income Tax Procedure (BA 423) .....	...	4	...	...	4	...
Elements of Finance (BA 222) .....	...	4	4	...	4	4
Elements of Marketing (BA 223)	4	4	4	4	4	4
Business Law (BA 256, 257, 258)	3	3	3	3	3	3
¹ Electives	15	16	16	15	16	16
Senior Year						
² Secretarial Science (SS 411, 412)	3	3	...	3	3	...
² Seminar in Secretarial Science (SS 407) .....	...	1	...	...	1	...
Merchandising and Selling (SS 436) .....	...	3	...	...	3	...
General Advertising (SS 439) .....	...	...	3	...	...	3
International Trade (Ec 440)	4	...	...	4	...	...
Money and Banking (Ec 413) .....	...	...	4	...	...	4
Latin-American Relations (PS 418) .....	...	3	...	...	3	...
Pacific Area Relations (PS 419) .....	...	...	3	...	...	3
International Relations (PS 417)	3	...	...	3	...	...
¹ Electives	5	5	5	5	5	5
	15	15	15	15	15	15

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 industry. Courses offered in the Department of Economics (pages 115-117) supplement the work of the Department of Business Administration.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

BA 111, 112, 113. Principles of Accounting. 4 hours each term.

An introduction to the field of accounting and business administration. Technique of account construction and preparation of financial statements; application of accounting principles to practical business problems.

BA 115. Introduction to Business and Industry. 4 hours fall.

Survey of business organization, operation, and management intended to orient the student in the field of business and industry and to help him determine a field of major emphasis.

BA 116. Survey of Modern Industry. 4 hours spring.

Principal industries of the United States and Pacific Northwest; dynamic nature and social problems of American industry. Student is helped to choose the technical and scientific fields in which he desires to concentrate.

BA 211. Principles of Cost Accounting. 3 hours fall.

Basic principles; differences between accounting systems involving and not involving cost system problems and practise sets. Prerequisite: BA 111, 112, 113, or BA 385, 386.

¹Ninety of the hours taken for a baccalaureate degree must be in liberalizing courses.

²Offered each term.

BA 212, 213, 214. Advanced Accounting. 3 hours each term.

Balance sheet valuation and profit determination; handling and interpretation of the principles, balance sheet, and profit and loss items with particular reference to corporations. Prerequisite: BA 113.

BA 218. Analysis of Financial Statements. 3 hours winter.

Accounting theory and practice for effective management and control of industrial and trading concerns; emphasis on the preparation, analysis, and interpretation of balance sheets and operating reports. Prerequisite: BA 111, 112, 113, or BA 385, 386.

BA 221. Industrial Organization and Operation. 4 hours fall.

Principles of management applied to industrial concerns; functional management as applied by Taylor and subsequent industrial managers. Prerequisite or parallel: Ec 203 or 211 or 212 or 214.

BA 222. Elements of Finance. 4 hours winter.

Financial institutions; financial problems in launching a business; expansion; budgetary control; credits and collections; borrowing; management of earnings. Prerequisite or parallel: elementary economics; BA 113, or equivalent.

BA 223. Elements of Marketing. 4 hours spring.

Methods, policies, and problems involved in the marketing of producers' and consumers' goods; middlemen; current trends; legislation in marketing field. Prerequisite or parallel: Ec 203 or 211 or 212 or 214.

***BA 256. Business Law.** 4 hours any term.

History of legal systems and legal institutions; source of obligations; interpretation and discharge; bankruptcy, suretyship, and insurance.

***BA 257. Business Law.** 4 hours any term.

Agency; negotiable instruments; personal property.

***BA 258. Business Law.** 4 hours any term.

Specialized business and business organization; corporations and partnerships; law of real property including estate.

UPPER-DIVISION COURSES

BA 372. Sales Management. 4 hours spring.

Selling from point of view of the business executive; distributing and expanding sales; selling organization; principles of salesmanship; training the sales force; market and sales research. Prerequisite: BA 223, 439.

BA 374. Industrial Purchasing. 3 hours winter.

Significant managerial problems raised by the 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 377. General Insurance. 3 hours spring.

Aims to familiarize student with the various insurance means at disposal of management for use in shifting, reducing, or eliminating risks; fire, casualty, compensation, fidelity and surety, marine, and other types of insurance.

* Special sections for technical students, carrying 3 hours credit each term, are offered as follows: BA 256 fall, BA 257 winter, BA 258 spring.

- BA 385. Accounting for Technical Students.** 3 hours any term.
An abbreviated course covering the general principles of accounting. The ultimate aim is to prepare the student to read and interpret accounting facts, rather than to construct accounts.
- BA 386. Accounting for Technical Students.** 3 hours winter or spring.
The accounting peculiar to partnerships and corporations; preparation, analysis, and interpretation of financial statements. Prerequisite: BA 385.
- BA 403. Special Problems for Technical Students.** (g) 1 to 5 hours any term.
Opportunity to do supervised individual work in some field of special application and interest. Subjects chosen must be approved by the major professor. Prerequisite: senior or graduate standing. Staff.
- BA 411. Marketing Problems.** 3 hours spring.
Costs of distribution; price determination; appraisal of systems of marketing in view of social and economic changes. Prerequisite: BA 223.
- BA 412. Credits and Collections.** 3 hours spring.
Principles and practices of credit management with particular reference to mercantile credit. Prerequisite: BA 222.
- BA 413. Production Management.** 4 hours spring.
An analysis of the problems of production, factory organization, and factory management, studied from the point of view of the production manager. Prerequisite: BA 221.
- BA 414. Principles of Personnel Management.** (g) 3 hours winter.
Scientific management; job analysis; systematic hiring, placing and promoting; wage payment; turnover; labor participation in management; public's concern in such participation. Prerequisite: Ec 203 or 211 or 212 or 214.
- BA 415. Practical Personnel Procedure.** 3 hours winter.
Actual procedure followed by a personnel department in its handling of such functions as: hiring, promoting, transferring, training, paying, and taking care of worker health and morale. Prerequisite: BA 414.
- BA 416. Case Problems in Personnel Management.** 3 hours spring.
For advanced students in industrial relations and personnel management. Opportunity is given under guidance of a qualified leader to analyze, discuss, and offer solutions. Prerequisite: BA 415.
- BA 418. Budgetary Control.** 3 hours winter.
Budgeting in its accounting and management aspects; types of budgets; technique of budget preparation; budget coordination and enforcement. Prerequisite: BA 211.
- BA 421. Advanced Cost Accounting.** 3 hours fall.
Major problems of cost allocation in factories; factory procedure; distribution of cost burden between departments; controlling costs; cost reports; cost systems. Prerequisite: BA 211.
- BA 423. Income Tax Procedure.** 3 hours spring.
Income, excess profits, and other federal and state taxes as they affect business; technical and accounting phases of the business man's tax problems. Prerequisite: BA 113.

- BA 431. **Applied Business Finance.** 3 hours spring.
Financial problems facing business enterprises from the point of view of the business executive. Prerequisite: BA 222.
- BA 438. **Principles of Advertising.** 3 hours fall.
Social and economic aspects of advertising; uses and limitations; effect on consumer; use of research in determining scope, consumer needs, and groups.
- BA 439. **Effective Selling and Promotion.** 3 hours winter.
Designed to acquaint student with functions of sales promotion in correlating merchandising and publicity; discovering or making sales opportunities; fundamentals of sound salesmanship. Prerequisite: BA 223, 438.
- BA 463. **Investments.** (g) 3 hours fall.
Markets and the price of securities; demand and supply; computing earnings; governmental and corporation bonds and real estate loans as investment securities; stock exchange. Prerequisite: BA 222.
- BA 470. **Business Statistics.** (g) 3 hours fall.
Analysis of time series, including secular trends, seasonal and cyclical movements; simple, multiple, partial, and curvilinear correlation; correlation of time series and forecasting. Prerequisite: Mth 109.
- BA 473. **Business and Industrial Policy.** 3 hours spring.
A qualified business and industrial leader must be in position to determine and interpret policy, the guide to the operation of business. Only advanced students who have achieved thorough familiarity with business and industry are admitted; required of all major students in business and industry.
- BA 494. **Cost Accounting for Industrials.** (g) 3 hours spring.
Factory cost accounting; phases of industrial management necessary to the installation and operation of a modern cost system. Prerequisite: BA 386.

GRADUATE SERVICE COURSES

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

Commercial Education

IN conjunction with the Division of Business and Industry, the School of Education meets the demand for well-prepared teachers of commercial branches in secondary schools. In the selection of their courses both in business and industry and secretarial science and in education, students should advise with both the Division of Business and Industry and the School of Education. For the requirements for certification see SCHOOL OF EDUCATION.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

- Ed 408c. **Methods and Materials.** (See Ed 408, page 256.) Associate Professor Stutz.
- CEd 401. **Research.** Terms and hours to be arranged.
- CEd 403. **Thesis.** Terms and hours to be arranged.

Ced 405. **Reading and Conference.** Terms and hours to be arranged.

Ced 407. **Seminar.** Terms and hours to be arranged.

GRADUATE COURSES

Ced 501. **Research.** Terms and hours to be arranged.

Ced 503. **Thesis.** Terms and hours to be arranged.

Ced 505. **Reading and Conference.** Terms and hours to be arranged.

Ced 507. **Seminar.** Terms and hours to be arranged.

Ced 541. **Current Practices in Typewriting.** 3 hours fall.

Principles underlying development of typing skills; motivation, supplementary materials, and special devices. Prerequisite: Ed 408c and teaching experience in typing. Associate Professor Stutz.

Ced 542. **Current Practices in Shorthand.** 3 hours winter.

Correct writing habits; correlation of sound and symbol response; word and sentence building and transcription technique. Prerequisite: Ed 408c and experience in teaching stenography. Associate Professor Stutz.

Ced 543. **Problems in Commercial Education.** 3 hours spring.

Trends in high-school commercial curriculum; evaluation of debatable methods and available research studies. Prerequisite: Ed 408c and teaching experience in commercial subjects. Associate Professor Stutz.

Secretarial Science

THE major in secretarial science prepares young men and women for secretarial service in positions for which a college education is demanded or desirable. 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 industry and in other major curricula of the 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; rhythm drills, dictation exercises; writing paragraphs; punctuation and mechanical arrangement of business correspondence, legal forms, tabulating, manifold, speed practice. Students with at least one year of typing are not permitted to take SS 121 for credit. Five periods laboratory work; 1 hour home assignment.

SS 124. **Typing of Army and Navy Correspondence and Forms.** 2 hours.

Application of typing to writing Army and Navy letters, military forms, pay rolls, daily roster, military orders, etc. Accurate and rapid control of numer-

als. Prerequisite: SS 123 (nonsecretarial science students, SS 121 or equivalent). Five periods laboratory work.

SS 211, 212, 213. Applied Stenography. 3 hours each term.

Advanced principles and phrases; dictation and transcripts covering vocabularies of representative businesses; legal forms; newspaper and magazine articles. Prerequisite: SS 113, 123 or equivalent. Three recitations; 3 one-hour laboratory periods; 3 hours home work.

SS 214. Army and Navy Applied Stenography. 3 hours.

Principles, phrases, and short cuts of shorthand as they apply to the several branches of the United States war services; special attention to Army, Navy, Aviation, and Marine Corps vocabularies, including intensive dictation. Army and Navy office routine and organization are introduced through dictation material. Prerequisite: SS 213 (nonsecretarial science students must have consent of instructor). Three recitations; 3 one-hour laboratory periods.

UPPER-DIVISION COURSES

SS 311, 312. Office Procedure. 5 hours each term fall and winter.

The most efficient stenographic methods and office practice; filing; advanced dictation; transcripts; reports; modern office appliances. Prerequisite: SS 213 or equivalent. Three lectures; 3 two-hour laboratory periods.

SS 313. Office Organization and Management. 5 hours spring.

Scientific secretarial office management; organization; arrangement; operation; employment and training of office workers; efficiency problems; business ethics. Prerequisite: SS 312.

SS 314. Office Procedures of Army, Navy, and War Industries. 3 hours.

Office training for students expecting to be employed in the secretarial and clerical departments of wartime industries, of the Army and Navy, or of women's service organizations. Clerical procedures and practices; duplicating machines and processes; preparation of forms, letters; advanced dictation and filing. Two lectures; 1 two-hour laboratory period. Prerequisite: SS 313 (nonsecretarial science students must have consent of instructor).

SS 407. Seminar. 1 hour any term.

SS 411. Secretarial Science. 3 hours fall.

Duties and problems of the secretary in business and professions; relation to employer and fellow employees; office supervision. Prerequisite: SS 313 or equivalent. Professor Yerian.

SS 412. Secretarial Science. 3 hours any term.

Continuation of SS 411. Practical office experience. Nine hours laboratory each week in campus offices. Professor Yerian.

SS 436. Merchandising and Selling. (g) 3 hours winter.

Retail organizations, practices, policies, and problems; stock-control systems; buying; methods of sales promotion; general sales fundamentals and techniques. Professor Yerian.

SS 439. General Advertising. (g) 3 hours spring.

Economic and social implications of advertising; advertising agency; the "Campaign;" selection of media; retail and mail-order advertising; mechanics of advertising; layouts and copywriting. Professor Yerian.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) may be taken for graduate credit. For graduate courses in commercial education, see page 238.

School of Education

Faculty

JAMES RALPH JEWELL, Ph.D., LL.D., Dean of the School of Education; Director of High-School Teacher Training.

CARL WALTER SALSER, Ed.M., Assistant Dean of the School of Education.

CLYTIE MAY WORKINGER, Placement Secretary.

RUTH LANO, Secretary, School of Education.

Education

PROFESSORS SALSER (department head), SEYMOUR*, MITCHELL*, LANGTON, CHAMBERS, LASLETT†, WARRINGTON, CLINTON, HUNTER, SEEN, BAKKUM, MARTIN*, WELLS*, SHERBURNE.†

ASSISTANT PROFESSORS SWAN†, REICHART, REID.

Agricultural Education

PROFESSOR GIBSON (department head).

SUPERVISING TEACHER GREEN.

Commercial Education

ASSOCIATE PROFESSORS STUTZ, FRICK.

Home Economics Education

PROFESSOR BLAZIER (department head).

STATE SUPERVISOR AND TEACHER TRAINER KOHLHAGEN.

ASSISTANT PROFESSORS ROSKIE, DU BOIS.

SUPERVISING TEACHERS VAN DEUSEN, VENATOR.

Industrial Education

PROFESSOR COX (department head).

ASSOCIATE PROFESSORS O. D. ADAM†, PAULSON (acting), MEYER.

SUPERVISING TEACHERS HAHN†, SALING†, GOFF.

Science Education

PROFESSORS STEVENSON (department head), ATWOOD.*

ASSOCIATE PROFESSORS WILKINSON†, MORRIS.

* Associate Faculty. Teacher training is an enterprise in which many different departments have a share. The President of the College, at the request of the School of Education, appoints each year certain faculty members from other schools on the campus to serve also as associate and advisory members of the School of Education faculty.

† On leave for military or civilian war service.

General Statement

ALL professional preparation for teaching within the State System of Higher Education, except preparation for strictly elementary-school teaching, is organized under the School of Education. The school is concerned especially with the preparation of teachers for the high schools of Oregon, and with the promotion of high standards of secondary education.

The School of Education operates on both the University and the State College campuses. Preparation for high-school teaching in the various fields is divided between the two institutions in accordance with the allocation of major curricula. The director of high-school teacher training, with offices at Eugene, has administrative control over all high-school teacher education within the State System.

At the State College are given major curricula preparing for teaching of biological science, general science, physical science, mathematics, agriculture, home economics, industrial arts, commercial education, and approved combinations of subjects, and for educational and vocational guidance.

At the University are given general education courses, professional work in educational administration, and major curricula preparing for teaching of literature, languages, social sciences, biological science, general science, physical science, mathematics, arts, business administration, music, physical education, and approved combinations of subjects. The University also offers training to prepare teachers for work with atypical children.

In planning its curricula the School of Education has recognized three qualifications for a good teacher: (1) mastery of subject matter; (2) an understanding of child and adolescent psychology, and of professional problems and techniques; (3) a broad and liberal education.

Admission. High-school graduates who plan to teach may enroll in the School of Education as freshmen. In this way requirements will be met easily and certainly met, an adviser will be available at all times, proper teaching fields will be chosen, and the most valuable supporting courses will be selected and worked into the student's program. This means the best possible basis for recommendation and placement at graduation. Junior-college graduates from accredited institutions enter the School of Education as juniors and may complete the work in two years for the B.A. or B.S. degree. Students having had one year in junior college enter as sophomores in the School of Education. Lower-Division students who complete the first two years of college work at the State College or the University, or at other accredited institutions, enter the School of Education as juniors. These students ordinarily will have one or two of their teaching fields under way and will experience little difficulty in selecting a major or two minors. Graduates of colleges of education who have completed two years of work will enter the School of Education as third-year students; those who have completed three years of work will ordinarily enter as seniors. Such students ordinarily receive full credit for all work taken in the colleges except that not more than 9 hours of credit are allowed for practice teaching from the colleges of education. Graduates of two-year colleges of education are likely to be deficient one or two terms in English and occasionally one or more terms in science. As soon as these courses have been made up the student receives the Junior Certificate and full junior standing.

Facilities. The central offices, lecture rooms and laboratories, and rooms and facilities for the testing and advisory service of the School of Education

are located in the newly remodeled, fire-proof and modernized Education Hall. The building also houses the departments of Psychology, Philosophy, Religion, Geology, and Mathematics. Special provisions are made for testing and advisory work, film projection, and radio reception. Supervised teaching is carried on in both the senior high school and the junior high school of Corvallis, and in neighboring high schools including Albany, Oregon City, and Philomath.

Baccalaureate Degrees. Students majoring in education may become candidates for the following baccalaureate degrees: Bachelor of Arts, Bachelor of Science, and Bachelor of Education. For each of these degrees the student must fulfill all State College requirements for these degrees, besides major requirements. For the B.A. degree 36 term hours in arts and letters, including a minor in one of the modern languages, must be completed; for the B.S. degree 36 term hours of science or 36 term hours of social science, or 45 term hours in both, are required.

Special Requirements. Candidates for a bachelor's degree in the School of Education must submit: (a) 36 term hours in education and psychology, of which at least 24 term hours must be in upper-division or graduate education courses; (b) for recommendation for a high-school teaching certificate, one major or two minors in teaching fields (see pages 247-252).

Outlines of Psychology (Psy 221, or Psy 201, 202, 203, or equivalent) is prerequisite to all upper-division education courses.

A scholarship average within the upper 50 per cent of the State College grade range ordinarily is prerequisite to registration for upper-division teacher training courses. In admitting students into these courses, the faculty of the School of Education gives additional consideration to psychological rating, teaching personality, and in doubtful cases to marked improvement in scholarship during the sophomore or junior year.

In the case of first courses in science or foreign languages, an entire year sequence must be completed (e.g., Ch 101, 102, 103) before credit is allowed. A student with a minor in a modern language may, upon application to the dean's office, be excused from taking literature.

Graduate Work. Graduate work in education, leading to the Master of Arts, Master of Science, Master of Education, and Doctor of Education degrees, is offered at the State College through the Graduate Division. For an M.A. or M.S. degree, the student must complete a graduate major in education and a 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. Candidates for the Ed.D. degree must have a record of successful teaching experience. They will ordinarily include in their programs intensive work in statistics and research. Reading knowledge of French, German, or other languages may be required if it is regarded as essential to the student's program. The program of study for each candidate for the Ed.D. degree is carefully planned and integrated with the aim of preparing men and women for immediate, effective, professional service in administrative, supervisory, and advanced teaching positions in the fields allocated at the State College. The regulations governing graduate study are stated under GRADUATE DIVISION in this Catalog.

Supervised Teaching. The School of Education provides an opportunity for supervised high-school and junior high-school teaching in all the major fields allocated at the State College. Supervised teaching cannot be done at the

State College in fields in which the State College does not offer major work, except that students minoring in physical education may do their supervised teaching in physical education when approved by the director of supervised teaching. Student teachers observe teaching by expert instructors, work out lesson plans under the guidance 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.

Guidance Clinic, Testing and Advisory Service. Members of the education faculty, supplemented by several members from other schools on the campus, constitute a guidance clinic and give much of their time to individual work with students. Frequent meetings of the clinic are held throughout the academic year. The services of the clinic are open and easily available to students in any school on the campus. The testing and advisory service conducted by the Guidance Clinic enables students to take various tests of aptitude and ability and to have expert assistance in interpreting results.

Educational and Vocational Guidance. Under the organization plan of the State System of Higher Education, training for educational and vocational guidance is allocated to the State College. The major curriculum in guidance, counseling, and personnel work (see pages 253-254) extending through five or more years leads to baccalaureate and advanced degrees and prepares students for service as counselors, deans of girls, deans of boys, teachers of occupations courses, and for other phases of personnel work. Observation and supervised practice in counseling and guidance are provided. Students in this major are, as a rule, expected to prepare themselves in at least one teaching field and preferably in two as entrance upon student counseling and personnel work is through experience and success in the high-school or junior-college classroom. Experience in fields of work other than teaching is desirable for all counselors and personnel workers.

Teacher Placement Service. A Placement Service is maintained by the School of Education for the placement of graduates of the State College who are prepared and qualified to teach in the secondary schools. The Placement Service compiles and makes available to school officials full information concerning the preparation and experience of graduates who desire teaching positions. The Placement Service also furnishes students information concerning the certification requirements and school laws of other states, and will recommend graduates for certification in other states, on the endorsement of the Dean of the School of Education and the State College Registrar. The following fees are charged by the Placement Service:

Registration fee	\$3.00
Charge for late registration	1.00
Charge for late payment of registration fee	1.00
Credential fee .....	.25
Credential fee for out-of-state certification	2.00

State Teacher's Certificate

ALL teachers in the high schools of the state of Oregon must hold a high-school teacher's certificate, issued by the State Superintendent of Public Instruction. To be eligible for a one-year certificate after February 10, 1943, graduates of the State College must satisfy the following requirements:

- (1) A total of 45 term hours of college work after meeting the requirements for the baccalaureate degree.

(2) A minimum of 40 term hours of work in education, 15 term hours of which must be in upper-division or graduate courses taken after meeting the requirements for the baccalaureate degree. This work must be distributed as follows:

	<i>Term hours</i>
Secondary Education (Ed 311)	3
Educational Psychology (Ed 312)	3
Principles of Teaching (Ed 313)	3
Methods and Materials (Ed 408)	3
Supervised Teaching (Ed 415)	6
Oregon School Law and Oregon System of Education (Ed 316)....	2
One of the following: Ed 511, Ed 543, Ed 546	3
Electives in education, including 9 term hours at the graduate level	17

(3) Oregon History (Hst 377), 3 term hours.

(4) General Psychology (Psy 221 followed by Ed 312 and Ed 461 or 460; or Psy 201, 202, 203), 9 term hours

Ed 311, 312, 313, and 415 must be taken in residence—they cannot be taken by correspondence.

Under regulations adopted by the Oregon State Board of Education in January 1941, new teachers employed in approved high schools may be assigned to teach only in those subject fields in which they have completed adequate college preparation. The State Board of Education has set the following minimum standards of subject preparation:

ENGLISH: 36 term hours, including at least 9 term hours in composition and rhetoric (it is recommended that a substantial amount of work in speech be included in this training). LANGUAGE: the equivalent of 30 term hours of college preparation in each language taught (high-school credits evaluated in terms of college hours may be accepted in meeting the minimum requirements). SOCIAL STUDIES: 36 term hours, including at least 18 term hours in American and European or world history, and a total of at least 10 term hours in two or more of the following subjects—government, economics, sociology, geography. MATHEMATICS: 15 term hours of college mathematics. COMMERCE: *Shorthand*, 18 term hours (may include high-school or business-college work evaluated in terms of college hours or equivalent performance standards); *Typing*, 6 term hours (may include high-school or business-college work); *Bookkeeping*, *Business Training*, *Commercial Law*, 24 term hours in accounting and business administration. NATURAL SCIENCE: *Elementary Science*, 24 term hours in the natural sciences, including at least 9 term hours in physical science and 9 term hours in biological science; *Biology*, 18 term hours; *Physics*, 12 term hours; *Chemistry*, 12 term hours. PHYSICAL EDUCATION AND HEALTH EDUCATION: 12 term hours in physical education and 12 term hours in health education. INDUSTRIAL ARTS: 24 term hours. HOME ECONOMICS: 24 term hours. AGRICULTURE: 24 term hours.

To be recommended by the State College for a teaching position, a student in satisfying the minimum subject requirements in the fields in which he intends to teach must take certain specified courses. These courses are listed on pages 247-252.

Believing that a broad knowledge in the fields of English, social studies, mathematics, natural science, and the fine arts should be a part of the equipment of every teacher, whatever his subject field, the State Board of Education has recommended that, beginning with the school year 1943-44, the college preparation of all new teachers employed in state-approved high schools should include the following:

ENGLISH: 24 term hours in literature, composition, speech, dramatics. SOCIAL STUDIES: 24 term hours in history, political science, economics, sociology, geography, philosophy. (A maximum of 6 term hours in library science may be applied toward satisfying the recommendation in English or social studies.) SCIENCE AND MATHEMATICS: 17 term hours, including 9 hours in biological science and 8 hours in physical science and mathematics or in either of these fields. ARTS AND CRAFTS: 6 term hours in music, or in plastic, graphic, or industrial arts (equivalent performance standards may be accepted if approved by the teacher-training institution).

Students wishing to qualify for certification and placement should confer with the members of the faculty of the School of Education not later than the end of the second term of their sophomore year.*

Application for certification must be made to the State Superintendent of Public Instruction. An official record of the applicant's preparation, required as a basis for certification, will be submitted to the State Superintendent by the State College Registrar, on request.

The holder of a one-year state certificate, after six months' successful teaching experience in this state and on the recommendation of the city school superintendent or county school superintendent under whose supervision the applicant last taught, will receive a five-year state certificate authorizing him to teach in the high schools or junior high schools of this state.

A five-year certificate may be renewed when the holder thereof has taught successfully for a period of 24 months during the life of such certificate, or has completed 15 term hours in courses approved by the State Board of Education in a standard college or university. When a teacher who is regularly employed by a school board has been granted a leave of absence by such board, the school months included in such leave of absence shall be counted the same as months of teaching in determining eligibility for renewal of a five-year certificate.

The holder of a one-year state certificate, or a five-year state certificate, or a state life certificate, is authorized to act as city superintendent of the schools of any city.

The following fees are payable to the State Superintendent of Public Instruction at the time the application for certification is made:

One-year certificate	\$2.00
Five-year certificate	2.00
Renewal of five-year certificate	2.00

Emergency Certificate. Any holder of a bachelor's or master's degree may obtain an emergency certificate on completion of 9 hours in suitable education courses. The emergency certificate is issued only to teachers who have obtained a teaching position. The certificate is good for one year only for the subject specified and for a specified high school.

Subject Preparation

IN ORDER to be recommended by the State College for a teaching position a graduate must have prepared himself, through suitable College courses, for the teaching of at least two subjects. To 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.

One of the student's subject fields must be a field which is allocated as a major to Oregon State College and in which the State College offers supervised teaching, namely: agriculture, biological science, commercial education, general science, home economics, industrial arts, mathematics, or physical science. Exceptions to this requirement may be made in the case of students transferring from other institutions, who have completed courses in special methods and supervised teaching before entering the State College.

Listed below are courses which the State College requires for minimum subject preparation in the several teaching fields; these requirements satisfy

* Attention is called especially to the fact that a minimum scholarship average within the upper 50 per cent of the State College grade range is expected before registration for upper-division teacher training courses. See SPECIAL REQUIREMENTS, page 244.

the subject-preparation standards of the State Board of Education (see page 246). It is important to note, however, that they satisfy the *minimum* requirements only. Where majors are outlined the major (including upper-division work) should be chosen in preference to the minor, particularly by students who plan to teach in other states. Students should consult members of the faculty of the schools or departments in which they are taking subject-preparation courses concerning additional courses they should elect to strengthen their preparation.

Certain subject-matter courses that do not satisfy major or minor requirements are of great help to teachers (for example, work in oral English, extemporaneous speaking, journalism, library, economics, sociology, and political science). Students preparing to teach in junior or senior high schools are advised and urged to take J 111, Elementary Journalism, and J 313, Public Information Methods. All high-school teachers will find these courses valuable in connection with high-school newspaper work and in connection with school news in the newspapers of the local community. Students should consult members of the faculty of the School of Education concerning such supplementary training that would be of particular value in relation to their individual training programs.

The approved majors and minors in teaching fields are classified in two groups. Students who present two minors instead of a major must include one minor in the first of these groups.

Group I. Majors and Minors

A student seeking a high-school teacher's certificate must select either a major or a minor in this group.

Agriculture

	Term hours	
	For major	For minor
Physical Science	12	9
Biological Science	12	9
Electives in Agriculture	12	9
	<hr/> 36	<hr/> 27

The major and minor in agriculture are for prospective teachers of general agriculture and are designed to serve the following purposes: (1) to provide high schools of moderate size with teachers prepared to teach a combination of courses in the fields of agriculture and natural science; (2) to familiarize prospective teachers of the natural sciences with concrete situations, materials, and problems in agriculture and rural life valuable in vitalizing the instruction; (3) to prepare teachers who can offer a separate course in agriculture for farm boys mainly for its vocational and vocational-guidance values.

Biological Science

General Zoology	9	9
General Botany	9	9
Entomology (Elementary or General)	3-6	3
Bacteriology (Elementary or Principles)	3-6	3
Electives in field of biology (6-9 hours in upper division)	12-6	....
	<hr/> 36	<hr/> 24
Or Human Biology		
General Zoology	9	
Evolution and Eugenics	3	
Genetics	3	
Principles of Bacteriology	3	
Physiology	9	
Elementary Human Anatomy	9	
	<hr/> 36	

	Term hours	
	For major	For minor
<i>Or Health Education</i>		
Elementary Human Anatomy (Z 208, 209, 210)	9	
Elementary Human Physiology (Z 211)	5	
General Bacteriology (Bac 204, 205)	6	
Nutrition (FN 225)	3	
Health Education (Ed 351, 352)	6	
School Health Problems (Ed 421, 422, 423)	6	
	35	

Physical Science Survey is recommended to accompany Biological Science major, and Biological Science Survey is recommended to accompany Physical Science major, unless the student is minoring in the opposite field.

Commercial Education

Stenography (SS 111, 112, 113)	9	9
Typing (SS 121, 122, 123)	6	6
Principles of Accounting (BA 111, 112, 113)	12	.....
Applied Stenography (SS 211, 212, 213)	9	9
Office Procedure (SS 311)	5	5
Business Law (BA 256)	4	.....
	45	29

Students who have had one year or more of typing or shorthand will receive advanced standing according to ability shown in placement test provided by the Department of Secretarial Science.

Students, on approval, may take BA 115, 116, 221, and other courses in place of some of the courses listed in either the major or the minor, but see page 246.

General Science

Biological Science Survey	12	12
Physical Science Survey	12	12
Electives in biological or physical science	9	9
Biological or physical science (upper-division)	9	.....
	42	33

Specific courses or areas covered by survey courses may be substituted in either major or minor. Desirable electives are: Elementary Entomology, Principles of Bacteriology, Photography, Astronomy, Geology of Oregon, Field Geology, Ornithology, Evolution and Eugenics.

Home Economics

Foods (FN 220, 221, 222 for students electing chemistry; FN 211, 212, 213 for those not electing chemistry)	9	9
Nutrition (FN 225)	3	3
Clothing (CT 250, 211, 212 for students electing specified art courses; CT 250, 217, 218, 219 for those not electing specified art courses)	9	9
Child Development (HAd 311, 312)	6	6
Household Management (HAd 340)	3	3
Electives from at least two of the following groups totaling 15 hours	15	.....

A. Foods

Food Purchasing (FN 411), 3 hours
 Experimental Cookery (FN 435), 3 hours
 Quantity Cookery and Catering (IEC 311), 3 hours
 Cafeteria Management (IEC 320), 3 hours
 Feeding the Family (FN 325), 2 hours
 Food Management (FN 412), 3 hours
 Food Demonstrations (FN 413), 3 hours

B. Clothing

Home Furnishing (CT 231), 3 hours
 Costume Design (CT 311), 3 hours
 Clothing (CT 312), 3 hours
 Applied Design (CT 335), 3 hours
 Home Furnishing (CT 331), 3 hours
 Home Furnishing (CT 431), 3 hours
 Consumer Buying in Clothing and Textiles (CT 350), 3 hours

C. Household Administration

	Term hours For major	For minor
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All courses in the Department of Household Administration are open to those who have completed a minor in home economics, but the following are particularly recommended in the order named:

Home Management House (HAD 350), 5 hours

Family Relationships (HAD 422), 3 hours

Nursery School Procedures (HAD 425), 3 hours

Total for Home Economics	45	30
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Industrial Arts

Methods in Woodworking (IA 112, 113)	6	6
Engineering Drawing (GE 111, 112, 113)	6	6
Lower-Division Drawing (AA 291)	3	3
Wood Turning (IA 220)	2	2
Machine and Tool Maintenance (IA 225)	2	2
Fiber Furniture Weaving (IA 326)	2	2
Millwork—Machine Woodwork (IA 311)	3	3
Wood and Metal Finishing (IA 316)	2	2
Industrial Arts Organization (Ed 330)	2	2
The General Shop and Its Problems (IEd 473)	2	2
Furniture Construction (IA 313) or Carpentry (IA 333)	2-3	....
Occupational Analysis (IEd 472)	3	....
Written and Visual Teaching Aids (IEd 474)	3	....
Shop Planning and Organization (IA 411)	3	....
Electives in general metal work, or additional courses in woodwork and drawing subjects	6	5
	45-46	35

See page 264 for a statement of objectives controlling the major and minor. The major outlined is a basic major with woodworking emphasis. Students desiring a different combination, or help on individual problems, should confer with the head of the Department of Industrial Arts. See page 264 for statement of the three types of program offered. Students who wish to teach industrial arts in states that demand additional certification requirements should refer to the professional-technical curriculum for industrial-arts education (pages 276-278) and should confer with the head of the Department of Industrial Arts.

Mathematics

Elementary Analysis (Mth 101, 102, 103) or equivalent	12	12
Differential and Integral Calculus or equivalent	12	12
Upper-division approved mathematics courses	12	....
	36	24

For three terms of Calculus students may substitute two terms of Calculus and one term of either Modern Geometry, Higher Algebra, or Theory of Equations and Determinants.

Physical Science

General Chemistry	15	12-15
General Physics	12	12
Geology (Oregon) .....	....	3
Geology (Oregon or General)	3-9	....
Electives in the field of physical science (upper-division)	6-3	....
	36-39	27-30

Biological Science Survey is recommended to accompany Physical Science major, and Physical Science Survey is recommended to accompany Biological Science major, unless the student is minoring in the opposite field. Suggested electives for major are: Photography, Astronomy.

Group II. Minors

Art

	Term hours for minor
Survey of Creative Arts (Art Appreciation) (AA 114, 115, 116)	9
Lower-Division Drawing (AA 291)	3
Lower-Division Decorative Design (AA 295)	3
Color and Composition (AA 162)	3
Elective courses in Commercial Design, Crafts, House Planning, Block Printing, Drawing	6
	<hr/> 24

Business Administration

Principles of Accounting (BA 111, 112, 113)	12
Elements of Marketing (BA 223)	4
Business Law (BA 256)	4
Industrial Organization and Operation (BA 221)	4
	<hr/> 24

*English

Literature Survey (Eng 101, 102, 103) or Introduction to Literature (Eng 104, 105, 106)	9
Two terms of Shakespeare	6
American Literature (Eng 163)	3
English Composition for Teachers (Eng 324)	3
Electives	6
	<hr/> 27

*Speech

Extempore Speaking (Sp 111, 112, 113)	6
Voice and Diction (Sp 120)	3
Interpretation I (Sp 121)	3
Community Drama (Sp 247)	3
Electives	12
	<hr/> 27

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
Electives approved by department	6
	<hr/> 27

German

GL 1, 2, 3 (first year), or equivalent, and the following courses:	
Second-Year German (GL 4, 5, 6)	12
German Literature	9
Electives approved by department	6
	<hr/> 27

Music

<i>Band</i>	
Music Survey (Mus 127, 128, 129)	3
Harmony I, II, III (Mus 111, 112, 113)	9
Band Organization (Mus 331, 332, 333)	6
Band Organization (Mus 334, 335, 336)	6
	<hr/> 24
<i>Orchestra</i>	
Music Survey (Mus 127, 128, 129)	3
Harmony I, II, III (Mus 111, 112, 113)	9
Orchestral Conducting (Elementary) (Mus 291, 292, 293)	6
Advanced Conducting and Orchestration (Mus 324, 325, 326)	6
	<hr/> 24

* Note: Six term hours of speech may be counted in the English minor and six term hours of literature in the Speech minor.

*Glee Club and Chorus*Term hours
for minor

Music Survey (Mus 127, 128, 129)	3
Harmony I, II, III (Mus 111, 112, 113)	9
Individual Instruction (Voice) (Mus 190—2 terms) or Group Instruction in Voice (Mus 191—2 terms)	2
Glee Club Conducting (Mus 433)	1
College Chorus (Mus 290—6 terms)	6
Sightsinging and Ear Training (Mus 147, 148, 149)	3
	<hr/> 24

Any one of the three groups of courses—Band, Orchestra, Glee Club and Chorus—satisfies the requirements for a minor in music. For students who expect to lead glee clubs and choruses in high schools, previous piano training is essential and unless the student has had this preparation, additional work in piano may be needed. If the student is competent in accompanying, this can be adjusted.

Physical Education**MEN**

Introduction to Physical Education (PE 121, 122, 123)	6
Technique of Gymnastics (PE 174)	2
Technique of Football, Track, and Field (PE 175)	2
Technique of Minor Sports (PE 176)	2
Technique of Baseball and Basketball (PE 276)	2
Technique of Boxing and Wrestling (PE 275)	2
Technique of Swimming, Tennis, and Golf (PE 274)	2
Coaching of Football (PE 347)	Three courses selected from this group
Coaching of Basketball (PE 346)	
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	24

All teachers of physical education in Oregon are also required to have at least 12 hours in health education. Courses in health education include: PE 221; PE 358; Ed 351, 352; Ed 421, 422, 423; Bac 204, 205, 206; Bac 350; Bac 461; FN 225; HAd 225. Students interested in teaching Physical Education or Biological Science, or both, may include a minor in health education.

WOMEN

Introduction to Physical Education (PE 121, 122, 123)	6
Physical Education Technique (Women) (PE 343, 344, 345)	9
Electives approved by the department, chosen from the following:	
Organization and Administration (PE 423), 3 hours	}
Supervised Teaching (Ed 415), 3 hours	
Tests and Measurements in Physical Education (PE 422), 3 hours	
School and Community Club Work (Ed 425), 3 hours	
Principles of Physical Education (PE 421), 3 hours	}
Nature and Function of Play (PE 435), 3 hours	
Seminar in Summer Camp Leadership (Ed 407), 1 or 2 hrs....	
Leadership in Party Games (PE 240), 2 hours	9
	<hr/> 24

Social Science

Any three of the following sequences or any two of the following sequences accompanied by an upper-division sequence in any one of these fields:

History of Western Civilization (Hst 201, 202, 203)	9	}	27*
History of American Civilization (Hst 224, 225, 226)	9		
Principles of Economics (Ec 201, 202, 203)	9		
Modern Governments (PS 201, 202, 203)	12		
Elements of Sociology (Soc 201, 202, 203)	9		

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
	<hr/> 27

* A student planning to teach social science in Oregon must complete 36 hours in these fields.

Professional Curricula in Education

B.A., B.S., Ed.B., M.A., M.S., Ed.M., Ed.D. Degrees

STUDENT'S BASIC PROGRAM

THE following program of study shows the work that should be followed by students who are intending to become high-school teachers or whose special interest lies in the field of guidance, counseling, and personnel. (Related work in other schools outside the School of Education is shown only when it is necessary in building the proper curriculum.)

MAJORS	MAJOR IN GUIDANCE, COUNSELING, AND PERSONNEL WORK	MINORS	MINORS
<i>In which observation, supervised teaching, and apprentice teaching may be done at the State College.</i>	<i>Including observation and supervised practice at the State College.</i>	<i>In which observation, supervised teaching, and apprentice teaching may be done at the State College.</i>	<i>In which observation (but not supervised teaching) is provided at the State College</i>
Agriculture	The major in Guidance, Counseling, and Personnel Work should be accompanied by a major or two minors in teaching fields.	Agriculture	Art
Biological Science		Biological Science	Business Administration
Commercial Education		Commercial Education	English (Journalism)
General Science		General Science	French
Home Economics		Home Economics	German
Industrial Arts		Industrial Arts	Music
Mathematics		Mathematics	Social Science
Physical Science		Physical Education	Spanish
		Physical Science	Speech

Freshman Year¹

	Term hours		
	F	W	S
Required:			
English Composition (Eng 111, 112, 113)	3	3	3
Military Science (men)	1	1	1
Physical Education	1	1	1
Recommended electives:			
Courses in teaching field	3	3	3
Laboratory Science or Mathematics	3	3	3
Methods of Study (Ed 101)	3	3 or (3)	3 or (3)
Mental Hygiene (Ed 102)	(3)	3 or (3)	(3)
Choosing a Vocation (Ed 104)	2	2	2
Art, Foreign Language, Music, Speech, etc.	2	2	3
	16	16	16

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 major subject and one or two minor subjects, chosen from the lists of available majors and minors. (The courses required for the various majors and minors are listed on pages 248-252.) Some preparation in an additional field should be included if possible and also one or more extracurricular activities. The School of Education provides a large number of electives in each term of the four-year program for the bachelor's degree. The fifth year required for the master's degree or High School Teacher's Certificate, or both, is practically all elective.
- In the freshman year General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education. Women take Social Ethics (PE 131) one term.
- Emphasis in the junior year should continue on subject-matter preparation. Each subject included in the student's program should be carefully planned with a faculty adviser. By the student's senior year most of the subject-matter preparation should have been completed and special attention should be given to the professional courses in education.
- Students who decide to take a B.S. or B.A. degree without a High School Teacher's Certificate may complete the requirements for graduation in four years, omitting Supervised Teaching and all Methods courses. Summer session attendance may be used to reduce the time or the term load. Students who plan carefully may complete the regular work for the bachelor's degree and also the additional credits for a High School Teacher's Certificate in four years' time by using one or two summer sessions.
- Students looking forward to work as counselors, deans of girls, deans of boys, teachers of occupations courses, and to other phases of personnel and guidance work in connection with the public schools and other social agencies and organizations should include the following courses: Ed 416, 461, 485, 486, 487, 517, 527; Soc 314.

	Sophomore Year ¹		
	F	W	S
<i>Required:</i>			
² Elementary Psychology (Psy 201, 202, 203)	3	3	3
Literature	3	3	3
Extempore Speaking (Sp 111)	(3)	or 3	or (3)
History of Oregon (Hst 377)	1	(3)	or 3
Military Science (men)	1	1	1
Physical Education	1	1	1

Recommended electives:

Courses in teaching field	3	3	3
Education as a Profession (Ed 211), Art Appreciation, Debate, Dramatics, Family Relationships, Journalism, Music Appreciation, Political Science, Religion, Sociology, etc.	5	2	2
	16	16	16

Junior Year¹

<i>Required:</i>			
Secondary Education (Ed 311)	3	.....	.....
Educational Psychology (Ed 312) .....	.....	3	.....
Principles of Teaching (Ed 313) .....	.....	.....	3
Outlines of Economics (Ec 211 or 212)	4-3	.....	.....
General Sociology (Soc 211 or 212) .....	.....	4-3	.....
American National Government (PS 212) .....	.....	.....	3

Recommended electives:

Courses in teaching field	6	6	6
Educational Sociology, Economics, Health Education, Library Methods, Marketing Organizations, Military Science, Public Information Methods, etc.	3-4	3-4	4
	16	16	16

Senior Year¹

<i>Required:</i>			
Methods and Materials (Ed 408)	3	or 3	or 3
Supervised Teaching (Ed 415)	3-9	3-9	3-9
Oregon School Law and Oregon System of Education (Ed 316) (may be taken fifth year)	2	or 2	or 2

Recommended electives:

Measurement in Secondary Education (Ed 416); School Health Problems (Ed 421, 422, 423); School and Community Club Work (Ed 425); Construction and Use of Visual Aids (Ed 431); History of Education (Ed 440); Psychology of Childhood (Ed 460); Adolescence: Growth and Development of the Individual (Ed 461); The Junior High School (Ed 470); Guidance and Personnel Practices (Ed 485); Current Occupational Trends (Ed 486); Civic Education (Ed 489); Character Education (Ed 490); Group Thinking (Ed 491); Organization and Supervision for High-School Teachers (Ed 498); Military Science	4-10	4-10	4-10
	16	16	16

Fifth Year

See pages 245-247 for requirements for a State Teachers' Certificate since February 10, 1943. Fifth-year students meeting certification requirements are not required to qualify for a master's degree. In some cases such students may qualify for a second bachelor's degree. For most high-school positions, however, a master's degree is desirable. Students preparing to enter counseling, guidance, and personnel work should qualify for a master's degree. See Graduate Study below.

GRADUATE STUDY

Students may pursue graduate study in the School of Education for a master's or doctor's degree as preparation for junior or senior high-school, junior-college, or college teaching in fields allocated as majors at the State College, or for counseling, guidance, and personnel work in secondary schools or in colleges. The programs of graduate students are in all cases worked out on an individual basis, in terms of the needs and objectives of the student, and in accordance with the regulations of the Graduate Division.

¹See GENERAL NOTES on page 253.

²Or Psy 221, 3 hours, followed by Ed 312, Ed 461 or 460.

Education

INSTRUCTION given in education covers the principles and the technique of teaching at the secondary and college levels, educational psychology, special methods in teaching the various major subjects in which the State College gives teacher training, the history and philosophy of education, guidance, counseling, and personnel work.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Ed 101. Methods of Study. 3 hours any term.

Specific methods of study as applied to various subject-matter fields; the general principles of note-taking; study schedule; fixing study habits; evaluation of the various broad fields of human learning.

Ed 102. Mental Hygiene. 3 hours any term.

The conditions of healthy mental development and normal reactions to life and the college environment; the habits, attitudes, and proper functioning of a normal mind. Professor Chambers.

Ed 104. Choosing a Vocation. 2 hours spring.

To assist students in studying vocational openings and their personal abilities, using tests, occupational reports, interviews, visits, clinical recommendations and other helps. Professor Salser.

Ed 211. Education as a Profession. 2 hours spring.

Essential qualities of a good teacher; teacher and community; departmental teaching, administration and supervision, research, adult education, vocational education; rewards, advantages, and disadvantages.

UPPER-DIVISION COURSES

See Special Requirements, page 253.

Ed 311. Secondary Education. 3 hours any term.

Problems of the high school from the standpoint of the teacher; aims, functions, and characteristics. Prerequisite: Psy 201, 202, 203, or Psy 221, 222.

Ed 312. Educational Psychology. 3 hours any term.

Laws of learning and application to classroom; motivation; transfer of training; memory; forgetting; psychology of secondary school subjects. Prerequisite: Psy 201, 202, 203, or Psy 221, or equivalent.

Ed 313. Principles of Teaching. 3 hours any term.

Application of psychology to teaching; individual differences; types of learning; secondary education; socialization; supervised study; measuring results. Prerequisite: Ed 311, 312. Professor Clinton.

Soc 314. Educational Sociology. 3 hours spring.

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

Ed 316. Oregon School Law and Oregon System of Education. 2 hours any term.

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. Professor Clinton.

- Ed 330. **Industrial Arts Organization.** 2 hours winter.
Selection and organization of subject matter for shop work and drawing courses in secondary schools; evaluation of jobs, projects, and class problems; teaching plans. Prerequisite: Ed 313 and junior standing.
- Ed 341. **Rural Education.** 3 hours winter.
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. Professor Gibson.
- Ed 351. **Health Education.** 3 hours fall.
Philosophy and principles of health education; organization and administration; adult health education. Associate Professor Morris.
- Ed 352. **Health Education.** 3 hours winter.
Continuation of Ed 351. Subject matter of health instruction and its use in secondary schools and in adult health education. Prerequisite: Ed 351. Associate Professor Morris.
- 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. Assistant Professor Dixon.
- Ed 401. **Research.** Terms and hours to be arranged.
- Ed 403. **Thesis.** Terms and hours to be arranged.
- Ed 405. **Reading and Conference.** Terms and hours to be arranged.
- Ed 407. **Seminar.** 1 or 2 hours any term.
Prerequisite: Ed 311, 312, 313. Professor Salser and staff.
- Ed 408. **Methods and Materials.** 3 hours any term.
Problems and methods in selecting and organizing materials for instruction; comparison and evaluation of methods, laboratory techniques, supplies, equipment; economy of time and materials. Courses include: (a) agriculture, (b) biological science, (c) commerce, (d) home economics, (e) industrial arts, (f) mathematics, and (g) physical science. Prerequisite: Ed 311, 312, 313. (Six hours maximum allowed toward certification.)
- Ed 415. **Supervised Teaching.** 3 to 9 hours.
Experience in classroom procedures along the lines of the student's academic preparation and interests. Prerequisite: Ed 311, 312, 313. Professor Stevenson.
- Ed 416. **Measurement in Secondary Education.** (G) 3 hours any term.
Construction and desirable uses of standard tests and scales for measuring achievement in secondary-school subjects; elements of statistical method. Prerequisite: Ed 311, 312, 313, or equivalent. Professor Clinton.
- Ed 421, 422, 423. **School Health Problems.** (G) 2 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. Professor Langton.
- Ed 425. **School and Community Club Work.** (G) 3 hours winter.
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: Ed 311, 312, 313. Professor Seen.

- Ed 431. **Construction and Use of Visual Aids.** (G) 3 hours winter.
Film, slide, chart, and other visual materials; selection and use to best advantage; operation of projectors and other equipment. Prerequisite: Ed 311, 312, 313, or equivalent. Assistant Professor Reid.
- Ed 440. **History of Education.** (G) 3 hours fall.
Growth and development of education; Plato, Aristotle, Renaissance educators, Comenius, Locke, Rousseau, Pestalozzi, Froebel, Herbart, Herbert Spencer, and Dewey. Prerequisite: Ed 311, 312, 313. Professor Warrington.
- Ed 460. **Psychology of Childhood.** (G) 3 hours fall or spring.
Mental development; native responses; play, self-assertion, instinctive social attitudes; speech, emotions; simple, complex mental processes; mental organization. Prerequisite: Ed 311, 312, 313.
- Ed 461. **Adolescence: Growth and Development of the Individual.** (G) 3 hours winter.
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: Ed 311, 312, 313.
- Ed 464. **Vocational Legislation and Administration.** (G) 3 hours.
For students with teaching experience and training in industrial subjects to qualify for administrative or supervisory service. Prerequisite: Ed 488 or equivalent. Extramural or summer quarter. Associate Professor Paulson.
- Ed 470. **The Junior High School.** (G) 3 hours fall or winter.
Junior high school and guidance movement; purposes and opportunities of junior high school years. Outstanding junior high schools are studied. Prerequisite: Ed 461 or equivalent. Professor Salser.
- Ed 480. **The Conference Method in Vocational Education.** (G) 3 hours.
Designed to develop ability in conference leading. Technique; practice in conducting conferences. Prerequisite: Ed 408e or consent of instructor. Two two-hour conference periods. Extramural or summer quarter.
- Ed 485. **Guidance and Personnel Practices.** (G) 3 hours fall.
An introduction to the field of guidance and counseling. Means and methods of assisting students with personal and vocational problems; necessary school policies. Prerequisite: Ed 311, 312, 313. Professor Salser.
- Ed 486. **Current Occupational Trends.** (G) 3 hours winter.
Materials available in occupational world; interpretations of present trends; sources of such material; value and usefulness for high-school and college students. Prerequisite: Ed 311, 312, 313. Professor Salser.
- Ed 487. **Counseling.** (G) 3 hours spring.
Mental, achievement, trade, and other tests; administration of such tests; classification; methods in educational and vocational counseling. Prerequisite: Ed 485 or 486. Professor Salser.
- Ed 488. **Philosophy of Vocational Education.** (G) 3 hours winter.
Place and need of vocational education in a democracy; evolution of philosophy of vocational education as a phase of the general education program. Prerequisite: Ed 311, 312, 313, or equivalent.
- Ed 489. **Civic Education.** (G) 3 hours fall or spring.
School as transmitter of social inheritance; contribution of school organization, subjects, methods, extra-school activities, and discipline to citizenship training. Prerequisite: Ed 313 or equivalent. Professor Salser.

- Ed 490. **Character Education.** (G) 3 hours any term.
Character in social purposes of education; dynamic function of feelings; conditioning of interests; ideals; habit formation; integration of habits and attitudes. Prerequisite: Ed 311, 312, 313. Professor Warrington.
- Ed 491. **Group Thinking.** (G) 3 hours spring.
Reasoned judgment on public affairs; how diversified groups may cooperate in discovering new roads to new and better goals; technique of leadership in group thinking. Prerequisite: Ed 311, 312, 313. Professor Warrington.
- Ed 492. **Character Education Problems.** (G) 3 hours.
Bearing of social change on conduct; democratic participation in group thought-life; successful plans; program building. Offered at present summer quarter only. Prerequisite: Ed 490. Professor Warrington.
- Ed 497. **Adult Education.** (G) 3 hours fall.
Development, methods, and results; public schools, extension instruction, industrial and commercial organizations, radio, and other agencies of adult learning. Prerequisite: Ed 311, 312, 313. Professor Warrington.
- Ed 498. **Organization and Supervision for High-School Teachers.** (G) 3 hours winter.
Administrative organization, methods, and purposes of supervision as they involve the classroom teacher. Prerequisite: Ed 311, 312, 313. Professor Clinton.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

- Ed 501. **Research.** Terms and hours to be arranged.
In addition to the regular courses listed, members of the staff supervise research and investigation by qualified graduate students. Registration by permission of staff members. Prerequisite: graduate standing in Education. See also AEd 501, CEEd 501, HEEd 501, IEd 501, SEEd 501.
Problems in Adult Education—Professor Warrington.
Problems in Curriculum and Instruction—Professor Clinton.
Problems in Educational Psychology—Professor Stevenson.
Problems in Guidance—Professor Salser.
Problems in History or Philosophy of Education—Professors Salser and Warrington.
Problems in Measurements—Professor Clinton.
Problems in Secondary Education—Professor Salser.
Problems in Higher Education—Professors Salser and Goode.
Problems in Social or Moral Education—Professor Warrington.
- Ed 503. **Thesis.** Terms and hours to be arranged.
- Ed 505. **Reading and Conference.** Terms and hours to be arranged.
- Ed 507. **Seminar.** Terms and hours to be arranged.
- Ed 508. **Curriculum Workshop.** Terms and hours to be arranged.
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 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. Professor Salser and staff.

- Ed 512. Introduction to Thesis Writing.** 2 hours fall.
Open to graduate students in education and other schools. Finding materials; thesis organization; types of research suited to problems; bibliography. Prerequisite: graduate standing. Professor Clinton.
- Ed 517. Statistical Methods in Education.** 3 hours winter or spring.
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. Professor Clinton.
- Ed 522. Foreign School Systems.** 3 hours winter.
Comparative study of education in France, Germany, Great Britain, and Denmark; effectiveness of liberal and vocational education in the countries studied. Prerequisite: Ed 440.
- Ed 524. Curriculum Construction.** 3 hours winter.
Building junior and senior high-school curricula; theories and policies since 1900; selecting and organizing subject matter; courses of study; curriculum organization. Prerequisite: Ed 311, 312, 313, or equivalent.
- Ed 526. Construction and Use of Objective Examinations.** 3 hours winter or spring.
Principles and statistics involved in the selection of test items; types of examinations, validity; reliability; administering, scoring, grouping results. Prerequisite: Ed 416. Professor Clinton.
- Ed 527. Tests and Their Social Uses.** 3 hours spring.
Application to cultural, moral, social, and educational problems; basic principles leading to improvement; adjustment of students in scholastic and personal activities. Prerequisite: Ed 416. Professor Clinton.
- 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 demands to meet needs. Prerequisite: Ed 311, 312. Professor Chambers.
- Ed 543. History of American Education.** 3 hours spring.
Intellectual development of America with special reference to education. Prerequisite: knowledge of American history; Ed 311, 312, 313, or equivalent.
- Ed 546. Philosophy of Education.** 3 hours winter.
Fundamental problems of education, with some attempt at their solution; meaning of philosophy; philosophy of education; value for teacher and administrator. Prerequisite: Ed 311, 312, 313. Professor Warrington.
- Ed 555. College and University Teaching.** 3 hours spring.
Mental tests; objective examination; other movements in college teaching. Problems are outlined by members of faculty best equipped to present them. Prerequisite: graduate standing. Professor Goode.
- Ed 561. Advanced Educational Psychology.** 3 hours.
Experimental material that seems most useful and relevant to educational psychology. Prerequisite: graduate standing in education.

Agricultural Education

THE Department of Agricultural Education is responsible for the training of teachers and supervisors of agriculture in secondary schools, for all-day, part-time, and evening schools for both young and adult farmers, and the training for leadership in rural life and education. Special attention is given

to the preparation of teachers, directors, supervisors, and teacher trainers as provided for by the Federal laws for vocational education commonly known as the Smith-Hughes Act and the George-Deen Act. Included within the scope of this department's work are certain field, research, and extension activities involving the preparation of instructional material for the use of agriculture instructors in cooperation with staff members of the School of Agriculture.

The Department of Agricultural Education is a joint department within both the School of Agriculture and the School of Education.

Requirements for Teaching Agriculture. Teachers of agriculture need to have a fundamental knowledge and a high level of doing ability in most of the departmental fields of the School of Agriculture. At the beginning of his college course the prospective teacher should advise with the head of the Department of Agricultural Education regarding the courses he should select in each of the fields of agriculture. Certain qualifications essential in teaching vocational agriculture should be considered by the student, in conference with the head of this department, when applying for admission into this field of teaching. Students interested in Smith-Hughes agriculture see footnote on page 192.

Requirements in Agriculture:

- (1) Graduation from a college of agriculture of standard rank.
- (2) The course requirements in agriculture and education (for Smith-Hughes teaching) can be met in either of two ways: first, by majoring in the Agricultural Education curriculum, pages 192-193, which includes requirements in both agriculture and education; second, by pursuing one of the three other curricula in agriculture in the sophomore year and one of the major curricula in General Agriculture, Agricultural Economics, Animal Industries, or Plant Industries, during the junior and senior years. The latter plan will be approved provided sufficient electives are available for meeting the course requirements in agriculture as outlined in the Agricultural Education curriculum (School of Agriculture, pages 192-193) as well as the requirements in education.
- (3) 70 to 80 term hours of special work in agriculture are usually required. The student's choice of courses should depend somewhat on his previous training and experience and the recommendations of the head of the department. The suggested sequence and distribution of courses are given in the major curriculum on pages 192-193. Regardless of the department in which the student majors he should have a minimum of term hours in the respective departments distributed as follows: Animal Husbandry, 10; Dairy Husbandry, 6; Poultry Husbandry, 6; Veterinary Medicine, 4; Soils, 9; Farm Crops, 12; Horticulture, 6; Agricultural Economics and Marketing, 6; Farm Management, 12; Agricultural Engineering, 18.
 - (a) Vocational Certificate. The four-year curriculum in Agricultural Education, pages 192-193, is designed to fulfill the requirements for this certificate.
 - (b) Secondary school certificate. The requirements for this certificate are given on pages 245-247.

For more specific information regarding the methods of meeting the requirements for both types of teaching certificates in the field of Agricultural Education, confer with the head of the department.

Graduate Study and Apprentice Teaching in Agricultural Education. As the demands on teachers of agriculture the country over are becoming more exacting each year additional work after graduation in the fields of agriculture and education is desirable, and in certain states, including Oregon, Washington, and California, is required for the secondary school certificate. To meet this demand, a fifth year of graduate work including apprentice teaching is available for a limited number of graduates of approved standing. The plan provides for the location of apprentice teachers in high-school centers near Corvallis where they may acquire credit, both by work at the College and in the field, toward a master's degree.

General Electives. Certain courses are open to all students in agriculture and others who are interested in training for leadership in rural life. Special attention is called to Ed 341, Rural Education.

DESCRIPTION OF COURSES*

UPPER-DIVISION COURSES

AEd 401. **Research.** Terms and hours to be arranged.

AEd 403. **Thesis.** Terms and hours to be arranged.

AEd 405. **Reading and Conference.** Terms and hours to be arranged.

AEd 407. **Seminar.** Hours to be arranged, two terms.

Ed 408a. **Methods and Materials.** 3 hours winter or spring.

(See Ed 408, page 256.) Professor Gibson.

AEd 417. **The Agricultural Curriculum.** (G) 3 hours, winter or spring.

Determining course content and evaluating types of course organization with reference to the objectives to be attained in the field of agriculture in secondary schools. Prerequisite: Ed 313. Professor Gibson.

AEd 418. **Adult Education in Agriculture.** (G) 3 hours winter.

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.

GRADUATE COURSES

AEd 501. **Research.** Terms and hours to be arranged.

AEd 503. **Thesis.** Terms and hours to be arranged.

AEd 505. **Reading and Conference.** Terms and hours to be arranged.

AEd 507. **Seminar.** Terms and hours to be arranged.

AEd 516. **Extension Course in Teacher Training.** Hours to be arranged, any term.

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. Professor Gibson.

AEd 533. **Rural Survey Methods.** 3 hours spring.

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. Professor Gibson.

* See also courses in the Department of Education, especially Ed 341.

Commercial Education

In conjunction with the Division of Business and Industry the School of Education is able to meet the demand for well-prepared teachers of commercial branches in secondary schools. In the selection of their collegiate courses both in business and industry and secretarial science and in education, students should advise with both the Division of Business and Industry and the School of Education. (The term hours in education required for a certificate to teach in accredited high schools are indicated on pages 245-247.)

DESCRIPTION OF COURSES*

Ced 401. **Research.** Terms and hours to be arranged.

Ced 403. **Thesis.** Terms and hours to be arranged.

Ced 405. **Reading and Conference.** Terms and hours to be arranged.

Ced 407. **Seminar.** Terms and hours to be arranged.

Ed 408c. **Methods and Materials.** (See Ed 408, page 256.) Associate Professor Stutz.

GRADUATE COURSES

Ced 501. **Research.** Terms and hours to be arranged.

Ced 503. **Thesis.** Terms and hours to be arranged.

Ced 505. **Reading and Conference.** Terms and hours to be arranged.

Ced 507. **Seminar.** Terms and hours to be arranged.

Ced 541. **Current Practices in Typewriting.** 3 hours fall.

Principles underlying the development of typing skills; motivation, supplementary materials, and special devices. Prerequisite: Ed 408c and teaching experience in typing. Associate Professor Stutz.

Ced 542. **Current Practices in Shorthand.** 3 hours winter.

Correct writing habits; sound and symbol response; development of supplementary material through word and sentence building and transcription technique. Prerequisite: Ed 408c. Associate Professor Stutz.

Ced 543. **Problems in Commercial Education.** 3 hours spring.

Recent and current trends in high school commercial curriculum; evaluation of methods and research studies. Prerequisite: Ed 408c and teaching experience in commercial subjects. Associate Professor Stutz.

Home Economics Education

PROFESSIONAL training for prospective teachers of home economics is afforded by the Department of Home Economics Education, which is a joint department within both the School of Home Economics and the School of Education. Any student in the School of Home Economics having a scholarship record below average should confer with the Dean of the School of Home Economics before registering for teacher-training work. (For information regarding the specific requirements for the State Teacher's Certificate see pages 245-247.)

* See also courses in the Department of Education.

DESCRIPTION OF COURSES*

UPPER-DIVISION COURSES

- Hed 401. Research. Terms and hours to be arranged.
- Hed 403. Thesis. Terms and hours to be arranged.
- Hed 405. Reading and Conference. Terms and hours to be arranged.
- Hed 407. Seminar. Terms and hours to be arranged.
- Ed 408d. Methods and Materials. (See Ed 408, page 256.) Professor Blazier.
- Hed 412. Organization and Administration of Homemaking Education. (G) 3 hours any term.
Typical organizations of homemaking departments on both the vocational and nonvocational basis with particular attention to equipment and management. Prerequisite: Ed 408d. Professor Blazier.
- Hed 413. The Supervision of Home Projects. (G) 2 hours spring.
The use of home projects in home economics instruction with field work in supervision of home projects. Prerequisite: Ed 408d. One recitation; 1 two-hour laboratory period. Professor Blazier.
- Hed 420. Community Problems in Nutrition. (G) 3 hours winter.
Nutrition problems 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. Professor Blazier.
- Hed 440. Adult Education in Home Economics. (G) Hours to be arranged, winter.
Problems in adult-education program authorized under Smith-Hughes Act; field work in promoting, organizing, observing, and teaching adult classes. Prerequisite: Hed 412. Professor Blazier.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

- Hed 501. Research. Terms and hours to be arranged.
- Hed 503. Thesis. Terms and hours to be arranged.
- Hed 505. Reading and Conference. Terms and hours to be arranged.
- Hed 507. Seminar. Terms and hours to be arranged.

Industrial Education

JOINTLY with the Department of Industrial Arts, the Department of Industrial Education trains teachers and supervisors in industrial-arts education and in trade and industrial (Smith-Hughes vocational) education. While the department is organized as a part of the School of Education, and offers no technical courses or curricula of its own, it makes use of such courses in other schools and departments as serve its needs. Special attention is called to the joint administration of curricula for teacher training in industrial-arts education and in vocational trade and industrial education. The Department of Industrial Arts (School of Engineering) is responsible for the general curricula and technical training, while the Department of Industrial

* See also courses in the Department of Education.

Education (School of Education) is responsible for the professional teacher-training courses and applied pedagogy.

Three Programs Available. Three intensities of training are open to those interested in industrial-arts education:

(1) The four-year professional-technical program, leading to the degree of Bachelor of Science or Bachelor of Industrial Arts, meets certification requirements of any state in the Union except those requiring graduate study as a prerequisite to certification. In such cases it furnishes an excellent foundation for the required graduate study, which may be completed at Oregon State College or elsewhere. (See pages 276-278.)

(2) The teaching major in industrial arts affords an opportunity for approximately half the training in technical industrial-arts subject matter that is available to the student in the four-year professional-technical program. It provides a program suited to the needs of teachers in the smaller schools of the state. It is also adapted to the needs and interests of those who transfer to Oregon State College from normal schools, teachers colleges, and universities with two years of nontechnical training. (See page 250.)

(3) The minor is intended as a background for superintendents, principals and others who desire a speaking acquaintance with industrial arts techniques and objectives, and for those who plan to teach industrial arts under very limited conditions. Recommendation as a teacher on the basis of an industrial arts minor will be limited accordingly, usually embracing only elementary wood-working and drawing instruction in schools not qualified for a more extensive program. (See page 250.)

Graduate Study in Industrial Education. Many school systems, and some state departments of education, now require all teachers to present graduate study or a master's degree as a principal prerequisite to a teaching credential for the secondary schools. Since the demands upon teachers the country over are becoming increasingly more exacting each year, graduate work in industrial education brings its proportional rewards and is usually necessary for those who desire to enter the fields of supervision, administration, or teacher-education. Programs of study leading to the degree of Master of Arts, Master of Science, or Master of Education are outlined by this department for industrial-arts or industrial-education students and teachers with approved graduate standing.

Extramural Courses. Through cooperation with the State Board for Vocational Education and through the establishment of extension centers, provision is made whereby certain courses of this department are offered as extramural courses. Classes are taught in Portland on occasion, and other extension centers may be established as need warrants. This is especially true of those courses for the training of journeymen as vocational-industrial teachers, for the training of teachers in general continuation subjects, and for graduate or undergraduate courses adaptable to the professional advancement of the teacher in service. For further information concerning extramural courses consult the head of the Department of Industrial Education.

DESCRIPTION OF COURSES*

UPPER-DIVISION COURSES

IEd 401. **Research.** Terms and hours to be arranged.

IEd 403. **Thesis.** Terms and hours to be arranged.

* See courses in the Department of Education, especially Ed 330, and courses in technical subject matter in the Department of Industrial Arts, pages 297-302.

- IEd 405. **Reading and Conference.** Terms and hours to be arranged.
- IEd 407. **Seminar.** Terms and hours to be arranged.
- Ed 408e. **Methods and Materials.** (See Ed 408, page 256.)
- IEd 470. **History of Manual and Industrial Education.** (G) 3 hours winter.
Historical developments to present; Socrates, Plato, Rousseau, Pestalozzi, Froebel, John Dewey; present-day aims of industrial-arts and vocational-industrial education. Prerequisite: Ed 313, 408e. Associate Professor Meyer.
- IEd 471. **Teaching Supplementary Subjects.** (G) 3 hours.
Content and methods in mathematics, drawing, and science, for Smith-Hughes program. Prerequisite: mathematics, drawing, and science, and consent of instructor. Extramural or summer quarter. Associate Professor Adams and staff.
- IEd 472. **Occupational Analysis.** (G) 3 hours fall.
Analysis of an occupation, trade, or job into its component subdivisions, blocks, operations, and teaching units; occupational analysis in teaching procedure. Prerequisite: Ed 313, 408e. Associate Professor Meyer.
- IEd 473. **The General Shop and Its Problems.** (G) 2 hours fall.
The "general shop" type of organization; advantages and limitations; probable future; content, organization, and methods of presenting subject matter; class control. Prerequisite: Ed 311, 312, 313, 330. Professor Cox.
- IEd 474. **Written and Visual Teaching Aids.** (G) 3 hours winter or spring.
Instruction sheets and visual aids for more efficient teaching in large and diversified classes; evaluation of available materials; diagrams, charts, models, and instruction sheets. Prerequisite: IEd 473 or equivalent. Professor Cox.
- IEd 475. **Project Analysis and the Contract Plan.** (G) 2 hours.
Projects suitable for various types of shop teaching; contract plan; technique of preparing contracts; suggestions for use in industrial-arts classes. Prerequisite: IEd 473 or equivalent. Professor Cox.
- IEd 478. **Cooperative Part-Time Education.** (G) 3 hours.
Laws affecting part-time schools; types of pupils; teachers; the coordinator; cooperation with outside organizations. Prerequisite: Ed 488 or equivalent. Extramural or summer quarter. Associate Professor Adams and staff.
- IEd 482. **Supervision of Industrial Education.** (G) 2 hours.
Specific problems of supervision in trade and industrial and the industrial-arts education groups. Prerequisite: extended teaching experience; Ed 464, 488. Extramural or summer quarter. Associate Professor Adams and staff.
- IEd 484. **Industrial Education and Changing Conditions.** (G) 3 hours.
Developments in industry; trends in state and federal programs; vocational-industrial education under George-Deen Act. Prerequisite: Ed 488 or equivalent. Extramural or summer quarter. Associate Professor Adams.
- IEd 485. **Labor, Industry, and the Apprenticeship Program.** (G) 3 hours.
Problems of labor and industry as reflected in federal and state apprenticeship program and regulations related thereto. Prerequisite: Ed 488 or equivalent. Extramural or summer quarter. Associate Professor Adams.
- IEd 494. **Problems of Coordination.** (g) 3 hours.
Selection of trainees; selection of industrial shops; vocational memorandums and apprentice indentures; adjusting class work and work experience. Prerequisite: IEd 478 and Ed 488, or their equivalent. Associate Professor Adams or Associate Professor Paulson.

GRADUATE COURSES

Courses numbered 400-499 and designated (ø) or (G) may be taken for graduate credit.

- IEd 501. **Research.** Terms and hours to be arranged.
IEd 503. **Thesis.** Terms and hours to be arranged.
IEd 505. **Reading and Conference.** Terms and hours to be arranged.
IEd 507. **Seminar.** Terms and hours to be arranged.

Science Education

PROFESSIONAL preparation for prospective teachers of science and mathematics is afforded by the Department of Science Education, which is a joint department within the School of Education and the School of Science. For information regarding specific requirements for the High School Teacher's Certificate, see pages 245-247.

DESCRIPTION OF COURSES*

UPPER-DIVISION COURSES

- SEd 401. **Research.** Terms and hours to be arranged.
SEd 403. **Thesis.** Terms and hours to be arranged.
SEd 405. **Reading and Conference.** Terms and hours to be arranged.
SEd 407. **Seminar.** Terms and hours to be arranged.
Ed 408b. **Methods and Materials.** (See Ed 408, page 256.) Professor Stevenson.
Ed 408f. **Methods and Materials.** (See Ed 408, page 256.) Professor Stevenson.
Ed 408g. **Methods and Materials.** (See Ed 408, page 256.) Professor Stevenson.

GRADUATE COURSES

- SEd 501. **Research.** Terms and hours to be arranged.
SEd 503. **Thesis.** Terms and hours to be arranged.
SEd 505. **Reading and Conference.** Terms and hours to be arranged.
SEd 507. **Seminar.** Terms and hours to be arranged.

* See also courses in the Department of Education.

School of Engineering and Industrial Arts

Faculty

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

GEORGE WALTER GLEESON, Ch.E., Assistant Dean of the School of Engineering and Industrial Arts.

BESSIE MARIE SKAAL, B.S., Secretary to the Dean.

General Engineering

INSTRUCTORS BOALS, KIRK, MCCLINTOCK.

Chemical Engineering

PROFESSOR GLEESON (department head).

ASSISTANT PROFESSOR LOCKE.*

INSTRUCTOR SCHULEIN.

Civil Engineering

PROFESSORS MOCKMORE (department head), GRIFFITH*, GLENN, HOLCOMB, SIMMONS.

ASSOCIATE PROFESSORS DOLAN, WATERMAN, MERRYFIELD, WANLESS, MEHLIG.

INSTRUCTORS CAVANAGH, COOPEY, WILLIAMS.

VISITING LECTURER: CONDÉ BALCOM MCCULLOUGH, C.E., LL.B., Eng.D.

Electrical Engineering

PROFESSORS McMILLAN (department head)*, WOOSTER, ALBERT (acting department head), STARR.

ASSOCIATE PROFESSORS NICHOLS*, COCKERLINE, VARNER.

ASSISTANT PROFESSORS FEIKERT, EVEREST*, VINYARD.

INSTRUCTORS OORTHUY, PRITCHETT, HUGGINS, BRUNS, WITTKOPF, McLEAN, WHITE.

Mechanical Engineering

PROFESSORS GRAF (department head), MARTIN, PHILLIPS, THOMAS, RUFFNER, PAUL.

ASSOCIATE PROFESSORS HUGHES, MANN, SIMS.

ASSISTANT PROFESSOR WILLEY.

INSTRUCTORS PALMERLEE*, SKINNER*, MILLER, HAITH, ARENTS, JUDSON.

Mining and Metallurgical Engineering

ASSOCIATE PROFESSOR SCHLECHTEN (acting department head).

* On leave for military or civilian war service.

Industrial Arts

PROFESSOR COX (department head).

ASSOCIATE PROFESSOR MEYER.

ASSISTANT PROFESSORS SHEELY, ENGESSER*, JOHNSON.

MECHANICIAN HARWOOD.

Curricula in Engineering and Industrial Arts

*B.A., B.S., B.I.A., M.A., M.S.,
Ch.E., C.E., E.E., M.E., Met.E., Min.E. Degrees*

*Chemical Engineering
Civil Engineering
Electrical Engineering
Industrial Engineering
Mechanical Engineering*

*Metallurgical Engineering
Mining Engineering
Industrial Administration
Industrial Arts Education*

FOUR-YEAR curricula leading to baccalaureate degrees are offered in the School of Engineering as follows: a general curriculum in Chemical Engineering; a general curriculum in Civil Engineering with options in Highway Engineering and Business; a general curriculum in Electrical Engineering with options in Power, Communication, and Business; a general curriculum in Industrial Engineering; a general curriculum in Mechanical Engineering with options in Aeronautical Engineering and Business; a general curriculum in Mining Engineering and in Metallurgical Engineering; curricula in Industrial Administration and Industrial Arts Education.

Requirements for Graduation. In each of the four-year curricula offered in the School of Engineering the fulfillment of the Lower-Division group requirements for professional schools is prescribed. The student must complete the upper-division work as outlined or elected in the Engineering School with the approval of the department head and the dean.

For a bachelor's degree, a total of 204 term hours including the required work in physical education and military science is required. For the degree of Bachelor of Science at least 36 term hours of science are required, 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 237 term hours may, on approval, receive both the Bachelor of Arts and the Bachelor of Science degrees.

The requirements for the M.A., M.S., Ch.E., C.E., E.E., M.E., Met.E., and Min.E. degrees are printed under GRADUATE DIVISION.

Curricular Organization. The curricula offered in the Engineering School are organized into the following curricular groups:

A. Chemical Engineering, Metallurgical Engineering, and Mining Engineering as four-year sequence curricula.

* On leave for military or civilian war service.

B. Civil, Electrical, Industrial, and Mechanical Engineering including a common freshman curriculum and differentiated sophomore and upper-division curricula in these four fields.

C. Industrial Administration and Industrial Arts Education.

Engineering curricula are organized about four general fields of knowledge or training, and the sequence of courses in each curriculum is determined for the purpose of developing strong continuity in the various fields. The four fields are: (1) general engineering science and technology; (2) mathematics and physical science; (3) language, literature, English, and social science; and (4) military education, physical education, and free electives.

Exploratory Contacts. The lower-division curricula insofar as possible have been arranged to afford early contact with engineering training for those who are undetermined in the selection of a major engineering field.

Curricular groups A and B as listed above are differentiated by their primary foundations in chemistry and physics. An undecided student who desires exploratory contact with chemical engineering should register in curricular group A, for should he decide after the first term to investigate curricular group B, he may do so without increasing his undergraduate period of training. One who, on the contrary, explores curricular group B and decides at the end of his freshman year to transfer to curricular group A will find his training necessarily extended beyond four years.

As one and one-half years of algebra and one year of geometry are required for entrance to the engineering curricula (industrial administration and industrial arts education excepted), students who have not completed these requirements and desire a degree in engineering must spend more than four years for graduation. The program of such students in the freshman year includes the mathematics that they lack, together with other freshman courses excepting those technical courses for which mathematics is prerequisite.

A. Chemical, Metallurgical, and Mining Engineering

CHEMICAL ENGINEERING

Freshman Year

	Term hours		
	F	W	S
Chemical Engineering Survey (ChE 111, 112, 113)	1	1	1
Principles of Chemistry (Ch 201, 202, 203)	4	4	4
Elementary Analysis (Mth 101, 102, 103)	4	4	4
English Composition (Eng 111, 112, 113)	3	3	3
Engineering Drawing (GE 111, 112)	2		2
Machine Shop Practice (IA 260) or Forging and Welding (IA 250)		2	
General Hygiene (PE 150)	1	1	1
Military Science	1	1	
*Physical Education			
	16	16	17

Sophomore Year

Chemical Technology (ChE 211)	2		
Industrial Stoichiometry (ChE 212, 213)		2	2
Advanced Qualitative Analysis (Ch 231)	4		
Quantitative Analysis (Ch 232, 233)		4	4
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
Engineering Physics (Ph 111, 112, 113)	3	3	3
Military Science	1	1	1
Physical Education	1	1	1
Social Science or Language and Literature	3	3	3
	18	18	18

*General Hygiene (PE 150), 2 term hours, is taken one term of the freshman year.

	Junior Year		
	Term hours		
	F	W	S
Industrial Chemical Calculations (ChE 311)	4	....	....
Chemical Engineering Thermodynamics (ChE 312) .....	....	4	....
Elementary Unit Operations (ChE 313) .....	....	....	4
Organic Chemistry (Ch 430, 431, 432)	4	4	4
Physical Chemistry (Ch 440, 441, 442)	4	4	4
Mechanics (Statics) (ME 212)	3	....	....
Strength of Materials (ME 311) .....	....	3	....
Materials of Engineering (ME 316) .....	....	....	3
¹ Electives	3	3	3
	18	18	18

Senior Year			
Unit Operations (ChE 411, 412, 413)	3	3	3
Elements of Process Industries (ChE 441, 442, 443)	3	3	3
Chemical Engineering Laboratory (ChE 414, 415, 416)	3	3	3
Industrial Electricity (EE 354, 355)	3	3	....
Chemical Plant Design (ChE 433) .....	....	....	4
Electives	3	4	3
	15	16	16

MINING ENGINEERING AND METALLURGICAL ENGINEERING*

	Freshman Year		
	Term hours		
	F	W	S
Mineral Industry Survey (MiE 141, 142) .....	....	1	1
Principles of Chemistry (Ch 201, 202, 203)	4	4	4
Elementary Analysis (Mth 101, 102, 103)	4	4	4
English Composition (Eng 111, 112, 113)	3	3	3
Engineering Drawing (GE 111, 112, 113)	2	2	2
General Hygiene (PE 150) .....	....	....	2
Military Science	1	1	1
Physical Education	1	1	....
	15	16	17

Sophomore Year			
Engineering Physics (Ph 111, 112, 113)	3	3	3
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
Advanced Qualitative Analysis (Ch 231)	4	....	....
Quantitative Analysis (Ch 232) .....	....	4	....
Assaying (Met 263) .....	....	....	3
Geology (G 201, 202, 203)	3	3	3
Geology Laboratory (G 204, 205, 206)	1	1	1
Military Science	1	1	1
Physical Education	1	1	1
	17	17	16

MINING ENGINEERING

Junior Year			
Mineralogy (G 312, 313, 314)	4	4	4
Mechanics (Statics) (ME 212)	3	....	....
Strength of Materials (ME 311) .....	....	3	....
Fluid Mechanics (CE 341) .....	....	3	....
Plane Surveying (CE 226)	3	....	....
Fire Assaying (Met 471, 472)	2	2	....
Mine Surveying (MiE 453) .....	....	....	3
Mineral Dressing (Met 481, 482)	3	3	....
Elements of Mining (MiE 433) .....	....	....	3
Mineral Dressing Laboratory (Met 483) .....	....	....	3
¹ Electives	3	3	4
	18	18	17

*Advanced Military Science may be elected only if the social science requirements have been completed. If GL 1, 2, 3 has already been completed, Scientific German (GL 320, 321, 322) should be elected.

*The freshman and sophomore years are identical for both metallurgical and mining engineering. The curriculum for metallurgical engineering in the junior and senior years is being formulated.

	Senior Year	Term hours		
		F	W	S
Mine Exploration (MiE 441)		3	---	---
Mining Methods (MiE 442)		---	3	---
Mine Development (MiE 443)		---	---	3
General Metallurgy (Met 461)		3	---	---
Metallurgy of the Common Metals (Met 462)		---	4	---
Stratigraphy (G 323)		4	---	---
Physiography (G 322)		---	4	---
Structural Geology (G 321)		---	---	4
Mine Design (MiE 463)		---	---	2
Outlines of Economics (Ec 212), American National Government (PS 212), and other Social Science		3	3	3
Electives		5	4	5
		18	18	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 (CE 111, 112, 113)		2	2	2
Elementary Analysis (Mth 101, 102, 103)		4	4	4
Engineering Physics (Ph 111, 112, 113)		3	3	3
English Composition (Eng 111, 112, 113)		3	3	3
Military Science		1	1	1
*Physical Education		1	1	1
		16	16	16

CIVIL ENGINEERING

Sophomore Year

Plane Surveying (CE 221, 222, 223)	3	3	3
Descriptive Geometry (CE 211)	3	---	---
Field Curves (CE 231)	---	3	---
Mechanics (CE 212, 213)	---	3	3
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
American National Government (PS 212)	3	---	---
General Sociology (Soc 212)	1	---	3
Military Science	1	1	1
Physical Education	1	1	1
	18	18	18

Junior Year

NORM

Strength of Materials (CE 351, 352)	3	3	---
Structural Analysis (CE 382)	---	4	---
Reinforced Concrete (CE 383)	---	---	4
Fluid Mechanics (CE 311)	3	---	---
Advanced Hydraulics (CE 312)	---	3	---
Hydraulic Machinery (CE 313)	---	---	3
Roads and Pavements (CE 333)	---	---	3
Curves and Earthwork (CE 332)	---	---	3
Materials of Engineering (ME 316)	3	---	---
Industrial Electricity (EE 356)	3	---	---
Outlines of Economics (Ec 212)	---	3	---
	12	13	13

GENERAL AND HIGHWAY OPTIONS

Junior-Year Norm	12	13	13
Electives	4	4	4
	16	17	17

*General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education.

	BUSINESS OPTION		
	Term hours		
	F	W	S
Junior-Year Norm	12	13	13
Accounting for Technical Students (BA 385, 386)	3	3	....
Cost Accounting for Industrials (BA 494) .....	....	....	3
Extempore Speaking (Sp 111)	3	....	....
Elective .....	....	....	1
	18	16	17

Senior Year

NORM

Structural Engineering (CE 481), Structural Design (CE 482)	4	4	....
Estimating and Cost Analysis (CE 460) .....	....	....	3
Masonry and Foundations (CE 472) .....	....	4	....
Sanitary Engineering (CE 412)	3	....	....
Contracts and Specifications (CE 427) .....	....	....	3
Steam, Air, and Gas Power (ME 346) .....	....	....	3
Engineering Geology (G 324) .....	....	3	....
	7	11	9

GENERAL OPTION

Senior-Year Norm	7	11	9
Building Design (CE 483) .....	....	....	4
Hydrology (CE 411)	3	....	....
Structural Materials Laboratory (ME 415) .....	....	3	....
Electives	7	4	4
	17	18	17

HIGHWAY OPTION

Senior-Year Norm	7	11	9
Highway Engineering (CE 421, 422)	4	3	....
Economics of Highway Transportation (CE 425) .....	....	....	3
Highway Materials Laboratory (ME 414)	3	....	....
Electives	4	4	4
	18	18	16

BUSINESS OPTION

Senior-Year Norm	7	11	9
Hydrology (CE 411)	3	....	....
Business Law (BA 256, 257, 258)	3	3	3
Principles of Personnel Management (BA 414)	3	....	....
Merchandising and Selling (SS 436) .....	....	3	....
Money and Banking (Ec 413) .....	....	....	4
Elective	1	1	....
	17	18	16

STRUCTURAL DESIGN IN ARCHITECTURAL OPTION

B.S. Degree at University

Freshman and Sophomore Years (University)

The freshman and sophomore years in this curriculum are taken at the University in the School of Architecture and Allied Arts. It is recommended that the student in his freshman and sophomore years take the following courses, with such additions as may best fit individual cases: graphics, drawing or architectural modeling, architectural design, construction, elementary analysis, general physics, calculus, and architectural history. Students also take English composition, physical education, and the lower-division group requirements in arts and sciences.

Junior Year (State College)

	Term hours		
	F	W	S
Plane Surveying (CE 221, 222, 223)	3	3	3
Strength of Materials (CE 351, 352)	3	3	....
Structural Analysis (CE 382) .....	....	4	....
Reinforced Concrete (CE 383) .....	....	....	4
Materials of Engineering (ME 316)	3	....	....
Structural Materials Laboratory (ME 415) .....	....	3	....
Practical Electricity (IA 370)	3	....	....
Welding Practice (IA 350) .....	....	....	1
Forging and Welding (IA 250) .....	....	....	2
Electives	5	3	7
	17	16	17

	Term hours		
	F	W	S
Senior Year (State College)			
Structural Engineering (CE 481), Structural Design (CE 482)	4	4	4
Building Design (CE 483)	---	4	---
Masonry and Foundations (CE 472)	3	---	---
Fluid Mechanics (CE 311)	---	---	3
Estimating and Cost Analysis (CE 460)	---	---	3
Steam, Air, and Gas Power (ME 346)	7	9	6
Industrial Electricity (EE 356)	---	---	---
Electives	17	17	16

ELECTRICAL ENGINEERING

Sophomore Year

Introduction to Electrical Engineering (EE 201, 202, 203)	4	4	4
Plane Surveying (CE 226)	---	---	3
Machine Shop Practice (IA 260)	2	2	---
Forging and Welding (IA 250)	---	---	2
Foundry Practice (IA 240)	4	4	4
Differential and Integral Calculus (Mth 201, 202, 203)	3	3	3
Elementary General Chemistry (Ch 101, 102, 103)	3	---	---
Elementary Journalism (J 111)	---	3	1
Extempore Speaking (Sp 111)	1	1	1
Military Science	1	1	1
Physical Education	18	18	18

Junior Year

NORM

Electrical Engineering (EE 311, 312, 313)	3	3	3
Electrical Engineering Laboratory (EE 321, 322, 323)	3	3	3
Mechanics (ME 212, 213)	3	3	---
Materials of Engineering (ME 316)	---	---	3
Heat Power Engineering (ME 331, 332)	3	3	---
Fluid Mechanics (CE 341)	---	---	3
	12	12	12

POWER AND COMMUNICATION OPTION

Norm	12	12	12
Accounting for Technical Students (BA 385)	3	---	---
American National Government (PS 212)	---	3	---
Outlines of Economics (Ec 212)	---	---	3
Electives	3	3	3
	18	18	18

BUSINESS OPTION

Norm	12	12	12
Accounting for Technical Students (BA 385, 386)	3	3	---
Cost Accounting for Industrials (BA 494)	---	---	3
Electives	2	2	1
	17	17	16

Senior Year

NORM

Electrical Engineering (EE 411, 412, 413)	3	3	3
Electrical Design (EE 414, 415, 416)	1	1	1
Seminar (EE 407)	1	1	1
	5	5	5

POWER OPTION

Senior-Year Norm	5	5	5
Electrical Engineering Laboratory (EE 421, 422, 423)	3	3	3
Electrical Transients (EE 451)	3	---	---
High-Voltage Engineering (EE 452, 453)	---	3	3
Electives	5	5	5
	16	16	16

	COMMUNICATION OPTION ¹			Term hours		
	F	W	S	F	W	S
Senior-Year Norm	5	5	5			
Communication Engineering (EE 461, 462, 463)	3	3	3			
Vacuum Tubes and Circuits (EE 464, 465)	3	3	3			
Engineering of Sound Systems (EE 466) or Radio Engineering (EE 467) ..	1	1	1			
Radio Engineering Practices (EE 481, 482, 483) or electives	4	4	4			
Electives						
	16	16	16			

BUSINESS OPTION						
Senior-Year Norm	5	5	5			
Electrical Engineering Laboratory (EE 421, 422, 423)	3	3	3			
Vacuum Tubes and Circuits (EE 464)	3	3	3			
Illumination (EE 431, 432)	3	3	3			
Merchandising and Selling (SS 436)	3	3	3			
Business Law (BA 256, 257, 258)	3	3	3			
Outlines of Economics (Ec 212)	3	3	3			
Money and Banking (Ec 413)						
	17	17	18			

INDUSTRIAL ENGINEERING

Freshman Year

See Common Freshman Year, page 266.

Sophomore Year

Foundry Practice (IA 141)	3	3	3			
Forging and Welding (IA 152)		3	3			
Machine Shop (IA 163)			3			
Pattern Making (IA 111)	3	3	3			
Introduction to Scientific Management (IA 266)			2			
Descriptive Geometry (ME 211)	3	3	3			
Mechanics (ME 212, 213)		3	3			
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4			
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3			
Outlines of Economics (Ec 212)		3	3			
Military Science	1	1	1			
Physical Education	1	1	1			
	18	18	17			

Junior Year

Mill-Work—Machine Woodwork (IA 311)	3	3	3			
Machine Shop Practice (IA 261)		2	2			
Machine Shop (IA 362)			2			
Methods and Motion Study (IA 366)	3	3	3			
Time Study (IA 367)		3	3			
Production Planning and Control (IA 368)			3			
Industrial Electricity (EE 356)	3	3	3			
Mechanism (ME 312)		3	3			
Materials of Engineering (ME 316)			3			
Business Law (BA 256, 257)	3	3	3			
Economic Development of the United States (Ec 215)		4	4			
Industrial Psychology (Psy 215)			3			
Electives	5	3	6			
	17	18	17			

Senior Year

Quantitative Management (IA 461, 462)	3	3	3			
Production Machine Work (IA 363)	3	3	3			
Welding Practice (IA 350)		1	1			
Industrial Instrumentation (ME 476)			3			
Metallography and Pyrometry (ME 481)	3	3	3			
Applied Statistics (Mth 341, 342)		3	3			
Accounting for Technical Students (BA 385, 386)	3	3	3			
Cost Accounting for Industrials (BA 494)			3			
Labor Problems (Ec 425)			4			
Collective Bargaining and Labor Legislation (Ec 426)		4	4			
Electives	5	3	4			
	17	17	17			

¹Students may specialize in radio operation and management in the Business Option (pages 272-273) or may pursue a radio operation sequence in the industrial administration curriculum (pages 276-277).

MECHANICAL ENGINEERING

Sophomore Year

	Term hours		
	F	W	S
Descriptive Geometry (ME 211)	3	---	---
Mechanics (ME 212, 213)	---	3	3
Plane Surveying (CE 226)	3	---	---
Foundry Practice (IA 240)	2	---	---
Machine Shop Practice (IA 260)	---	2	---
Forging and Welding (IA 250)	---	---	2
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
American National Government (PS 212)	---	3	---
General Sociology (Soc 212)	---	---	3
Differential and Integral Calculus (Mth 201, 202, 203)	4	4	4
Military Science	1	1	1
Physical Education	1	1	1
	17	17	17

Junior Year

NORM

Heat Engineering (ME 321, 322, 323)	4	4	4
Mechanical Laboratory (ME 351, 352, 353)	2	2	2
Strength of Materials (ME 314, 315)	3	3	---
Mechanism (ME 312)	---	3	---
Outlines of Economics (Ec 212)	---	---	3
	9	12	9

GENERAL OPTION

Junior-Year Norm	9	12	9
Materials of Engineering (ME 316)	3	---	---
Fuels and Lubricants (ME 325)	---	---	3
Fluid Mechanics (CE 341), Hydraulic Machinery (CE 342)	3	3	---
Accounting for Technical Students (BA 385)	---	---	3
Electives	3	3	3
	18	18	18

AERONAUTICAL OPTION

Junior-Year Norm	9	12	9
Materials of Engineering (ME 316)	---	---	3
Aerodynamics (ME 342)	---	3	---
Aeropropulsion (ME 343)	---	---	3
Fluid Mechanics (CE 341)	3	---	---
Differential Equations (Mth 421)	3	---	---
Electives	3	3	3
	18	18	18

BUSINESS OPTION

Junior-Year Norm	9	12	9
Materials of Engineering (ME 316)	---	---	3
Fluid Mechanics (CE 341), Hydraulic Machinery (CE 342)	3	3	---
Accounting for Technical Students (BA 385, 386)	3	3	---
Cost Accounting for Industrials (BA 494)	---	---	3
Electives	3	---	3
	18	18	18

Senior Year

NORM

Machine Design (ME 411, 412)	3	3	---
Modern Materials (ME 421)	3	---	---
Industrial Engineering (ME 473)	---	---	3
	6	3	3

¹Students intending to elect the Aeronautical Option will take ME 241 instead of IA 240.

	Term hours		
	F	W	S
Senior-Year Norm	6	3	3
Machine Design (ME 413) .....	.....	.....	3
¹ Power-Plant Engineering (ME 431, 432)	3	3	.....
Mechanical Laboratory (ME 451, 452)	2	2	.....
¹ Mechanical Laboratory (ME 453) .....	.....	.....	2
Gas Technology (ME 422) .....	.....	3	.....
Industrial Instrumentation (ME 476) .....	.....	.....	3
Industrial Electricity (EE 351, 352, 353)	3	3	3
Electives	3	3	3
	17	17	17

AERONAUTICAL OPTION

Senior-Year Norm	6	3	3
Airplane Design (ME 441, 442, 443)	3	3	3
Aeronautical Laboratory (ME 456, 457)	2	2	.....
Advanced Aerodynamics (ME 446) .....	.....	.....	3
Airplane Structural Analysis (ME 447, 448)	3	3	.....
Electricity in Aeronautics (EE 358) .....	.....	3	.....
Airway Communication Systems (EE 359) .....	.....	.....	3
Electives	4	3	4
	18	17	16

BUSINESS OPTION

Senior-Year Norm	6	3	3
Mechanical Laboratory (ME 451, 452)	2	2	.....
Gas Technology (ME 422) .....	.....	3	.....
Industrial Electricity (EE 351, 352, 353)	3	3	3
Business Law (BA 256, 257, 258)	3	3	3
Merchandising and Selling (SS 436) .....	.....	3	.....
General Advertising (SS 439) .....	.....	.....	3
Investments (BA 463) .....	.....	.....	3
Electives (technical)	3	.....	2
	17	17	17

C. Industrial Administration and Industrial Arts Education²

INDUSTRIAL ADMINISTRATION³

Freshman Year

	Term hours		
	F	W	S
Pattern Making (IA 111)	3	.....	.....
Methods in Woodworking (IA 112, 113) .....	.....	3	3
Foundry Practice (IA 141)	3	.....	.....
Forging and Welding (IA 152) .....	.....	3	.....
Machine Shop (IA 163) .....	.....	.....	3
Engineering Drawing (GE 111, 112, 113)	2	2	2
Intermediate Algebra (Mth 100), Trigonometry (Mth 106), Elements of Statistics (Mth 109)	4	4	4
English Composition (Eng 111, 112, 113)	3	3	3
⁴ Physical Education	1	1	1
Military Science	1	1	1
	17	17	17

¹Students interested in automotive engineering may substitute ME 491, 492, 493 for ME 431, 432, 453.

²The objectives controlling the makeup of curricula in industrial arts education and industrial administration, and the types of training for which they are designed are stated on pages 297-298.

³Students interested in radio station operation and management will confer with the department regarding substitution of courses such as Ph 331, 332, 333, Sp 334, 335, 336, EE 481, 482, 483, etc.

⁴General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education.

Sophomore Year

Term hours

	F	W	S
Machine and Tool Maintenance (IA 225 or 265)	2	.....	.....
Machine Shop Practice (IA 261) or Carpentry (IA 333)	2-3	.....	.....
Machine Shop (IA 362) or Wood Turning (IA 220) .....	.....	.....	2
Introduction to Scientific Management (IA 266) .....	.....	.....	2
Lower-Division Drawing (AA 291), Lower-Division Decorative Design (AA 295)	3	3	3
House Planning and Architectural Drawing (AA 178)	3	.....	.....
House Planning and Architectural Drawing (AA 179) or Descriptive Geometry (ME 211) .....	.....	3	.....
House Planning and Architectural Drawing (AA 180) or Tool Design (IA 263) .....	.....	.....	3
General Physics (Ph 201, 202, 203)	4	4	4
Business English (Eng 217)	3	.....	.....
Extempore Speaking (Sp 111) .....	.....	3	.....
Military Science	1	1	1
Physical Education	1	1	1
	17	17-18	16

Junior Year

Methods and Motion Study (IA 366)	3	.....	.....
Time Study (IA 367) .....	.....	3	.....
Production Planning and Control (IA 368) .....	.....	.....	3
Production Machine Work (IA 363) or Machine Woodwork (IA 311)	3	.....	.....
Materials of Engineering (ME 316) .....	.....	.....	3
Automobile Mechanics (AE 312) .....	.....	3	.....
Business Law (BA 256, 257)	3	3	.....
Outlines of Economics (Ec 211)	4	.....	.....
Economic Development of the United States (Ec 215) .....	.....	4	.....
Money and Banking (Ec 413) .....	.....	.....	4
Technical electives .....	.....	2	4
General electives	3	3	3
	16	18	17

Senior Year

Quantitative Management (IA 461, 462)	3	3	.....
Metallography and Pyrometry (ME 481)	3	.....	.....
Accounting for Technical Students (BA 385, 386)	3	3	.....
Cost Accounting for Industrials (BA 494) .....	.....	.....	3
Industrial Psychology (Psy 215) .....	.....	3	.....
Labor Problems (Ec 425) .....	.....	.....	4
Collective Bargaining and Labor Legislation (Ec 426) .....	.....	4	.....
Technical electives	5	2	7
General electives	3	3	3
	17	18	17

INDUSTRIAL ARTS EDUCATION¹

Freshman Year

Pattern Making (IA 111)	3	.....	.....
Methods in Woodworking (IA 112, 113) .....	.....	3	3
Foundry Practice (IA 141)	3	.....	.....
Forging and Welding (IA 152) .....	.....	3	.....
Machine Shop (IA 163) .....	.....	.....	3
Engineering Drawing (GE 111, 112, 113)	2	2	2
English Composition (Eng 111, 112, 113)	3	3	3
Lower-Division Courses in Science Group	3-4	3-4	3-4
Military Science	1	1	1
*Physical Education	1	1	1
	16-17	16-17	16-17

¹Students interested in nonteaching fields (see pages 297-298) should consult the department head regarding substitutions for courses listed.

*General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education.

	Sophomore Year		
	Term hours		
	F	W	S
Machine and Tool Maintenance (IA 225 or 265)	2	.....	.....
Lower-Division Drawing (AA 291)	3	.....	.....
Lower-Division Decorative Design (AA 295) .....	.....	3	.....
Sheet-Metal Work (IA 380) or Lower-Division Decorative Design (AA 295—second course) .....	.....	.....	3
House Planning and Architectural Drawing (AA 178)	3	.....	.....
House Planning and Architectural Drawing (AA 179) or Descriptive Geometry (CE 211) .....	.....	3	.....
House Planning and Architectural Drawing (AA 180) or Tool Design (IA 263) .....	.....	.....	3
Modern Governments (PS 201)	4	.....	.....
General Sociology (Soc 212) .....	.....	.....	3
Outlines of Psychology (Psy 221, 222) .....	.....	3	3
Business English (Eng 217) or Elementary Journalism (J 111)	3	.....	.....
Extempore Speaking (Sp 111) .....	.....	3	.....
Parliamentary Procedure (Sp 231) .....	.....	.....	3
Military Science	1	1	1
Physical Education	1	1	1
Technical elective .....	.....	3	.....
	17	17	17

Junior Year

Millwork—Machine Woodwork (IA 311) or Production Machine Work (IA 363)	3	.....	.....
Carpentry (IA 333) .....	.....	3	.....
Wood and Metal Finishing (IA 316) .....	.....	.....	2
Automobile Mechanics (AE 312, 313, 314)	3	3	3
Educational Psychology (Ed 312)	3	.....	.....
Industrial-Arts Organization (Ed 330) .....	.....	2	.....
Methods and Materials (Ed 408e) .....	.....	.....	3
Secondary Education (Ed 311)	3	.....	.....
Principles of Teaching (Ed 313) .....	.....	3	.....
Measurement in Secondary Education (Ed 416) .....	.....	.....	3
Technical electives	2	3	3
General electives	3	3	3
	17	17	17

Senior Year

Practical Electricity (IA 370)	3	.....	.....
Stagecraft and Lighting (Sp 244) or Public Information Methods (J 313) (3) .....	.....	or (3)	.....
Materials of Engineering (ME 316) or Commercial Woods (WP 331) .....	.....	.....	3
The General Shop and Its Problems (IEd 473)	2	.....	.....
Written and Visual Teaching Aids (IEd 474) .....	.....	3	.....
Shop Planning and Organization (IA 411) .....	.....	.....	3
Occupational Analysis (IEd 472)	3	.....	.....
Supervised Teaching (Ed 415) .....	.....	3	3
History of Manual and Industrial Education (IEd 470) .....	.....	3	.....
History of Oregon (Hst 377) .....	.....	3	.....
Oregon School Law and Oregon System of Education (Ed 316) .....	.....	.....	2
Technical electives	3	2	2
Electives	6	3	4
	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. The courses are taught by members of the civil, mechanical, and electrical engineering departmental staffs who for purposes of coordination and unified effort work as a committee in planning and supervising the instruction.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

GE 101, 102, 103. Engineering Problems. 2 hours each term.

Lectures and 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 111. Engineering Drawing. 2 hours.

Training in the use of drafting tools, in geometrical construction and in the art of lettering; principles of orthographic projection. Three two-hour drawing periods.

GE 112. Engineering Drawing. 2 hours.

Shape description; size description; the use of the auxiliary planes of projection; sections and violations; fasteners; isometric drawing; lettering. Prerequisite: GE 111. Three two-hour periods.

GE 113. Engineering Drawing. 2 hours.

Intersections and developments; charts and diagrams; mechanical perspective; freehand technical and pictorial drawing; practical application of drawing principles to working drawings. Prerequisite: GE 112. Three two-hour periods.

GE 114. Elementary Production Illustration. 2 hours.

The study and application of special techniques of perspective drawing to make accurate pictorial drawings; now used in industry to supplement or replace regular engineering drawing. Prerequisite: GE 113. Two three-hour periods.

UPPER-DIVISION COURSE

GE 444. Technological Patents. 2 hours.

The various phases of the patent system with emphasis on factors pertinent to development of technical processes and equipment.

Chemical Engineering

"Chemical engineering, as distinguished from the aggregate number of subjects comprised in courses of that name, is not a composite of chemistry and mechanical and civil engineering, but itself a branch of engineering, the basis of which is those unit operations which in their proper sequence and coordination constitute a chemical process as conducted on the industrial scale." *Adopted by The American Institute of Chemical Engineers, 1922.*

THE curriculum in chemical engineering is designed to give a broad training in the principles fundamental to chemical industry. It aims to lay a foundation for responsible work in laboratory and plant, and to prepare the student for graduate work in either chemical engineering or chemistry. The course is equally applicable in preparation for research, design, control, operation, or technical sales. The student is first given a thorough foundation in chemistry, mathematics, English, and physics. This is followed by professional subject matter that falls into three groups: (1) courses that provide a knowledge of the more advanced principles of chemistry; (2) courses in engineering subjects; and (3) courses that deal with chemical engineering as a separate entity. The last group includes a thorough study of the unit operations of chemical engineering and their applications to chemical processes.

The course is designed to give a broad training in fundamentals, rather than specialized training for a narrow field. A corresponding breadth of oppor-

tunity is presented, including the entire field of chemical industry as well as allied lines. Many positions of responsibility, particularly in research and development work, demand a more extensive training than can be given in four years, and students with the proper qualifications are advised to pursue graduate work leading to advanced degrees.

Since chemical engineering is a group A sequence, particular attention is directed to the remarks under Exploratory Contacts, page 269.

Equipment. The Department is located in Chemistry Hall, where laboratory facilities have been provided for instruction in both unit operations and manufacturing processes. Laboratories have been designed to facilitate pilot plant studies of typical chemical problems. Instruments commonly employed to obtain engineering data are available, as well as an adequate supply of the usual reagents and chemical apparatus. Special laboratories are available for advanced projects.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

ChE 111, 112, 113. **Chemical Engineering Survey.** 1 hour each term.

The profession of chemical engineering; engineering procedures and methods. One lecture; 1 two-hour computation period.

ChE 211. **Chemical Technology.** 2 hours.

Fundamentals of chemical engineering; graphical analysis; instrumentation; control of process variables; applications in the solution of typical problems. One lecture; two recitations.

ChE 212, 213. **Industrial Stoichiometry.** 2 hours each term.

Quantitative interpretation and application of physical and chemical data to various industrial chemical processes. One lecture; two recitations.

UPPER-DIVISION COURSES

ChE 311. **Industrial-Chemical Calculations.** 4 hours.

Continuation of stoichiometry and application of physical and chemical principles to industrial problems. Quantitative treatment of selected industrial processes. Three lectures; 1 three-hour computation period.

ChE 312. **Chemical Engineering Thermodynamics.** 4 hours.

Principles and relationships of thermodynamics as applied to typical problems encountered in the field of chemical engineering. Three lectures; 1 three-hour computation period.

ChE 313. **Elementary Unit Operations.** 4 hours.

Introduction to unit operations of chemical engineering; operations of flow of fluids and flow of heat. Three lectures; 1 three-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 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. One lecture; 1 four-hour laboratory period.

ChE 421, 422, 423. Industrial Chemistry. (g) 2 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.

ChE 433. Chemical Plant Design. (g) 4 hours.

Problems in the design of a chemical plant and chemical-engineering equipment; design-room procedures emphasized. Reports required. Two lectures; 2 two-hour periods.

ChE 441, 442, 443. Elements of Process Industries. (g) 3 hours each term.

Inorganic and organic chemical technology with emphasis on the development of commercial operations. 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 hours to be arranged.

ChE 503. Thesis. Terms and hours to be arranged.

ChE 505. Reading and Conference. Terms and hours to be arranged.

ChE 507. Seminar. Terms and hours to be arranged.

ChE 511. Industrial Plastics. 3 hours.

Classification of modern plastics, their preparation, properties, and special fields of application; commercial processes of manufacture; fabrication. Prerequisite: Ch 430, 431, 432, or equivalent.

ChE 512. Economic Balance. (G) 3 hours.

Solution of typical chemical engineering and applied chemistry problems from the standpoint of economic considerations; optimum conditions of design and operation. Two lectures, 1 recitation.

ChE 513. Petroleum Refining. (G) 3 hours.

Processes by which crude petroleum is converted into commercial products; special attention to application of fundamental operations of absorption, distillation, cracking, etc. Two lectures; 1 recitation.

ChE 523. Process Laboratory. 3 hours.

Laboratory study of selected unit processes. Designed to emphasize the fundamentals of the subject. Prerequisite: organic chemistry. One lecture; 1 four-hour laboratory period.

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, sani-

tation, and municipal engineering, and to permit some latitude of choice in the four general fields of structures, hydraulics, sanitation, and highways. The civil engineer's problems in the development of the Northwest are directly related to the structural, hydraulic, and highway fields. The curriculum is planned to prepare graduates for advancement to responsible positions in these fields.

Highway engineering is offered as an option in the civil-engineering curriculum and is differentiated from that curriculum only in the senior year. The aim in these courses is to meet the demand in this state and throughout the Northwest for men equipped to take charge of road and street construction and maintenance work.

Thorough theoretical instruction is accompanied by as much laboratory and field practice as possible. In the study of highways, special reference is made to the conditions and needs of Oregon.

Equipment. The department is provided with quarters and equipment for adequately and thoroughly performing its work. The third floor of Apperson Hall is devoted to classrooms and drawing rooms. A large room on the ground floor of Industrial Arts Building houses the surveying instruments, and the entire middle third of the Engineering Laboratory is occupied by hydraulic and sanitary equipment. The equipment of the instrument room consists of 25 transits, 25 levels, and 7 plane tables, 2 theodolites, together with the necessary auxiliary supply of stadia, level, and line rods, hand levels, tapes, and other minor equipment.

The equipment of the hydraulic laboratory is adequate for the execution of all basic experimental work in the field of hydraulic engineering. The machinery installed is modern and complete. It is extensive enough so that all the theoretical studies of the classroom may be verified by the performance of machines in the laboratory. Classified on the factors of quantity of water, pressure under which water is available, square feet of floor space, and value of equipment, it ranks among the leading hydraulic laboratories of the United States. The major items of the equipment are two direct-connected 8-inch centrifugal pumps operated by 40-horsepower motors; a 35-inch Pelton impulse wheel with oil-pressure governor; a 14-inch spiral-cased Francis-type reaction turbine with Pelton governor; a large pressure tank five feet in diameter by twenty feet high; and two 16,000-pound capacity weighing tanks mounted upon direct reading scales.

The department is equipped with modern testing laboratories, including the best cement and highway-testing machinery, thus affording students in civil engineering the opportunity of studying by direct observation and experiment the strength and properties of the various engineering materials.

The structural division is equipped with the most modern apparatus for the mechanical analysis of statically indeterminate structures including a twelve-gage, three-microscope Beggs Deformeter set, a Gottschalk Continostat, and a 4½-inch photoelastic polariscope.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

CE 211. Descriptive Geometry. 3 hours.

Principles of orthographic projection; applications to the graphical solution of engineering problems. Prerequisite: GE 112. One recitation; 2 three-hour drawing periods.

CE 212. Mechanics (Statics). 3 hours.

Applied mechanics for engineering students. Prerequisite: differential calculus. One recitation; 2 two-hour computing 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 computing periods.

CE 221. Plane Surveying. 3 hours.

Theory, use, and adjustment of level and transit; measurement and subdivision of land. One recitation; 2 three-hour periods field work.

CE 222. Plane Surveying. 3 hours.

Continuation of CE 221. Surveying problems as related to subdivision of public land, farm, and city surveying; special problems and methods. Prerequisite: CE 221. One recitation; 2 three-hour periods field work.

CE 223. Plane Surveying. 3 hours.

Use of stadia and of plane table; topographical mapping and drawing; determination of meridian by stellar and by solar observation. Prerequisite: CE 222. One recitation; 2 three-hour field periods.

CE 226. Plane Surveying. 3 hours.

Theory, use, and adjustment of engineer's level and transit. One recitation; 2 three-hour periods field work.

CE 231. Field Curves. 3 hours.

Instruction and field work in simple curves and compound curves as related to railroads, highways, and canals. Prerequisite: CE 221. Two recitations; 1 three-hour period field work.

UPPER-DIVISION COURSES**CE 311. Fluid Mechanics. 3 hours.**

Application of mechanics to compressible and incompressible fluids; laboratory measurements. Prerequisite: CE 212; Mth 203. Two recitations; 1 three-hour laboratory period.

CE 312. Advanced 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 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 periods field work.

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.

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. Prerequisite: CE 231. One recitation; 2 three-hour periods field work.

CE 333. Roads and Pavements. 3 hours.

Fundamental principles of location, construction, and maintenance of roads; materials used in road and street building.

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 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, ME 316. 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. Any term, hours to be arranged.****CE 405. Reading and Conference. Terms and hours to be arranged.****CE 407. Seminar. 1 hour.****CE 411. Hydrology. (G) 3 hours fall.**

Precipitation, storage, and run-off; field studies in standard methods of measurement. Two recitations; 1 three-hour laboratory period.

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: CE 333. 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. Prerequisite: CE 333. 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. Prerequisite: CE 333.
- CE 426. **Highway Administration and Finance.** (G) 3 hours.
Development of highway systems; organization of state and national highways; principles of highway finance; federal aid; technical functions of various highway units. Prerequisite: CE 333.
- CE 427. **Contracts and Specifications.** (g) 3 hours.
General principles and laws of contracts as applied to engineering.
- CE 438. **Municipal Engineering and City Planning.** (G) 3 hours.
Modern city streets, boulevards, and transportation systems; drainage and sanitation; water supply; lighting.
- CE 451. **Water-Power Engineering.** (G) 3 hours any term.
Development of water power; storage and load; characteristics of modern turbines; selection of turbines; problems in design. Prerequisite: CE 313, or 342. One recitation; 2 three-hour laboratory periods.
- 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 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 welded steel and reinforced-brick masonry; fabrication and construction. Prerequisite: CE 472, 481. Two recitations; 2 three-hour laboratory periods.
- CE 485. 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.
- CE 486. 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 487. Structural Stresses.** (G) 2 hours.
Stress analysis of space frames and continuous frames; use of tension coefficients and distributed moments. Prerequisite: senior standing. One lecture; 1 three-hour laboratory period.
- CE 488. Mechanical Methods of Stress Analysis.** (G) 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. Prerequisite: senior standing. 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.

Electrical Engineering

THE curriculum is designed to train the young engineer in the fundamental principles of electrical engineering. Both electrical theory and practice are presented by means of lectures, recitations, laboratory courses, and inspection trips. Experience with actual conditions can be acquired only in the field during vacation and after graduation. For this reason, and in order to afford mutual contact between the student and the men in his profession, the student is urged to spend his vacation periods in some phase of electrical industry.

As outlined on pages 273-274 the work in the senior year is divided into the Power, Communication, and Business options. The student selects the program in which his interests lie.

The Power Option includes courses dealing with machines and electronic devices for generating, transmitting, distributing, and utilizing electric energy. Emphasis is placed on the technical problems involved in high-voltage transmission.

The Communication Option provides courses for the students whose interests are in the field of wire communication, radio, sound reproduction, television, and related work. Instruction is available to seniors particularly interested in radio broadcasting to enable them to qualify for a government license.

The Business Option offers courses in business administration and law for those students whose interests lie in the field of management rather than in the more technical fields.

Equipment. The electrical-engineering laboratories are located in Apperson Hall. Laboratory equipment is available for demonstrating and verifying the fundamental electrical principles and theory and also for original research in some of the important fields. This equipment is located in the electric-power, communications, electrical-measurements, high-voltage, standardizing, and battery laboratories.

The power laboratory is equipped with alternating and direct-current machinery, control equipment, artificial three-phase power transmission lines, and electronic power apparatus.

The communications laboratory is well provided with equipment for making studies involving currents, voltages, and frequencies of the magnitudes used in both wire and wireless communication; for studying radio and television apparatus, electronic devices, electroacoustic equipment, and similar apparatus. Standardized oscillators and measuring equipment are available for studying frequencies from 20 cycles per second to ultra-high-frequencies of 3,000 megacycles per second. Wave guides and other equipment for studies at ultra-high-frequencies are also available. The facilities of Radio Station KOAC, including the 5,000-watt Western Electric transmitter with directional antenna array, and the extensive sound-amplifying equipment of the State College group-address systems are also available for instructional and experimental purposes.

The measurements laboratory has adequate facilities designed for laboratory work on basic electrical theory during the sophomore year.

The high-voltage laboratory is equipped with apparatus for 60-cycle potentials up to 200,000 volts and impulse or "lightning" voltage waves of adjustable shape and magnitude up to 600,000 volts. This laboratory is also provided with a high-voltage Dufour cathode-ray oscillograph, sphere gap voltmeters, surge-voltage recorders, high-voltage rectifiers, and other apparatus necessary for the usual high-voltage tests.

The standardizing laboratory is provided with instruments for the precise measurement of potential, current, and power over wide ranges and for the standardization and calibration of electrical measuring instruments and meters.

The battery laboratory contains both lead-acid and alkaline storage batteries and charging equipment for maintenance and testing.

Oscillographs and oscilloscopes of the Duddell type and also of the high-voltage and low-voltage cathode-ray types are available for the study of transients and other phenomena in any of the laboratories.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

EE 201, 202, 203. Introduction to Electrical Engineering. 4 hours each term.

Fundamental electrical phenomena and their relation to electrical engineering. Prerequisite: Mth 103, Ph 113, GE 103, or instructor's approval. One lecture; 2 two-hour recitations; 1 three-hour laboratory.

UPPER-DIVISION COURSES

EE 311, 312, 313. Electrical Engineering. 3 hours each term.

The electric circuit; direct- and alternating-current machines, their basic theory and characteristics.

- EE 321, 322, 323. **Electrical Engineering Laboratory.** 3 hours each term.
A laboratory course coordinated with EE 311, 312, 313. One lecture; 1 three-hour laboratory period.
- EE 351, 352, 353. **Industrial Electricity.** 3 hours each term.
Fundamental electrical principles and electrical equipment emphasizing the applications to industry. Prerequisite: Junior Certificate. Two lectures; 1 three-hour laboratory period.
- EE 354, 355. **Industrial Electricity.** 3 hours.
Direct and alternating current circuits and machines. Especially for chemical engineering students. Prerequisite: Junior Certificate. 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 engineering students. Prerequisite: Junior Certificate. 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 Certificate. Two lectures; 1 three-hour laboratory period.
- EE 359. **Airway Communication Systems.** 3 hours.
Systems of electrical communication used in air transportation. Prerequisite: Junior Certificate. 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.** (g) 3 hours each term.
Analysis of electric-power generation, transmission, and distribution with special reference to economic and financial problems.
- EE 414, 415, 416. **Electrical Design.** (g) 1 hour each term.
Design and computations supplementary to EE 411, 412, 413. One three-hour computation period.
- EE 421, 422, 423. **Electrical Engineering Laboratory.** (G) 3 hours each term.
Advanced studies of direct- and alternating-current machinery and electronic power apparatus; applications to electric power systems. One lecture; 1 three-hour laboratory period.
- EE 431, 432. **Illumination.** (G) 3 hours each term.
Light sources and their application to exterior and interior illumination.
- EE 451. **Electric Transients.** (G) 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 452, 453. **High-Voltage Engineering.** (G) 3 hours each term.
Experimental investigation and study of dielectric phenomena in high-voltage engineering. Two lectures; 1 four-hour laboratory period.

- EE 461, 462, 463. Communication Engineering.** (G) 3 hours each term.
Fundamental theory of electrical communication; commercial telephone, telegraph, radio, and television systems; design of equipment; long-line transmission theory; networks; wave filters and wave guides. Two lectures; 1 three-hour laboratory period.
- EE 464, 465. Vacuum Tubes and Circuits.** (G) 3 hours each term.
Thermionic vacuum tubes, phototubes, and other electronic devices and their uses in electrical circuits. Two lectures; 1 three-hour laboratory period.
- EE 466. Engineering of Sound Systems.** (G) 3 hours.
Microphones, amplifiers, loud speakers, and other similar apparatus; design, installation, and operation of sound systems, including broadcast studios. Two lectures; 1 three-hour laboratory period.
- EE 467. Radio Engineering.** (G) 3 hours.
Design and testing of modern transmitters, receivers, antenna systems, and associated equipment used in radio, facsimile, and television. Prerequisite: EE 313, 462, 465. Two lectures; 1 three-hour 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. One lecture; 1 two-hour laboratory period.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

- EE 501. Research.** Terms and hours to be arranged.
- EE 503. Thesis.** Terms and hours to be arranged.
- EE 505. Reading and Conference.** Terms and hours to be arranged.
- EE 507. Seminar.** Terms and hours to be arranged.
- EE 542. Electrical Transportation.** 3 hours.
Application of electricity to street and interurban transportation; traffic conditions; rolling stock; speed time curves.
- EE 555. Electrical Characteristics of Transmission Circuits.** 3 hours.
Transmission theory; electrical characteristics of transmission lines including power limits and system stability, and electrical networks. Two lectures; 1 three-hour laboratory period.
- EE 573. Electrical Problems.** 3 hours.
Advanced problems in electrical engineering, unbalanced circuits, symmetrical components, and equivalent networks.

Industrial Engineering

See statement of objectives, fields, facilities, and description of courses in industrial engineering under DEPARTMENT OF INDUSTRIAL ARTS, pages 297-302.

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.

Equipment. The department has drafting and computing rooms supplied with the necessary desks, boards, and lockers. The laboratories are equipped for tests and demonstrations in steam, gas, and aeronautical engineering, and on engineering materials. This equipment is located in the Engineering Laboratory, Mines Building, and the old power house.

The steam laboratory contains two turbines and four engines of different types, installed in such a way that complete tests for economy and efficiency can be made. Other steam engines, permanently installed, are used for the more elementary work. A horizontal water-tube boiler furnishes the steam for laboratory purposes and for heating the building, and is provided with the necessary facilities for testing. The college heating plant, consisting of three 5,000-square-foot boilers and necessary auxiliaries, is also provided with testing facilities.

A special laboratory has been equipped for tests on domestic heating, ventilating, and air-conditioning apparatus. Several small boilers fired by oil burner, coal stoker, and sawdust burner have been provided and fitted for experimental tests and research. A gas-fired air-conditioning unit is also available.

The internal-combustion engine laboratory contains gas and gasoline engines, a semi-Diesel, a full Diesel connected to generator, an automotive-type Diesel with dynamometer, and a four-cylinder 120-horsepower two-stroke-cycle oil engine, 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; a complete airplane of the Navy fighter type; and numerous wing panels, tail surfaces, instruments, and miscellaneous airplane parts. Two small smoke tunnels for the study of air flow are also available.

Approximately 14,000 square feet of floor space is devoted to engineering materials affording separate laboratories for structural materials, cement and concrete, bituminous and nonbituminous highway materials, soil mechanics, photoelasticity, oils, fuels, and the microscopic examination, radiography, spectrum analysis, and heat treatment of metals. The equipment is modern and is well arranged for the work of instruction and research.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

ME 211. Descriptive Geometry. 3 hours.

Theory and problems on the projection of points, lines, surfaces, and solids. Prerequisite: GE 111, 112. One recitation; 2 three-hour drawing periods.

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 241. Introduction to Aeronautics. 2 hours any term.

Brief descriptive survey of principles of flight, engine and propeller operations; navigation and meteorology; governmental aeronautical aids and regulations. Prerequisite: consent of instructor.

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. Prerequisite: ME 212. Two recitations; 1 two-hour computing period.

ME 312. Mechanism. 3 hours.

Mechanical movements; velocity ratios; transmission of motion by link works; gearing, cams, and belting. One recitation; 2 three-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 213. Two recitations; 1 two-hour period.

ME 316. Materials of Engineering. 3 hours any term.

Materials of engineering construction; methods and specifications adopted by the American Society for Testing Materials, etc. One lecture; 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 113; Ch 103. Three recitations; 1 three-hour period.

ME 325. Fuels and Lubricants. 3 hours.

Preparation and processing of solid and liquid fuels; production of motor fuels and lubricants; tests on bearings and lubricants. Prerequisite: ME 321, 351, or equivalent. 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 113. 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 airplane; 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. Two recitations; 1 three-hour 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 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 periods.

ME 414. Highway Materials Laboratory. (g) 3 hours.

For students specializing in highway engineering. Road and paving materials and binders tested and their relative values determined; sheet-asphalt mixtures and bituminous mortars; types of roads and pavements analyzed for density, composition, and grading. One lecture; 1 four-hour 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 period.

ME 421. Modern Materials. (G) 3 hours.

Late developments in engineering materials by critical reviews of recent and current literature. Prerequisite: ME 311, or 314, 316.

ME 422. Gas Technology. (G) 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: senior standing.

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 period.

ME 441, 442, 443. Airplane Design, (g) 3 hours each term.

Design of airplanes for specific duties. Prerequisite: ME 342. One recitation; 2 three-hour laboratory periods.

ME 446. Advanced Aerodynamics. (G) 3 hours.

Fundamental theory of fluid flow, infinite and finite wing theory as developed by Kutta-Joukowski, Prandtl, and others. Prerequisite: ME 342.

ME 447, 448. 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, heating and ventilating equipment, a complete boiler plant, and internal-combustion engines; reports. Prerequisite: ME 353. One four-hour 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. 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. Prerequisite: ME 342, 353. One four-hour period.
- ME 473. Industrial Engineering.** (G) 3 hours.
Especially arranged for engineering students. Various industrial organization systems and their methods of operation.
- ME 476. Industrial Instrumentation.** (G) 3 hours.
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: senior standing. Lecture and demonstration.
- ME 481. Metallography and Pyrometry.** (G) 3 hours.
Designed to give a working knowledge of the methods of study of structure of metals and alloys. Prerequisite: ME 316. One lecture; 1 four-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 321, 322, 323. Two lectures; 1 three-hour 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 516. Stress Analysis.** 3 hours.
Designed to give a working knowledge of methods of solving problems in strength of materials that the usual methods of analysis will not satisfy. Prerequisite: ME 315.
- ME 517, 518. Photoelasticity.** 3 hours each term.
Experimental determination of stresses in components of mechanisms and structures by use of photoelastic methods. Prerequisite: ME 316, 416. One lecture; 1 four-hour laboratory period.
- ME 519. Soil Mechanics.** (g) 3 hours.
Evaluation and utilization of soil materials for engineering applications; highway subgrades, earth-dam construction, and foundation support. Prerequisite: ME 316, CE 351, ME 311 or 314. One lecture, 1 four-hour period.

ME 521. Mechanical Vibrations. 3 hours.

Vibration as applied to mechanical engineering. General theory of systems having one or more degrees of freedom; applications to internal combustion engines, airplanes, vehicles, rotating machinery; vibration isolation and absorption; vibration measuring instruments. Prerequisite: ME 213, ME 312, Mth 421.

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. One recitation; 2 three-hour periods.

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 581. Metallography. 3 hours.

Alloy equilibrium diagrams; difficult specimens; high-power photomicrography; correlation of properties of metals with micro-structure; dilatometry; structure and treatment of special steels; metal radiography. Prerequisite: ME 481. One lecture; 1 four-hour 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 421, 481, or equivalent.

C A A Civilian Pilot Training

The courses of study, prescribed by the Civil Aeronautics Administration, formerly given on the campus and at Albany Airport have been discontinued until circumstances permit their resumption. CAA War Training Service courses supervised by Oregon State College were later conducted at Prineville, Oregon, to provide flight and ground instruction for men assigned by the Army Air Forces.

CA 241. Primary Civilian Pilot Training. 6 hours.

History of aviation; civil air regulations; navigation; meteorology; parachutes; aircraft and theory of flight; engines; instruments; radio uses and forms; individual flying instruction. Professor Ruffner in charge.

CA 341. Advanced Civilian Pilot Training. 12 hours.

Prescribed by the Civil Aeronautics Administration for the secondary training of students who have completed individual flying instruction. Professor Ruffner in charge.

Mining and Metallurgical Engineering

INSTRUCTION in mining engineering, first developed in connection with the other engineering work, was organized in the School of Mines in 1913.

In 1932, in the reorganization of the Oregon higher education program the School of Mines was discontinued and the work in mining engineering was made

service work in the School of Engineering. On January 27, 1942, major work in mining engineering was restored on the same basis as in the other departments of the School of Engineering.

The courses in mining engineering are designed to give the student a knowledge of the fundamental principles involved in the exploitation of mineral deposits. A study is made of the type of machinery used, plant design, details of operation, management, and the economic aspects involved. Metallurgical engineering courses are designed especially to acquaint the student with the general problems involved in a beneficiation of our nonmetallic and metallic products. Methods of concentration, smelting, and other means of extraction and refining are studied, along with the efficient use of fuels and refractories. Enough laboratory work is included to enable the student to apply the theories discussed in the classroom. Emphasis is laid on fundamental principles and economics of operation.

Equipment. The department has lecture rooms, laboratories, and offices in the Mines Building. The assaying and metallurgical laboratories are equipped with the necessary apparatus for conducting experimental metallurgical operations. Ore-dressing laboratories affording modern metallurgical testing equipment are located in the basement. Class and drafting-room facilities are available in this building.

COURSES IN METALLURGICAL ENGINEERING

LOWER-DIVISION COURSES

Met 263. Assaying. 3 hours.

Commercial methods of wet and dry assay of ores, metallurgical products. Prerequisite: Ch 233 or equivalent. One recitation; 2 three-hour laboratory periods.

UPPER-DIVISION COURSES

Met 461. General Metallurgy. (g) 3 hours.

Properties of metals, alloys, fuels, refractories; pyrometallurgy, hydrometallurgy, electrometallurgy; general operations. Prerequisite: Ch 233 or equivalent.

Met 462. Metallurgy of the Common Metals. (g) 4 hours.

Principles and practice of the production of gold, silver, copper, lead, zinc, aluminum, iron and steel; metallurgical calculations.

Met 471, 472. Fire Assaying. (g) 2 hours each term.

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: G 312.

Met 481, 482. Mineral Dressing. (g) 3 hours each term.

Principles of comminution, concentration, and related processes; methods of treatment and machinery used. Prerequisite or parallel: Met 263, G 312.

Met 483. Mineral Dressing Laboratory. (g) 3 hours.

Quantitative experiments to demonstrate principles and teach practice of mineral dressing methods; procedures for ore testing; technical reports. Prerequisite: Met 482. One lecture; 2 three-hour laboratory periods.

GRADUATE COURSES

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

COURSES IN MINING ENGINEERING

LOWER-DIVISION COURSES

- MiE 141, 142. Mineral Industry Survey.** 1 hour each term.
The profession of mining engineering; general survey of the mineral industry.
- MiE 243. Excavation, Explosives, and Blasting.** 3 hours.
Special methods of surface excavations. Consult with department before registering.

UPPER-DIVISION COURSES

- MiE 401. Research.** (g) Terms and hours to be arranged.
- MiE 403. Thesis.** (g) Terms and hours to be arranged.
- MiE 405. Reading and Conference.** (g) Terms and hours to be arranged.
- MiE 407. Seminar.** (g) 1 hour each term.
- MiE 433. Elements of Mining.** (g) 3 hours.
General consideration of the elements of mining and methods used to develop and mine mineral deposits.
- MiE 441. Mine Exploration.** (g) 3 hours.
Mine exploration and examination with reference to mine organization, mining law, sampling, valuation, and exploration methods.
- MiE 442. Mining Methods.** (g) 3 hours.
Methods of mining with reference to specific mining operations.
- MiE 443. Mine Development.** (g) 3 hours.
Continuation of MiE 442 with reference to correlation of various operations involved; ventilation, transportation, drainage, power plant, management, economics.
- MiE 453. Mine Surveying.** (g) 3 hours.
Surveying problems met with in mining-engineering practice; determination of true meridian. Prerequisite: CE 221, GE 111, 112, 113. One lecture; 2 three-hour laboratory periods.
- MiE 461. Mine Economics and Mining Law.** (g) 3 hours.
Mining costs and legal phases. Students should consult with the department before registering.
- MiE 462. Mine and Power Equipment.** (g) 3 hours.
Mining machinery, power installation, their correlation. Students should consult with the department before registering. Prerequisite: MiE 433.
- MiE 463. Mine Design.** (g) 2 hours.
Advanced problem study. Students should consult with the department before registering. Prerequisite: MiE 433, 442. Two three-hour laboratory periods.

GRADUATE COURSES

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

Industrial Arts

THE industrial arts occupy a place of constantly increasing importance in the modern world. Artisans of today are dependent upon industrial design as the product of applied art, but no industrial designer is likely to be efficient in the production of plans acceptable to industry without an integral and intimate knowledge of industrial processes, the skills, and the machine applications necessary to the products that he and the artisans of industry will create. The Department of Industrial Arts trains industrial managers, industrial engineers, industrial teachers for the public schools, and industrial designers and artisans.

In meeting the aims and purposes set forth above, the work of the department is properly classified under four major headings:

- (1) Industrial Arts Education: preparing—
 - a. Industrial-arts teachers in secondary schools.
 - b. Trade and industrial instructors.
 - c. Industrial designers.
- (2) Industrial Administration: preparing for service as junior technical executives in industrial technology for—
 - a. Technical operations, inspection, testing, and research.
 - b. Production management, maintenance, service, safety, and improvement.
- (3) Industrial Engineering: preparing for service in the profession of industrial engineering, including the functions of plant layout, cost analysis, safety engineering, and scientific management in industries.
- (4) Service courses in shop work for chemical engineering, electrical engineering, and mechanical engineering students.

The Industrial Engineering Curriculum (page 274) is designed to train students for the engineering, production, or the 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 management principles as applied to operation analysis, labor problems, work simplification, plant layout, production planning and control. Students are prepared for those positions in industry that require a combination primarily 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.

The Industrial Administration Curriculum (pages 276-277) 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 some business administration. The 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 rapidly

into supervisory and junior executive positions. Options and 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, improvement, or service occupations, such as technicians in industry, assistant managers, radio station operators and managers, time-study men, and assistants to industrial engineers.

The Curriculum in Industrial Arts Education (pages 277-278) is planned to train industrial arts teachers for the public schools or to prepare for college teaching; to train trade and industrial instructors; and, in cooperation with the art and other departments, to train industrial designers. The advanced courses are based upon and interpreted through the technical background formed during the first two years. While a strong motivating thread of technical training is present throughout the four-year curriculum, during the junior and senior years notable opportunity is provided for election of both technical and nontechnical subjects that will meet needs of students following different avenues of training. For teaching, at least one minor must be elected in another field.

Facilities. The Department of Industrial Arts is housed in the Industrial Arts Building and the Foundry. Both are modern, well-lighted structures, with a combined floor space of approximately twenty-five thousand square feet. The principal subdepartments include Drafting, Woodwork and Furniture Construction, Millwork in Wood, Wood and Metal Finishing, Pattern Making, Foundry, Forging and Welding, Machine Shop, and Sheet Metal. Each of these subdepartments is provided with individual shops of ample size and is equipped along modern and approved lines. In addition the facilities and equipment of other departments, such as Art and Architecture, Agricultural Engineering (Farm and Automobile Mechanics), Technical Forestry, Mechanical Engineering, the School of Science, and the Corvallis Public Schools contribute toward the enrichment of curricular opportunities for industrial-arts students. The supervised teaching for those majoring in industrial education is done in the Corvallis Public Schools. The program for the last two years of work in industrial education is administered jointly with the School of Education.

DESCRIPTION OF COURSES*

LOWER-DIVISION COURSES

***IA 111. Pattern Making. 3 hours.**

Fundamentals of pattern making; relation of pattern making to drafting, design, foundry and machine-shop operation. One lecture; 6 laboratory hour-periods.

***IA 112, 113. Methods in Woodworking. 3 hours each term.**

Woodworking, with special reference to tool technique, applied design, and craftsmanship in new and individual projects. Prerequisite: IA 111 or approval of the department. One lecture; 6 laboratory hour-periods.

***IA 141. Foundry Practice. 3 hours.**

Constitution, properties, and design limitations of castings in gray iron, malleable iron, and steel; methods used in the production of castings. One lecture; 2 three-hour laboratory periods.

* In courses designated by asterisks, in addition to the regularly scheduled meetings, the student attends three general lectures to be arranged during the term.

- *IA 152. Forging and Welding. 3 hours.**
Bending, shaping, upsetting, and welding of iron; hardening and tempering steel; brazing; elementary acetylene and electric welding; care of equipment; organization of instructional materials. One lecture; 2 three-hour periods.
- *IA 163. Machine Shop. 3 hours.**
Use of basic machine tools; suggestions for courses of study and teaching. One lecture; 2 three-hour laboratory periods.
- IA 220. Wood Turning. 2 hours.**
Tool processes and lathe technique; designing, turning, and finishing of individual projects of merit. Prerequisite: IA 111, 112, or equivalent. One lecture, 5 laboratory hour-periods.
- IA 225. Machine and Tool Maintenance (Wood Shop). 2 hours.**
Methods of care and maintenance of woodworking tools, machines, and supplementary equipment. Prerequisite: IA 111 or 112 or equivalent. Two lectures; 4 laboratory hour-periods.
- *IA 240. Foundry Practice. 2 hours any term.**
Introductory course covering constitution, properties, and design limitations of castings in iron and steel; foundry methods. Not open to students majoring in industrial arts. One lecture; 1 four-hour laboratory period.
- *IA 250. Forging and Welding. 2 hours any term.**
Principles and practice of forging and welding, including gas, electric, thermit, and hammer welding. Not open to students majoring in industrial arts. One lecture; 1 four-hour laboratory period.
- *IA 260. Machine Shop Practice. 2 hours any term.**
Manipulation of basic machine tools, with prescribed projects; correlation of engineering, managerial, and manufacturing problems. Not open to students majoring in industrial arts. One lecture; 1 four-hour laboratory period.
- IA 261. Machine Shop Practice. 2 hours.**
Manipulation of basic machine tools with individual projects. Survey of machines used for quantity production. Prerequisite: IA 163 or 260. One lecture; 1 four-hour laboratory period.
- IA 263. Tool Design. 3 hours.**
Fundamentals of tool design applied to production tools, jigs, fixtures, and power machines, all correlated with general shop practice. Two lectures; 4 drafting periods.
- IA 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: IA 163 or 260. Two lectures; 4 laboratory hour-periods.
- IA 266. Introduction to Scientific Management. 2 hours.**
History, development, and scope of scientific management. Laws of scientific management as applied to manufacturing. Three lectures.

* In courses designated by asterisks, in addition to the regularly scheduled meetings, the student attends three general lectures to be arranged during the term.

UPPER-DIVISION COURSES

- IA 311. Mill Work—Machine Woodwork.** 3 hours.
A production course in machine woodworking. Prerequisite: IA 111 or 112 or equivalent. Three three-hour laboratory periods, including 1 lecture hour.
- IA 312. Furniture Design.** 2 hours.
Study of types and periods of furniture. Application of the principles of design to furniture and cabinet drawing. Prerequisite: GE 112, AA 295 or equivalent. One lecture, 5 laboratory hour-periods.
- IA 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: IA 311, 312. Six laboratory hour-periods.
- IA 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: IA 112 or equivalent. One lecture; 5 laboratory hour-periods.
- IA 316. Wood and Metal Finishing.** 2 hours.
Materials and processes for old and new work for both wood and metal surfaces; brush and spray application of all types of finishing materials. Prerequisite: IA 112 or equivalent. One lecture; 5 laboratory hour-periods.
- IA 321. Wood Turning.** 1 hour.
Continuation of IA 220. Emphasis on more intricate cuts and turning processes, special chucking devices, and fancy turning. Prerequisite: IA 220. One three-hour laboratory period.
- IA 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: IA 112 or equivalent. Six laboratory hour-periods, including 1 lecture hour.
- IA 332. Pattern Making.** 2 hours.
Continuation of IA 111, with emphasis on problems in making of patterns for more complicated machine parts and on factors influencing production cost of these parts. Six laboratory hour-periods.
- IA 333. Carpentry.** 3 hours.
The fundamentals of house carpentry; practical application of problems in framing, use of steel square, exterior and interior finish, and estimating. Prerequisite: IA 112. One lecture; 6 laboratory hour-periods.
- IA 342. Foundry Practice.** 2 hours.
A study of equipment used in school and home work shops. Prerequisite: IA 141 or 240. One lecture, 1 four-hour laboratory period.
- IA 343. Brass and Alloy Foundry.** 2 hours.
Making ornamental castings of brass, bronze, and aluminum; molding, melting, pouring, cleaning, polishing, and coloring. Prerequisite: IA 141 or 240. One lecture; 1 four-hour laboratory period.
- IA 350. Welding Practice.** 1 hour any term.
The problems of electric and acetylene welding, with reference to intricate and specialized operations. Prerequisite: IA 152 or 250. One lecture; 2 laboratory hour-periods.

IA 352. Blacksmithing. 3 hours.

Farm blacksmithing problems, including the usual basic operations in forging and welding. Intended primarily for Vocational Agriculture majors. One lecture; 2 three-hour laboratory periods.

IA 353. Ornamental Iron Work. 2 hours.

Craftsmanship in wrought-iron work; designing and making of wrought-iron furnishings, lamps, light fixtures, etc. Prerequisite: IA 152 or 250. Six laboratory hour-periods.

IA 357. Metal Crafts. 3 hours.

Diversified metal crafts; advanced sheet-metal work, metal spinning, and craft work in iron, copper, and Britannia metal. Prerequisite: AA 295; IA 343, 353, or 380. One lecture; 6 laboratory hour-periods.

IA 361. Safety in Industry. 3 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.

IA 362. Machine Shop. 2 hours spring.

Manipulation of basic machine tools and operations requiring accomplished skills; individual projects; application of jigs, fixtures, and dies. Prerequisite: IA 261. One lecture; 5 laboratory hour-periods.

IA 363. Production Machine Work. 3 hours.

Application of tools, jigs, fixtures, and dies in relation to quantity production; individual problems and projects. Prerequisite: IA 261 and 362. One lecture; 6 laboratory hour-periods.

IA 366. 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: IA 266 or consent of instructor. One lecture; 6 laboratory periods.

IA 367. Time Study. 3 hours.

Theory and application of time study techniques; job analysis and standardization; construction of standard data and formula application; wage payment systems and merit rating. Prerequisite: Junior standing and consent of instructor. One lecture: 6 laboratory periods.

IA 368. Production Planning and Control. 3 hours.

Departmental organization and types of production control techniques; codification and symbolization; forecasting, materials control, routing, scheduling, dispatching, and inspecting. Prerequisite: IA 366, 367. One lecture; 2 three-hour laboratory periods.

IA 370. Practical Electricity. 3 hours.

Basic instruction in practical electricity, covering principles of electrical circuits and controls, with possible application in fields of light and power wiring, stagecraft and lighting, communications including radio.

IA 380. Sheet-Metal Work. 3 hours.

Projects in sheet-metal work and pattern drafting involving the fundamental machine and hand-tool operations; equipment and supplies needed in the school shop. Prerequisite: GE 112. One lecture; 6 laboratory hour-periods.

IA 405. Reading and Conference. Terms and hours to be arranged.

IA 407. Seminar. 2 hours.

Prerequisite: senior standing.

IA 411. Shop Planning and Organization. (G) 3 hours.

Planning and organizing the physical plant for different types of school shops.

Prerequisite: Ed 415. One lecture; 6 laboratory hour-periods.

IA 461, 462. Quantitative Management. (G) 3 hours each term, fall and winter.

Quantitative analysis and economic optimum selection of machines, equipment, and labor; quantitative control in inverse relationships, least-cost combinations in purchasing quantities and seasonal production. Prerequisite: calculus and IA 360, 366, 367.

IA 463. Industrial Supervision Principles. 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: IA 368 or consent of instructor.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit. Graduate courses in industrial education are listed under SCHOOL OF EDUCATION.

IA 505. Reading and Conference. Terms and hours to be arranged.**IA 507. Seminar. Terms and hours to be arranged.**

School of Forestry

Faculty

PAUL MILLARD DUNN, M.S.F., Dean of the School of Forestry; Professor of Forestry.

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

ADELAIDE SIMPSON, Secretary to the Dean.

Logging Engineering

PROFESSOR PATTERSON.

Technical Forestry

PROFESSORS MASON, STARKER.*

ASSOCIATE PROFESSORS SCHROEDER*, BARNES.

ASSISTANT PROFESSORS NETTLETON*, McCULLOCH.*

ASSISTANT FORBES.

Wood Products

ASSOCIATE PROFESSOR VOORHIES.*

General Statement

OREGON has an interest in forestry greater than any other state in the Union. The state has within its limits an area of 28,000,000 acres that, because of peculiarities of soil, topography, and climate, appear to be permanently classified as forest land. It has the largest amount of standing timber possessed by any state and it produces more lumber annually than any other. The Oregon State School of Forestry has the obligation to train men to manage these great properties for continuous maximum production and economical and efficient distribution of product.

Logging Engineering. The logging engineer is the product of the Pacific Northwest. The Department of Logging 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 Logging 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, in bridge design, and in making topographic logging plans.

* On leave of absence.

Technical Forestry. In technical forestry the school has a dual responsibility: to the Federal Government in training men to be of service in helping to manage the National Forests and other federally owned forest lands; to the State of Oregon in preparing men to aid in solving the forestry problems that are involved chiefly in the forestation and protection of the commonwealth's privately and publicly owned timberlands.

A major option is offered in **FOREST RECREATION**, preparing students for professional and administrative service in the development and use of national and state forests for recreational purposes. Students in this option pursue the regular technical forestry curriculum except during the junior year when they follow a special program of study.

Wood Products. The utilization of products of the forests now includes a wide variety of manufacturing processes. The problems involve efficient plant design, organization and management of the plant, seasoning of wood, product improvement and development, human efficiency, and scientific merchandising. With these problems in mind and in response to demands of the lumber industry for men trained in wood products a carefully chosen group of courses is offered.

A major option is offered in **LIGHT BUILDING CONSTRUCTION**, a field of special significance to Oregon because wood is one of the state's principal products. With increasing interest in improving and extending American housing and new methods of wood utilization, men trained in the field should find their services in demand. Students in this option follow the same program as those in the wood products major except that they make certain substitutions in the sophomore and junior years and in the senior year follow a special curriculum.

Four-Year and Five-Year Curricula. In the freshman and sophomore years all students in forestry pursue the same studies, following which they may elect one of the three majors on either a five-year or a four-year basis.

FOUR-YEAR CURRICULA (B.S., B.F. DEGREES). For the bachelor's degree the student is required to complete 204 term hours of collegiate work. Every student before graduation must have completed at least 9 term hours in each of two groups in liberal arts and sciences. For the Bachelor of Science degree the student must present 36 term hours of science. A minimum of 70 professional hours is required by the School of Forestry. No student will be recommended for graduation who has not had at least six months of practical field work that is in line with his objective and that has been accepted as satisfactory by the faculty of the School of Forestry.

FIVE-YEAR CURRICULUM (B.S., M.F. DEGREES). The forester is being called upon more and more to serve as planner and coordinator in the use of wild land. It is not enough to determine merely the kind of use for which the land is inherently best suited. An appropriate balance must be sought between farm, pasture, forest, range, recreation, wildlife, watershed, and other uses, in the light of sound national requirements for products and services. Hence the forester must be better prepared in the basic and social sciences. To meet the demand for men trained in the broader field, the five-year curriculum, including four years of undergraduate work leading to the degree of Bachelor of Science and a graduate year leading to the degree of Master of Forestry, is strongly recommended.

Advanced Degrees. The degrees of Master of Forestry and Master of Science are offered to graduates of the State College, or other colleges of equal

rank, who have met the State College requirements for graduate study. The graduate program and thesis for the Master of Forestry degree are designed to fit the student for administrative or professional work in forestry, logging engineering, or wood products. The work for the Master of Science degree develops the student for research work in his particular field.

The degree of Forest Engineer is offered to graduates of the School of Forestry who have had at least five years of successful forestry practice following graduation and 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 DIVISION.

Minors. Graduates of the School of Forestry often are employed in work that combines forestry with related fields. Students desiring training for such work may take a minor in the field of their choice. Minors most commonly selected by students majoring in technical forestry are fish and game management, grazing, soil conservation, recreation, entomology, and pathology; students majoring in wood products may take a minor in pulp and paper.

Summer Employment. The principal operations of the lumber industry of the United States are in the Pacific Northwest. Students who are physically fit find employment in the logging camps and in sawmills. The United States Forest Service has adopted a definite policy of employing forestry students during vacation periods. Students expecting to engage in forestry work are thus enabled to obtain valuable field experience at reasonable pay without incurring the costs incident to traveling long distances.

Equipment. The Forestry Building (1917), three stories high, 80 by 136 feet, constructed of brick, contains roomy laboratories for working in silviculture, dendrology, mensuration, forest protection, technology, mapping, logging engineering, timber testing, wood technology, lumber grading, and wood preservation. Space is devoted to a collection of manufactured wood products, showing the various uses to which wood may be put, and to the forest museum containing large specimens of all commercial woods of the United States. The laboratories are well equipped with appropriate instruments and apparatus. Through the courtesy of the manufacturers of logging equipment much valuable logging machinery is available for demonstration purposes. Lumber-manufacturing concerns have generously supplied the school with wood products made from various species of Oregon trees. All publications dealing with general forestry, logging, or lumber manufacture are provided. The Forest Products Laboratory and the Dry Kiln (1942, 1927) are buildings 40 by 35 feet and 24 by 60 feet in size. The laboratory is equipped with a complete steam plant, a small commercial dry kiln with modern instruments and control apparatus; chipping, wood flour, and other equipment.

Actual field work, essential in preparing men for work in forestry and logging engineering, is made possible in the large timbered areas easily accessible from the State College. Some of the largest lumber-manufacturing and pulp-and-paper plants in the Northwest are within two or three hours' ride from Corvallis.

Lands. A State forest of 75,000 acres, located within 75 miles of the campus, has been placed, by law, at the disposal of the School of Forestry for scientific management. An area of 160 acres of logged and second-growth fir, presented to the school by the Spaulding Logging Company, lies within ten

miles of the campus. Mrs. Mary J. L. McDonald of San Francisco gave the school for demonstration purposes 640 acres of timbered land lying near Prospect in the Crater Lake region. Mrs. McDonald also made possible the acquisition of 4,800 acres of second-growth Douglas fir, lying within seven miles of the campus and known as the McDonald Forest; this area is devoted to experimental work in reforestation, and also serves as a base for laboratory work in surveying, mapping, timber estimating, logging road location, forest protection, and tree and shrub identification. A tract of cut-over land, 180 acres in extent, is devoted to arboretum and experimental planting purposes. A forest nursery on the arboretum tract, financed by the United States Forest Service and the State Board of Forestry, is operated in cooperation with the school; here the student has an opportunity to do actual nursery work. A full-time nurseryman and assistant are required for this project.

Through the generosity of Mr. John W. Blodgett, prominent timberman, a tract of 2,400 acres of cut-over land in Columbia County has been presented to the School of Forestry for research in reforestation.

Curricula in Forestry

Logging Engineering
Wood Products

Light Building Construction

Technical Forestry
Forest Recreation

LOWER-DIVISION CURRICULUM

	Term hours		
	F	W	S
Freshman Year			
General Forestry (F 111)	3	---	---
Forest Protection (F 112)	---	3	---
Forest Problems (F 114)	2	---	---
Tree Identification (F 153)	---	---	4
General Botany (Bot 201, 202)	3	3	---
Forest Engineering: Forest Surveying Instruments (LE 123)	---	---	3
Intermediate Algebra (Mth 100)	4	---	---
Trigonometry (Mth 106)	---	4	---
Elements of Statistics (Mth 109)	---	---	4
Extempore Speaking (Sp 111)	---	3	---
English Composition (Eng 111, 112, 113)	3	3	3
Military Science	1	1	1
¹ Physical Education	1	1	1
	17	18	16
Sophomore Year			
Mensuration: Felled Timber and Its Products (F 221), Mensuration: Standing Timber (F 222)	4	4	---
² Forest Engineering (LE 224, 225, 226)	5	5	5
Qualitative Physics (Ph 211, 212)	3	3	---
Wood Utilization (WP 330)	---	---	4
Outlines of Economics (Ec 212)	3	---	---
Descriptive General Chemistry (Ch 130)	---	---	3
Modern Governments (PS 201, 202)	---	4	4
Military Science	1	1	1
¹ Physical Education	1	1	1
	17	18	18

¹General Hygiene (PE 150), 2 term hours, is taken in place of physical education one term of the freshman year.

²Students expecting to major in wood products may take approved courses in lieu of this subject. Students in light building construction may take some of the following: IA 333, 370, GE 111, 112, J 111.

UPPER-DIVISION CURRICULA¹

LOGGING ENGINEERING

B.S., B.F. Degrees

	Term hours		
	F	W	S
Junior Year			
Bridge Design (LE 381)	3	---	---
Logging Methods (LE 392)	3	---	---
Forest Valuation (F 321)	---	---	4
Business Law (BA 256, 257)	3	3	---
Accounting for Technical Students (BA 385, 386)	3	3	---
Logging Machine Design (LE 386)	---	3	---
Engineering Geology (G 324)	---	3	---
Silviculture (F 345)	3	---	---
Logging Equipment (LE 382)	---	3	---
Commercial Woods (WP 331)	---	---	3
Cost Accounting for Industrials (BA 494)	---	---	3
Timber Transportation (LE 374)	---	---	4
*Electives	3	3	3
	18	18	17
Senior Year			
Timber Transportation (LE 474, 475, 476)	4	4	4
Logging Plans (LE 471, 472, 473)	5	5	5
Forest Policy (F 411)	4	---	---
Forest Economics (F 412)	---	4	---
Seminar (F 407)	1	1	1
*Electives	3	3	7
	17	17	17

TECHNICAL FORESTRY

B.S., B.F. Degrees

Junior Year			
Identification of Woods (WP 334)	---	4	---
Mensuration: Timber Growth (F 223)	---	---	4
Dendrology (F 353)	4	---	---
Logging Methods (LE 392)	---	3	---
Silviculture (F 341, 342, 343)	4	4	4
Fire Protection (F 331)	3	---	---
Accounting for Technical Students (BA 385)	---	3	---
Range and Range Livestock Management (AH 220)	3	---	4
Forest Valuation (F 321)	---	---	4
Electives	3	3	5
	17	17	17
FOREST RECREATION OPTION			
Silviculture (F 341, 343)	---	4	4
Forest Valuation (F 321)	---	---	4
Forest Wildlife Management (FG 310, 311, 312)	3	3	3
Home Ground Planning (LA 279)	---	3	---
Plant Materials (LA 326)	3	---	---
Landscape Architecture (LA 379)	---	---	3
Forest Sanitation (Bac 361)	3	---	---
Fire Protection (F 331)	---	3	---
Park Forestry (F 361)	4	---	---
Electives	4	4	3
	17	17	17

¹In any of the curricula the student may take one or more minors in liberal arts and sciences according to his needs and interests. Students in the five-year curriculum (page 303) have a broader opportunity to elect additional courses according to individual aims and aptitudes.

²Recommended Electives: Lumber Seasoning (WP 494), Production Control (WP 412), Principles of Personnel Management (BA 414), Labor Problems (Ec 425), Transportation (Ec 435), Differential and Integral Calculus (Mth 201, 202, 203), Steam, Air, and Gas Power (ME 346), Nutrition (FN 225), Principles of Forest Entomology (Ent 321), Business English (Eng 217), Technical Report Writing (Eng 118), Community Hygiene (PE 221), First Aid (PE 358), Typing (SS 121), Camp Cookery (FN 250), Forest Management Problems (F 325).

	Senior Year		
	Term hours		
	F	W	S
Forest Policy (F 411)	4	.....	.....
Forest Economics (F 412) .....	.....	4	.....
Wood Properties, Seasoning, and Grading (WP 397) .....	.....	.....	4
Forest Management: Recreation (F 421), Timber Management: Even-aged Stands (F 422), Timber Management: Many-aged Stands (F 423)....	3	3	3
Forest Administration (F 311, 312, 313)	3	3	3
Seminar (F 407)	1	1	1
Electives	6	6	6
	17	17	17

MINORS

Entomology			
Principles of Forest Entomology (Ent 321), Forest Entomology (Ent 322, 323)	3	3	3
Advanced Forest Entomology (Ent 423)	4 or	(4) or	(4)
Entomological Nomenclature and Literature (Ent 352) .....	.....	3	.....
Aquatic Entomology (Ent 341) .....	.....	.....	4
Fish and Game Management			
Forest Wildlife Management (FG 310, 311, 312)	3	3	3
Range and Pasture Botany (Bot 314) .....	.....	.....	3
Range Livestock Management (AH 419, 420) .....	.....	3	3
Management of Game Fish (FG 454) .....	.....	3	.....
Management of Big Game (FG 457)	3	.....	.....
Grazing			
General Botany (Bot 203) .....	.....	.....	3
Stock Judging I (AI 111) .....	.....	3	.....
Range and Pasture Botany (Bot 314) .....	.....	.....	3
Forest Wildlife Management (FG 310, 311, 312)	3	3	3
Systematic Botany (Bot 313) .....	.....	.....	4
Principles of Plant Ecology (Bot 341) .....	.....	4	.....
Range Livestock Management (AH 419, 420) .....	.....	3	3
Range Survey Methods (AH 333)	3	.....	.....
Range Improvement and Maintenance (FC 319) .....	.....	3	.....
Pathology			
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
Systematic Botany (Bot 313) .....	.....	.....	4
Principles of Plant Pathology (Bot 351)	4	.....	.....
Plant Pathological Technique (Bot 451)	3	.....	.....
Microtechnique (Bot 469) .....	.....	3	.....
Science			
Engineering Geology (G 324) .....	.....	3	.....
Principles of Forest Entomology (Ent 321)	3	.....	.....
Forest Pathology (Bot 315) .....	.....	3	.....
Principles of Plant Ecology (Bot 341) .....	.....	4	.....
Forest Soils (Sls 214) .....	.....	.....	3
Soil Conservation			
Range Improvement and Maintenance (FC 319) .....	.....	3	.....
Cover Crop and Soil-Erosion Prevention Plants (FC 320) .....	.....	2	.....
Soil Conservation Engineering (AE 471)	3	.....	.....
Soil Conservation (Sls 413) .....	.....	3	.....
Forest Soils (Sls 214) .....	.....	.....	3
Climatology (Sls 319) .....	.....	.....	2

WOOD PRODUCTS

B.S., B.F. Degrees

Junior Year			
Identification of Woods (WP 334) .....	.....	4	.....
Forest Management Problems (F 325) .....	.....	.....	3
Wood Grading (WP 333)	4	.....	.....
¹ Accounting for Technical Students (BA 385, 386)	3	3	.....
¹ Cost Accounting for Industrials (BA 494) .....	.....	.....	3
Business Law (BA 256, 257, 258)	3	3	3
Money and Banking (Ec 413) .....	.....	.....	4
Timber Mechanics (WP 332)	4	.....	.....
Forest Valuation (F 321) .....	.....	4	.....
Electives	3	3	5
	17	17	18

¹Students in light building construction may defer accounting to the senior year and take AA 178, 179, and a social science elective.

	Senior Year		
	Term hours		
	F	W	S
Forest Policy (F 411) .....	.....	.....	4
Forest Economics (F 412) .....	.....	4	.....
Lumber Seasoning (WP 494)	4	.....	.....
The Lumber Plant (WP 495)	4	.....	.....
Lumber Merchandising (WP 496) .....	.....	.....	4
Production Control (WP 412) .....	.....	4	.....
International Trade (Ec 440)	4	.....	.....
Sawmill Administration (WP 411) .....	.....	.....	3
Seminar (F 407)	1	1	1
Electives	4	8	5
	17	17	17

LIGHT BUILDING CONSTRUCTION OPTION

Forest Policy (F 411)	4	.....	.....
Elements of Marketing (BA 223) .....	.....	4	.....
General Advertising (SS 439) .....	.....	.....	3
Science or Social-science elective	3	.....	.....
House Planning and Architectural Drawing (AA 178, 179) .....	.....	3	3
Seminar (WP 407)	1	1	1
Farm Structures (AE 461, 462)	3	3	.....
Lumber Merchandising (WP 496) .....	.....	.....	4
Sawmill Administration (WP 411)	3	.....	.....
Electives	3	4	4
	17	15	15

MINORS

Business Administration			
Elements of Finance (BA 222) .....	.....	4	.....
Investments (BA 463) .....	.....	.....	3
Production Management (BA 413)	4	.....	.....
Business Statistics (BA 470) .....	.....	3	.....
Special Problems for Technical Students (BA 403) .....	.....	5	.....
Pulp and Paper			
Principles of Chemistry (Ch 201, 202, 203)	4	4	4
Organic Chemistry (Ch 226, 227)	5	5	.....
Quantitative Analysis (Ch 234) .....	.....	.....	5
Pulp and Paper Chemistry (Ch 460, 461, 462)	3	3	3

FIVE-YEAR UNDERGRADUATE AND GRADUATE CURRICULUM

B.S., M.F. Degrees

Freshman and Sophomore Years

See LOWER-DIVISION CURRICULUM, page 300.

	Junior Year		
	Term hours		
	F	W	S
Identification of Woods (WP 334) .....	.....	4	.....
Mensuration: Timber Growth (F 223) .....	.....	.....	4
Dendrology (F 353)	4	.....	.....
Fire Protection (F 331) .....	.....	3	.....
Logging Methods (LE 392) .....	.....	.....	3
Forest Pathology (Bot 315) .....	.....	3	.....
Forest Soils (Sls 214) .....	.....	.....	3
Range and Pasture Botany (Bot 314) .....	.....	.....	3
Principles of Plant Ecology (Bot 341) .....	.....	4	.....
Wood Properties, Seasoning, and Grading (WP 397)	4	.....	.....
Electives	9	4	4
	17	18	17
	Senior Year		
	F	W	S
Silviculture (F 341, 342, 343)	4	4	4
Forest Administration (F 311, 312, 313)	3	3	3
Forest Wildlife Management (FG 310, 311, 312)	3	3	3
Home Ground Planning (LA 279)	3	.....	.....
Landscape Architecture (LA 379) .....	.....	.....	3
Electives	4	8	4
	17	18	17

Recommended Electives: General Advertising (SS 439), Steam, Air, and Gas Power (ME 346), Materials of Engineering (ME 316), Fuels and Lubricants (ME 325), Differential and Integral Calculus (Mth 201, 202, 203), Business English (Eng 217), Merchandising and Selling (SS 436), Principles of Personnel Management (BA 414), Business Statistics (BA 470).

	Graduate Year	Term hours		
		F	W	S
Forest Management (F 521, 522, 523)		3	3	3
Forest Economics (F 511)		3	....	....
Forest Fire Protection (F 531)	3
Silviculture (F 541)	3	....
Thesis (F 503)		3	3	3
Seminar (F 507)		3	3	3
Electives		3	3	3
		15	15	15

Logging Engineering

COURSES in logging engineering are designed to prepare men to deal with the woods problems peculiar to the lumber industry of the Pacific Northwest. Emphasis is placed on the preparation of logging plans and the transportation of timber from the woods to the mills.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- LE 123. Forest Engineering: Forest Surveying Instruments.** 3 hours any term.
Measurement of distance, direction, and elevation. Two recitations; 1 three-hour laboratory period.
- LE 224. Forest Engineering: Elements of Forest Mapping.** 5 hours fall or winter.
Theory and use of engineer's transit and level; survey of definite areas; direct and indirect leveling; computing and plotting of field data. Three recitations; 1 two-hour laboratory period; 1 four-hour field period.
- LE 225. Forest Engineering: Forest Surveys.** 5 hours any term.
Public land surveys; mapping of definite area by approved methods; drafting of field data; free-hand lettering; theory of photographic surveying. Three recitations; 1 two-hour laboratory period; 1 four-hour field period.
- LE 226. Forest Engineering: Forest Surveys and Structures.** 5 hours winter or spring.
Theory and application of triangulation; solar and polar observations; forest roads, trails, shelters, bridges, and communication systems. Three recitations; 1 two-hour laboratory period; 1 four-hour field period.

UPPER-DIVISION COURSES

- LE 370. Field Work.** 1 to 6 hours.
Practical field work between the sophomore and junior years or between the junior and senior years. A satisfactory report based on approved outline must be submitted. (See Section 18, Academic Regulations pamphlet.)
- LE 374. Timber Transportation.** 4 hours spring.
Survey of the problem; development of methods; small operations. Two lectures; 2 three-hour laboratory periods. Professor Patterson.
- LE 381. Bridge Design.** 3 hours fall.
Design of wood structures as applied to logging transportation systems; details, specifications, and cost estimates. One recitation; 2 two-hour laboratory periods. Professor Patterson.

- LE 382. **Logging Equipment.** 3 hours winter.
Rigging; logging power-units; construction equipment; camp layouts. One lecture; 2 two-hour laboratory periods. Professor Patterson.
- LE 386. **Logging Machine Design.** 3 hours winter.
Details of standard equipment, rigging, and tools constructed in camp shops. One lecture; 2 two-hour laboratory periods. Professor Patterson.
- LE 392. **Logging Methods.** 3 hours.
Relation between logging and forest production; felling and bucking; skidding, loading, hauling; relative merits of various methods. Professor Patterson.
- LE 471. **Logging Plans.** 5 hours fall.
Control of area; instrument control; surveying timbered area; preparation of topographic and relief maps; cruising. One recitation; 1 three-hour field period; 1 nine-hour field period.
- LE 472. **Logging Plans.** (g) 5 hours winter.
Working plans from data obtained in LE 471; logging-area limits; transportation; landings and machine settings; costs; logging report. Prerequisite: LE 392, 471, 474. Three recitations; 2 two-hour periods. Professor Patterson.
- LE 473. **Logging Plans.** (g) 5 hours spring.
Management control: organization, planning, employment standardization, wages, purchasing, stores, tools, plant, production. Prerequisite: LE 474. Three recitations; 2 two-hour periods. Professor Patterson.
- LE 474. **Timber Transportation.** (g) 4 hours fall.
Motor truck transportation; logging railroads; miscellaneous systems. Two lectures; 2 two-hour laboratory periods. Professor Patterson.
- LE 475. **Timber Transportation.** (g) 4 hours winter.
Economic theory of location and construction of transportation systems; grades; alignment, etc. Prerequisite: LE 474. One lecture; 1 nine-hour field period.
- LE 476. **Timber Transportation.** (g) 4 hours spring.
Structures and materials for use with transportation systems; costs of surveys, construction, operation, and maintenance reports. Prerequisite: LE 475. One lecture; 1 nine-hour field period.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

- LE 501. **Research.** Terms and hours to be arranged.
- LE 503. **Thesis.** Terms and hours to be arranged.
- LE 505. **Reading and Conference.** Terms and hours to be arranged.
- LE 507. **Seminar.** Terms and hours to be arranged.
Seminars: Timber Transportation, Logging Methods, Logging Plans.

Technical Forestry

BASIC training for the practice of forestry, particularly in the Northwest, is afforded in the courses in technical forestry. Stress is laid on the scientific methods involved in measuring, tending, and utilizing the forest crop, and the social, political, and economic considerations that determine the character of forest policy and practice.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

- F 111. General Forestry.** 3 hours any term.
Preliminary survey of the entire field of forestry including the development of forestry in the United States and the origin and distribution of our public domain. May be elected by students in other schools.
- F 112. Forest Protection.** 3 hours any term.
Preliminary study of forest protection; training and knowledge needed to fit the first-year forester for work in forest protection. Two lectures or recitations; 1 three-hour laboratory period.
- F 114. Forest Problems.** 2 hours any term.
Practical application of classroom work to the solving of elementary field problems. One lecture, 1 three-hour laboratory period.
- F 153. Tree Identification.** 4 hours fall or spring.
Principal Pacific Coast timber trees; range, occurrence, size, growth, form; climate, soil, and moisture requirements; resistance; reproduction. Two lectures; 1 two-hour laboratory period; 1 three-hour field period.
- F 211. General Forestry.** 3 hours fall.
Sustained yield; forest protection; lumbering; tree identification. (Not open to forestry students). Two recitations; 1 three-hour laboratory period.
- F 212. Forest Administration.** 3 hours winter.
Administration of the National Forests; United States Forest Service policies in regard to fire, trespass, timber, grazing, lands, research, public relations, and accounts. (Not open to forestry students.)
- F 221. Mensuration: Felled Timber and Its Products.** 4 hours any term.
The cubic contents; scaling and grading logs; piece and cord measurements. Three recitations; 1 three-hour field or laboratory period.
- F 222. Mensuration: Standing Timber.** 4 hours any term.
The volume of individual trees; timber cruising. Three recitations; 1 three-hour field period.
- F 223. Mensuration: Timber Growth.** 4 hours winter or spring.
Growth of even-aged stands; growth of many-aged stands; growth of individual trees. Three recitations; 1 three-hour field period.

UPPER-DIVISION COURSES

- F 311. Forest Administration: Land Use.** 3 hours any term.
Application of principles and techniques of economic planning to the problem of coordinating forest land uses with one another and with other forms of land use.

- F 312. Forest Administration: Laws.** 3 hours any term.
Critical survey of state forest laws; Federal laws dealing with forest lands and their administrative interpretation.
- F 313. Forest Administration: Control.** 3 hours any term.
Personnel work and financial control on public and private forest property.
- F 321. Forest Valuation.** 4 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. Three lectures; 1 three-hour laboratory period.
- F 325. Forest Management Problems.** 3 hours spring.
Growth and yield studies applied to even and uneven aged forest stands; co-ordinating logging methods with sustained yield production. Two lectures or recitations; 1 three-hour laboratory period.
- F 331. Fire Protection.** 3 hours any term.
Fire prevention; presuppression; suppression. Two lectures or recitations; 1 three-hour laboratory period.
- F 341. Silviculture: Forest Ecology.** 4 hours any term.
Factors affecting distribution and succession of forest vegetation. Three recitations; 1 three-hour field period.
- F 342. Silviculture: Forest Practices.** 4 hours any term.
Treatment of stands to insure perpetuation of forest resources. Three recitations; 1 three-hour field period.
- F 343. Silviculture: Forestation.** 4 hours any term.
Nursery practice; establishment and maintenance of plantations. Three recitations; 1 three-hour field period.
- F 345. Silviculture.** 3 hours fall.
Silvicultural practices requisite for insuring reproduction following logging; seed trees; selection cuttings; justifiable regeneration costs. For students in logging engineering.
- F 353. Dendrology.** 4 hours fall or spring.
Classification and identification of forest trees; silvical characteristics and distribution; life history and requirements. Two recitations; 2 two-hour laboratory periods.
- F 360. Conservation of Natural Resources.** 3 hours winter.
Nature, extent, and importance of organic resources of United States and methods of conserving them, including conservation education; forest, forage, recreation, wildlife, soil, water aspects. Not open to forestry students.
- F 361. Park Forestry.** 4 hours fall.
Trees and their treatment for park and recreational purposes. Three recitations; 1 three-hour laboratory period.
- F 370. Field Work.** 1 to 6 hours.
Practical field work between the sophomore and junior years or between the junior and senior years carried on with private interests, the state, or the Forest Service; report based on an approved outline. Staff.
- F 401. Research.** Terms and hours to be arranged.
- F 403. Thesis.** Terms and hours to be arranged.

- F 405. **Reading and Conference.** Terms and hours to be arranged.
- F 407. **Seminar.** 1 hour each term.
- F 411. **Forest Policy.** (g) 4 hours any term.
Forestry in the economic and sociological life of the country. Three lectures; 1 three-hour laboratory period.
- F 412. **Forest Economics.** (g) 4 hours any term.
The economic forces that control and regulate the forest enterprises. Three lectures; 1 three-hour laboratory period.
- F 417, 418. **Regional Forestry.** 2 hours each term fall and winter.
Survey of the field of technical forestry. Of special interest to those who plan to enter the Federal or State Forest Service.
- F 421. **Forest Management: Recreation.** (g) 3 hours fall or spring.
Forest recreation, its importance and nature; planning forest use for recreational purposes in relation to other forest uses. Two lectures; 1 three-hour laboratory period.
- F 422. **Timber Management: Even-aged Stands.** (g) 3 hours fall or winter.
The conversion of natural or denuded forests to a normal even-aged condition. Two lectures; 1 three-hour laboratory period.
- F 423. **Timber Management: Many-aged Stands.** (g) 3 hours winter or spring.
The conversion of natural many-aged forest to a normal condition. Two lectures; 1 three-hour laboratory period.

GRADUATE COURSES

Courses numbered 400-499 and designated (p) or (G)
may be taken for graduate credit.

- F 501. **Research.** Terms and hours to be arranged.
- F 503. **Thesis.** Terms and hours to be arranged.
- F 505. **Reading and Conference.** Terms and hours to be arranged.
- F 507. **Seminar.** Terms and hours to be arranged.
Seminars: Forest Mensuration, Forest Administration, Forest Protection, Dendrology, Municipal Forestry, Recreational Forestry, Forest Economics, Forest Ecology.
- F 511. **Forest Economics.** 3 hours.
Taxation of forest lands, the effects of taxation on lumbering and sustained yield. Prerequisite: graduate standing and consent of instructor.
- F 512. **Forest Economics.** 3 hours.
Forest fire damage appraisal; insurance of timberlands. Prerequisite: graduate standing and consent of instructor.
- F 521, 522, 523. **Forest Management.** 3 hours each term.
Administration of forest lands for recreational purposes; managing even aged and many aged stands for timber production. Prerequisite: F 223; F 343. Two recitations; 1 three-hour period.
- F 531. **Forest Fire Protection.** 3 hours.
Forest fire plans, their preparation and execution. Prerequisite: graduate standing and consent of instructor.

F 541, 542, 543. **Silviculture.** 3 hours each term.

Advanced approach in treatment of stands; research methods. Prerequisite: graduate standing and consent of instructor. One lecture; 1 four-hour laboratory period.

Wood Products

COURSES in wood products are designed to meet the needs of men who desire to prepare themselves for service in the wood-manufacturing industry. Especial attention is given to manufacturing conditions existing in the Pacific Northwest.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

WP 221. Lumber Industry Practice. 2 hours.

Facts and problems designed for student preparing for secretarial work in lumber industry. Not open to forestry students. One lecture; 1 three-hour laboratory period.

WP 222. The Lumber Industry. 2 hours.

A technical, social, and economic description of the lumber industry for the nonforestry student, including students preparing for teaching, extension work, or secretarial work.

UPPER-DIVISION COURSES

WP 330. Wood Utilization. 4 hours any term.

Adaptation to commercial uses; chief wood-using industries; relative amounts of commercial species used annually; substitutes; byproducts. Three lectures; 1 two-hour period.

WP 331. Commercial Woods. 3 hours spring.

Identifying woods commonly used; seasoning, gluing, and preservation of woods. Primarily to meet requirements of woodworkers and engineers. Two lectures; 1 two-hour laboratory period.

WP 332. Timber Mechanics. 4 hours fall.

Mechanical properties of principal commercial timber; obtaining strength data; use of strength data. Two recitations; 2 two-hour laboratory periods.

WP 333. Wood Grading. 4 hours fall.

Basic grades and standing commercial grading rules. Two lectures; 2 two-hour laboratory periods.

WP 334. Identification of Woods. 4 hours fall or winter.

Wood structure; identification of important commercial woods; physical and structural properties. Two lectures; 2 two-hour laboratory periods.

WP 397. Wood Properties, Seasoning, and Grading. 4 hours fall or spring.

Mechanical and physical properties; lumber seasoning; lumber grading. Abbreviated course for students not majoring in wood products. Three lectures; 1 two-hour laboratory period.

WP 411. Sawmill Administration. 3 hours spring.

Personnel control in lumbering operations. Two lectures; 1 three-hour laboratory period.

- WP 412. **Production Control.** 4 hours winter.
Production-control systems as applied to sawmills. Three lectures; 1 two-hour laboratory period.
- WP 494. **Lumber Seasoning.** (g) 4 hours fall.
Air seasoning; kiln-drying methods and their merits; effect of kiln-drying on wood structure; types of kilns; recording instruments; field trips. Two lectures; 2 two-hour laboratory periods.
- WP 495. **The Lumber Plant.** (g) 4 hours fall.
Electric versus steam mills; machinery and power of small and large plant; lumber-handling devices; examination of up-to-date mills; reports. Three lectures; 1 two-hour laboratory period.
- WP 496. **Lumber Merchandising.** (g) 4 hours spring.
Lumber salesmanship; selling agencies; trade associations; standardization of sizes and grades; trade-marking; advantages of wood construction.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

- WP 501. **Research.** Terms and hours to be arranged.
- WP 503. **Thesis.** Terms and hours to be arranged.
- WP 505. **Reading and Conference.** Terms and hours to be arranged.
- WP 507. **Seminar.** Terms and hours to be arranged.
Seminars: Wood Utilization, Wood Properties, Sawmill Management.
- WP 594. **Lumber Seasoning.** 3 hours.
Studies in research technique in seasoning; advanced studies in technical problems. Prerequisite: WP 494.

School of Home Economics

Faculty

AVA BERTHA MILAM, M.A., Dean of the School of Home Economics.
SALLY McLELLAN, B.S., Secretary and Assistant to the Dean.

Clothing, Textiles, and Related Arts

PROFESSOR FRITCHOFF (department head).
ASSOCIATE PROFESSORS GATTON, PATTERSON.
ASSISTANT PROFESSOR STRICKLAND.
INSTRUCTORS EDABURN, MACCLOSKEY.

Extension Methods

PROFESSOR SAGER.

Foods and Nutrition

PROFESSORS WILLIAMS (department head), FINCKE.
ASSOCIATE PROFESSOR KOLSHORN.
ASSISTANT PROFESSORS GARRISON, TAYLOR, ARNOLD, OVERMAN.
INSTRUCTORS ASHE, HOPPE, CARPENTER, HULL.
RESEARCH ASSISTANTS DAVEY, MILLING.

Home Economics Education

PROFESSOR BLAZIER (department head).
ASSOCIATE PROFESSOR KOHLHAGEN.
ASSISTANT PROFESSORS ROSKIE, DU BOIS.
SUPERVISING TEACHERS VAN DEUSEN, VENATOR.

Home Economics Research

PROFESSORS WILSON (in charge), FINCKE.

Household Administration

PROFESSORS PRENTISS (department head), BRANDON.
ASSOCIATE PROFESSORS OEHLER (director of home management houses), READ.
ASSISTANT PROFESSOR VAN HORN.
INSTRUCTOR FEIGENSON.
GRADUATE ASSISTANTS ARNEY, HARPER.

Institution Economics

PROFESSOR HUNTER (department head, director of dormitories).
ASSISTANT PROFESSOR BIBEE (supervisor of Memorial Union Dining Service).

*Home Economics Extension**

PROFESSOR SAGER (state leader of home demonstration agents).

ASSOCIATE PROFESSORS CASE (extension nutritionist), MACK (extension nutritionist).

ASSISTANT PROFESSORS RODENWOLD (director of women's programs, Radio Station KOAC), LUTZ (extension specialist in home management), LANE (extension specialist in clothing and textiles).

General Statement

ALL problems of home and family life fall within the field of home economics. The School of Home Economics seeks to serve, directly or indirectly, every Oregon home. Through resident teaching the school contributes directly to the life of the commonwealth; students are trained for the responsibilities of homemaking and parenthood, for education, administration and management, and for other work in home economics and allied fields. The true homemaker not only must be trained in the science, the art, and the economics of the household, but also must have a well-rounded personality, with intelligent interests, trained judgment, and cultivated tastes, enabling her to solve the problems of the changing modern home with its complex social and civic relationships. Hence the home economics curriculum must be liberal as well as technical.

Through research and extension, closely coordinated with the resident teaching, effort is constantly directed toward the solution of home problems.

Undergraduate Curricula. Training in homemaking, important in the education of every young woman, is fundamental in all the work of the school. Curriculum A (pages 320-321) provides especially for those whose main object in attending college is preparation for home life. Students in this curriculum may also prepare for teaching and other earning fields related to home economics. Curriculum B (page 321), termed the professional curriculum, provides an excellent background for students who wish to enter the earning fields. In the junior and senior years the student may specialize in some field such as home-economics teaching, home-economics extension, hospital dietetics, institutional management, nutrition, nursery school teaching, farm security, or commercial fields of home economics. In both curricula courses in English, art, history, economics, science, and other departments of general training, supplement the home economics courses. Curriculum C (pages 322-323) is planned for students who enter the School of Home Economics following two years of lower-division work in liberal arts. The student's four-year program is thus divided into two distinct parts, two years devoted to general studies and two years devoted largely to home economics. Students in this curriculum must fulfill the same requirements in biological and physical sciences and social sciences as in the other curricula.

For 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.

* Extension work in home economics is a part of the Federal Cooperative Extension Service. The resident-instruction and extension staffs cooperate closely in the upbuilding of Oregon home and family life.

For students, undergraduate and graduate, who wish to prepare for work in wartime or other nursery schools, opportunities for special training are offered. (See page 323.)

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 page 324.)

Requirements for Graduation. For the B.A. or B.S. degree in home economics a minimum of 192 term hours must be completed. The work should be distributed as suggested by the following curricula. At least 45 term hours in upper-division courses are required. Transfers from other institutions are required to complete at least 18 term hours in home economics at this institution. Curricula A and B as printed include the 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.

Graduate Work. All departments of the School of Home Economics offer graduate work leading to the master's degree (M.A., M.S.). The fields include clothing, textiles, and related arts; foods and nutrition; household management, child development, family relationships, and related fields; and institution economics.

Home-Economics Research. The School of Home Economics cooperates with the State Agricultural Experiment Station in conducting research on home problems. In foods and nutrition, studies are under way on the conservation of nutritive values of foods; factors affecting the palatability of foods; nutritional status of rural children; and ascorbic acid metabolism of adults. Studies are also under way in problems of housing.

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 the State College and with the United States Department of Agriculture in the upbuilding of Oregon home and family life. Members of the home-economics faculty prepare correspondence courses in home-economics subjects that form a part of the program of the divisions of Federal Cooperative Extension and General Extension. Resident-instruction staff members teach courses in home economics in the annual summer short course for 4-H club members. Special courses in home-economics extension are offered in the Department of Extension Methods.

Facilities. Modern facilities for carrying on all phases of home-economics work are provided in the Home Economics Building, the Home Management Houses, the Nursery School, and the Memorial Union Dining Service. Food laboratories, a nutrition laboratory, and animal laboratories are maintained, together with facilities for instruction in family cookery and table service. Seven laboratories provided with modern equipment are devoted to clothing, textiles, and related arts. The Memorial Union dining-room facilities afford

opportunity for training in different types of food service, including tearoom, banquet, and catering service. The central kitchen and cold-storage rooms are equipped with modern labor-saving and power equipment. The halls of residence for men and for women are available for study of housing problems. The nursery schools and the two home-management houses, Kent and Withycombe, are located on the campus.

The supervised teaching is carried on in the public schools of Corvallis, the plant and equipment of the high schools being used by the student-teacher group. The Home Economics Extension Department, through which the School of Home Economics maintains direct relationship with the homemakers and the 4-H club girls of the state, provides guidance to undergraduate and graduate students who wish to specialize in this field. The department supervises apprenticeship training in counties located near the State College.

Undergraduate Curricula in Home Economics¹

B.A., B.S. Degrees

Curriculum A

	Term hours		
	F	W	S
Freshman Year			
Color and Composition (AA 160, 161)	3	3	(3)
House Planning and Architectural Drawing (AA 178)	(3)	(3)	3
Physical and Biological Science	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
Introduction to Home Economics (HAD 101)	1	---	---
History of Western Civilization (Hst 201, 202, 203)	3	3	3
Social Ethics (PE 131)	---	---	---
*Appreciation of Music (Mus 121)	1	(1)	(1)
Family and Personal Budgets (HAD 240)	---	1	---
General Hygiene (PE 150)	(2)	2	(2)
Physical Education	1	1	1
*Electives	---	---	3
	15	16	16
Sophomore Year			
Foods (FN 211, 212, 213)	3	3	3
Textiles (CT 250)	3	(3)	(3)
Clothing (Selection) (CT 211), Clothing (Construction) (CT 212)	(3)	3	3
*Elementary Psychology (Psy 201, 202, 203)	3	3	3
Nutrition (FN 225)	(3)	(3)	3
Literature	3	3	3
Physical Education	1	1	1
Electives	3	3	---
	16	16	16
Junior Year			
Outlines of Economics (Ec 211)	4	(4)	(4)
General Sociology (Soc 211)	(4)	4	(4)
Food Purchasing (FN 411)	(3)	(3)	3
Home Furnishing (CT 331)	3	(3)	(3)
Household Management (HAD 340)	(3)	3	(3)
Child Development (HAD 311, 312)	3	3	(3)
Physiology (Z 306, 307)	3	3	---
Feeding the Family (FN 325)	---	---	2
Costume Design (CT 311) or Consumer Buying in Clothing and Textiles (CT 350)	(3)	(3)	3
Electives	4	4	9
	17	17	17

¹See Suggestive Elective Combinations, pages 322, 323.

*Mus 122, 123 are recommended electives.

*Students who have not had sufficient preparation in clothing are required to take CT 111 in their freshman year as a prerequisite to CT 212. For exemption from CT 111 the student must pass the clothing placement test given at the opening of the fall term.

*Or Psy 221, 222.

Senior Year

Term hours		
F	W	S
5	(5)	(5)
2	(2)	(2)
(3)	4	(3)
9	12	16
16	16	16

Home Management House (HAD 350)	5	(5)	(5)
² Family Relationships (HAD 422)	2	(2)	(2)
Political Science	(3)	4	(3)
Electives	9	12	16
	16	16	16

Curriculum B

Freshman Year

Color and Composition (AA 160, 161)	3	3	(3)
House Planning and Architectural Drawing (AA 178)	(3)	(3)	3
History of Western Civilization (Hst 201, 202, 203)	3	3	3
Elementary General Chemistry (Ch 101, 102, 103)	3	3	3
English Composition (Eng 111, 112, 113)	3	3	3
Social Ethics (PE 131)	---	---	---
² Appreciation of Music (Mus 121)	1	(1)	(1)
Introduction to Home Economics (HAD 101)	1	---	---
Family and Personal Budgets (HAD 240)	---	1	---
General Hygiene (PE 150)	(2)	2	(2)
Physical Education	1	(1)	1
³ Electives	---	---	3
	15	15	16

Sophomore Year

Foods (FN 220, 221, 222)	3	3	3
Textiles (CT 250)	(3)	(3)	3
Clothing (Selection) (CT 211)	3	(3)	(3)
Clothing (Construction) (CT 212)	(3)	(3)	3
Organic Chemistry (Ch 226)	4	---	---
Elements of Biochemistry (Ch 250)	---	4	---
Physiology (Z 306, 307)	3	3	---
Literature	3	3	3
⁴ Outlines of Psychology (Psy 221, 222)	(3)	3	3
Physical Education	1	1	1
	17	17	16

Junior Year

Costume Design (CT 311)	3	(3)	(3)
Clothing (CT 312) or Applied Design (CT 335)	(3)	(3)	3
Home Furnishing (CT 331)	(3)	3	(3)
General Bacteriology (Bac 204)	(3)	(3)	3
Household Management (HAD 340)	(3)	(3)	3
Nutrition (FN 320, 321)	3	3	(3)
General Sociology (Soc 211)	(4)	4	(4)
Child Development (HAD 311, 312)	3	3	(3)
Extempore Speaking (Sp 111) or Elementary Journalism (J 111)	3	(3)	(3)
Outlines of Economics (Ec 211)	4	(4)	(4)
Household Physics (Ph 214)	---	---	4
Electives	---	3	4
	16	16	17

Senior Year

Family Relationships (HAD 422)	2	(2)	(2)
Home Management House (HAD 350)	(5)	5	(5)
Political Science	(3)	(3)	3
Electives	14	11	13
	16	16	16

¹HAD 413 or HAD 425 may be substituted.²Mus 122, 123 are recommended electives.³Students who have not had sufficient preparation in clothing are required to take CT 111 in their freshman year as a prerequisite to CT 212. For exemption from CT 111 the student must pass the clothing placement test given at the opening of the fall term.⁴Or Psy 201, 202, 203.

Curriculum C

A minimum of 45 term hours in home economics is required. Of the required 45 term hours 39 are prescribed. See statement on pages 71-72 regarding the science, social science, or arts and letters requirement for B.S. or B.A. degree.

During the freshman and sophomore years the student must have taken an approved program in arts and sciences leading to the Junior Certificate or equivalent. Courses in home economics need not have been taken, but students who find it possible to take a year (9 term hours) of foods or of clothing and textiles, or both, will be enabled to elect a wider range of advanced courses in home economics during their junior and senior years.

	Term hours		
	F	W	S
Junior Year			
Nutrition (FN 225)	3	(3)	(3)
Foods (FN 211, 212, 213) or (FN 220, 221, 222)	3	3	3
Textiles (CT 250), Clothing (CT 211, 212) or Clothing Selection (CT 217), Clothing Construction (CT 218, 219)	3	3	3
Home Furnishing (CT 331 or 331)	(3)	3	(3)
Outlines of Economics (Ec 211)	(4)	4	(4)
Outlines of Psychology (Psy 221, 222)	3	3	(3)
Family and Personal Budget (HAD 240)	4	1	10
Electives	16	17	16
Senior Year			
Electives in Home Economics courses (upper division)	3	3	3
Household Management (HAD 340)	3	(3)	(3)
Child Development (HAD 311, 312)	3	3	(3)
Feeding the Family (FN 325)	2	2	2
Home Management House (HAD 350)	(5)	(5)	5
General Sociology (Soc 212)	(3)	3	(3)
Political Science	(3)	3	(3)
Electives	7	7	6
	16	16	16

Suggested Elective Combinations

Home Economics students wishing to prepare for certain earning phases of home economics may elect any of the following groups of courses.

COMMERCIAL WORK IN CLOTHING, TEXTILES, AND RELATED ARTS

For students interested in commercial work in the fields of clothing, textiles, and related arts the following courses are suggested:

	Term hours
French	12
Organic Chemistry	4
Art Appreciation (AA 114, 115, 116)	6
Lower-Division Drawing	6
Consumer Buying in Clothing and Textiles (CT 350)	3
Dress Design (CT 411)	3
Commercial Clothing (CT 412)	3
Clothing for Children (CT 420)	3
Home Furnishing (CT 431)	3
Applied Design (CT 435)	3
Textiles (CT 450)	3
Merchandising and Selling (SS 436)	3
Educational Psychology (Ed 312)	3
Elementary Journalism (J 111)	3
Extempore Speaking (Sp 111)	3
Radio Speaking (Sp 334)	3

COMMERCIAL WORK IN FOODS AND NUTRITION

For students in Curriculum B preparing for commercial positions, such as journalism, radio, or food demonstration work, the following courses are suggested:

	Term hours
Extempore Speaking (Sp 111)	3
Elementary Journalism (J 111)	3
Experimental Cookery (FN 435)	3
Food Purchasing (FN 411)	3
Food Management (FN 412)	3
Food Demonstrations (FN 413)	3
Household Equipment (HAD 330)	3
Educational Psychology (Ed 312)	3
General Bacteriology (Bac 204, 205)	6

	Term hours		
	F	W	S
Voice and Diction (Sp 120)	3	---	3
Radio Speaking (Sp 334)	3	---	---
Nutrition of the Infant and Child (FN 421)	---	3	---
Quantity Cookery and Catering (IEc 311)	3	---	---
Economics of the Family (HAD 441)	3	---	---
Principles of Teaching (Ed 313)	3	or 3	or 3

CHILD DEVELOPMENT AND NURSERY SCHOOL

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		
	F	W	S
First Aid (PE 358)	---	---	2
Child Development (HAD 413)	---	---	3
Parent Education (HAD 423)	---	---	2
Nursery School Procedures (HAD 425, 426)	---	---	6
Studies in Child Development and Family Relationships (HAD 490)	---	---	3
Economics of the Family (HAD 441)	---	---	3
Statistical Methods in Education (Ed 517)	---	---	3
Individual Differences (Psy 471, 472, 473)	---	---	9
The following courses are suggested as desirable electives:			
Nutrition of the Infant and Child (FN 421)	---	---	3
House Planning in Relation to Function (HAD 443)	---	---	2
Character Education (Ed 490)	---	---	3
Group Thinking (Ed 491)	---	---	3
Character Education Problems (Ed 492)	---	---	3
Social Problems (Soc 411, 412)	---	---	4-6
Speech Defects (Sp 250)	---	---	3
The Family (Soc 312)	---	---	3
Clothing for Children (CT 320)	---	---	3

To be recommended for positions in wartime nursery schools or child-care centers, students should take HAD 425, followed by HAD 426 and HAD 405 (3 hours), allowing in their schedule 3 days per week, 9:00 a.m. to 4:00 p.m. for practice in the Nursery School. In addition, HAD 407, Seminar on the Nursery School, 2 hours, is required.

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 245-252 for requirements). These requirements for certification are not requirements for graduation in home economics. For those who wish to teach in reimbursed vocational departments, Curriculum A or B is required including Sp 111 and CT 312.

	Term hours		
	F	W	S
Secondary Education (Ed 311)	3	---	---
Educational Psychology (Ed 312)	3	---	---
Principles of Teaching (Ed 313)	---	3	---
Oregon School Law and Oregon System of Education (Ed 316)	2	or 2	or 2
History of Oregon (Hst 377)	---	---	3
Methods and Materials (Ed 408d)	3	or 3	or 3
Supervised Teaching (Ed 415) (hours to be arranged)	---	---	---
Organization and Administration of Homemaking Education (HEd 412)	3	or 3	or 3

INSTITUTION ECONOMICS AND DIETETICS

For students in Curriculum B preparing for positions as dietitians in hospitals, dormitories, cafeterias, hotels, and tearooms, the following courses are required:

	Term hours		
	F	W	S
General Bacteriology (Bac 204, 205)	---	---	---
Principles of Accounting (BA 111)	---	3	---
Educational Psychology (Ed 312)	---	---	---
Principles of Teaching (Ed 313)	---	3	---
Quantity Cookery and Catering (IEc 311)	---	---	---
Physiological Chemistry (Ch 330, 331)	---	2	3
Nutrition in Disease (FN 420)	---	---	3
Institutional Organization and Administration (IEc 430)	2	---	---
Institutional Equipment (IEc 420)	---	3	---
Institutional Marketing (IEc 440)	---	---	2
Institution Experience (IEc 450)	---	---	4

Suggested electives: Food Purchasing (FN 411), Food Management (FN 412), Food Demonstrations (FN 413), Experimental Cookery (FN 435), Advanced Nutrition (FN 422), Nutrition of the Infant and Child (FN 421), Readings in Nutrition (FN 481), Principles of Personnel Management (BA 414).

HOME ECONOMICS EXTENSION

For students preparing for positions in the field of home economics extension the following courses are suggested as electives.

	Term hours		
	F	W	S
Junior Year			
Educational Psychology (Ed 312)	---	3	---
Problems of the Consumer-Buyer (HAD 442)	---	3	---
Applied Design (CT 335)	---	---	3
Principles of Teaching (Ed 313)	---	---	3
Elementary Journalism (J 111)	3	---	---
Public Information Methods (J 313)	3	---	---
Community Drama (Sp 247)	---	3	---
Speech Defects (Sp 250)	---	---	3
Home Ground Planning (LA 279)	3	---	---

Senior Year			
Extempore Speaking (Sp 111)	3	---	---
Family Relationships (HAD 422)	---	---	2
Extension Methods (EM 411, 412), Reading and Conference (EM 405)	3	3	3
Food Purchasing (FN 411)	3	---	or 3
House Planning in Relation to Function (HAD 443)	---	---	2
Nursery School Procedures (HAD 425)	3	or 3	or 3
Nutrition of the Infant and Child (FN 421)	3	or 3	or 3
Household Equipment (HAD 330)	---	---	3

ONE YEAR OF HOME ECONOMICS

Students who plan to spend only one year in college should usually take the following home-economics courses:

	Term hours		
	F	W	S
Introduction to Home Economics (HAD 101)	1	---	---
Nutrition (FN 225)	---	3	---
Food Preparation (FN 218)	---	3	---
Clothing Selection (CT 217)	3	---	---
Clothing Selection and Construction (CT 218, 219)	---	3	3
Family Relationships (HAD 222)	2	---	---
Child Care and Training (HAD 225)	---	---	3
Home Furnishing (CT 231)	---	3	---

In addition students will take Eng 111, 112, 113; PE 131, 150, and required physical education; Psy 111, Sp 111, and a term of literature.

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, 161)	3	3	---
Textiles (CT 250)	---	---	3
Science (sequence meeting group requirement)	3	3	3
Literature or History of Western Civilization (Hst 201, 202, 203)	3	3	3
Family Relationships (HAD 222)	2	---	---
Family and Personal Budgets (HAD 240)	---	1	---

In addition students will take Eng 111, 112, 113; PE 131, 150, and required physical education; Sp 111, Mus 121, and an elective.

Second year:			
Foods (FN 211, 212, 213)	3	3	3
Clothing (CT 211, 212)	3	3	---
Home Furnishing (CT 331)	---	---	3
Nutrition (FN 225)	2	---	---
Outlines of Psychology (Psy 221, 222)	3	3	---
Outlines of Economics (Ec 211)	4	---	---
Household Management (HAD 340)	---	3	---
Child Development (HAD 225)	---	3	---
Home Management House (HAD 350)	---	---	5

In addition students will take required physical education and electives.

Suggested electives and substitute courses: HAD 330, CT 235 or 335, LA 279, AA 178, Ph 161, SS 121, 122, 123, J 111, R 211, 220, Literature, Eng 231, Soc 211, SS 111, 112, 113.

¹Ch 101, 102, and Ch 121 are recommended for students able to carry this work. Psy 201, 202, 203 with Psy 204, 205, 206 satisfies group requirement and will also be accepted as substitute for Psy 221, 222.

²If Ch 121 is taken, FN 220, 221, 222.

SUGGESTED MINORS

Suggested outlines of minors in various fields, such as arts and sciences, physical education, journalism, speech and dramatics, languages, business administration and secretarial science are supplied on request. See also SUBJECT PREPARATION for teaching on pages 247-252.

Clothing, Textiles, and Related Arts

OFFICES, classrooms, and laboratories of the Department of Clothing, Textiles, and Related Arts are located in the Home Economics Building. All necessary furnishings and equipment are available for thorough instruction in textiles, clothing, tailoring, costume design, house decoration, and applied design.

DESCRIPTION OF COURSES

REQUIRED

- Curriculum A: CT 211, 212, 250, 311 or 350, 331.
Curriculum B: CT 211, 212, 250, 311, 312 or 335, 331.
Curriculum C: CT 211, 212, 250, 331 or 217, 218, 219, 231.

ELECTIVE

- Curriculum A: CT 311, 312, 335, 350, 411, 412, 420, 431, 435, 450.
Curriculum B: CT 335, 350, 411, 412, 420, 431, 435, 450.
Curriculum C: CT 235, 311, 312, 335, 411, 412, 420, 431, 435, 450.
For students in education, secretarial science, etc.: CT 217, 218, 219, 231, 235, 250.

Students planning to register for clothing courses CT 111, 212, 312 should keep in mind, when planning their wardrobes for the college year, that these courses require a certain amount of clothing construction. Students in clothing and textiles courses who do not wish to make garments for themselves may be furnished material through orders given the department.

LOWER-DIVISION COURSES

- CT 111. **Elementary Clothing.** 3 hours any term.
Fundamental processes of hand and machine sewing; selection and construction of simple garments and household articles. Six periods laboratory work.
- 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, 161. Two lectures; 1 two-hour laboratory period.
- 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.
Required in Curriculum C and elective for students in other schools. Aims to develop good taste in dress and to give an appreciation in selection of clothing from standpoint of beauty, health, and economy.
- CT 218, 219. **Clothing Construction.** 3 hours each term, winter and spring.
Principles of selection and construction applied in planning and construction of garments. Elective for students other than home economics. Prerequisite to CT 219: CT 217. Three two-hour laboratory periods.
- CT 231. **Home Furnishing.** 3 hours fall.
Elective for students other than home economics. Aims to develop appreciation of beauty and suitability in home furnishings; materials and processes involved. Three two-hour laboratory periods.

CT 235. Applied Design. 3 hours spring.

Required in Curriculum C; elective for students in other schools. Decorative art involving a consideration of line, form, and color as applied to problems in weaving, block print, stenciling, etc. Three two-hour laboratory periods.

CT 250. Textiles. 3 hours any term.

Fabrics; buying and use of clothing and house-furnishing materials; properties, uses of different textile fibers and fabrics. Prerequisite: chemistry desirable but not required. Two lectures; 1 two-hour laboratory period.

UPPER-DIVISION COURSES

CT 311. Costume Design. 3 hours any term.

Art principles applied in selection and design of appropriate costumes; historic costume and relation to modern dress. Prerequisite: CT 212, 250. One lecture; 2 two-hour laboratory periods. Professor Fritchhoff.

CT 312. Clothing. 3 hours any term.

Principles of tailoring and draping; independence, initiative, originality in designing, planning, and constructing garments. Prerequisite: CT 311. Six laboratory periods. Assistant Professor Strickland.

CT 320. Clothing for Children. 3 hours fall.

Selection and construction of clothing for children from the standpoint of health, beauty, and cost. Prerequisite: CT 212, 250. One lecture; 2 two-hour laboratory periods. Assistant Professor Strickland.

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.178. One recitation; 2 two-hour laboratory periods. Associate Professor Patterson.

CT 335. Applied Design. 3 hours any term.

Line, form, and color; original designs executed in various media for clothing and house-furnishing accessories; weaving, block printing, etc. Prerequisite: CT 212, 250. Three two-hour periods. Associate Professor Patterson.

CT 350. Consumer Buying in Clothing and Textiles. 3 hours.

Problems in the production and consumption of textiles and clothing, with emphasis on the economic principles involved. Prerequisite: CT 212, 250 Ec 211.

CT 401. Research. Terms and hours to be arranged.**CT 403. Thesis.** Terms and hours to be arranged.**CT 405. Reading and Conference.** Terms and hours to be arranged.**CT 407. Seminar.** Terms and hours to be arranged.**CT 411. Dress Design.** (G) 3 hours spring.

Designing, modeling, and creative work; historic costume and its relation to modern fashions. Prerequisite: CT 312. One lecture; 2 two-hour laboratory periods. Professor Fritchhoff.

CT 412. Commercial Clothing. (G) 3 hours winter.

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. Assistant Professor Strickland.

CT 431. Home Furnishings. (G) 3 hours spring.

Further study of interior decoration as applied to the small home, with practical application of skills and practices. Prerequisite: CT 331, 335. One lecture; 2 two-hour laboratory periods. Associate Professor Patterson.

CT 435. Applied Design. (G) 3 hours winter.

For students desiring advanced work in applied design. Prerequisite: CT 331, 335. Three two-hour laboratory periods. Associate Professor Patterson.

CT 450. Textiles. (G) 3 hours fall.

Recent research; gathering consumer information and presenting it by radio, exhibits, or brief talks. Prerequisite: CT 331, 350, one year chemistry. Two lectures; two hours laboratory. Associate Professor Gatton.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

CT 501. Research. Terms and hours to be arranged.**CT 503. Thesis.** Terms and hours to be arranged.**CT 505. Reading and Conference.** Terms and hours to be arranged.**CT 507. Seminar.** Terms and hours to be arranged. Professor Fritchhoff and staff.

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 home demonstration agents, county agents, 4-H club agents, extension specialists, and for similar types of work in which extension methods are commonly used.

The extension worker must be well trained not only in the subject matter of her field but also in the methods by which extension work is successfully carried on. She must be able to give or know how to obtain authoritative advice for her community or county on any problem that may arise related to her field of service. She must know and practice the technique of platform speaking and demonstration, radio speaking, how to conduct discussions, and how to support the extension program by effective publicity. Excellent opportunities for combining a major in home economics with training in journalism, speech and dramatics, economics, sociology, and other departments, supplemented by work in extension methods, should materially assist in meeting the need for better training on the part of extension workers.

This department is a joint department within both the School of Agriculture and the School of Home Economics.

DESCRIPTION OF COURSES**UPPER-DIVISION COURSES****EM 405. Reading and Conference.** Terms and hours to be arranged.

Professor Sager and Associate Professor Mack.

EM 411, 412. Extension Methods. (G) 3 hours each term.

History and organization of extension work; methods employed by extension specialists, county agricultural and home demonstration agents, 4-H club leaders, etc. Professor Sager.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

Foods and Nutrition

FIVE laboratories for foods instruction, accommodating eighteen students each, are provided. Two dining rooms and small kitchens are used in meal service in the department and for occasions by the school. For work in nutrition a chemical laboratory, a basal-metabolism laboratory, and laboratories for animal experimentation are provided.

DESCRIPTION OF COURSES

REQUIRED

Curriculum A: FN 211, 212, 213, 225, 325, 411.

Curriculum B: FN 220, 221, 222, 320, 321.

Curriculum C: FN 211, 212, 213 or 220, 221, 222, and 225, 325.

ELECTIVE

Curriculum A: FN 211, 212, 213, 225, 325, 411.

Curriculum B: FN 220, 221, 222, 320, 321.

Curriculum C: FN 211, 212, 13 or 220, 221, 222, and 225, 325.

For students in education, pharmacy, etc.: FN 211, 212, 213, 218, 224, 225, 240, 250.

LOWER-DIVISION COURSES

FN 211, 212, 213.* Foods. 3 hours each term.

Selection, preparation, and service. Prerequisite or parallel; one year of biological or physical science. FN 225 should parallel or precede FN 213. Two recitations; 2 two-hour laboratory periods.

FN 218. Food Preparation. 3 hours any term.

For women students not majoring in home economics. Basic principles of food preparation, menu making, and meal service. One recitation; 2 two-hour laboratory periods.

FN 220, 221, 222.* Foods. 3 hours each term.

Foods in scientific and economic aspects; selection, preparation, and service. Prerequisite: Ch 101, 102, 103; Ch 226 prerequisite or parallel. Two recitations; 2 two-hour laboratory periods.

FN 224. Nutrition for National Defense. 1 hour any term.

National and local situation in nutrition; present plan for dealing with it; nutritive values of foods; diet patterns; adequacy of student diets; dietary deficiencies; diet in physical fitness program.

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 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.

* 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.

UPPER-DIVISION COURSES

- FN 320. **Nutrition.** 3 hours any term.
Digestive and metabolic processes and products; quantitative basis in dietetics; standards adopted. Prerequisite: FN 222, Ch 250, Z 306; Z 307 may be parallel. Two lectures; 1 two-hour period. Assistant Professor Garrison.
- FN 321. **Nutrition.** 3 hours any term.
Application of principles of nutrition to individual and family group; projects in animal experimentation. Prerequisite: FN 320. Two lectures; 1 two-hour period. Assistant Professor Garrison.
- FN 325. **Feeding the Family.** 2 hours spring.
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 225, FN 213.
- FN 401. **Research.** Terms and hours to be arranged.
- FN 403. **Thesis.** Terms and hours to be arranged.
- FN 405. **Reading and Conference.** Terms and hours to be arranged.
- FN 407. **Seminar.** Terms and hours to be arranged.
- FN 411. **Food Purchasing.** 3 hours any term.
Standards, grades, and qualities of food products; factors governing cost; food laws; ethics of buying and selling. Prerequisite: FN 213 and 225, or 222; Ec 211. Two lectures; 2 two-hour periods. Associate Professor Kols-horn.
- FN 412. **Food Management.** (g) 3 hours fall or winter.
Includes complete responsibility in purchasing, menu making, meal management. Prerequisite: FN 213, 225, 411; or FN 222, 320. Six periods. Assistant Professor Arnold.
- FN 413. **Food Demonstrations.** (g) 3 hours.
Principles and techniques; practical experience. Especially for students interested in commercial work or teaching. Prerequisite: FN 213, 225, 411; or FN 222, 320. Six periods. Assistant Professor Arnold.
- 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. Professor Williams.
- Hed 420. **Community Problems in Nutrition.** (G) 3 hours.
Nutrition problems of high-school teacher in contacts with community. Individual and group field projects in a nutrition-health program. Prerequisite: FN 321, Ed 313. Assistant Professor Garrison.
- FN 421. **Nutrition of the Infant and Child.** (G) 3 hours.
Nutritional needs from prenatal life through adolescence; maternal dietary requirements. Prerequisite: FN 321. Professor Williams.
- FN 422, 423. **Advanced Nutrition.** (G) 3 hours each term. Students may register for one or two terms.
Problems in energy metabolism; vitamin values; calcium and phosphorus studies; surveys of dietaries; balance studies. 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; preparation for independent investigations. Prerequisite: Ch 226, FN 222. Associate Professor Kolshorn.

FN 481. Readings in Nutrition. (G) 3 hours.

Research studies in nutrition reviewed; interpretations and significance. Fundamental course for graduate work in nutrition. 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 Williams and staff.****Home Economics Education**

PROFESSIONAL training for prospective teachers of home economics is afforded by the Department of Home Economics Education. Any student having a scholarship record below average should confer with the Dean of the School of Home Economics before registering for teacher-training work.

This department is a joint department within both the School of Home Economics and the School of Education.

DESCRIPTION OF COURSES**UPPER-DIVISION COURSES****HEd 401. Research. Terms and hours to be arranged.****HEd 403. Thesis. Terms and hours to be arranged.****HEd 405. Reading and Conference. Terms and hours to be arranged.****HEd 407. Seminar. Terms and hours to be arranged.****Ed 408d. Methods and Materials. (See Ed 408, page 251). Professor Blazier.****HEd 412. Organization and Administration of Homemaking Education. (G) 3 hours any term.**

Typical organizations of homemaking departments on both vocational and nonvocational basis; equipment and management. Prerequisite: Ed 408d. Professor Blazier.

HEd 413. The Supervision of Home Projects. (G) 2 hours spring.

Use of home projects in home-economics instruction; field work in supervision of home projects. Prerequisite: HEd 412. One recitation; 1 two-hour laboratory period. Professor Blazier.

HEd 420. Community Problems in Nutrition. (G) 3 hours winter.

Nutrition problems 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. Assistant Professors Roberts and Garrison.

HEd 440. Adult Education in Home Economics. (G) Hours to be arranged, winter.

Problems in the adult-education program authorized under the Smith-Hughes Act; field work in promoting, organizing, observing, and teaching adult classes. Prerequisite: HEd 412. Professor Blazier.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

HEd 501. Research. Terms and hours to be arranged.

Problems in home economics education. Professor Blazier.

HEd 503. Thesis. Terms and hours to be arranged.

HEd 505. Reading and Conference. Terms and hours to be arranged.

HEd 507. Seminar. Terms and hours to be arranged. Professor Blazier.

Household Administration

IN THE Department of Household Administration instruction is offered in household management, economics of the family, problems of the consumer-buyer, home nursing, household equipment, housing, child development, nursery school, parent education, and family life. Offices, classrooms, and equipment laboratory are located in the Home Economics Building. Two well-equipped Home Management Houses, the Nursery School, and the Federal Cooperative Nursery School, are located on the campus.

DESCRIPTION OF COURSES

REQUIRED

Curricula A and B: HAd 101, 240, 311, 312, 340, 350, 422.

Curriculum C: HAd 240, 311, 312, 340, 350.

ELECTIVE

Curricula A and B: HAd 230, 330, 401, 403, 405, 407, 413, 423, 425, 426, 441, 442, 443, 490.

Curriculum C: HAd 230, 330, 401, 403, 405, 407, 413, 422, 423, 425, 426, 441, 442, 443, 490.

For students in secretarial science, education, pharmacy, etc.: HAd 222, 225, 230, 101, 239, 240, and any other courses for which prerequisites have been taken.

LOWER-DIVISION COURSES

HAd 101. Introduction to Home Economics. 1 hour fall.

Aims to orient beginning students in the field of home economics and to assist them in adjusting themselves to college life.

HAd 222. Family Relationships. 2 or 3 hours any term.

Aims to give a better understanding of present-day family life and some of the problems existing. Open to both men and women. Two recitations.

HAd 225. Child Care and Training. 3 hours winter or spring.

Growth, development, care, and training of the young child; observations in the nursery school. For students not in home economics degree curricula. Open to both men and women. No prerequisites.

HAd 230. Home Nursing. 2 hours any term.

Home care of the sick; demonstrations of ordinary nursing techniques under home conditions; improvising equipment.

HAd 239. Home Management. 3 hours spring.

Problems in management of home; management of money, time, and energy in relation to family living. For students not in home-economics degree curricula; for both men and women. No prerequisites.

HAd 240. Family and Personal Budgets. 1 hour winter or spring.

Unit course for students who desire to gain greater proficiency in control of their personal finances and knowledge of the principles governing the making of family budgets. Open to both men and women.

UPPER-DIVISION COURSES

HAd 311, 312. Child Development. 3 hours each term, fall and winter or winter and spring.

Growth and development of normal preschool child; observations in nursery school. Prerequisite: Psy 201, 202, 203, or 221, 222. Three recitations; 1 one-hour observation period. Professors Brandon and Prentiss.

HAd 330. Household Equipment. 3 hours spring.

Selection, operation, care, and arrangement of household equipment. Prerequisite: one term of foods. Two recitations; 1 three-hour laboratory period.

HAd 340. Household Management. 3 hours any term.

Problems arising in management of a home; management of time and energy. Prerequisite: FN 213 or 222; Ec 211 (may parallel), HAd 240.

HAd 350. Home Management House. 5 hours any term.

Principles underlying management of a home are put into practice during six weeks' residence in a house. Prerequisite: HAd 311, 312, HAd 340. Associate Professor Oehler and assistants.

HAd 401. Research. Terms and hours to be arranged.**HAd 403. Thesis.** Terms and hours to be arranged.**HAd 405. Reading and Conference.** Terms and hours to be arranged.**HAd 407. Seminar.** Terms and hours to be arranged.**HAd 413. Child Development.** (G) 3 hours fall.

Growth and development in middle and late childhood and early adolescence. Prerequisite: HAd 311, 312. Professor Brandon.

HAd 422. Family Relationships. (G) 2 hours any term.

Factors entering into adjustments within modern family group. Prerequisite or parallel: HAd 312, 340; or Ed 460, 461, 490, or equivalent. Open to both men and women. Professor Prentiss.

HAd 423. Parent Education. (G) 2 hours winter.

Methods and content in parent education. Prerequisite: HAd 312; HAd 340. It is suggested that Ed 491 precede this course. Two recitations. Associate Professor Read.

HAd 425, 426. Nursery School Procedures. (G) 3 hours each term.

Developing insight into child behavior; promoting growth through enrichment of environment. Observation and practice. Prerequisite: HAd 311, 312.* Two three-hour periods; 2 recitations. Associate Professor Read.

* HAd 425 prerequisite to 426 but may be taken alone.

HAd 441. Economics of the Family. (G) 3 hours fall.

Family income, sources, adequacy, distribution; household production; economic contribution of women in homemaking. Prerequisite: Ec 211, HAd 340 (latter may be taken parallel).

HAd 442. Problems of the Consumer-Buyer. (G) 3 hours winter.

Problems of household buyer in an intelligent selection of goods on modern market; types of retail marketing agencies; methods of improving consumer-buying. Prerequisite: Ec 211, HAd 340.

HAd 443. House Planning in Relation to Function. (G) 2 hours.

Private dwellings from standpoint of varying needs and interests; "ideal" whole-family house; evaluation of features as basis for elimination when planning houses. Prerequisite: HAd 312, 340. Offered in summer quarter.

HAd 490. Studies in Child Development and Family Relationships. (G) 3 hours fall or winter.

Methods and techniques used in experimental investigations of child development and family relationships. Prerequisite: HAd 311, 312, 422. Professor Brandon.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G) may be taken for graduate credit.

HAd 501. Research. Terms and hours to be arranged.**HAd 503. Thesis. Terms and hours to be arranged.****HAd 505. Reading and Conference. Terms and hours to be arranged.****HAd 507. Seminar. Terms and hours to be arranged.**

Institution Economics

COURSES in institution economics are planned to meet the needs of students who desire to prepare for positions in the field of institutional management. Two halls of residence for women and five for men, together with the banquet rooms and tea rooms in the Memorial Union, are used as laboratories. The facilities are adequate for thorough training in this field.

DESCRIPTION OF COURSES**UPPER-DIVISION COURSES****IEc 311. Quantity Cookery and Catering. 3 hours fall.**

Standardization of formulas, dietetic value, cost; equipment; menu planning; preparation and service of foods for special functions. Prerequisite: FN 213 or 222. One lecture; 2 two-hour periods. Assistant Professor Bibee.

IEc 320. Cafeteria Management. 3 hours.

For student who plans to teach and manage a school cafeteria. Menu study, cafeteria plans, accounting, quantity cookery. At present offered summer quarter only. Prerequisite: FN 213 or 222. Assistant Professor Bibee.

IEc 401. Research. Terms and hours to be arranged. Professor Hunter.**IEc 403. Thesis. Terms and hours to be arranged. Professor Hunter.**

- IEc 405. **Reading and Conference.** Terms and hours to be arranged. Professor Hunter.
- IEc 407. **Seminar.** Terms and hours to be arranged. Professor Hunter.
- IEc 420. **Institutional Equipment.** (g) 3 hours winter.
Equipment for bedrooms, living rooms, dining rooms, and kitchens in different types of institutions; design, materials; construction, cost, and arrangement. Prerequisite: HAd 340. Professor Hunter.
- IEc 430. **Institutional Organization and Administration.** (g) 2 hours fall.
Principles of organization and administration as applied to various types of institutions; discussion of employment problems and training, labor laws, office records. Prerequisite: HAd 340. Professor Hunter.
- IEc 440. **Institutional Marketing.** (g) 2 hours spring.
Food purchasing; production and distribution of food commodities; marketing costs; factors influencing prices; marketing of meats, vegetables, fruits, eggs. Prerequisite: HAd 340. Professor Hunter.
- IEc 450. **Institution Experience.** (G) 4 hours spring.
Practice work in halls of residence, Memorial Union Dining Service, and office of director of dormitories. Prerequisite: IEc 311, 420, 430, 440. One lecture; 3 two-hour laboratory periods. Assistant Professor Bibee.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

- IEc 501. **Research.** Terms and hours to be arranged.
- IEc 503. **Thesis.** Terms and hours to be arranged.
- IEc 505. **Reading and Conference.** Terms and hours to be arranged.
- IEc 507. **Seminar.** Terms and hours to be arranged.

School of Pharmacy

Faculty

ADOLPH ZIEFLE, M.S., Phar.D., Dean of the School of Pharmacy.
LULA MARY STEPHENSON, Secretary to the Dean.

Practical Pharmacy

ASSOCIATE PROFESSOR BRITT (in charge of department).
PROFESSOR ZIEFLE.

Pharmaceutical Analysis

ASSISTANT PROFESSOR HENRY (in charge of department, director of the Drug Laboratory of the Oregon State Board of Pharmacy).

Pharmacology and Pharmacognosy

ASSOCIATE PROFESSOR STUHR (in charge of department).

General Statement

IN 1898, on petition of the druggists of Oregon, pharmacy was first established as a separate department of Oregon State College. The aim was to provide for more thorough theoretical and practical instruction than could be provided in the average drug store, in which up to that time most young men and women were trained for the pharmacy profession. From its inception the department grew steadily, and in 1917 it was raised to the rank of a school. The school is an integral part of the State College organization, and as a consequence has shared in the support accorded by the State of Oregon and the national government. As a result of this support, together with the fact that it is a part of a great educational institution, the school is equipped to offer standard curricula and to maintain a high degree of excellence in its work.

The School of Pharmacy is a member of the American Association of Colleges of Pharmacy and is accredited by the American Council on Pharmaceutical Education. Institutions holding membership in these organizations must maintain certain minimum requirements for entrance and graduation. Their influence has been so great that many states either by law or by ruling of the state board of pharmacy recognize their standards. Diplomas as well as the work of students in this school are recognized by all state boards of pharmacy requiring graduation from an accredited school of pharmacy as a prerequisite for examination and registration.

Requirements of the Pharmaceutical Profession. Public sentiment demands high requirements for the practice of pharmacy through the enactment of stringent state and federal laws. Pharmacists must now have a scientific training such as cannot be obtained by merely working in a drug store. The minimum college requirement of the Oregon State Board of Pharmacy is com-

pletion of an accredited four-year curriculum in pharmacy as a prerequisite for examination and registration.

Pharmacy as a Profession for Women. No field of work offers more desirable opportunities for women than pharmacy. The work is clean, pleasant, and agreeable, and women are peculiarly adapted to it. The technical work of manufacturing and dispensing drugs involves the traits of neatness and accuracy that, generally speaking, are more predominant in women than in men. As more than seventy-five per cent of all drugs and druggists' sundries are purchased by women, it is natural that those patrons should often prefer to deal with women.

Drug-Store Experience. The Oregon State Board of Pharmacy requires one year of drug-store experience (2,400 hours) before registration can be granted. Students are not required to have had such experience to register in or be graduated from the School of Pharmacy. Such experience is very desirable, however, and students are urged to acquire one or preferably two years of experience before taking up the courses in pharmacy. The Oregon State Board of Pharmacy does not allow credit for part-time drug-store experience while the student is in attendance at any educational institution.

Oregon Law Relating to the Practice of Pharmacy. The Oregon State Pharmacy Law is enforced by the Oregon State Board of Pharmacy. The state law outlines the scope and duties of registered pharmacists with regard to the dispensing of prescriptions, the sale of poisons, and other professional services. A registered pharmacist may operate and manage a drug store, compound medicinal substances, and sell poisons, and it is his duty to train apprentices in the professional phases of pharmacy.

A resumé of the Oregon State Pharmacy Law passed in 1921 and amended in 1935 is as follows:

To qualify as REGISTERED PHARMACIST, a candidate must meet the following requirements:

- (1) He must be an American citizen and at least twenty-one years of age.
- (2) He must be a graduate of a school or college of pharmacy accredited by the Oregon State Board of Pharmacy, the American Association of Colleges of Pharmacy, and the American Council on Pharmaceutical Education.
- (3) He must take the registered pharmacist's examination, make a weighted average of seventy-five per cent, and not fall below sixty per cent in any one subject. His grade in the examination in compounding prescriptions and practical work must be at least seventy-five per cent.
- (4) He must have completed one year of practical drug-store experience under the supervision of a registered pharmacist comprising a minimum of at least 2,400 hours of work per calendar year. In no case will more than 2,400 hours of practical experience be credited for any calendar year. In no case may drug-store experience be counted that the candidate may have had before his sixteenth birthday. No credit is allowed for drug-store experience gained while in attendance at a school or college of pharmacy. Blanks are provided by the State Board of Pharmacy for the registration of practical experience. All such experience must be certified to on an affidavit by a registered pharmacist.

Eligibility for Examination. All graduates of the School of Pharmacy who are American citizens and twenty-one years of age are eligible to take the examinations of the Oregon State Board of Pharmacy. Those graduates who pass in all subjects and meet all other requirements receive the certificate of registered pharmacist. Graduates who have not completed at least 2,400 hours of drug-store work have no standing whatsoever as registered pharmacists until they can fulfill this requirement.

Preparation for Examinations of State Boards of Pharmacy. Before they can practice pharmacy, all graduates are required to pass the examination of a state board of pharmacy. During the third term of each academic year,

the faculty organizes review classes for senior students for the purpose of giving trial state-board examinations, studying typical state-board questions, studying specimens of drugs and chemicals for examination in identification, giving oral examinations, and using all other means to aid the students in the various subjects in which they will be examined. Because of this service graduates of the School of Pharmacy have made an outstanding record in the examinations of the Oregon State Board of Pharmacy.

Reciprocity. As the Oregon State Board of Pharmacy is a member of the National Association of State Boards of Pharmacy, graduates who are registered by this Board are privileged to reciprocate without further examination with all states except California and New York.

O. S. P. A. Educational Fund. Oregon druggists assembled at the thirty-sixth annual convention of the Oregon State Pharmaceutical Association held in the Pharmacy Building, July 1925, established an Educational Fund to assist worthy students of the School of Pharmacy who have a reasonable amount of means to complete their course. The operation of the fund is under the direction of a Board of Trustees elected from membership in the state association. As a basis for granting loans students are required to submit on the application form a budget, references, the name of a guarantor, and other information regarding their assets and liabilities. The average loan per student per year is \$100. Only in exceptional cases are loans granted during the first term.

Major Curricula

FOUR-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 curriculum. In the junior and senior years the curricula are differentiated into Practical Pharmacy and Professional Pharmacy. The distinction between these two fields of study is one of emphasis, as service in the field of either curriculum is both practical and professional. A total of 192 term hours must be completed for a degree in either curriculum.

A. PRACTICAL PHARMACY CURRICULUM. This curriculum is designed to provide thorough instruction in pharmacy, chemistry, biology, accounting, business law, and related subjects, to prepare the student not only to pass the examinations of state boards of pharmacy but to serve efficiently in all branches of practical drug-store work. As the commercial phases of pharmacy are rapidly becoming a dominant feature of the modern drug store, a series of lectures and demonstrations in the model drug store is given each year to the members of the senior class by a group of twenty nonresident lecturers representing all phases of the drug business.

Fields open to thoroughly prepared and experienced pharmacists include: preparation and dispensing of medicines; service as dispensers and clinical technicians in hospitals, managers and proprietors of drug stores, chemists and department managers for laboratories that manufacture drugs and chemicals; public-health work where the graduate is expected to advise the public in health and sanitation, and a variety of other positions demanding a knowledge of pharmacy and related subjects.

- B. **PROFESSIONAL PHARMACY CURRICULUM.** Students wishing to enter positions demanding more intensive preparation in scientific and cultural subjects than is provided in the practical pharmacy curriculum, together with basic training in pharmacy and related subjects, may prepare through this curriculum for the following positions: research and manufacturing chemists with wholesale drug firms; traveling representatives with drug firms who call on physicians and pharmacists in the interest of newly developed drugs and other substances; inspectors for state and federal bureaus; pharmacists and specialists with the United States government in the departments of public health, veterans' administration, the Navy, the Army, internal revenue department, federal pure-food and drug laboratories, chemists with state boards of health and state food and drug laboratories, and a variety of other positions. Graduates of this curriculum are eligible to take the examinations of any state board of pharmacy. If they qualify as registered pharmacists, they are licensed to dispense prescriptions and to operate a drug store.

Options in the election of courses are permitted according to the student's interests and needs. Prior to registration for each term the dean outlines for each student the courses he should elect to fulfill his objective, together with delinquencies.

As the State College is listed as an approved institution by the American Medical Association, a student by completing the professional pharmacy curriculum can qualify in the period of four years for admission to a Class A medical school and for the degree of Bachelor of Arts or Bachelor of Science. For admission to the study of dentistry the preliminary educational requirements are two years (ninety term hours) of training in liberal arts and sciences, including one year of English, general chemistry, biology or zoology and physics, and one-half year of organic chemistry; the regular two-year premedical course as given by standard liberal-arts colleges is recommended. If a student is interested in any specific medical or dental school, he should study current catalogs and other requirements. Upon request the dean will furnish all information necessary to outline the student's program.

Advanced standing is granted to students transferring from other institutions of collegiate rank. Application for advanced standing is made on official transcript submitted to the Registrar. On receipt of the advanced-standing report, the dean makes a study of the student's case and outlines the program to be followed for graduation in pharmacy or for any other objective.

All transfer students who have not been registered in an accredited school or college of pharmacy, regardless of the amount of credit presented, must be registered in pharmacy for three collegiate years to qualify for graduation and examination by a state board of pharmacy. This requirement is effective in all accredited schools and colleges of pharmacy.

Graduate Work. Candidates for the master's degree 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. In all cases, a minimum of one entire academic year of three terms in residence is necessary when full time is devoted to the fulfillment of the requirements for the degree. If a candidate devotes part time to instructional work, for which compensation is received, a period longer than three terms is required. Institutional requirements for the degrees of Master of Arts and Master of Science will be found under GRADUATE DIVISION.

Facilities

MODERN facilities for the work of the School of Pharmacy are afforded in the Pharmacy Building. These include special laboratories, a model drug store, State Board of Pharmacy Drug Laboratory, a complete sign-card and window-trimming department, museum, library, and study room. The laboratories and lecture rooms are equipped with all apparatus necessary for practical pharmaceutical instruction. Students have individual desks supplied with the materials necessary for the specific course.

Model Drug Store. Donations from wholesale and jobbing firms, from manufacturers of drug-store fixtures, and from other sources have made it possible for the School of Pharmacy to equip a model drug store in the Pharmacy Building. The fixtures consist of Stedman's rubberoid flooring, 32 feet of mahogany English wall cases, 18 feet of plate-glass marble-base showcases, a 10-foot wrapping counter, a 10-foot mahogany prescription case, 25 feet of cross partition, an intercommunicating telephone, and similar displays. These fixtures, together with a complete stock, are used for instruction in salesmanship, showcase and window trimming, inventory, the keeping of poison and narcotic records, taking copies of prescriptions over a telephone, systematizing a drug stock, and store management. As the stock and fixtures were donated for instructional purposes, nothing is actually sold or dispensed.

State Drug Laboratory. The Oregon State Board of Pharmacy, in October 1927, established in the Pharmacy Building a State Drug Laboratory, which is supervised by trained chemists. The purpose of the laboratory is to assist Oregon pharmacists in enforcing Section 20 of the Oregon laws as amended in 1935 fixing the responsibility for the purity of drugs upon the pharmacist. The laboratory is maintained also to prevent dishonest practice and gross adulteration of medicinal substances sold by individuals other than pharmacists, and to make it a legal necessity that all drugs sold in the state shall be true to label.

The funds required to equip and maintain the laboratory are furnished by the Oregon State Board of Pharmacy. The room, permanent laboratory furniture, and other requisites are furnished by the State College. The director of the laboratory is a member of the faculty of the School of Pharmacy.

Four-Year Curricula in Pharmacy¹

B.A., B.S. Degrees

Practical Pharmacy

Professional Pharmacy

LOWER-DIVISION CURRICULUM

Freshman Year

	Term hours—		
	F	W	S
English Composition (Eng 111, 112, 113)	3	3	3
General Chemistry (Ch 204, 205, 206)	5	5	5
² History, Mathematics, or elective	3	3	3
Theoretical Pharmacy (Phr 111, 112)	3	3	—
³ Pharmaceutical Processes (Phr 113)	—	—	3
Military Science	1	1	1
⁴ Physical Education	1	1	1
	16	16	16

¹Both curricula as outlined include the necessary 36 term hours of science for a B.S. degree; the professional curriculum also includes the necessary 36 hours of arts and letters (including two years of a foreign language) necessary for a B.A. degree.

²Students who wish to enlist in the Army or Navy reserve corps may elect mathematics in the freshman year and physics in the sophomore year.

³Students expecting to major in the professional curriculum take German (GL 1, 2, 3, or equivalent), in place of Phr 111, 112, 113.

⁴General Hygiene (PE 150), 2 term hours, is taken one term in place of physical education. Women take Social Ethics (PE 131) one term.

	Sophomore Year			Term hours		
	F	W	S	F	W	S
Organic Chemistry (Ch 226, 227)	5	5	5	5	5	5
*Inorganic Pharmacy (Phr 311)	4	4	4	4	4	4
*German, Physics, or French (or elective)	2	2	2	2	2	2
*Sign Card Writing (Phr 211, 212)	3	3	3	3	3	3
Accounting for Technical Students (BA 385)	4	4	4	4	4	4
Business Law (BA 256) or elective	1	1	1	1	1	1
Natural Products and Drug Principles (PhA 321)	1	1	1	1	1	1
Physical Education	1	1	1	1	1	1
Military Science	1	1	1	1	1	1
Elective	1	1	1	1	1	1
	16	17	16	16	17	16

PRACTICAL PHARMACY

Junior Year

(See Lower-Division Curriculum above.)

General Bacteriology (Bac 204)	3	3	3	3	3	3
Pathogenic Bacteriology (Bac 332)	3	3	3	3	3	3
Immunity and Serum Therapy (Bac 333)	3	3	3	3	3	3
Practical Pharmacognosy (PhP 331, 332, 333)	3	3	3	3	3	3
Quantitative Drug Analysis (PhA 361, 362)	3	3	3	3	3	3
Physiology (Z 306, 307, 308)	3	3	3	3	3	3
Drug Assaying (PhA 327)	3	3	3	3	3	3
Pharmaceutical Calculations (Phr 313)	3	3	3	3	3	3
Microscopy of Drugs (PhP 438) or Military Science, or elective	(3) or (3)	(3) or (3)	(3) or (3)	(3) or (3)	(3) or (3)	(3) or (3)
Galenic Pharmacy (Phr 317)	3	3	3	3	3	3
Military Science or approved elective	3	3	3	3	3	3
	18	17	15	18	17	15

Senior Year

Practical Pharmacology (PhP 491, 492, 493)	3	3	3	3	3	3
Proprietary Remedies (Phr 451)	3	3	3	3	3	3
Organic Pharmacy (Phr 440)	3	3	3	3	3	3
U. S. Pharmacopoeia and National Formulary (Phr 441, 442)	3	3	3	3	3	3
Drug-Store Practices (Phr 447, 448, 449) or Military Science	3	3	3	3	3	3
Manufacturing Pharmacy (Phr 444)	3	3	3	3	3	3
Prescription Lectures (Phr 454)	3	3	3	3	3	3
Prescription Incompatibilities (Phr 455)	3	3	3	3	3	3
Prescription Compounding (Phr 456)	3	3	3	3	3	3
Approved elective	3	3	3	3	3	3
	15	15	15	15	15	15

PROFESSIONAL PHARMACY

Junior Year

(See Lower-Division Curriculum.)

Vertebrate Zoology (Z 204, 205, 206)	4	4	4	4	4	4
Theoretical Pharmacy (Phr 120)	4 or (4)	4 or (4)	4 or (4)	4 or (4)	4 or (4)	4 or (4)
Inorganic Pharmacy (Phr 311)	3	3	3	3	3	3
Practical Pharmacognosy (PhP 331, 332)	3	3	3	3	3	3
Pharmaceutical Calculations (Phr 313)	3	3	3	3	3	3
Galenic Pharmacy (Phr 317)	3	3	3	3	3	3
Vocabulary Building (Eng 211)	3	3	3	3	3	3
Elementary Physical Chemistry (Ch 340)	3	3	3	3	3	3
Military Science or nonscience elective	3	3	3	3	3	3
	17	18	15	17	18	15

¹Students expecting to major in the professional curriculum take Ch 232 instead of Phr 311.

²Both curricula as outlined include the necessary 36 term hours of science for a B.S. degree; the professional curriculum also includes the necessary 36 hours of arts and letters (including two years of a foreign language) necessary for a B.A. degree.

³Students expecting to major in the professional curriculum take General Physics (Ph 201, 202, 203) in place of Phr 211, 212, and omit the spring-term elective.

	Senior Year	Term hours		
		F	W	S
Elementary Psychology (Psy 201, 202)		---	3	3
Organic Pharmacy (Phr 440)		3	---	---
U. S. Pharmacopoeia and National Formulary (Phr 441, 442)		---	3	3
Practical Pharmacology (PhP 491, 492)		3	3	---
Prescription Lectures (Phr 454)		3	---	---
Prescription Compounding (Phr 456)		---	---	3
Literature or Public Speaking or Military Science		3	3	3
Natural Products and Drug Principles (PhA 321)		---	---	3
Approved electives		3	4	---
		15	16	15

Practical Pharmacy

IN THE Department of Practical Pharmacy are offered elementary, basic, and advanced courses in theoretical pharmacy, pharmaceutical processes, and commercial pharmacy. Most of the work is of upper-division and graduate character.

DESCRIPTION OF COURSES

LOWER-DIVISION COURSES

Phr 111, 112. **Theoretical Pharmacy.** 3 hours each term fall and winter.

Two lectures; 1 recitation; 1 three-hour laboratory period. Professor Ziefle, Associate Professor Britt.

Phr 113. **Pharmaceutical Processes.** 3 hours spring.

Fundamental manipulation used in manufacture of simple galenical preparations. Prerequisite: Phr 112 or 120. Two lectures; 1 recitation; 1 three-hour laboratory period. Associate Professor Britt.

Phr 120. **Theoretical Pharmacy.** 4 hours any term.

Same as Phr 111, 112, except no laboratory work. Admission restricted to students from other institutions with advanced standing for one year of general chemistry and other science. Five lectures. Professor Ziefle.

Phr 211, 212. **Sign Card Writing.** 2 hours each term fall and winter.

Printing of labels, price tags, and simple display signs; preparation of display standards and backgrounds; other display work. Students furnish brushes and pens. Three two-hour periods. Assistant Professor Henry.

Phr 220. **Household Preparations.** 3 hours any term.

Common remedies, technical preparations, toilet requisites, and druggists' sundries. Students prepare samples and study mode of application. Two lectures; 1 three-hour laboratory period. Professor Ziefle.

UPPER-DIVISION COURSES

Phr 311. **Inorganic Pharmacy.** 5 hours spring.

Inorganic chemicals and their preparations used in medicine. Students make samples of chemicals, tests for impurities. Prerequisite: Ch 205. Three lectures; 2 three-hour laboratory periods. Associate Professor Britt.

Phr 313. **Pharmaceutical Calculations.** 3 hours fall or winter.

Weights and measures used in pharmacy; percentage solution; alligation; specific gravity; thermometers; etc. Prerequisite: Ch 206, Phr 113. Associate Professor Britt.

¹Phr 447, 448, 449 required except for students taking advanced R.O.T.C.

- Phr 317. **Galenical Pharmacy.** 5 hours winter.
Galenical preparations as outlined in the U. S. Pharmacopoeia and National Formulary; preparation of simple galenicals. Prerequisite: PhP 331, Ch 226. Three lectures; 2 three-hour periods. Associate Professor Britt.
- Phr 440. **Organic Pharmacy.** 3 hours fall.
Organic chemicals and their preparations used in medicine; correlation between chemical constitution and physiological action. Prerequisite: Phr 317, PhP 333, Ch 227. Associate Professor Britt.
- Phr 441, 442. **U. S. Pharmacopoeia and National Formulary.** 3 hours each term winter and spring.
All drugs in United States Pharmacopoeia and National Formulary; unofficial drugs and preparations in dispensaries; composition; uses; manufacture. Prerequisite: Phr 440. Associate Professor Britt.
- Phr 444. **Manufacturing Pharmacy.** 3 hours fall.
Manufacture of the more complex pharmaceuticals involving chemical reactions in their preparation. Prerequisite: Phr 317, Ch 227. Three three-hour laboratory periods. Associate Professor Stuhr.
- Phr 447, 448, 449. **Drug-Store Practices.** 3 hours each term.
Establishing a store, arrangement, salesmanship, showcase and window trimming, inventory, narcotic and poison records, taking prescriptions over telephone, etc. Prerequisite: Phr 313. Two lectures; 1 three-hour period. Professor Ziefle.
- Phr 450. **Pharmacy Law.** 2 hours spring.
Oregon Pharmacy Law; promulgations of Oregon State Board of Pharmacy; Federal Food, Drugs, and Cosmetic Act, Harrison Narcotic Act; other laws. One lecture; 1 recitation. Professor Ziefle.
- Phr 451. **Proprietary Remedies.** 3 hours winter.
Preparations of pharmaceutical manufacturers; composition and therapeutic use. Text, *New and Nonofficial Remedies*, supplemented by literature and reports. Prerequisite: Phr 440. Assistant Professor Henry.
- Phr 454. **Prescription Lectures.** 3 hours fall.
Theory of prescription compounding; management of prescription department. Prerequisite: Phr 317, PhP 333, Ch 227. Two lectures; 1 three-hour laboratory period. Associate Professor Britt.
- Phr 455. **Prescription Incompatibilities.** 3 hours winter.
Several hundred incompatibilities are studied. Cause of incompatibility and best method of overcoming it. Prerequisite: Phr 454. Two lectures; 1 three-hour laboratory period. Associate Professor Britt.
- Phr 456. **Prescription Compounding.** 3 hours spring.
Students apply principles learned in Phr 454, 455 to compounding of more than one hundred prescriptions met with in actual practice. Prerequisite: Phr 455. One lecture; 2 three-hour periods. Associate Professor Britt.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

- Phr 501. **Research.** Terms and hours to be arranged.
- Phr 503. **Thesis.** Terms and hours to be arranged.
- Phr 505. **Reading and Conference.** Terms and hours to be arranged.
- Phr 507. **Seminar.** Terms and hours to be arranged.

Pharmaceutical Analysis

ALL courses in drug analysis, qualitative and quantitative, are offered through the Department of Pharmaceutical Analysis. All the work is of upper-division or graduate character. The Department of Pharmaceutical Analysis is under the supervision of the Director of the Drug Laboratory of the Oregon State Board of Pharmacy.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

PhA 321. Natural Products and Drug Principles. 3 hours spring.

Composition and identification of natural products, alkaloids, synthetic drugs, and newer remedies. Prerequisite: Ch 226. One lecture; 2 three-hour laboratory periods. Assistant Professor Henry.

PhA 327. Drug Assaying. 3 hours spring.

Quantitative determination of purity of more common official and unofficial drugs. Prerequisite: Ch 227. One lecture; 2 three-hour laboratory periods. Assistant Professor Henry.

PhA 361, 362, 363. Quantitative Drug Analysis. 3 hours each term.

Advanced methods. Students showing proficiency in this course may do special work in State Drug Laboratory. Prerequisite: Phr 311, Ch 227. One lecture; 2 three-hour laboratory periods. Assistant Professor Henry.

PhA 441. Toxicology. (G) 3 hours.

Detection of common inorganic and organic poisons; emphasis on alkaloids and synthetics. Prerequisite: PhP 333, PhA 321, Ch 227. One lecture; 2 three-hour laboratory periods. Assistant Professor Henry.

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

CCOURSES in the identification of medicinal plants, together with all courses dealing with the physiological action of drugs and their therapeutic value, are included in the Department of Pharmacology and Pharmacognosy. All the work is of upper-division or graduate character.

DESCRIPTION OF COURSES

UPPER-DIVISION COURSES

PhP 331, 332, 333. Practical Pharmacognosy. 3 hours each term.

Official botanical, animal, and synthetic drugs; macroscopic identification. Prerequisite: Phr 113, Ch 227. Associate Professor Stuhr.

PhP 438. Microscopy of Drugs. 3 hours any term.

Microscopic structure and characteristics of drugs; identifying powdered drugs; detecting adulterations. Prerequisite: PhP 332. Associate Professor Stuhr.

PhP 491, 492, 493. Practical Pharmacology. 3 hours each term.

Physiological action of drugs on human organism; toxicological aspects of poisonous drugs. Prerequisite: Phr 317, PhP 333. Two lectures; 1 three-hour laboratory period. Associate Professor Stuhr.

PhP 494. Pharmacological Standardization. (G) 3 hours winter or spring.

Biological assaying; methods of U. S. P.; certain unofficial but well-recognized procedures. Prerequisite: PhP 493, Ch 227, Bac 333, Z 308. One lecture; 2 three-hour laboratory periods. Associate Professor Stuhr.

GRADUATE COURSES

Courses numbered 400-499 and designated (g) or (G)
may be taken for graduate credit.

PhP 501. Research. Terms and hours to be arranged.

PhP 503. Thesis. Terms and hours to be arranged.

PhP 505. Reading and Conference. Terms and hours to be arranged.

PhP 507. Seminar. Terms and hours to be arranged.

Conducted jointly with Phr 507 and PhA 507.

Army Specialized Training Program

ERWIN BERTRAN LEMON, B.S., Dean of Administration; Coordinator of Army Specialized Training Program.

LIEUTENANT COLONEL GLEN MERRILL WEBSTER, B.S., Professor of Military Science and Tactics; Commandant.

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

GEORGE WALTER GLEESON, Ch.E., Assistant Dean of the School of Engineering and Industrial Arts.

CLAIR VAN NORMAN LANGTON, Dr.P.H., Ed.D., Director of the Division of Physical Education.

MAHLON ELLWOOD SMITH, Ph.D., Dean of Lower Division and Service Departments.

UNIT 3900 of the Army Specialized Training Program at Oregon State College was the first to be established in the Ninth Service Command.

The training program began in March 1943 with a group of 381 soldier students, and the group of 11 men who received certificates at special field exercises September 29, 1943, were among the first in the United States to complete the AST work. In the summer period the number of soldier students at Oregon State College was increased to 1,354; in the fall it was 1,279 and in the winter it was 1,260.

Purpose. The Army Specialized Training Program, established by the War Department in collaboration with civilian educators December 18, 1942, is officially described as follows: "Its purpose is to provide the continuous and accelerated flow of high grade technicians and specialists needed by the Army. To achieve this purpose, qualified soldiers are sent to colleges and universities selected by the War Department for terms of prescribed study in fields where the Army's own training facilities are insufficient in extent or character. These soldiers are selected on a broad, democratic basis. While in academic training they are on active duty, in uniform, under military discipline, and receive regular Army pay." Gen. George C. Marshall, Chief of Staff, United States Army, stated: "With the establishment of the minimum Selective Service age of 18, the Army was compelled to assure itself that there would be no interruption in the flow of professionally and technically trained men who have hitherto been provided in regular increments by American colleges and universities."

Program. The ASTP term is a twelve-week period. An interval of one week is provided between terms. The number of terms varies according to curricula. The program is divided into two phases: Basic and Advanced. The Basic phase is roughly equivalent to the first one and one-half years of a college course; it comprises three twelve-week terms and is in general prerequisite to the work of the Advanced phase except for students whose prior education has

included the Basic phase requirements. The Advanced phase, opening with courses ordinarily taken in the second half of the sophomore year, carries the student to a point of development commensurate with the Army's needs; in general this point is reached in four terms or less.

Credit. The curricula for the Army Specialized Training Program were prepared under the supervision of the Army by a group of outstanding teachers suggested by the American Council on Education and with the cooperation of an advisory committee composed of ten leading college and university presidents. In the opinion of this advisory committee the ASTP curricula are at the undergraduate and graduate level and are worthy of appropriate credit toward academic degrees. Suggestions have been made of the amount of credit that might properly be granted for the various phases of the work, but in all cases the determination of the credit to be allowed falls within the province of the institution that accepts the credit.

The regular faculty of Oregon State College, augmented by additional instructors to care for the increased numbers in certain fields and for new subjects, has provided all the instruction for the AST program. From the beginning, it has been the aim of the instructional staff to conduct the courses in the manner which the Army desired, but at the same time effort has been made to maintain as nearly as possible standard academic levels of achievement. The AST courses have been evaluated in terms of regular courses in order that students in AST Unit 3900 may receive for their studies academic credit applicable at Oregon State College and at other universities and colleges. Students who began their AST work at Oregon State College in March or June 1943 and who had had sufficient previous college work (some of them already held baccalaureate degrees) were able in some cases to complete requirements for an Oregon State College degree at the graduation exercises in December 1943 and March 1944.

Curricula. The following curricula have been offered at Oregon State College under Army contracts in the Army Specialized Training Program: Basic-Phase Curriculum, "R Term;" Basic-Phase Curriculum BE-1; Basic-Phase Curriculum B-1; Advanced-Phase Tentative Curriculum 4E; Advanced-Phase Curriculum AE-S4, Communications; Advanced-Phase Curriculum O-1, Term 9a, Chemical Engineering, Chemistry, Chemistry (Sanitary Engineering Option), Civil Engineering, Civil Engineering (Sanitary Engineering Option), Electrical Engineering, Engineering, Mathematics, Mechanical Engineering, Mechanical Engineering (Industrial Engineering Option), Science; Advanced-Phase Curriculum 4A-1, Term 4a, Civil, Electrical, and Mechanical Engineering; Advanced-Phase Curriculum 4A-2, Chemical Engineering; Advanced-Phase Curriculum AE, Advanced Engineering Special 1; Advanced-Phase Curriculum CE-1, Civil Engineering; Advanced-Phase Curriculum EE-1, Electrical Engineering, (Communication and Power Specialists, Communication Specialists, Power Specialists); Advanced-Phase Curriculum ME-1, Mechanical Engineering; Advanced-Phase Curriculum 71, Foreign Area and Language Studies; Advanced-Phase Curriculum 704, 705, Foreign Area and Language Studies, "B Plan."

Under the various curricular headings below, the courses offered are listed according to the departments offering the instruction. As listed the courses are designated by the numbers assigned in the Army Specialized Training Division syllabi and, in addition, by a series of numbers assigned by Oregon State College for more precise identification. Detailed course descriptions and syllabi of all the courses are contained in the official bulletins of the Army Specialized Training Division.

Basic-Phase Curriculum, "R Term"

Summer 1943

English	AEng R	English. hours.
Mathematics	AMth R	Mathematics. hours.
Military Science and Tactics	AMS 1	Military. 1 hour.
Physical Education	APE 1	Physical Education. 1 hour.
Physics	APh R	Physics. hours.

Basic-Phase Curricula BE-I and B-I

First Term: spring 1943, summer 1943, fall 1943, winter 1944, spring 1944.
 Second Term: summer 1943, fall 1943, winter 1944.
 Third term: summer 1943, fall 1943, winter 1944.

Chemistry			
AST 205	ACh 205	Chemistry. 3 hours.	(Spring 1944: 2 hours.)
AST 206	ACh 206	Chemistry. 4 hours.	
English			
AST 111	AEng 111-1	English. 3 hours.	(Spring 1944: 2 hours.)
AST 111	AEng 111-2	English. 2 hours.	
AST 111	AEng 111-3	English. 2 hours.	
General Engineering			
AST 001	AGE 001-3	Engineering Drawing. 2 hours.	
Geology			
AST 163	AGeo 163-1	Geography. 2 hours.	
AST 163	AGeo 163-2	Geography. 2 hours.	
History			
AST 133	AHst 133-1	History. 3 hours.	(Spring 1944: 2 hours.)
AST 133	AHst 133-2	History. 2 hours.	
AST 133	AHst 133-3	History. 2 hours.	
Mathematics			
AST 406	AMth 406	Mathematics. 6 hours.	(Spring 1944: 4 hours.)
AST 407	AMth 407	Mathematics. 5 hours.	
AST 408	AMth 408	Mathematics. 5 hours.	
Military Science and Tactics			
.....	AMS 1	Military. 1 hour.	
.....	AMS 2	Military. 1 hour.	
.....	AMS 3	Military. 1 hour.	
Physical Education			
.....	APE 1	Physical Education. 1 hour.	
.....	APE 2	Physical Education. 1 hour.	
.....	APE 3	Physical Education. 1 hour.	
Physics			
AST 304	APh 304	Physics. 4 hours.	
AST 305	APh 305	Physics. 4 hours.	
AST 306	APh 306	Physics. 4 hours.	
Political Science			
AST 163	AGeo 163-3	Geography. 2 hours.	(Fall 1943, Winter 1944: 3 hours.)
AST 163a	AGeo 163a	Geography. 2 hours.	(Spring 1944.)

Advanced-Phase Curriculum O-I Term 9a

Summer 1943

CHEMISTRY

Chemistry		
.....	ACh 9a-1	Advanced Chemical Technique. 6 hours.
.....	ACh 9a-2	Advanced Organic Chemistry. 4 hours.
.....	ACh 9a-3	Physical Chemistry. 4 hours.

Military Science and Tactics	AMS 9a	Military. 1 hour.
Physical Education	APE 9a	Physical Education. 1 hour.

CHEMICAL ENGINEERING

Chemical Engineering	AChe 9a	Advanced Chemical Engineering. 6 hours.
Chemistry	ACh 9a	Advanced Chemistry. 5 hours.
Mathematics	AMth 421-2	Differential Equations. 5 hours.
Military Science and Tactics	AMS 9a	Military. 1 hour.
Physical Education	APE 9a	Physical Education. 1 hour.
Physics	APh 405	Reading and Conference. 5 hours. (Radio Frequency Measurement)
	APh 505	Reading and Conference (Light). 5 hours.
	APh 551	Theory of Heat. 5 hours.

CHEMISTRY (SANITARY ENGINEERING OPTION)

Chemistry	ACh 9a-1	Advanced Chemical Technique. 6 hours.
	ACh 9a-2	Advanced Organic Chemistry. 4 hours.
	ACh 9a-3	Physical Chemistry. 4 hours.
Civil Engineering	AC 9a-3	Sanitary Engineering. 6 hours.
Military Science and Tactics	AMS 9a	Military. 1 hour.
Physical Education	APE 9a	Physical Education. 1 hour.

CIVIL ENGINEERING

Civil Engineering	AC 9a-1	Transportation. 6 hours.
	AC 9a-2	Construction. 6 hours.
Mathematics	AMth 421-2	Differential Equations. 5 hours.
Military Science and Tactics	AMS 9a	Military. 1 hour.
Physical Education	APE 9a	Physical Education. 1 hour.
Physics	APh 505	Reading and Conference (Advanced General Physics). 5 hours.
	APh 505	Reading and Conference (Light). 5 hours.

CIVIL ENGINEERING (SANITARY ENGINEERING OPTION)

Civil Engineering	AC 9a-1	Transportation Engineering. 6 hours.
	AC 9a-2	Construction Engineering. 6 hours.
	AC 9a-3	Sanitary Engineering. 6 hours.
Military Science and Tactics	AMS 9a	Military. 1 hour.
Physical Education	APE 9a	Physical Education. 1 hour.

ELECTRICAL ENGINEERING

Electrical Engineering	AE 9a	Departmental Studies. 12 hours.
Mathematics	AMth 421-2	Differential Equations. 5 hours.
	AMth 9a	Advanced Mathematics. 5 hours.

Military Science and Tactics	AMS 9a	Military. 1 hour.
Physical Education	APE 9a	Physical Education. 1 hour.
Physics	APh 9a	Advanced Physics. 5 hours.
	APh 405	Reading and Conference. 5 hours.
		(Radio Frequency Measurements)
	APh 505	Reading and Conference (Sound). 5 hours.

MATHEMATICS

Mathematics	AMth 421-2	Differential Equations. 5 hours.
	AMth 425	Vector Analysis. 6 hours.
	AMth 435	Numerical Calculus. 6 hours.
	AMth 9a	Advanced Mathematics. 5 hours.
Military Science and Tactics	AMS 9a	Military. 1 hour.
Physical Education	APE 9a	Physical Education. 1 hour.
Physics	APh 9a	Advanced Physics. 5 hours.
	APh 405	Reading and Conference (Radio Frequency Measurements). 5 hours.
	APh 505	Reading and Conference (Advanced General Physics). 5 hours.
	APh 505	Reading and Conference (Light). 5 hours.
	APh 505	Reading and Conference (Sound). 5 hours.

MECHANICAL ENGINEERING

Mathematics	AMth 9a	Advanced Mathematics. 5 hours.
	AMth 421-2	Differential Equations. 5 hours.
Mechanical Engineering	AM 9a-1	Engineering Materials. 3 hours.
	AM 9a-2	Stress Analysis. 3 hours.
	AM 9a-3	Internal Combustion Engines. 3 hours.
	AM 9a-4	Thermodynamics. 3 hours.
Military Science and Tactics	AMS 9a	Military. 1 hour.
Physical Education	APE 9a	Physical Education. 1 hour.
Physics	APh 9a	Advanced Physics. 5 hours.
	APh 405	Reading and Conference (Radio Frequency Measurements). 5 hours.
	APh 505	Reading and Conference (Light). 5 hours.
	APh 551	Theory of Heat. 5 hours.

MECHANICAL ENGINEERING (INDUSTRIAL ENGINEERING OPTION)

Industrial Arts	AM 9a-5	Industrial Engineering. 6 hours.
Mathematics	AMth 9a	Advanced Mathematics. 5 hours.
	AMth 421-2	Differential Equations. 5 hours.
Mechanical Engineering	AM 9a-1	Engineering Materials. 3 hours.
	AM 9a-2	Stress Analysis. 3 hours.
Military Science and Tactics	AMS 9a	Military. 1 hour.
Physical Education	APE 9a	Physical Education. 1 hour.
Physics	APh 9a	Advanced Physics. 5 hours.
	APh 405	Reading and Conference (Radio Frequency Measurements). 5 hours.
	APh 505	Reading and Conference (Light). 5 hours.

Advanced-Phase Curriculum 4a-I, Term 4a

CIVIL, ELECTRICAL, AND MECHANICAL ENGINEERING

Spring 1943, summer 1943, fall 1943, winter 1944

General Engineering		
AST 001	AGE 001-4a	Drawing. 2 hours.
Mathematics		
AST 406-7-8	AMth 406-7-8	Mathematics. 5 hours.
Military Science and Tactics		
-----	AMS 4	Military. 1 hour.
Physical Education		
-----	APE 4	Physical Education. 1 hour.
Physics		
AST 304-5-6	APh 304-5-6	Physics. 5 hours.

Advanced-Phase Curriculum 4a-2

CHEMICAL ENGINEERING

Summer 1943

Chemistry		
AST 205-6	ACh 205-6	Chemistry. 2 hours.
Mathematics		
AST 406-7-8	AMth 406-7-8	Mathematics. 5 hours.
Military Science and Tactics		
-----	AMS 4	Military. 1 hour.
Physical Education		
-----	APE 4	Physical Education. 1 hour.
Physics		
AST 304-5-6	APh 304-5-6	Physics. 5 hours.

Advanced-Phase Curriculum ChE-I, Chemical Engineering (Fourth Term)

Summer 1943

Chemical Engineering		
AST 403	AChE 403-a	Industrial Chemical Calculations. 3 hours.
Chemistry		
AST 401	AChE 401-4	Qualitative Analysis. 3 hours.
AST 402	AChE 402	Quantitative Analysis. 4 hours.
AST 403	AChE 403-b	Physical Chemistry. 4 hours.
Mathematics		
AST 401	AMth 401	Mathematics. 5 hours.
Military Science and Tactics		
-----	AMS 4	Military. 1 hour.
Physical Education		
-----	APE 4	Physical Education. 1 hour.

Advanced-Phase Curriculum AE, Advanced Engineering Special I (Fifth and Sixth Terms)

Fifth Term: fall 1943.

Sixth Term: winter 1944.

Electrical Engineering		
AST 401	AM 401-6b	Elements of Electrical Engineering. 5 hours.

General Engineering		
AST 001	AGE 001-3	Engineering Drawing. 2 hours.
Industrial Arts		
AST 406	AM 406-b	Shop Practices. 2 hours.
Mechanical Engineering		
AST 401	AM 401-4a	Mechanics. 6 hours.
AST 401	AM 401-4b	Thermodynamics. 5 hours.
AST 401	AM 401-5a	Strength of Materials. 4 hours.
AST 401	AM 401-5b	Materials Testing Laboratory. 1 hour.
AST 410	AM 410-5	Internal Combustion Engines. 6 hours.
AST 411	AM 411	Internal Combustion Engines Laboratory. 1 hour.
AST 430	AM 430	Metallography and Heat Treatment. 4 hours.
Military Science and Tactics		
-----	AMS 5	Military. 1 hour.
-----	AMS 6	Military. 1 hour.
Physical Education		
-----	APE 5	Physical Education. 1 hour.
-----	APE 6	Physical Education. 1 hour.

Advanced Phase Curriculum CE-I, Civil Engineering (Fourth, Fifth, and Sixth Terms)

Fourth Term: spring 1943, summer 1943, fall 1943.

Fifth Term: summer 1943, fall 1943, winter 1944.

Sixth Term: fall 1943, winter 1944.

Civil Engineering		
AST 401	AC 401-4a	Mechanics. 6 hours.
AST 401	AC 401-5a	Strength of Materials. 4 hours.
AST 401	AC 401-5c	Fluid Mechanics. 4 hours.
AST 403	AC 403-6a	Structural Design. 5 hours.
Civil Engineering, Chemistry, Bacteriology		
AST 403	AC 403-6b	Water Supply and Sewerage. 4 hours.
Civil Engineering		
AST 403	AC 403-6c	Transportation. 4 hours.
AST 403	AC 403-6d	Foundations. 4 hours.
AST 407	AC 407	Surveying—Elementary. 3 hours.
AST 408	AC 408-4	Engineering Drawing and Structural Drafting. 1 hour.
AST 408	AC 408-5	Surveying—Advanced. 3 hours.
AST 409	AC 409	Engineering Drawing—Topographic Drafting. 1 hour.
AST 413	AC 413	Stress Analysis. 3 hours.
Electrical Engineering		
AST 401	AC 401-4b	Elements of Electrical Engineering. 5 hours.
Mathematics		
AST 401	AMth 401	Mathematics. 5 hours.
Mechanical Engineering		
AST 401	AC 401-5b	Materials Testing Laboratory. 1 hour.
AST 405	AC 405	Internal Combustion Engines. 4 hours.
Military Science and Tactics		
-----	AMS 4	Military. 1 hour.
-----	AMS 5	Military. 1 hour.
-----	AMS 6	Military. 1 hour.
Physical Education		
-----	APE 4	Physical Education. 1 hour.
-----	APE 5	Physical Education. 1 hour.
-----	APE 6	Physical Education. 1 hour.

Advanced-Phase Curriculum EE-I, Electrical Engineering

COMMUNICATION AND POWER SPECIALISTS (FOURTH AND FIFTH TERMS)

Fourth Term: spring 1943, summer 1943, fall 1943, winter 1944.

Fifth Term: summer 1943, fall 1943, winter 1944, spring 1944.

Electrical Engineering		
AST 403	AEE 403-4	Electrical Measurements. 2 hours.
AST 403	AEE 403-5	Engineering Mathematics. 3 hours. (Spring 1944: 2 hours.)

AST 405	AEE 405	Electric and Magnetic Phenomena. 6 hours. (Spring 1944: 4 hours.)
AST 409	AEE 409	Direct Current Machinery. 4 hours. (Spring 1944: 3 hours.)
AST 414	AEE 414	Electric Circuits. 7 hours. (Spring 1944: 6 hours.)
Industrial Arts		
AST 406a	AEE 406a	Shop Practices. 1 hour.
Mathematics		
AST 401	AMth 401	Mathematics. 5 hours. (Spring 1944: 4 hours.)
Mechanical Engineering		
AST 401	AEE 401-4	Mechanics. 6 hours. (Spring 1944: 5 hours.)
AST 401	AEE 401-5a	Strength of Materials. 4 hours.
AST 401	AEE 401-5b	Materials Testing Laboratory. 1 hour.
Military Science and Tactics		
-----	AMS 4	Military. 1 hour.
-----	AMS 5	Military. 1 hour.
Physical Education		
-----	APE 4	Physical Education. 1 hour.
-----	APE 5	Physical Education. 1 hour.

COMMUNICATION SPECIALISTS (SIXTH AND SEVENTH TERMS)

Sixth Term: fall 1943, winter 1944, spring 1944.

Seventh Term: winter 1944, spring 1944.

Electrical Engineering		
AST 410	AEE 410-6	Alternating Current Machinery. 5 hours.
AST 415	AEE 415	Electronics and Associated Circuits. (Theory and Laboratory.) 6 hours.
AST 416	AEE 416	Electric Circuits—Transients. 3 hours.
AST 417	AEE 417	Electric Circuits—Distributed Constants. 3 hours.
AST 420	AEE 420	High Frequency and U. H. F. Circuits and Laboratory. 8 hours. (Spring 1944: 7 hours.)
AST 422	AEE 422	Communication Networks. 4 hours.
AST 424	AEE 424	Servo-Mechanism and Control Devices. 4 hours.
AST 426	AEE 426	Radiation and Propagation. 3 hours.
AST 429	AEE 429	Servo-Mechanism and Control Devices. 5 hours. (Spring 1944.)
AST 435	AEE 435	Telephone Circuits and Equipment. 5 hours. (Spring 1944.)
Military Science and Tactics		
-----	AMS 6	Military. 1 hour.
-----	AMS 7	Military. 1 hour.
Physical Education		
-----	APE 6	Physical Education. 1 hour.
-----	APE 7	Physical Education. 1 hour.

POWER SPECIALISTS (SIXTH AND SEVENTH TERMS)

Sixth Term: spring 1943.

Seventh Term: summer 1943.

Electrical Engineering		
AST 411	AEE 411-6	Alternating Current Machinery. 5 hours.
AST 412	AEE 412-7a	Alternating Current Machinery. 5 hours.
AST 412	AEE 412-7b	Electric Power Transmissions. 3 hours.
AST 415	AEE 415	Electronics and Associated Circuits. 6 hours.
AST 416	AEE 416	Electric Circuits—Transients. 3 hours.
AST 424	AEE 424	Servo-Mechanism and Control Devices. 4 hours.
Mechanical Engineering		
AST 401	AEE 401-6	Thermodynamics. 5 hours.
AST 410	AEE 410-7	Internal Combustion Engines. 6 hours.
AST 411	AEE 411-7	Internal Combustion Engines Laboratory. 1 hour.
Military Science and Tactics		
-----	AMS 6	Military. 1 hour.
-----	AMS 7	Military. 1 hour.
Physical Education		
-----	APE 6	Physical Education. 1 hour.
-----	APE 7	Physical Education. 1 hour.

Advanced-Phase Curriculum ME-I, Mechanical Engineering (Fourth, Fifth, and Sixth Terms)

Fourth Term: spring 1943, summer 1943, fall 1943, winter 1944.

Fifth Term: spring 1943, summer 1943, fall 1943, winter 1944, spring 1944.

Sixth Term: summer 1943, fall 1943, winter 1944, spring 1944.

Electrical Engineering		
AST 401	AM 401-6b	Elements of Electrical Engineering. 5 hours.
Industrial Arts		
AST 406	AM 406-b	Shop Practices. 2 hours.
Mathematics		
AST 401	AMth 401	Mathematics. 5 hours. (Spring 1944: 4 hours.)
Mechanical Engineering		
AST 401	AM 401-4a	Mechanics. 6 hours. (Spring 1944: 5 hours.)
AST 401	AM 401-4b	Thermodynamics. 5 hours. (Spring 1944: 4 hours.)
AST 401	AM 401-5a	Strength of Materials. 4 hours.
AST 401	AM 401-5b	Materials Testing Laboratory. 1 hour.
AST 401	AM 401-6a	Fluid Mechanics. 4 hours. (Spring 1944: 3 hours.)
AST 402	AM 402	Kinematics. 4 hours. (Spring 1944: 3 hours.)
AST 406	AM 406-a	Engineering Drawing. 2 hours. (Spring 1944: 1 hour.)
AST 408	AM 408	Machine Design. 5 hours. (Spring 1944: 6 hours.)
AST 410	AM 410-5	Internal Combustion Engines. 6 hours. (Spring 1944: 4 hours.)
AST 410	AM 410-6	Mechanical Vibrations. 3 hours.
AST 411	AM 411	Internal Combustion Engines Laboratory. 1 hour.
AST 420	AM 420	Mechanical Laboratory. 1 hour.
AST 430	AM 430	Metallography and Heat Treatment. 4 hours.
AST 471	AM 471	Properties of Metals. 3 hours. (Spring 1944.)
AST 524	AM 524	Advanced Mechanical Laboratory. 1 hour. (Spring 1944.)
Military Science and Tactics		
.....	AMS 4	Military. 1 hour.
.....	AMS 5	Military. 1 hour.
.....	AMS 6	Military. 1 hour.
Physical Education		
.....	APE 4	Physical Education. 1 hour.
.....	APE 5	Physical Education. 1 hour.
.....	APE 6	Physical Education. 1 hour.

Advanced-Phase Tentative Curriculum 4 E

Winter term 1944

General Engineering		
AST 001	AGE 001-4E	Engineering Drawing. 2 hours.
Geology		
AST 163	AGeo 163-1	Geography. 2 hours.
History		
AST 133	AHst 133-1	History. 3 hours.
Mathematics		
AST 406	AMth 406	Mathematics. 6 hours.
Military Science and Tactics		
.....	AMS 4	Military. 1 hour.
Physical Education		
.....	APE 4	Physical Education. 1 hour.
Physics		
AST 304	APh 304	Physics. 4 hours.

Advanced-Phase Curriculum AE-S4, Communications (Fourth Term)

Winter term 1944

Electrical Engineering			
AST 381	AEE 381	Principles of Wire Communication.	4 hours.
AST 382	AEE 382	Principles of Radio.	9 hours.
Industrial Arts			
AST 406	AEE 406b	Shop Practices.	2 hours.
Military Science and Tactics			
.....	AMS 4	Military.	1 hour.
Physical Education			
.....	APE 4	Physical Education.	1 hour.

Advanced-Phase Curriculum 705, Foreign Area and Language Studies (Fourth Term)

Summer 1943

Arts and Letters			
AST 706	AAL 706	Area Study.	8 hours.
History			
AST 134	AAL 134	Modern History and Contemporary World Affairs.	4 hours.
Military Science and Tactics			
.....	AMS 4	Military.	1 hour.
Modern Languages			
AST 755	AAL 755	Language Study.	8 hours.
Physical Education			
.....	APE 4	Physical Education.	1 hour.
Political Science			
AST 912	AAL 912	Police Science and Law Enforcement.	

Advanced-Phase Curriculum 704, Foreign Area and Language Studies, "B" Plan (Fourth and Fifth Terms)

Fall 1943

Arts and Letters			
AST 710	AAL 710	Area Study (Geographical Aspects).	8 hours.
AST 711	AAL 711	Area Study (Historical Aspects).	8 hours.
Military Science and Tactics			
.....	AMS 4	Military.	1 hour.
.....	AMS 5	Military.	1 hour.
Modern Languages			
AST 756	AAL 756	Language Study.	9 hours.
AST 757	AAL 757	Language Study.	9 hours.
Physical Education			
.....	APE 4	Physical Education.	1 hour.
.....	APE 5	Physical Education.	1 hour.

Advanced-Phase Curriculum 71, Foreign Area and Language Studies (Fifth and Sixth Terms)

Winter 1944

Arts and Letters

AST 266 AAL 266
AST 267 AAL 267

Area Study. 7 hours.
Area Study. 7 hours.

History

AST 202 AAL 202
AST 203 AAL 203

Contemporary History, 1914 to the Present. 1 hour.
Contemporary History, 1914 to the Present. 1 hour.

Military Science and Tactics

..... AMS 5
..... AMS 6

Military. 1 hour.
Military. 1 hour.

Modern Languages

AST 216 AAL 216
AST 217 AAL 217

Language Study. 9 hours.
Language Study. 9 hours.

Physical Education

..... APE 5
..... APE 6

Physical Education. 1 hour.
Physical Education. 1 hour.

Military Science and Tactics

(Personnel detailed from United States Army)

PROFESSOR WEBSTER (Lieutenant Colonel, Engineers), Commandant.

ASSOCIATE PROFESSORS DEFORD (Captain, Corps of Engineers).

ASSISTANT PROFESSORS JONES (Lieutenant Colonel, Field Artillery), HOLBROOK (Captain, Engineers), O'GRATTAN (First Lieutenant, Infantry), STACEY (Second Lieutenant, Field Artillery), HOLMES (Staff Sergeant, Engineers, Sergeant-Major).

INSTRUCTORS DEMITH (Sergeant Field Artillery Unit), PARKER (Staff Sergeant Field Artillery Unit), BURNS (Sergeant, Field Artillery Unit), CRAIG (Sergeant, Field Artillery Unit), CROWNOVER (Sergeant, Field Artillery Unit), GUMMER (Sergeant, Infantry Unit), JUSTICE (Sergeant, Field Artillery Unit), LAMBING (T/4 Field Artillery Unit), SIMON (T/4 Engineer Unit), COHN (Private, Field Artillery Unit).

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. For the academic year 1916-17, Oregon State College was classified by the United States War Department as a "Distinguished College," the highest rating for such an institution. The Cadet Corps has maintained distinguished standing. During the World War the number of graduates who served with distinction in our armed forces gave proof of the high quality of their preparation for public service and of the value to the nation of such military instruction.

During the war period, Oregon State College is aiding the Army Specialized Training Program with both equipment and personnel in the effort to develop potential officer material for our armed forces. The faculty and courses in military science and tactics will be modified from time to time to meet the requirements.

Reserve Officers' Training Corps. Oregon State College qualified under the provisions of the Act of Congress passed in 1916 which gave a greater measure of Federal aid and recognition to military training at this institution. The College agreed to meet prescribed standards of training in order that its graduates might receive commissions as reserve officers in the Army who would be available for service in event of a national emergency. The Corps of Cadets at Oregon State College regularly comprised the following units of the Reserve Officers' Training Corps: Infantry, Field Artillery, Engineers, and Band.

Requirements. Military instruction is required in the freshman and sophomore years of all men students who are citizens of the United States, under twenty-six years of age, and physically qualified except as stated below. Exemptions from military training are granted for the following reasons: physical

unfitness; age twenty-six or over; service of six months or more in the Army, Navy, or Marine Corps; noncitizenship; married and living with wife in Corvallis or vicinity; completion of four Citizen Civilian Military Training Camps; members of Naval or Marine Reserve; conscientious objection on account of *religious belief*, in which case the student is required to make application to the Commandant in writing accompanied by a letter from his parents or guardian and a letter from the pastor of his church showing that he is a member of the church in good standing, that the church does not believe in military training, and that the objection is based on this religious belief. Transfer students who have eighty or more hours of credit accepted at Oregon State College may be exempt, and in other exceptional cases exemption may be granted on the basis of individual handling by the Commandant.

Basic Course. The first two years of military instruction requiring five hours a week constitute what is known as the Basic Course of the Reserve Officers' Training Corps. During that period, the student does not receive any emoluments other than the use of a uniform provided by the War Department. Uniforms must be returned by the students at the end of each year or upon withdrawal from college. Shoes of the approved type must be provided by the student. Cadet corporals are selected from second-year students of this course.

All instruction for Basic R. O. T. C. is provided in classes offered for the Army Specialized Training Program.

Advanced Course. During the present emergency, no students will be enrolled in the Advanced Course.

Academic Credits. For the Basic Course, 1 hour of academic credit is allowed for each term.

Military Sports. Supplementary to normal instruction in marksmanship, the Military Department supervises the college rifle teams.

Description of Courses*

BRANCH IMMATERIAL

During the present emergency students in the Reserve Officers' Training Corps receive military instruction under the classification "Branch Immaterial." The regular courses in Infantry, Field Artillery, and Military Engineering are not offered. All instruction is provided in classes offered for the Army Specialized Training Program.

COURSES IN INFANTRY

LOWER-DIVISION COURSES

MS 111, 112, 113. **First-Year Basic Course.** 1 hour each term.

MS 211, 212, 213. **Second-Year Basic Course.** 1 hour each term.

* The regular military courses are not offered during the war period. Students in Basic R. O. T. C. are registered in "Branch Immaterial" and receive their instruction in classes offered for the Army Specialized Training Program.

UPPER-DIVISION COURSES

MS 311, 312, 313. First-Year Advanced Course. 3 hours each term.

MS 411, 412, 413. Second-Year Advanced Course. 3 hours each term.

COURSES IN FIELD ARTILLERY

LOWER-DIVISION COURSES

MS 121, 122, 123. First-Year Basic Course. 1 hour each term.

MS 221, 222, 223. Second-Year Basic Course. 1 hour each term.

UPPER-DIVISION COURSES

MS 321, 322, 323. First-Year Advanced Course. 3 hours each term.

MS 421, 422, 423. Second-Year Advanced Course. 3 hours each term.

COURSES IN MILITARY ENGINEERING

LOWER-DIVISION COURSES

MS 131, 132, 133. First-Year Basic Course. 1 hour each term.

MS 231, 232, 233. Second-Year Basic Course. 1 hour each term.

UPPER-DIVISION COURSES

MS 331, 332, 333. First-Year Advanced Course. 3 hours each term.

MS 431, 432, 433. Second-Year Advanced Course. 3 hours each term.

Division of Physical Education

Faculty

CLAIR VAN NORMAN LANGTON, Dr.P.H., Ed.D., Director of the Division of Physical Education.

ELIZABETH HEATH, B.S., Secretary to the Director.

Physical Education for Women

PROFESSOR SEEN (department head).

ASSOCIATE PROFESSORS MORRIS, THOMPSON.

ASSISTANT PROFESSORS MCALLESTER, REICHART.

INSTRUCTORS BRAUNS, HUPPRICH, SWEENEY.

Physical Education for Men

PROFESSORS LANGTON (director of division), LOCEY (director of intercollegiate athletics), COLEMAN (director of intramural sports, head coach of baseball).

ASSOCIATE PROFESSORS NEBELUNG*, ALLMAN, NASH, ADRIEN, LAMB.

ASSISTANT PROFESSORS SWAN (head coach of track)*, STEVENS (coach of rowing), DIXON (assistant coach of football)*, RAABE*, BERGSTROM*, COX.

INSTRUCTORS STINER (head coach of football), A. T. GILL (head coach of basketball), MOE (assistant coach of football)*, MCKALIP (freshman coach)*, CARR, E. L. GILL (assistant coach of football), FLOOD, WESTERHOUT.

General Statement

ALL instruction and related activities in the fields of physical education and hygiene are administered by the Division of Physical Education. Close cooperation is maintained with the Student Health Service and other student-welfare agencies of the State College.

Lower-division and service courses in physical education are offered at the State College. By action of the State Board of Higher Education on March 7, 1932, all major work in the Oregon State System of Higher Education leading to baccalaureate and advanced degrees in physical education was confined to the School of Physical Education at the University, and lower-division work (instruction in the freshman and sophomore years) was assigned to both the University and the State College.

The lower-division work in physical education is essentially the same at both institutions. While it is recommended that students intending to major in physical education enter the institution at which major work is offered at the beginning of their freshman year, they may, if they wish, spend their freshman and sophomore years at the State College, and transfer to the University for their major work at the beginning of the junior year, without loss of credit and with fundamental requirements for upper-division standing fully met.

* On leave for military or civilian war service.

At both institutions, the lower-division program is intended not only to lay the foundation for specialization in physical education, but also to serve the needs of students majoring in other fields. In addition to the lower-division work, the State College offers upper-division service courses in physical education.

As stated on page 6, the dean of the major school at the University serves as an adviser to the end that the work in physical education at the State College shall bear a proper relation to the work of the major school.

Students who plan to minor in physical education at the State College or major at the University should confer with advisers in the office of the Department of Physical Education for Women or for Men, respectively.

Intramural Sports. Intramural sports are conducted by both Physical Education departments. The department for women has charge of all women's athletics, conducts for the students a broad program of intramural sports, and offers a recreational program for men and women. The department for men carries on extensive organized sports programs that are separate and apart from intercollegiate athletics.

The function of the program of intramural sports is to give every student the moral, social, physical, and educational values of competitive sports. Competition is organized between living organizations, clubs, individuals, classes, and institutional departments. The program of sports provides for both individual and team endeavor. "Athletics for all" is the purpose of intramural sports promotion.

Athletic Organizations. Athletic organizations for men include the Minor "O" and Varsity "O" associations and the honor societies, Sigma Alpha and Sigma Delta Psi. The Women's Athletic Association sponsors a program of competitive and recreational activities for women. The Orange "O" letter, the senior plaque, and election to Parthenia are honor awards.

Student Health Service. A medical examination is required of all entering students. The Student Health Service advises with the Physical Education departments in the assignment of students to activities in accord with their physical needs. The following activity classification is made, based upon the medical examinations: (a) unlimited activity, (b) unlimited activity with observation, (c) restricted activity, (d) corrective gymnastics, (e) no activity.

Fees. The regular State College registration fee entitles every student to the use of gymnasium, pool, and showers, use of gymnasium 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.

Prerequisites for a Major. Students taking the first two years toward a major in physical education with the intention of transferring to the University should take all prerequisite subjects and the freshman and sophomore technical subjects. On transfer to the University these courses are accepted and adjustments made so that requirements for a degree in physical education can be completed in the junior and senior years. Prerequisite courses are as follows:

	Term hours
General Zoology	9
Elementary General Chemistry	12
English Composition	9
Elementary Human Physiology	6
Elements of Psychology	9
Sociology	9
Group requirements (year sequence elected from Language and Literature and Social Science groups)	12

Minor in Physical Education. Students preparing for part-time teaching in positions in physical education should take as a minor a minimum of 24 term hours of professional courses. On completion of the minor (see page 247), the student may be recommended for a part-time teaching position in physical education in the high schools of the state.

Required Courses. All undergraduate men and women are required to take physical activity courses. Courses PE 114, 115, 116, PE 131, PE 214, 215, 216, PE 314, 315, 316, and PE 414, 415, 416 for women, and PE 151, 152, 153, PE 251, 252, 253, PE 351, 352, 353, and PE 451 452, 453 for men, are required of all undergraduates. PE 150 (General Hygiene) is required of both men and women. For the Junior Certificate students are required to complete the following:

Freshman Year

Physical Education, 1 term hour each term for two terms. (Students in Nursing Education only, 1 hour each term for three terms.)

General Hygiene, 2 term hours for one term. (Students in Nursing Education only, 1 hour each term for three terms.)

Sophomore Year

Physical Education, 1 term hour each term for three terms.

Required activity courses are regularly scheduled classes planned as instructional hours leading to a knowledge and appreciation of the technique involved and not merely to give opportunity for recreation or exercise. Ample opportunity for exercise and recreation is provided, and all of the facilities of the department are at the student's disposal outside the regular class hours.

A broad program of physical fitness is now receiving greater emphasis than at any previous time. It involves the prevention of disease, the correction of remedial defects, good nutrition, muscular strength, endurance, basic motor skills, mental health, and morale. It emphasizes those activities that are of more immediate importance for the war effort.

The physical-activity courses for students taking a minor in physical education (PE 124-126, 224-226 for women; PE 174-176, 274-276 for men) may be considered as fulfilling the physical-education requirement for that year.

Description of Courses

SERVICE COURSES FOR WOMEN

LOWER-DIVISION COURSES

PE 147, 148, 149. General Hygiene. 1 hour each term.

Principles and practices of health promotion; individual and physiological hygiene; disease prevention and control; community hygiene and public health. Required in nursing education. Associate Professor Morris.

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 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, life-extension. Associate Professor Nash.

- PE 114, 115, 116. **Freshman Physical Education.** 1 hour each term.
Student is permitted to elect courses offered in basketball, volleyball, baseball, field hockey, soccer, field ball; archery, badminton, tennis, swimming, fencing, golf, riding; dancing; tumbling; mechanics of posture. Three periods.
- PE 131. **Social Ethics.** One term, no credit.
Woman's position and responsibility in the economic, social, and spiritual life of today; fundamental principles of conduct on campus and elsewhere. Brings students into early contact with their dean of women.
- PE 214, 215, 216. **Sophomore Physical Education.** 1 hour each term.
Same activities as in PE 114, 115, 116. Three terms required of all sophomore women. Three periods.

UPPER-DIVISION COURSES

- PE 314, 315, 316. **Junior Physical Education.** 1 hour each term.
Required of juniors. Same activities as in PE 114, 115, 116. Three periods. Staff.
- PE 414, 415, 416. **Senior Physical Education.** 1 hour each term.
Required of seniors. Same activities as in PE 114, 115, 116. Three periods. Staff.

SERVICE COURSES FOR MEN

LOWER-DIVISION COURSES

- PE 150. **General Hygiene.** 2 hours any term.
Principles and practices of health promotion, individual and physiological hygiene; disease prevention and control, community hygiene and public health.
- 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. Associate Professor Nash.
- 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.
- PE 251, 252, 253. **Advanced Physical Education.** 1 hour each term.
Required of sophomores. Three periods.

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, 123. **Introduction to Physical Education.** 2 hours each term.
Modern developments of physical education in relation to general education; aims and objectives; history of physical education; practical considerations, program, physical plant, and personnel. Professors Coleman and Seen.
- 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.
- PE 174. **Technique of Gymnastics.** 2 hours fall.
Laboratory course in technique and skills; practice in marching (military, gymnastic, calisthenic), mass athletics (games, relays, contests, track, and field), tumbling, and apparatus. Six periods. Associate Professor Adrion.
- PE 175. **Technique of Football, Track, and Field.** 2 hours winter.
Laboratory course in techniques and skills of football, track, and field activities; practice in fundamentals of these sports. Six periods. Mr. Stiner.
- PE 176. **Technique of Minor Sports.** 2 hours spring.
Laboratory course in techniques and skills of speedball, six-man football, soccer, volleyball, handball, and badminton; practice in fundamentals of these sports. Six periods.
- PE 221. **Community Hygiene.** 2 hours fall.
General principles of hygiene as applied to community problems; protection of health of community; contagious diseases and their prevention; organizations for promotion of healthful living. Associate Professor Nash.
- PE 224, 225, 226. **Physical-Education Laboratory.** 2 hours each term.
A continuation of PE 124, 125, 126. Six periods.
- PE 240. **Leadership of Party Games.** 2 hours fall or winter.
Study and practice of games for family recreation, parties, picnics, clubs, and community centers. Professor Seen.
- PE 274. **Technique of Swimming, Tennis, and Golf.** 2 hours fall.
Laboratory course in techniques and skills of swimming, life saving, diving, and water polo; practice in fundamentals of aquatics, tennis, and golf. Six periods. Professor Coleman, Associate Professor Adrion.
- PE 275. **Technique of Boxing and Wrestling.** 2 hours winter.
Laboratory course in techniques and skills of boxing and wrestling, practice in fundamentals of these sports. Six periods. Associate Professor Allman.
- PE 276. **Technique of Baseball and Basketball.** 2 hours spring.
Laboratory course in techniques and skills of baseball and basketball; practice in fundamentals of these sports. Six periods. Professor Coleman, Mr. A. T. Gill.

UPPER-DIVISION COURSES

- PE 343, 344, 345. **Physical-Education Technique (Women).** 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 (Men).** 2 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. Mr. A. T. Gill.
- PE 347. **Coaching of Football (Men).** 2 hours winter.
Football theory and practice, details of each position, training and managing, complete technique of developing offensive and defensive tactics, comparison of various systems in American intercollegiate football. Mr. Stiner.
- PE 348. **Coaching of Baseball (Men).** 2 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. Professor Coleman.
- PE 349. **Coaching of Track and Field (Men).** 2 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.
- 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.
- Ed 351. **Health Education.** 3 hours fall.
Philosophy and principles of health education; organization and administration. Provision is made for students interested in adult health education. Associate Professor Morris.
- Ed 352. **Health Education.** 3 hours winter.
Continuation of Ed 351. Subject matter of health instruction and its use in secondary schools and in adult health education. Prerequisite: Ed 351. Associate Professor Morris.
- PE 358. **First Aid.** 2 hours any term.
Emergency treatment of all classes of injuries (until the doctor comes). Leads to standard Red Cross certificate. Open as a service course to all departments. Associate Professors Allman and Nash.
- PE 359. **First Aid.** 2 hours spring.
Continuation of PE 358. Leads to Red Cross advanced and instructor's certificates. Open as a service course to all departments. Prerequisite: PE 358. Associate Professors Allman and Nash.
- 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 210. Associate Professor Allman.
- Ed 421, 422, 423. **School Health Problems.** (g) 2 hours each term.
Maintenance of health of school children; communicable diseases; school sanitation; planning, construction, and care of school buildings; school hygiene. Prerequisite: Ed 311, 312, 313. Professor Langton.
- PE 421. **Principles of Physical Education.** (g) 3 hours fall.
General philosophy and principles of physical education and its relation to general education. Professors Langton and Seen.

PE 422. Tests and Measurements in Physical Education. (g) 3 hours winter.

Survey of the field; special study of typical tests, methods of scoring, principles of test building. Should be preceded by or taken simultaneously with Ed 416 whenever possible. Associate Professor Nash.

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 Langton and Seen.

Ed 425. School and Community Club Work. (G) 3 hours winter.

A cooperative effort to prepare for effective club work and community leadership. Prerequisite: Ed 311, 312, 313. Professor Seen.

PE 435. Nature, Function, and Organization of Play. 3 hours spring.

Nature and function of play; adaptation of activities; program making. Playground instruction, management, and supervision. Assistant Professor Reichart.

Ed 437. Safety Education. (G) 3 hours spring.

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.

GRADUATE SERVICE COURSES

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

Graduate Division

OLOF LARSELL, Ph.D., Sc.D., Dean and Director of the Graduate Division, Oregon State System of Higher Education.

GEORGE REBEC, Ph.D., Counsellor of the Graduate Division, Oregon State System of Higher Education.

WILLIBALD WENIGER, Ph.D., Associate Dean of the Graduate Division, In Charge at the State College.

HOWARD RICE TAYLOR, Ph.D., Associate Dean of the Graduate Division, In Charge at the University.

JEANNE GAYLORD WHITE, Secretary to the Dean.

SHIRLEY TAMSON PAULSON, Secretary of the Graduate Division at the State College.

CLARA LYNN FITCH, Secretary of the Graduate Division at the University.

Graduate Councils

General Graduate Council. OLOF LARSELL, WILLIBALD WENIGER, H. R. TAYLOR, W. G. BEATTIE, J. R. JEWELL, E. L. PACKARD, FLORENCE BLAZIER, P. M. BRANDT, S. H. GRAF, R. R. HUESTIS, THEODORE KRATT, D. C. MOTE, E. S. WEST.

State College Graduate Council. OLOF LARSELL (chairman), WILLIBALD WENIGER (vice chairman), W. G. BEATTIE, FLORENCE BLAZIER, P. M. BRANDT, L. C. BRITT, W. H. DREESSEN, S. H. GRAF, P. M. DUNN, D. C. MOTE, C. W. SALSER.

University Graduate Council. OLOF LARSELL (chairman), H. R. TAYLOR (vice chairman), W. G. BEATTIE, R. R. HUESTIS, C. L. KELLY, THEODORE KRATT, R. W. LEIGHTON, E. H. MOORE, F. L. STETSON, PIERRE VAN RYSELBERGHE, HOYT TROWBRIDGE, L. A. WOOD.

Medical School Graduate Council. OLOF LARSELL (chairman), R. A. FENTON, H. F. HANEY, M. C. RIDDLE, E. S. WEST, RUTH WHEELOCK.*

Graduate Committees

Science. D. C. MOTE (chairman), W. B. BOLLEN, E. J. DORNFELD, E. C. GILBERT, W. E. MILNE, C. E. OWENS, E. N. STEVENSON, W. D. WILKINSON†, E. A. YUNKER.†

Agriculture. P. M. BRANDT (chairman), D. B. DeLOACH, HENRY HARTMAN, E. H. WIEGAND.

Education. C. W. SALSER (chairman), R. J. CLINTON, G. B. COX, O. R. CHAMBERS, E. N. STEVENSON.

Engineering and Industrial Arts. S. H. GRAF (chairman), G. W. GLEESON, F. O. McMILLAN†, C. A. MOCKMORE.

Forestry. P. M. DUNN (chairman), H. R. PATTERSON, GLENN VOORHIES.

Home Economics. FLORENCE BLAZIER (chairman), VERA H. BRANDON, ALMA C. FRITCHOFF, MELISSA HUNTER, JESSAMINE C. WILLIAMS.

Pharmacy. L. C. BRITT (chairman), E. T. STUHR.

General Studies. W. H. DREESSEN (chairman), R. E. DIMICK, K. J. GORDON, H. R. PATTERSON, J. W. SHERBURNE†, W. D. WILKINSON.†

Graduate Study

IN the disciplines of undergraduate education the primary aim is to prepare the student for cultured living and intelligent citizenship, and in techniques leading to a professional career. In graduate study the dominant aim is the

* On leave of absence.

† On leave for military or civilian war service.

development of the scholar, capable of original thinking and of creative achievement in the advancement and extension of knowledge. Hence a graduate degree indicates more than the mere completion of a prescribed amount of advanced study; it indicates that the student has shown both promise and performance in the field of independent scholarship.

Graduate study in the Oregon State System of Higher Education is defined to include all study beyond the bachelor's degree, in other than strictly professional curricula. By professional curricula are meant clearly defined and sharply specialized curricula, such as those in law and medicine, leading to professional degrees.

At the State College, the first advanced degree (A.M.) was conferred in 1876; in 1910 graduate study was placed under the administration of a special standing committee of the faculty. Advanced degrees were conferred occasionally at the University from the earliest days. In 1897 definite requirements of residence work were established for the master's degree. Graduate instruction was placed under the administrative control of the Graduate School in 1899-1900.

In 1933 all graduate work in the State System was coordinated under the Graduate Division.

Organization of Graduate Division

THE Graduate Division has jurisdiction over all graduate study in the State System leading to other than strictly professional degrees. The Graduate Division is administered through the graduate dean, the associate graduate deans at Oregon State College and the University of Oregon, and the graduate councils at the State College, the University, and the University of Oregon Medical School.

A State System General Graduate Council formulates policies for the improvement and coordination of the program of graduate instruction and research of the State System as a whole, and facilitates cooperation between the institutions in the development of common procedures in the administration of graduate work and uniform standards of graduate scholarship. The membership of the General Graduate Council includes the graduate dean, the associate deans, the dean of general research, the dean of general extension, the dean of education, and representatives from the institutional graduate councils.

The institutional graduate councils have jurisdiction over the policies and procedures of graduate work within their respective institutions. The actual formulation of departmental graduate programs and the working out and direction of the programs of individual students are responsibilities of the departments; but no department has authority to waive or supersede the general rules or requirements of the Graduate Division.

Institutional Allocation of Graduate Work

ON the basis of the allocations of curricula in the Oregon State System of Higher Education, all graduate study leading to advanced degrees at the institutions of the State System has been allocated by curricula or major subjects as follows:

Oregon State College—

The biological sciences, the physical sciences (including mathematics), and the professional and technical fields of agriculture, education, engineering, forestry, home economics, and pharmacy.

University of Oregon—

Liberal arts and sciences and the professional fields of architecture and allied arts, business administration, education, journalism, law, medicine (at the Medical School in Portland), music, and physical education.

In certain fields graduate work may be carried on at the Portland Extension Center, leading to degrees, through the Graduate Division, from the State College or the University.

Students may be enrolled for major work on one campus and for minor work on another.

General Regulations

FOUR classes of graduate students are recognized: (1) those wishing to become candidates for a master's degree; (2) those wishing to become candidates for a doctor's degree; (3) those desiring an engineer degree; and (4) those wishing merely to take work beyond the requirements for the bachelor's degree. Students of the first three classes follow programs organized in conformity with the rules stated below. Students in the fourth class register for the courses they desire, with the understanding that the institution is under no implied obligation to accept credit earned as credit toward a degree. Whether a student is adequately prepared to enter a particular course is determined by the instructor in charge and the head of the department.

Admission. A graduate of any accredited college or university is admitted to the Graduate Division by the registrar of the institution which he wishes to enter, upon filing an application for admission and an official transcript of his college record (including undergraduate and graduate work). Such admission, however, does not of itself entitle a student to become a candidate for a degree. Admission to candidacy for an advanced degree is granted only after the student has demonstrated, by passing a qualifying examination, the thoroughness of his previous preparation and his ability to do work of graduate character.

Graduate credit will not be granted for undergraduate work taken in excess of the requirements for the bachelor's degree.

Preparation Required for Graduate Study. Preparation for a graduate major must be an undergraduate major in the same subject, or a fair equivalent. Preparation for a graduate minor must be at least 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 work toward a degree will be expected to work out, in tentative form at least, a complete program of study leading toward the degree desired. This program should allow sufficient time for completion of the thesis. Work on the thesis should be begun as early as possible.

The normal load for a graduate student devoting all of his time to graduate study is 15 term hours (including course work and thesis). The maximum load is 16 term hours (17 term hours on petition). For assistants, scholars, and fellows the maximum load is 10 term hours; for part-time assistants, scholars, and fellows, the maximum is 15 term hours.

The graduate program of each candidate should include a substantial amount of work with at least three faculty members offering graduate instruction.

Grade Requirement. A grade-point average of 3.00 (a B average) is required for every graduate degree. Grades below C are not accepted for graduate credit.

Graduate Courses. All courses numbered in the 500s carry graduate credit, as do those in the 400s which have been approved by the Graduate Council. Approved courses in the 400s are designated in the catalogs by (G) or (g) following the course title. Courses designated (G) may form a part of either a major or a minor; courses designated (g) may be taken toward a minor only. Graduate students taking courses in the 400s are expected to do work of a higher order and broader scope than the work of undergraduate students in the same courses.

Fees and Deposits. Graduate students registered for seven term hours of work or more pay a fee of \$32.50 a term. Graduate students do not pay the nonresident fee. Graduate students registered for six term hours or less pay the regular part-time fee of \$4.00 a term hour but not less than \$10.00 a term. Payment of the graduate fee entitles the student to all services maintained by the State College for the benefit of students.

Graduate students must make a \$5.00 deposit once each year at the time of first registration. See page 76.

Master of Arts and Master of Science

Credit Requirement. For the departmental Master of Arts or Master of Science degrees, the student must complete a program of study totaling not less than 45 term hours in courses approved for graduate credit. Approximately two-thirds of the work (30 term hours) must be in the major and one-third (15 term hours) in the minor.

Residence Requirement. For all master's degrees the residence requirement is one academic year of full-time study, or equivalent. (Work taken in summer sessions will count toward the satisfaction of the residence requirement.) Graduate or research assistants may satisfy the residence requirement by five terms of work. Students who have taken graduate work at another institution may lighten their load by transferring credit; but transferred credit will not shorten the residence requirement.

A maximum of 15 term hours earned in graduate courses in the Portland Extension Center or at the University of Oregon may be counted as credit earned in residence toward the departmental master's degree. If adequate course offerings are available, all of the work toward the Master of Arts (General Studies) degree may be earned at the Portland Center.

Transferred Credit. A maximum of 15 term hours of graduate work done at another accredited institution, or in extension courses approved for graduate credit, may be transferred, provided that: (1) the work fits into a logical program for the degree; (2) the transfer is approved by the major department and by the Graduate Council; (3) grades of A or B have been earned. Credit granted for work done at another institution is tentative until validated by work in residence. (See also "Time Limit," page 370.)

Language Requirements. For the Master of Arts degree, the student must show, by examination or by adequate undergraduate courses, a reading knowledge of one foreign language, preferably French or German. By petition to the Graduate Council, a student may be permitted to substitute another language, if it is equally relevant to his program of graduate studies. For the

Master of Science degree there is no foreign-language requirement, unless a language is needed in the individual student's program.

Course Requirements. For the Master of Arts (departmental) and Master of Science degrees at least one year sequence in the 500-599 series (normally of seminar or research nature and for approximately 3 hours of credit per term) is required.

Time Limit. All work counted toward the master's degree (including work for which credit is transferred from another institution, the thesis, and the final examination) must be completed within a period of five years.

Qualifying Examination. A student wishing to become a candidate for a master's degree is given a qualifying examination designed to test his basic training and his ability to pursue studies at the graduate level in his chosen field. This examination may be oral or written or both. It must be taken before the student has completed 15 term hours of graduate work. If satisfactory knowledge and ability are demonstrated, the student is formally advanced to candidacy for the degree sought, subject to the approval of the associate dean of the Graduate Division.

Qualifying examinations are scheduled jointly by the department or school and the graduate office; a list of scheduled examinations is compiled at the beginning of the fall term and the beginning of the summer session, and is available at the graduate office.

Graduates of the State College who have maintained a grade-point average of at least 3.25 throughout their undergraduate work may be exempted from taking the qualifying examinations.

Thesis. Every candidate for a master's degree must file in the office of the Graduate Division three copies of an accepted thesis, and five copies of an abstract of the thesis not later than two weeks before the date of the final examination. Every thesis for a master's degree must have the approval of the major professor and the graduate committee of the school or college in which the candidate is majoring, before being filed with the Graduate Division.

The three copies of the thesis are filed unbound. Two are bound at the expense of the State College and are deposited in the Library. The third copy becomes the property of the major department. One of the Library copies is available for general circulation.

Full information concerning the prescribed style for theses may be obtained on request at the office of the Graduate Division.

Final Examination. A final oral examination of not less than two hours is required of every candidate for the master's degree; when deemed desirable a written examination may also be required. (For the master's degree, the examining committee consists of at least four members of the faculty, two in the student's major field, one in the minor field, and one in a field not directly connected with the candidate's studies.)

The examination committee is nominated by the student's adviser, subject to the approval of the associate dean of the Graduate Division, who is ex officio a member of all examining committees.

Master of Arts (General Studies). See page 375.

Doctor of Philosophy

General Requirements. The degree of Doctor of Philosophy is granted primarily for attainments and proved ability. There is no rigid credit require-

ment. It is the policy of the Graduate Division not to accept as a candidate for the Ph.D. degree any student whose academic training, both undergraduate and graduate, has been exclusively at the institution from which the degree is sought.

The student working toward the Ph.D. degree chooses a major and, subject to the approval of his major professor, two minor lines of study. If the major department offers several distinct lines of study, one minor may lie in that department. With the assistance of an advisory committee nominated by the major school or department and approved by the associate dean of the Graduate Division, the student outlines a program devoting approximately sixty per cent of his time to the major, including thesis, and approximately forty per cent to the minors.

Residence. For the doctor's degree, at least two years of full-time work beyond the master's degree are required, of which at least one year (usually the last) must be spent in residence at Oregon State College.

Preliminary Examinations. The student working toward the doctor's degree must pass a group of comprehensive preliminary examinations (at least partly oral) in his major and minor subjects not less than one academic year before he expects to receive the degree. Advancement to candidacy is contingent on passing these examinations.

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.

Thesis. Every candidate for the degree of Doctor of Philosophy must submit a thesis embodying the results of research, and giving evidence of originality and ability in independent investigation. The thesis must be a real contribution to knowledge, based on the candidate's own investigations. It must show a mastery of the literature of the subject, and be written in creditable literary form. It is expected that the preparation of an acceptable thesis will require at least the greater part of an academic year.

Three copies of the thesis and five copies of an abstract must be deposited, unbound, in the graduate office not less than two weeks before the time set for the final examination.

Final Examination. The final examination for the degree of Doctor of Philosophy may be written in part, but must include an oral examination, usually of three hours' duration. The oral examination is open to all members of the faculty and to advanced graduate students. The date of the oral examination is publicly announced at least one week before it is held. The examining committee consists of the candidate's advisory committee and other members, including at least one not directly connected with the major or minor department. The committee is nominated by the major department or school, subject to the approval of the associate dean of the Graduate Division. Five members of the examining committee are designated to read the thesis and determine its acceptability. Unanimous vote is necessary for approval.

In the oral examination the candidate is expected to defend his thesis and to show a satisfactory knowledge of his major and minor fields. The written examination, if given, is expected to cover aspects of the major and minor fields with which the thesis is not directly concerned.

Other Graduate Degrees

Master of Education. Candidates for the Master of Education degree must have had teaching experience. The thesis problem should deal with some applied or professional aspect of education. In other respects the requirements for this degree are similar to the requirements for the M.S. Since this is a professional degree, both the major and the minor will ordinarily consist of education courses.

Master of Forestry. The general requirements for the professional degree of Master of Forestry are the same as those for the Master of Science. The program of study is designed, however, not primarily for the research worker, but for the administrator. The thesis for the M.F. degree must be an original study showing the application of professional knowledge to the accomplishment of a specific practical objective.

Engineer Degrees. For the degrees of Chemical Engineer, Civil Engineer, Electrical Engineer, Forest Engineer, Mechanical Engineer, Metallurgical Engineer, and Mining Engineer, the candidate must hold a baccalaureate or master's degree in the corresponding field of engineering from the State College, must have had at least five years of successful professional practice following graduation, and must present a satisfactory thesis. Before January 1 of the academic year in which the degree is desired, the candidate submits to the head of the department in which his major interest lies a complete statement of his professional experience since receiving the bachelor's degree. If the statement is approved, after it has been examined by the head of the department, the school graduate committee, and the Graduate Council, the candidate is instructed to prepare and submit his thesis. The thesis must be of high order and is subject to the same scrutiny and regulations as other graduate theses. Upon acceptance of the thesis the candidate is recommended for the degree in the usual manner. The candidate registers for the degree with the State College Registrar, either in person or by mail, not later than March 1, and pays the thesis examination fee of \$10.00. After his thesis has been accepted he pays the usual graduation fee of \$6.50.

Doctor of Education. The degree of Doctor of Education is granted primarily for attainments and proved ability. Successful teaching experience is required. There is no rigid credit requirement but since a minimum of three years of graduate study is necessary, the total number of term hours of graduate credit including thesis will approximate 135.

Along with the 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.

Assistantships, Scholarships, and Fellowships

A VARYING number of graduate and research assistantships, scholarships, and fellowships are awarded annually to graduates of accredited universities and colleges who have superior records in their undergraduate work. All persons holding these positions are expected to register in the Graduate Division, and to become candidates for advanced degrees. Assistants, scholars, and fellows pay the same fees as other graduate students. Application should be made before March 15. Application blanks are furnished on request by the Graduate Division.

Graduate Assistantships. A graduate assistant renders services amounting to not more than 18 hours a week—reading papers, handling laboratory and quiz sections, etc. He is permitted to enroll for a maximum of 10 term hours of course work. A graduate assistant commonly completes the work for a master's degree in two years. The stipend is \$660 a year. Appointment is for one year; reappointment may be made for one additional year.

A part-time graduate assistant receives \$330 a year. His maximum course load is 15 term hours.

Research Assistantships. A research assistant aids a faculty member in carrying on a research project. Compensation and enrollment limitations are the same as for a graduate assistant.

Graduate and Research Scholarships. Scholarships are awarded to students whose promise is considered exceptional. Ordinarily, award of a scholarship is based on the student's record during a previous year of study and service at the institution. Required services and enrollment limitations are the same as for assistants. The stipend is \$780 a year.

Graduate and Research Fellowships. A fellow is normally a person proceeding toward the doctorate, with at least one year of markedly superior work toward that degree completed. The graduate fellow gives instructional assistance in his department. The duties of a research fellow are similar to the duties of a research assistant; a fellow is, however, expected to assume greater responsibility in connection with the research project to which he is assigned. Fellows are allowed to enroll for a maximum of 10 term hours of course work. The stipend is \$912 a year.

State Scholarships. A limited number of scholarships covering tuition and laboratory and course fees are available to graduate students in the institutions of the Oregon State System of Higher Education. All applicants, to be eligible, must be in need of financial assistance, and must show evidence of superior scholarship. Applications should be made to the Registrar of the State College, on official blanks furnished by his office, and must be filed before April 1.

Graduate Work at the State College

G RADUATE work at the State College is carried on under the auspices of the Graduate Division, and under the direction of the Graduate Council of the State College and the associate dean of the Graduate Division. Correspondence relating to graduate work in fields allocated to the State College should be addressed to the Graduate Division, Oregon State College, Corvallis, Oregon, or to the department concerned.

The State College is authorized to grant the following advanced degrees through the Graduate Division:

Doctor of Philosophy: Agriculture, Bacteriology, Botany, Chemistry, Entomology, Geology, Mathematics, Physics, Zoology.

Doctor of Education: Education.

Master of Arts (Departmental): Bacteriology, Botany, Chemistry, Education, Engineering, Entomology, Geology, Home Economics, Mathematics, Metallurgical Engineering, Mining Engineering, Pharmacy, Physics, Zoology.

Master of Arts (General Studies).

Master of Science: Agriculture, Bacteriology, Botany, Chemistry, Education, Engineering, Entomology, Forestry, Geology, Home Economics,

Mathematics, Metallurgical Engineering, Mining Engineering, Pharmacy, Physics, Zoology.

Master of Education: Education.

Master of Forestry: Logging Engineering, Technical Forestry, Wood Products.

Engineer: Chemical Engineering (Ch.E.); Civil Engineering (C.E.); Electrical Engineering (E.E.); Forestry, including Logging Engineering, Technical Forestry, and Wood Products (F.E.); Mechanical Engineering (M.E.); Metallurgical Engineering (Met.E.); Mining Engineering (Mi.E.).

A major may be selected from among several fields within a department or may involve two or more related departments. The scope of the departments and schools is indicated in the descriptions on earlier pages.

Graduate Work at the University

GRADUATE work at the University is carried on under the auspices of the Graduate Division, and under the direction of the Graduate Council of the University and the associate dean of the Graduate Division. Correspondence relating to graduate work in the fields allocated to the University should be addressed to the Graduate Division, University of Oregon, Eugene, Oregon, or to the department concerned.

The following degrees are granted by the University through the Graduate Division:

Doctor of Philosophy: Chemistry, Economics, Education, English, History, Medical Sciences, Psychology, Romance Languages, Sociology.

Doctor of Education: Education.

Master of Arts (Departmental): Anthropology, Architecture, Art, Biology, Business Administration, Chemistry, Classics, Economics, Education, English, Geology and Geography, German, History, Journalism, Landscape Architecture, Mathematics, Medical Sciences, Music, Pacific Basin Studies, Philosophy, Physical Education, Physics, Political Science, Psychology, Romance Languages, Sociology.

Master of Arts (General Studies).

Master of Science: Anthropology, Architecture, Art, Biology, Business Administration, Chemistry, Economics, Education, English, Geology and Geography, History, Journalism, Landscape Architecture, Mathematics, Medical Sciences, Music, Pacific Basin Studies, Philosophy, Physical Education, Physics, Political Science, Psychology, Sociology.

Master of Fine Arts: Art and Architecture, Landscape Architecture.

Master of Architecture: Architecture.

Master of Business Administration: Business Administration.

Master of Education: Education.

Master of Landscape Architecture: Landscape Architecture.

Master of Music: Music.

Graduate Work at the Medical School

THE University of Oregon Medical School offers graduate instruction leading to the Master of Arts, Master of Science, and Doctor of Philosophy degrees in the medical sciences: anatomy, bacteriology, biochemistry,

pathology, pharmacology, and physiology. The Medical School admits as candidates for graduate degrees in these fields only those students who are preparing for a professional career in medicine or allied fields, such as dentistry, nursing, and work as a medical or dental technician. Work toward these degrees is offered as an integral part of the program of the Graduate Division, and is subject to the rules and regulations of the Graduate Division. Graduate degrees earned at the Medical School are conferred by the University of Oregon, upon recommendation of the faculty of the Medical School.

In addition to opportunities for graduate study and research in the pre-clinical departments, arrangements may be made for special study of clinical problems by experimental methods, through the cooperation of the preclinical and clinical departments. In some cases, students doing work of this kind may qualify for graduate degrees.

Graduate Work at the Portland Center

IF adequate course offerings are available for an integrated program in the fields in which the student wishes to work, he may complete all the requirements for the Master of Arts (General Studies) degree at the Portland Center. In a number of fields, one-third of the work for the Master of Arts (departmental) or the Master of Science degree may be earned in Portland. Graduate work beyond the master's degree is not offered at the Portland Center. Graduate degrees earned at the Portland Center are awarded by the State College or the University according to major subject, in harmony with the allocation of curricula and degrees.

Master of Arts (General Studies)

IN addition to the regular Master of Arts (departmental) degree, the State College and the University offer the degree of Master of Arts (General Studies) in fields in which graduate work is allocated to the institution. This degree is granted for achievement in cultural scholarship, not for specialized work in one of the traditional fields of learning. The student pursues a program of study selected from the offerings of several departments. The requirements are flexible, but the work must be integrated and organic. The student's thesis provides the focus which determines the selection of courses for his program.

The credit requirement for this degree is 45 term hours, including credit for thesis. The thesis shall be the equivalent, in point of performance, of nine term hours of course work. A committee may, on recommendation of the student's adviser, waive the foreign-language requirement.

The general-studies program at the State College is supervised by a special committee of which Dr. William Henry Dreesen is chairman.

In addition to courses chosen from the offerings of the several State College schools and departments, the following courses are available for the general-studies student:

GSt 501. **Research in General Studies.** Terms and hours to be arranged.

GSt 503. **Thesis.** Terms and hours to be arranged.

GSt 505. **Reading and Conference.** Terms and hours to be arranged.

Part IV

Research

Extension

Enrollment and Degrees

Indexes

Research

ADVANCEMENT of human knowledge and technical and technological service to the commonwealth are recognized functions of institutions of higher learning. Research in the Oregon State System of Higher Education is encouraged and assisted through the General Research Council and divisional councils and by such special institutional agencies as the Agricultural Experiment Station and the Engineering Experiment Station of Oregon State College, and the Commonwealth Service Council of the University of Oregon.

General Research Council

General Council. E. L. PACKARD (chairman), OLOF LARSELL (vice chairman), W. F. ALLEN, C. B. BEALL, R. J. MAASKE, O. K. BURRELL, R. R. HUESTIS, R. W. LEIGHTON, A. L. ALBERT, W. E. MILNE, W. A. SCHOENFELD, H. R. TAYLOR, WILLIBALD WENIGER.

Natural Science Divisional Council. W. E. MILNE (chairman), W. B. BOLLEN, B. E. CHRISTENSEN, P. M. DUNN, NATHAN FASTEN, S. H. GRAF, E. T. HODGE, R. R. HUESTIS, A. H. KUNZ, D. C. MOTE, ETHEL I. SANBORN, E. T. STUHR, WILLIBALD WENIGER, E. S. WEST, JESSAMINE C. WILLIAMS, H. B. YOCOM.

Language, Literature, Art Divisional Council. C. B. BEALL (chairman), LOUIS ARTAU, F. M. COMBELLACK, J. L. FAIRBANKS, R. D. HORN, J. M. KIERZEK, E. C. A. LESCH, G. F. LUSSKY.

Medical Science Divisional Council. W. F. ALLEN (chairman), N. W. JONES, OLOF LARSELL, F. R. MENNE, F. R. MOUNT, H. J. SEARS, E. S. WEST.

Social Science Divisional Council. O. K. BURRELL (chairman), G. A. BAKKUM, VERA H. BRANDON, L. S. CRESSMAN, W. H. DRESEN, J. W. ELLISON, J. T. GANOE, C. L. HUFFAKER, R. W. LEEPER, K. J. O'CONNELL, W. SCHUMACHER, H. G. TOWNSEND, G. S. TURNBULL, L. A. WOOD.

THE General Research Council was established as an interinstitutional organization by the State Board of Higher Education for the purpose of stimulating the development of general research among the staff members of the State System whose projects do not fall in the organized and directed program of other research agencies at the State College and the University.

By subsequent action of the State Board, four divisional councils have been designated as follows: Language, Literature, and Art; Medical Science; Science; and Social Science. The divisional councils are advisory bodies assisting in the encouragement of research in their respective fields, in the development of cooperative research, and in the examination and evaluation of all projects for which research funds are requested.

The dean and director of general research is chairman of the General Research Council and the budgetary officer. The General Research Council is

concerned with the general policies affecting the research interests of staff members. It prepares annually and submits a budget for the support of general research. The council is authorized to make grants-in-aid to approved research projects initiated by staff members of the major institutions of the State System. Such grants are restricted to individuals or groups of individuals of the rank of instructor or higher. The General Research Council also assigns research assistants, research scholars, and research fellows to approved research projects requiring the technical assistance of graduate students. Assistantships, scholarships, and fellowships carry stipends of \$660, \$780, and \$912 respectively. Appointments are made jointly by the Research Council and the Graduate Division.

Agricultural Experiment Station

WILLIAM ALFRED SCHOENFELD, M.B.A., Director of the Agricultural Experiment Station.

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

ESTHER FLORA MCKINNEY, Accountant, Agricultural Experiment Station.

MARGARET HURST, B.S., Secretary, Agricultural Experiment Station.

DIVISION OF AGRICULTURAL ECONOMICS

ERMINE LAWRENCE POTTER, M.S., Agricultural Economist; In Charge, Division of Agricultural Economics.

Agricultural Economics

WILLIAM HENRY DREESEN, Ph.D., Agricultural Economist.

DANIEL BARTON DELOACH, Ph.D., Agricultural Economist.

Farm Management

DWIGHT CURTIS MUMFORD, M.S., Economist in Charge.

GUSTAV WESLEY KUHLMAN, Ph.D., Associate Economist.

*GEORGE BALFOUR DAVIS, B.S., Research Assistant (Farm Management).

HERMAN LAMOTTE THOMAS, M.S., Associate Agricultural Economist, Conservation Economic Division, Soil Conservation, United States Department of Agriculture.

DIVISION OF ANIMAL INDUSTRIES

PHILIP MARTIN BRANDT, A.M., Dairy Husbandman; In Charge, Division of Animal Industries.

Animal Husbandry

RAY GEORGE JOHNSON, B.S., Animal Husbandman.

ORAN MILTON NELSON, M.S., Animal Husbandman.

ALFRED WEAVER OLIVER, M.S., Associate Animal Husbandman.

* On leave for military or civilian war service.

Dairy Husbandry

GUSTAV HANS WILSTER, Ph.D., Dairy Husbandman.
 IDWAL RALPH JONES, Ph.D., Dairy Husbandman.
 HAROLD PLYMPTON EWALT, B.S., Assistant Dairy Husbandman.
 *ROY EDGAR STOUT, M.S., Research Assistant (Dairy Husbandry).

Fish and Game Management

ROLAND EUGENE DIMICK, M.S., Wildlife Conservationist in Charge.
 ARTHUR SKOGMAN EINARSEN, B.S., Associate Biologist, United States Fish
 and Wildlife Service.
 *JAY B LONG, B.S., Assistant Biologist (Fish and Game Management).

Poultry Husbandry

HUBERT ELMER COSBY, Poultry Husbandman in Charge.
 CLAYTON ERNEST HOLMES, Ph.D., Associate Poultry Husbandman.
 *WILBUR TARLETON COONEY, B.S., Assistant Poultry Husbandman.
 JAMES ARTHUR HARPER, M.S., Research Assistant (Poultry Husbandry).

Veterinary Medicine

JAMES NIVEN SHAW, B.S., D.V.M., Veterinarian in Charge.
 ERNEST MILTON DICKINSON, D.V.M., M.S., Veterinarian.
 OTTO HERBERT MUTH, D.V.M., M.S., Associate Veterinarian.
 DON REX MORRILL, D.V.M., M.S., Assistant Veterinarian.
 *ROBERT WATSON DOUGHERTY, D.V.M., M.S., Assistant Veterinarian.
 *ARNOLD SAMUEL ROSENWALD, B.S., D.V.M., Assistant Veterinarian.
 *MERWYN PIERCE CHAPMAN, Research Assistant (Veterinary Medicine).
 JOHN OTTO SCHNAUTZ, D.V.M., Research Assistant (Veterinary Medicine).
 JOHN WILLIAM OSEBOLD, D.V.M., Junior Veterinarian, Bureau of Animal
 Industry, United States Department of Agriculture.

DIVISION OF PLANT INDUSTRIES

WILLIAM ALFRED SCHOENFELD, B.S.A., M.B.A.; In Charge, Division of Plant
 Industries.

Farm Crops

DONALD DAVID HILL, Ph.D., Agronomist in Charge.
 HARRY AUGUST SCHOOT, M.S., Agronomist, Division of Forage Crops and Dis-
 eases.
 ROBERT ESTES FORE, Ph.D., Agronomist.
 HENRY HARDY RAMPTON, M.S., Associate Agronomist, Division of Forage
 Crops and Diseases.
 LINDEN ELI HARRIS, M.S., Associate Agronomist.
 HAROLD ETHAN FINNELL, M.S., Assistant Agronomist.
 ELTON NELSON, B.S., Agent, Division of Cotton and other Fiber Crops and
 Diseases.
 LOUISA AMES KANIPE, B.S., Assistant Seed Technologist (Junior Botanist).
 *LEROY ROBERT HANSEN, M.S., Research Assistant (Farm Crops).
 JACK DILLARD SATHER, B.S., Research Assistant (Farm Crops).

* On leave for military or civilian war service.

Food Industries

ERNEST HERMAN WIEGAND, B.S.A., Food Technologist in Charge.
THOMAS ONSDORFF, M.S., Associate Food Technologist.
EDWARD WINSLOW HARVEY, Ph.D., Assistant Food Technologist.
HERBERT STANFORD MADSEN, B.S., Assistant Food Technologist.
HO-YA YANG, Ph.D., Research Assistant.
EARL MILO LITWILLER, Ph.D., Assistant Food Technologist.
RUSSELL SINNHUBER, M.S., Assistant Biochemist, Seafoods Laboratory,
Astoria.

Horticulture

HENRY HARTMAN, M.S., Horticulturist in Charge.
*WILLIS PIERRE DURUZ, Ph.D., Horticulturist (Plant Propagation).
ARTHUR GEORGE BRISTOW BOUQUET, M.S., Horticulturist (Vegetable Crops).
CARL EPHRAIM SCHUSTER, M.S., Horticulturist, Division of Fruit and Vegetable Crops and Diseases.
GEORGE FORDYCE WALDO, M.S., Associate Pomologist, Division of Fruits and Vegetable Crops and Diseases.
ELMER HANSEN, M.S., Assistant Horticulturist (Pomology).
ALFRED NATHAN ROBERTS, M.S., Research Assistant (Horticulture).

Soil Science

WILBUR LOUIS POWERS, Ph.D., Soil Scientist in Charge.
CHARLES VLADIS RUZEK, M.S., Soil Scientist (Fertility).
†MORTIMER REED LEWIS, C.E., Irrigation and Drainage Engineer, Soil Conservation.
ROSCOE ELMO STEPHENSON, Ph.D., Soil Scientist.
EDWARD FRITCHOFF TORGERSOHN, B.S., Associate Soil Scientist (Soil Survey).
ALFRED WILLIAM MARSH, M.S., Assistant Irrigation Engineer, Cooperative Agent, Soil Conservation Service.
LYNNE K WOOD, Ph.D., Research Assistant.
RAY A PENDLETON, Ph.D., Associate Soil Technologist (Sugar Beet Seed).

OTHER DEPARTMENTS

Agricultural Chemistry

J SHIRLEY JONES, M.S.A., Chemist in Charge.
REGINALD HEBER ROBINSON, M.S., Chemist (Insecticides and Fungicides).
JOSEPH ROY HAAG, Ph.D., Chemist (Animal Nutrition).
DELOSS EVERETT BULLIS, M.S., Associate Chemist.
†MILES BRAYTON HATCH, M.S., Assistant Chemist.
*PAUL HENRY WESWIG, Ph.D., Assistant Chemist.
HERBERT STANFORD MADSEN, B.S., Assistant Chemist.

Agricultural Engineering

FREDERICK EARL PRICE, B.S., Agricultural Engineer in Charge.

* On leave for military or civilian war service.

† On leave of absence.

WILLIAM MAGRUDER HURST, B.S., Senior Agricultural Engineer, Bureau of Plant Industry, Soils and Agricultural Engineering, United States Department of Agriculture.

*HERBERT REEVES SINNARD, M.S., R.A., Associate Agricultural Engineer (Farm Structures).

GEORGE RAYMOND STAFFORD, Engineering Aid, Bureau of Plant Industry, Soils and Agricultural Engineering, United States Department of Agriculture.

HOWARD FRANCIS CARNES, B.S., Assistant Mechanical Engineer, Bureau of Plant Industry, Soils, and Agricultural Engineering, United States Department of Agriculture.

LEONARD MARTIN KLEIN, B.S., Assistant Mechanical Engineer, Bureau of Plant Industry, Soils, and Agricultural Engineering, United States Department of Agriculture.

DALE KIRK, B.S., Research Assistant (Agricultural Engineering).

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

RALPH NICHOLAS LUNDE, B.S., Assistant Agricultural Engineer.

Bacteriology

GODFREY VERNON COFSON, M.S., Bacteriologist in Charge.

JOSEPH ELLSWORTH SIMMONS, M.S., Bacteriologist.

WALTER BENO BOLLEN, Ph.D., Associate Bacteriologist.

Entomology

DON CARLOS MOTE, Ph.D., Entomologist in Charge.

BENJAMIN GARRISON THOMPSON, Ph.D., Associate Entomologist.

SIDNEY CARROLL JONES, M.S., Associate Entomologist.

KENNETH WIESNER GRAY, M.S., Associate Entomologist.

JOE SCHUH, M.S., Assistant Entomologist.

HUGH ENGLE MORRISON, M.S., Assistant Entomologist.

Home Economics

MAUD MATHES WILSON, A.M., Home Economist.

MARGARET LOUISE FINCKE, Ph.D., Nutritionist.

GERTRUDE N HOPPE, M.S., Research Assistant in Nutrition.

ANDREA OVERMAN, M.S., Assistant Home Economist.

Plant Pathology

CHARLES ELMER OWENS, Ph.D., Plant Pathologist in Charge.

SANFORD MYRON ZELLER, Ph.D., Plant Pathologist.

FRANK PADEN MCWHORTER, Ph.D., Plant Pathologist.

BLISS F. DANA, M.S., Plant Pathologist, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

FLOYD DOUGLAS BAILEY, M.S., Associate Pathologist, War Foods Administration Office of Distribution, Western Region, Livestock and Meats Branch, Insecticide Division, United States Department of Agriculture.

* On leave for military or civilian war service.

- PAUL WILLIAM MILLER, Ph.D., Associate Pathologist, Division of Fruits and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.
- GODFREY RICHARD HOERNER, M.S., Agent, Division of Drugs and Related Plants, Bureau of Plant Industry, United States Department of Agriculture.
- JOHN A MILBRATH, Ph.D., Assistant Plant Pathologist.
- LYTTON WESLEY BOYLE, Ph.D., Plant Pathologist, Emergency Plant Diseases, Prevention Bureau of Plant Industries, United States Department of Agriculture.

Publications and News Service

- CHARLES DAVID BYRNE, Ed.D., Director of Information.
- DELMER MORRISON GOODE, M.A., Editor of Publications.
- EDWIN THOMAS REED, B.S., A.B., Litt.D., Emeritus Editor of Publications.
- JOHN COLE BURTNER, B.S., In Charge of News Service.
- ETHEL E ALLEN, B.S., Assistant Editor of Publications.

BRANCH STATIONS

- LEROY CHILDS, A.B., Superintendent, Hood River Branch Experiment Station, Hood River.
- FRANK CHARLES REIMER, M.S., Superintendent, Southern Oregon Branch Experiment Station, Talent.
- DALE EVERETTE RICHARDS, B.S., Superintendent, Eastern Oregon Livestock Branch Experiment Station, Union.
- HAROLD KARL DEAN, B.S., Superintendent, Umatilla Branch Experiment Station, Hermiston; Division of Western Irrigation Agriculture, Bureau of Plant Industry, United States Department of Agriculture.
- HERBERT BADOLLET HOWELL, B.S., Superintendent, John Jacob Astor Branch Experiment Station, Astoria.
- GEORGE ADAMSON MITCHELL, B.S., Superintendent, Pendleton Branch Experiment Station, Pendleton; Assistant Agronomist, Division of Dry Land Agriculture, Bureau of Plant Industry, United States Department of Agriculture.
- MERRILL MAHONRI OVESON, M.S., Superintendent, Sherman Branch Experiment Station, Moro; Division of Cereal Crops and Diseases and Division of Dry Land Agriculture, Bureau of Plant Industry, United States Department of Agriculture.
- ELLIOTT STANFORD DEGMAN, Ph.D., Superintendent, Medford Branch Station, Medford; Associate Pomologist, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.
- EBER WESLEY ELDRED, B.S., Assistant Superintendent, Squaw Butte-Harney Cooperative Range and Livestock Station, Burns.
- ARCH WORK, B.S., Associate Irrigation Engineer, Division of Irrigation, Soil Conservation Service, United States Department of Agriculture, Medford.
- WILLIAM ARTHUR SAWYER, B.S., Superintendent, Squaw Butte-Harney Cooperative Range and Livestock Station, Burns, United States Grazing Service, Department of the Interior.

LOUIS GUSTAV GENTNER, M.S., Assistant Superintendent and Associate Entomologist, Southern Oregon Branch Experiment Station, Talent.

*JAMES FOSTER MARTIN, M.S., Junior Agronomist, Division of Cereal Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture, Pendleton.

GORDON GEORGE BROWN, A.B., B.S., Horticulturist, Hood River Branch Experiment Station, Hood River.

J R KIENHOLZ, Ph.D., Assistant Pathologist, Division of Fruit and Vegetable Crops and Diseases, Hood River.

JOSEPH BELANGER, B.S., Cooperative Research Agent, Conservation Experiment Station Division, Soil Conservation Service, Pendleton.

LAWRENCE ROBERT SWARNER, M.S., Agent, Division of Fruit and Vegetable Crops and Diseases, Medford.

SEAFOODS LABORATORY

EDWARD WINSLOW HARVEY, Ph.D., Assistant Food Technologist, Project Leader, Seafoods Laboratory, Astoria.

RUSSELL SINNHUBER, M.S., Assistant Biochemist, Seafoods Laboratory, Astoria.

AGRICULTURAL EXPERIMENTAL AREAS

HERBERT BADOLLET HOWELL, B.S., Superintendent, Northrup Creek Cut-over Land Grazing Experimental Area, Birkenfeld.

ALVIN EUGENE GROSS, M.S., Superintendent, Klamath Experimental Area and Nematode Project, Klamath Falls.

EDWIN KELTNER, B.S., Superintendent, Red Hill Soils Experimental Area, Oregon City.

DUDLEY L SITTON, B.S., Assistant Superintendent, 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 nine branch stations and four experimental areas advantageously located in such a way as to cover the varying agricultural conditions of Oregon.

The Central Station. At the central station about 1,177 acres of land are used by State College and Station workers engaged in the scientific investigation of problems presented by the different branches of agriculture. The Station includes the following departments: Agricultural Economics; Agricultural Engineering; Animal Husbandry; Bacteriology; Chemistry; Dairy Husbandry; Entomology; Farm Crops; Farm Management; Food Industries; Fish and Game Management; Home Economics; Horticulture; Plant Pathology; Poultry Husbandry; Soils; and Veterinary Medicine.

The scientific investigations of the station staff strongly support the instruction given in the classroom and through the Extension Service. Aside from the original investigations of economic significance to agriculture, the work affords daily object lessons in modern farm methods. To the students in

* On leave for military service.

the various fields of study the value of the investigative work can hardly be overestimated. To the state, from the point of view of economic progress, its value has been greater, in the estimation of many people, than the entire cost of the State College to the commonwealth. The work of the Experiment Station is fundamental in the agricultural development of the state. Oregon's soil and climatic conditions present many problems that are unique and that must be solved before the state can develop its great potential agricultural wealth.

The Branch Stations and Experimental Areas. The nine branch stations located at Astoria, Burns, Hermiston, Hood River, Medford, Moro, Talent, Union, and Pendleton and the four experimental areas located at Birkenfeld, Klamath, Ontario, and Oregon City conduct experiments on the major agricultural problems of their respective agricultural sections of the state.

The John Jacob Astor Branch Experiment Station. The major problems under investigation at this station are dairying, improvement of forage crops, soil fertility, soil management for Coast conditions, and the drainage, improvement, and cultivation of tide-lands.

The Umatilla Branch Experiment Station at Hermiston, 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 orcharding section.

The Sherman Branch Experiment Station at Moro, conducted 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, drainage practices, and soil conservation.

The Southern Oregon Branch Experiment Station at Talent is centering attention on problems of fruit production and general farming in the Rogue River Valley.

The Eastern Oregon Branch Livestock Experiment Station at Union is conducting experiments in fattening, wintering, grazing, and management of livestock; in the production of home-grown livestock, feeds, and cash crops; and in developing proper land utilization, soil conservation, and fertility maintenance in the Blue Mountain region.

The Medford Branch Experiment Station is conducted jointly by the United States Department of Agriculture, Bureau of Plant Industry and Soil Conservation, and the Oregon Agricultural Experiment Station. The major investigations deal primarily with problems of irrigation, drainage and soil fertility, and responses of pear trees to these practices.

The Pendleton Branch Experiment Station conducted cooperatively with the United States Department of Agriculture is equipped with 160 acres of land in an important wheat-growing belt for the purpose of establishing and maintaining crop rotation and soil conservation investigations.

The Squaw Butte-Harney Cooperative Range and Livestock Station consists of 16,000 acres of intermountain arid range lands used for experimental grazing work under controlled conditions with the object of rehabilitating depleted and wornout ranges; 183 acres of irrigated land used in conducting experiments in the production of alfalfa hay, legumes, and forage for livestock feeding and in

introducing, testing, and developing cash crops adapted to the high altitude areas of the Harney Basin; 520 acres of native meadow land used for experimental fall and winter pasture and for the production of native hay for feeding experimental livestock. The combination of range and meadow land makes a complete experimental unit conducted cooperatively and jointly by the Oregon Agricultural Experiment Station and the U. S. Grazing Service, Department of the Interior.

The Northrup Creek Experimental Area located near Birkenfeld, Oregon, is conducting investigations in the utilization of logged-off timber lands by experimenting with sod-forming grasses on such lands and the utilization of the forage by livestock.

The Klamath Experimental Area is conducting research in the control of nematodes and other pests and diseases of potatoes and in developing economic uses for class 5 lands, of which there are 12 to 15 thousand acres in the Klamath irrigated basin.

The Malheur Experimental Area is devoted to experiments in the economic production of vegetable and crop seeds and forage under the irrigated conditions of the Vale-Owyhee project, and in the production and utilization of forage crops for livestock.

The Red Soils Experimental Area is centering attention on rebuilding wornout red hill soils, of which there are approximately 800,000 acres in the Willamette Valley.

Engineering Experiment Station

RICHARD HAROLD DEARBORN, A.B., E.E., Director of the Engineering Experiment Station.

SAMUEL HERMAN GRAF, M.E., M.S., Director of Engineering Research.

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

PAUL MILLARD DUNN, M.S.F., Forestry.

*FREDERICK ALTON EVEREST, E.E., Radio Engineering.

GEORGE WALTER GLEESON, Ch.E., Chemical Engineering.

BURDETTE GLENN, M.S., Highway Engineering.

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

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., Mechanical 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.

BENJAMIN FRANKLIN RUFFNER, Aero.E., M.S., Aeronautical Engineering.

MILTON CONWELL SHEELY, B.S., Shop Processes.

ALBERT WILBUR SCHLECHTEN, Sc.D., Mining and Metallurgical Engineering.

*EUGENE CARL STARR, E.E., Electrical Engineering.

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

†GLENN VOORHIES, M.S., F.E., Wood Products.

* On leave for military or civilian war service.

† On leave of absence.

Technical Counselors

R. H. BALDOCK, State Highway Engineer, Salem.

IVAN BLOCH, Chief, Division of Industrial and Resources Development, Bonneville Power Administration, Portland.

R. R. CLARK, Designing Engineer, Corps of Engineers, Portland District, Portland.

DAVID DON, Chief Engineer, Public Utilities Commissioner, Salem.

C. B. McCULLOUGH, Assistant State Highway Engineer, Salem.

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.

EARL K. NIXON, Director, State Department of Geology and Mineral Industries, Portland.

JAMES H. POLHEMUS, President, Portland General Electric Co., Portland.

S. C. SCHWARZ, Chemical Engineer, Portland Gas & Coke Company, Portland.

J. C. STEVENS, Consulting Civil and Hydraulic Engineer, Portland.

CHARLES E. STRICKLIN, State Engineer, Salem.

STEPHEN N. WYCKOFF, Director, Pacific Northwest Forest and Range Experiment Station, United States Department of Agriculture, Forest Service, Portland.

BY ACT of the Board of Regents of the State College on May 4, 1927, the Engineering Experiment Station was established at Corvallis to serve the state in a manner broadly outlined by the following policy:

- (1) To serve the industries, utilities, professional engineers, public departments, and engineering teachers by making investigations of significance and interest to them.
- (2) To stimulate and elevate engineering education by developing the research spirit in faculty and students.
- (3) To publish and distribute through bulletins, circulars, and technical articles in periodicals the results of such studies, surveys, tests, investigations, and researches as will be of greatest benefit to the people of Oregon, and particularly to the state's industries, utilities, and professional engineers.

The Engineering Experiment Station is an integral part of the School of Engineering. All staff members and laboratory facilities of the Engineering School are available for the investigational work of the Station to the extent of the sums allocated or contributed for their operation and support. Much of the work of the station has been made possible by the assistance of industries and state and national associations.

The dean of engineering is director of the station, and the heads of the various major departments function as a council *ex-officio*. The director of research acts as chairman of the council, technical adviser upon investigation work, and as engineering editor of publications. The active staff is composed of members of the instructional staff who may be interested in various specific research projects, and of research fellows who are pursuing graduate study and are assigned to part-time work in the station. Experts who are especially qualified by training and experience to advise upon the investigations in certain fields have been appointed to the staff as special technical counselors. Some technical assistants have been supported by manufacturers and industrial associations interested in working out specific problems.

Extension

THROUGH extension services the benefits of all the state institutions of higher education are brought to the people of the state in their own communities. All divisions of the State System of Higher Education seek through every means possible, so far as resources and facilities permit, to serve the entire state. All extension activities of the several institutions are administered through two coordinated extension services: the General Extension Division and the Federal Cooperative Extension Service. The latter includes all extension activities carried on jointly with the Federal government.

General Extension Division

Administration

*WILLIAM GILBERT BEATTIE, B.A., Acting Dean and Director of General Extension and Summer Sessions; Professor of Education.

HENRY EUGENE STEVENS, Ed.D., Administrative Assistant in General Extension; Associate Professor of Education.

MARY E KENT, B.A., Eugene Office Manager; Assistant Professor of Extension Teaching.

Correspondence Study

MOZELLE HAIR, B.A., Head of Correspondence Study; Assistant Professor of Sociology.

DOROTHY S. JONES, Record Clerk.

CARMEN W. YOKUM, B.S., Mimeograph Clerk.

State-Wide Extension Classes

HENRY EUGENE STEVENS, Ed.D., Administrative Assistant in General Extension.

ELSIE M ISOTOFF, Secretary.

Portland Extension Center

MARGARET MORRISON SHARP, Administrative Assistant.

MAURINE CHURCHILL, Secretary.

MABLE HOLMES PARSONS, M.A., Professor of English.

ALFRED POWERS, B.A., Professor of Journalism.

HENRY EUGENE STEVENS, Ed.D., Associate Professor of Education; Adviser in General Studies.

PERCY M COLLIER, B.A., LL.B., Associate Professor of English.

PHILIP WOOD JANNEY, B.A., C.P.A., Associate Professor of Business Administration.

* JOHN FRANCIS CRAMER, Ed.D., will become Dean and Director of General Extension on July 1, 1944.

Radio Station KOAC

ALLEN MILLER, B.S., Program Manager; Associate Professor of Radio Speech.
ZELTA FEIKE RODENWOLD, M.S., Director of Women's Programs; Assistant
Professor of Home Economics Extension.

RICHARD E. FUSON, M.A., Announcer.

MARGARET E. WHITE, Secretary.

Visual Instruction

WILLIAM CURTIS REID, Ph.D., Head of Department; Associate Professor of
Visual Instruction.

RUTH P ADAMS, Secretary.

In-Service Extension in Elementary Education

HARVEY EDGAR INLOW, M.A., LL.B., Head of Department; Professor of Elementary Teacher In-Service Extension Education.

Summer Sessions

WILLIAM GILBERT BEATTIE, B.A., Acting Director of Summer Sessions; Director, Portland Summer Session.

VIRGINIA S. PEERY, Secretary of Summer Sessions.

THE General Extension Division of the Oregon State System of Higher Education serves the people of the state through adult education by means of extension classes, correspondence study, visual instruction, and radio, and administers the summer sessions of the institutions of the State System. Its work is organized into the following departments: At Corvallis: Visual Instruction; Radio Station KOAC. At Eugene: Correspondence Study; State-Wide Extension Classes. At Portland: Portland Extension Center; Summer Sessions. At Monmouth: In-Service Extension in Elementary Education.

A State-Wide Campus. Through the General Extension Division the curricula, personnel, and facilities of all the state institutions of higher education are made available in some degree to every citizen, group, and community in Oregon. The activities of the General Extension Division are closely coordinated with those of the Federal Cooperative Extension Service and all other organized service agencies in the state.

Portland Extension Center. General extension in Portland is carried on through the Portland Extension Center. More than a hundred evening, late afternoon, and Saturday morning courses in twenty-six different departments and professional schools were offered during the academic year 1943-44. The work of these classes is of standard college or university grade. Resident credit at the State College, the University, 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 State College or the University. Detailed information is published in the Portland Extension Center Announcements.

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 can 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.

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 to correspondence courses; any adult who has sufficient preparation to profit from them may enroll. Complete information is published in a special Correspondence Study Catalog.

Visual Instruction. The Department of Visual Instruction 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 is published listing the material available. This department is maintained jointly by the General Extension Division and the Federal Cooperative Extension Service.

Radio Station KOAC. Radio Station KOAC is Oregon's public-owned station of which the State Board of Higher Education is the managing agency. The station is located at Corvallis, Oregon, on the campus of Oregon State College, the licensee and operator of the physical plant. The General Extension Division of the State System of Higher Education directs the program service. Program talent is drawn from Oregon State College, the University of Oregon, the Oregon colleges of education, and from various departments of the state government. In addition, 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 daytime, 1,000 watts power evening on a frequency of 550 kilocycles by authority of the Federal Radio Commission. Announcements of radio programs are issued periodically, and will be furnished on request.

Summer Sessions. The summer sessions of the several institutions, although a phase of resident instruction, are administered under the General Extension Division. At the State College, the University, and the three colleges of education, the 1944 summer sessions have been organized as full summer quarters, made up of two five-and-one-half-week sessions. The summer program at the Portland Extension Center includes a full eleven-week quarter of evening classes and a six-week daytime summer session. Both undergraduate and graduate courses are offered at the University, State College, and Portland sessions. Information concerning the summer sessions is issued in separate bulletins.

Federal Cooperative Extension Service

Extension Staff at Corvallis

Administration

WILLIAM ALFRED SCHOENFELD, M.B.A., Director, Extension Service.
WILLIAM LE ROY TEUTSCH, B.S., Assistant Director, Extension Service.
CHARLES WESLEY SMITH, B.S., County Agent Leader.
AZALEA LINFIELD SAGER, M.A., State Home Demonstration Leader.
HARRY CASE SEYMOUR, State Leader of 4-H Club Work.
CLIFFORD LOVEJOY SMITH, M.S., Assistant County Agent Leader.
JOHN MYERS CLIFFORD, Extension Secretary.

Professors

FRANK LLEWELLYN BALLARD, B.S., Extension Agricultural Editor.
LE ROY BREITHAUPT, B.S., Extension Agricultural Economist (Statistics, News, and Outlook).
OVID TULLIUS MCWHORTER, B.S., Extension Horticulturist.
EDWIN RUSSELL JACKMAN, B.S., Specialist in Farm Crops.
HARRY GRANT AVERY, B.S., Assistant Extension Economist, Marketing.
PAUL CARPENTER, B.S., Extension Agricultural Economist (Marketing).
ROGER WILLIAM MORSE, B.S., Extension Dairyman.
JAMES RALPH BECK, B.S., State Supervisor, Farm Labor Service.
RAY GEORGE JOHNSON, B.S., Specialist in Range Management.
HARRY ARTHUR LINDGREN, B.S., Extension Animal Husbandman.
*JOHN COLE BURTNER, B.S., Extension Editor.

Associate Professors

HELEN JULIA COWGILL, M.A., Assistant State 4-H Club Leader.
LEONARD JOHN ALLEN, M.S., Assistant State 4-H Club Leader.
CLYDE WALKER, M.S., Extension Agricultural Engineer.
LUCY ADA CASE, M.A., Extension Nutritionist.
MABEL CLAIR MACK, M.S., Assistant State Supervisor, Farm Labor Service.
ARTHUR SOLOMON KING, M.S., Specialist in Soils.
NOEL LINDSAY BENNION, M.S., Extension Poultryman.

Assistant Professors

HAROLD H WHITE, M.S., Associate Extension Economist.
LOIS AILEEN LUTZ, M.A., Specialist in Home Management.
LUCY ROCENA LANE, M.A., Specialist in Clothing and Textiles.
ROBERT EDWARD RIEDER, B.S., Extension Entomologist and Plant Pathologist.
MARION DAWS THOMAS, B.S., Assistant Extension Economist.
GERALD TITUS NEWCOMB, M.S., Extension Soil Conservationist.

* Part time, Federal Cooperative Extension.

WILLIAM CURTIS REID, Ph.D., Specialist in Visual Instruction.
CHESTER EDISON OTIS, B.S., Assistant Specialist in Farm Crops.

Instructors

*ROBERT H STERLING, B.S., Assistant Specialist in Land Use Planning.
ELVERA CHARLOTTE HORRELL, Junior Extension Statistician.
ORAS VERNON CHENOWETH, B.S., Assistant Specialist in Soils.

County Extension Agents

Professors

WALTER ARMAND HOLT, B.S., County Agent, Umatilla County.
CHARLES ALBERT HENDERSON, B.S., County Agent, Klamath County.
OTTIS SCHULER FLETCHER, M.S., County Agent, Lane County.
ROBERT GREY FOWLER, B.S.A., County Agent, Jackson County.
SYLVESTER BENJAMIN HALL, B.S., County Agent, Multnomah County.
JOHN JERRY INSKEEP, M.S., County Agent, Clackamas County.
GEORGE HERRICK JENKINS, B.S., County Agent, Coos County.
*WILLIAM SAMUEL AVERILL, B.S., County Agent, Benton County.

Associate Professors

GEORGE ALLEN NELSON, B.S., County Agent, Columbia County.
PHILIP TUTHILL FORTNER, B.S., County Agent, Baker County.
DAVID HONORE KENNEDY, B.S., Club Agent, Tillamook County.
*RICHARD CARL KUEHNER, B.S., Club Agent, Lane County.
ARCHIE LEE MARBLE, B.S.A., County Agent, Hood River County.
CHESTER HAROLD BERGSTROM, B.S., County Agent, Tillamook County.
WILBUR WRAY LAWRENCE, B.S., County Agent, Wasco County.
VICTOR WALDEMAR JOHNSON, B.S., County Agent, Lake County.
FRANCES ANN CLINTON, M.S., Home Agent, Marion County.
RALPH EDWARD BROOKE, M.S., County Agent, Malheur County.
JAMES ROLAND PARKER, M.S., County Agent, Douglas County.
REX WARREN, M.S., County Agent, Yamhill County.
WALTER CHRISTIAN LETH, B.S., County Agent, Polk County.
AFTON ZUNDEL, B.S., County Agent, Clatsop County.
WINNIFRED KEIL GILLEN, M.S., Home Agent, Klamath County.

Assistant Professors

LEROY CLINTON WRIGHT, B.S., County Agent, Sherman County.
CLAY CARL MILLER, B.S., Club Agent, Multnomah County.
ROBERT MYRON KNOX, B.S., County Agent, Curry County.
GARNET DOUGLAS BEST, B.S., County Agent, Wallowa County.
†CHARLES JOSEPH WEBER, B.S., Urban Club Agent, Portland.

* On leave for military or civilian war service.

† Part time, Federal Cooperative Extension.

*HARRY LABARE RICHES, B.S., County Agent, Marion County.
OLIVER KENNETH BEALS, B.S., County Agent, Josephine County.
EARL A BRITTON, A.B., Club Agent, Douglas County.
MAUD CONWAY CASSWELL, B.S., Home Agent, Columbia County.
KENNETH WHITE SAWYER, B.S., County Agent, Jefferson County.
OSCAR EDWIN MIKESELL, B.S., County Agent, Linn County.
ETHAN LINDEN WOODS, B.S., County Agent, Crook County.
NELLIE CATHERINE LYLE, M.S., Home Agent, Lane County.
*MARJORIE ELLSWORTH, B.S., Home Agent, Union County.
RUTH ESTHER CRAWFORD, B.S., Home Agent, Josephine County.
HOWARD GEORGE SMITH, B.S., County Agent, Lincoln County.
CLIFFORD BERNARD CORDY, M.S., Assistant County Agent, Jackson County.
DOROTHY BISHOP DUNN, B.S., Home Agent, Coos County.
ROLAND WILLIAM SCHAAD, B.S., County Agent, Union County.
MELVIN EMMETT KNICKERBOCKER, B.S., County Agent, Grant County.
STONEWALL ANDREW JACKSON, B.S., County Agent, Benton County.
CLIFFORD DE VERE CONRAD, B.S., County Agent, Morrow County.
*WILLIAM FREDRICK MARSHALL, B.S., County Agent, Gilliam County.
PALMER STANLEY TORVEND, B.S., County Agent, Washington County.
ERNEST MILLARD HAUSER, B.S., Club Agent, Malheur County.
DONALD WAYNE JOSSY, B.S., Club Agent, Clatsop County.
MARION JANE FARRELL, B.S., Home Agent, Jackson County.
WILLIAM GERALD NIBLER, B.S., County Agent, Marion County.
EMMA IDA FREEHLING, B.S., Home Agent, Multnomah County.
JULIANNE WISE, M.S., Home Agent, Union County.
ELIZABETH JANE KNAPP, B.S., Home Agent, Baker County.
CAL GRAHAM MONROE, B.S., County Agent, Gilliam County.
GENE MAURICE LEAR, B.S., County Agent, Deschutes County.

Instructors

ARNOLD CHRISTIAN EBERT, B.S., County Agent, Wheeler County.
*WALTER JOHN JENDRZEJEWSKI, B.S., Assistant County Agent, Klamath County.
*HARRY JAMES ENDICOTT, B.S., Assistant County Agent, Malheur County.
AMOS WILBUR BIERLY, B.S., Club Agent, Marion County.
MARJORIE ILEE TYE, M.A., Home Agent, Wasco County.
JOHN ROBERT MCCAMBRIDGE, B.S., Assistant County Agent, Klamath County.
*LEEDS CRIM BAILEY, B.S., Assistant County Agent, Malheur County.
OLA FAYE NICHOLS, B.S., Home Agent, Washington County.
MYRTLE MAE CARTER, M.S., Home Agent, Umatilla County.
ELBERT NEIL HOFFMAN, B.S., Assistant County Agent, Malheur County.
ELIZABETH HEDWIG BOECKLI, Home Agent, Deschutes County.
EPHRAIM ALFRED DANIELSON, M.S., Club Agent, Lane County.

* On leave for military or civilian war service.

WILLIAM KING FARRELL, B.S., Club Agent, Benton County.
JOHN KEITH GRIMES, B.S., Club Agent, Clackamas County.
ELGIN MAC CORNETT, B.S., Assistant County Agent, Umatilla County.
JENS FREDERICK SVINTH, B.S., Assistant County Agent, Washington County.
JAMES FRANKLIN BISHOP, B.S., Assistant County Agent, Coos County.
JESSE BLAINE HOLLADAY, M.S., Assistant County Agent, Malheur County.
HAROLD IVAN TALLEY, Club Agent, Lake County.
NIELS JOHN HANSEN, B.S., Club Agent, Linn County.
EARLE FRED JOSSY, B.S., Club Agent, Jackson County.
JAMES BURTON APPLING, B.S., County Agent, Harney County.
JANET CAROLINE TAYLOR, B.S., Home Agent, Clackamas County.
TURNER HANKS BOND, B.S., Assistant County Agent, Clackamas County.
JEAN ELIZABETH McELHINNY, B.S., Home Agent, Yamhill County.
*HEROLD VERNON LOUGHEAD, B.S., Assistant County Agent, Marion County.
DAN WILLIAM YOUNG, B.S., Assistant County Agent, Lane County.
LOUIE HENRY GROSS, B.S., Club Agent, Yamhill County.
FRANK EUGENE HACKLER, B.S., Assistant County Agent, Umatilla County.
NELSON BARTRAM LEWIS, B.S., Assistant County Agent, Wasco County.
GEORGE ALBERT POPE, B.S., Club Agent, Clackamas County.
BEN ALLEN NEWELL, B.S., Assistant County Agent, Marion County.
JOHN PRICE SCHROEDER, B.S., Assistant County Agent, Union County.
THEODORE VAN TIBBUTT, Assistant County Agent, Polk County.
GEORGE DONALD PETERS, B.S., Club Agent, Klamath County.
JAMES FRED PARENT, B.S., Assistant County Agent, Baker County.
JENNIE MARIE WARREN, B.S., Home Agent-at-large.

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 the State College, 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 the 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.

*On leave for military or civilian war service.

Extension Projects. In order to assure the maximum of efficiency, extension work is conducted on the basis of definitely planned projects. These require approval by the proper State College authority and the Secretary of the United States Department of Agriculture before federal and state funds appropriated for the work may be expended.

The several distinct lines of work now covered by written projects, from which citizens of the state are receiving benefit, include:

General—general administration and organization of the Extension Service; county agent work; home demonstration work; 4-H club work; preparation, printing, and distribution of bulletins; news service and publicity; visual instruction.*

Agriculture—soils, irrigation, and drainage; soil conservation; horticulture; animal husbandry; dairying; poultry husbandry; farm crops; agricultural economics, including marketing and the collection and dissemination of statistical and outlook information; agricultural engineering; rodent eradication; land use planning.

Home Economics—nutrition; home management; clothing and textiles; community social organization.

These projects are not assumed to cover all problems of importance within the state. It is the purpose to put into operation and to emphasize those lines of extension service that are fundamental to large and important interests of farm and home welfare, or to material agricultural development.

* Supported jointly with General Extension Division.

Summary of Enrollment and Degrees Granted 1942-43

ENROLLMENT BY CURRICULUM AND CLASS, REGULAR SESSION 1942-43

Curriculum	Freshman year	Sophomore year	Junior year	Senior year	Graduate	Special	Sub-total	Total
<i>Liberal Arts and Sciences</i>								
Lower Division								
Arts and Letters	118	27	.....	.....	.....	3		
Science	240	181	.....	.....	.....	1		
Social Science	100	43	.....	.....	.....
Total, Lower Division	458	251	.....	.....	.....	4	713	
School of Science								
General Science .....	.....	.....	24	17	.....	.....
Bacteriology .....	.....	.....	1	3	1	.....	
Botany .....	.....	.....	1	1	1	.....	
Chemistry .....	.....	.....	8	12	25	.....	
Entomology .....	.....	.....	3	1	7	.....	
Geology .....	.....	.....	3	5	.....	.....
Mathematics .....	.....	.....	4	3	4	.....	
Physics .....	.....	.....	1	5	1	.....	
Zoology .....	.....	.....	2	2	3	.....	
Total, School of Science....	240	181	47	49	42	3	562	
Total, Liberal Arts and Science, excluding duplicates	458	251	47	49	42	4	.....	851
<i>Professional Curricula</i>								
School of Agriculture	160	138	84	81	18	.....		481
School of Education	48	60	48	31	22	.....		209
School of Engineering	613	298	156	136	5	1		1,209
School of Forestry	88	66	31	23	1	.....		209
School of Home Economics	185	176	133	83	23	2		602
School of Pharmacy	18	18	12	30	.....	.....		78
Secretarial Science	226	152	69	55	.....	5		507
Lower-division Professional								
Architecture and Allied Arts..	6	10	.....	.....	.....	.....		16
Business Administration	81	39	.....	.....	.....	1		121
Journalism	8	2	.....	.....	.....	.....		10
Music	1	.....	.....	.....	.....	.....		1
Unclassified .....	.....	.....	.....	.....	10	.....		10
Auditors .....	.....	.....	.....	.....	.....	.....		58
Totals (excluding duplicates)	1,892	1,210	580	488	121	13		4,362
Army Specialized Training Unit..	.....	.....	.....	.....	.....	.....		381
Total Students, Regular Session								4,743

DISTRIBUTION OF ENROLLMENT AS TO SEX AND RANK 1942-43

	Men	Women	Total
Total Graduate Students	60	61	121
Total Undergraduate Students	2,629	1,554	4,183
Total Auditors	8	50	58
Total Army Specialized Training Unit	381	.....	381
Totals	3,078	1,665	4,743

ENROLLMENT IN SUMMER SESSIONS, 1942

	Men	Women	Total
First Session	209	396	605
Second Session	98	97	195
Auditors	1	18	19
4-H Club Short Course	680	1,199	1,879
Totals	988	1,710	2,698
Net Total, excluding duplicates	903	1,636	2,539

ENROLLMENT IN GENERAL EXTENSION DIVISION

July 1, 1942, to June 30, 1943 (excluding duplicates)

	Undergraduate			Graduate			Total		
	Men	Wom-en	Total	Men	Wom-en	Total	Men	Wom-en	Total
<i>Extension Classes:</i>									
Portland Center	596	1,319	1,915	12	21	33	608	1,340	1,948
State-Wide:									
Camp Adair	42	-----	42	-----	-----	-----	42	-----	42
Corvallis	41	113	154	-----	-----	-----	41	113	154
Eugene	32	168	200	3	2	5	35	170	205
Marshfield	13	14	27	-----	-----	-----	13	14	27
Ontario	2	19	21	-----	-----	-----	2	19	21
Salem	4	39	43	1	2	3	5	41	46
Springfield	1	23	24	-----	-----	-----	1	23	24
Total, State-Wide Classes	135	376	511*	4	4	8	139	380	519
<i>Correspondence Study:</i>									
New registrants	695	671	1,366	-----	-----	-----	695	671	1,366
Students registered before July 1, 1942, who are still en- rolled	517	450	967	-----	-----	-----	517	450	967
Total, Correspond- ence Study	1,212	1,121	2,333	-----	-----	-----	1,212	1,121	2,333
GRAND TOTAL, Extension Classes and Corres- pondence Study	1,943	2,816	4,759	16	25	41	1,959	2,841	4,800*

* Eight undergraduates took work in both Springfield and Eugene.

SUMMARY OF DEGREES GRANTED 1942-43

<i>Advanced Degrees</i>		
Doctors of Engineering (honorary)	2	
Doctor of Laws (honorary)	1	
Doctor of Literature (honorary)	1	
Doctors of Philosophy	4	
Doctor of Education	1	
Masters of Arts	8	
Masters of Science	38	
Masters of Education	5	
Total Advanced Degrees	-----	60
<i>Bachelors' Degrees</i>		
Bachelors of Arts		
Science	11	
Education	4	
Home Economics	1	
Nursing Education	7	
Secretarial Science	3	
Bachelors of Science		
Science	52	
Agriculture	72	
Commerce	1	
Education	32	
Chemical Engineering	26	
Civil Engineering	25	
Electrical Engineering	39	
Mechanical Engineering	44	
Industrial Arts	9	
Forestry	25	
Home Economics	107	
Nursing Education	11	
Pharmacy	33	
Secretarial Science	46	
Bachelor of Education	1	
Bachelors of Forestry	2	
Total Bachelors' Degrees	-----	551
Total Degrees Granted 1942-43	-----	611

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