

The Bulletin
of the University of
Minnesota

General Information
For the Year 1919-1920



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The Bulletin of the University of Minnesota is issued as often as twice a month during the University year.

The Bulletin comprises—

The reports of the President and of the Board of Regents, the Register, the Bulletin of General Information, the annual announcements of the individual colleges of the University, announcements of special courses of instruction, and reports of University officers.

These bulletins will be sent gratuitously to all persons who apply for them. The applicant should state specifically which bulletin or what information is desired. Address

The REGISTRAR,
The University of Minnesota,
Minneapolis, Minnesota.

Research Publications. Containing results of research work. Papers are published as separate monographs numbered in several series.

Current Problems Series. Containing papers of general interest in various lines of work.

School of Mines Experiment Station Bulletin. Containing results of investigations conducted by the Station.

These publications are sent free to libraries and to other institutions publishing similar material. To individuals, a small charge is made. For lists and prices, address

The LIBRARIAN,
The University of Minnesota,
Minneapolis, Minnesota.

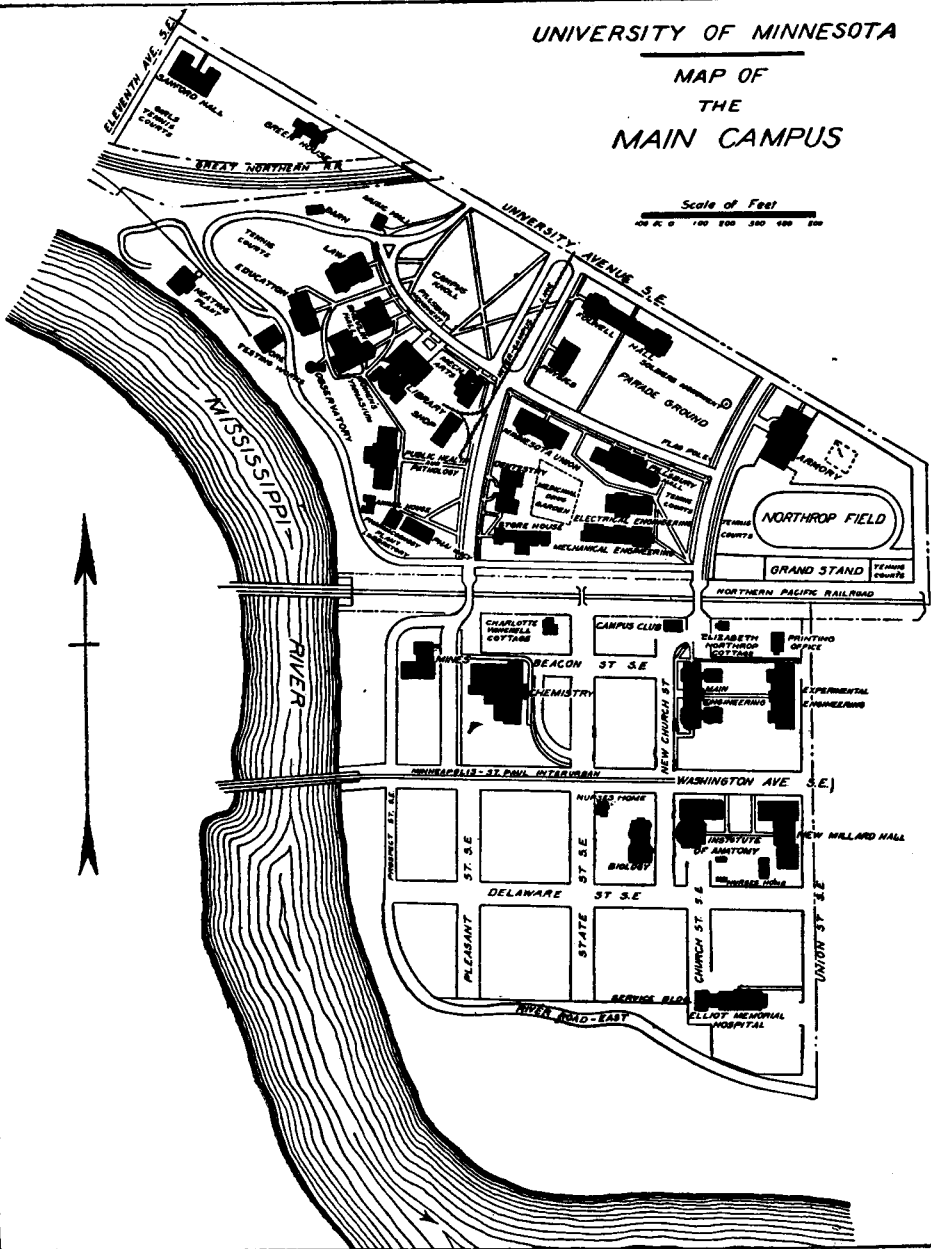
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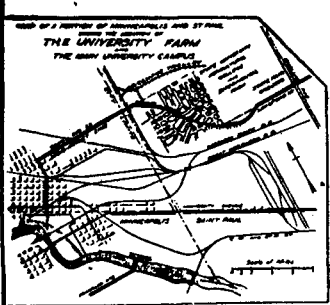
UNIVERSITY OF MINNESOTA

MAP OF THE MAIN CAMPUS

Scale of Feet
0 100 200 300 400 500

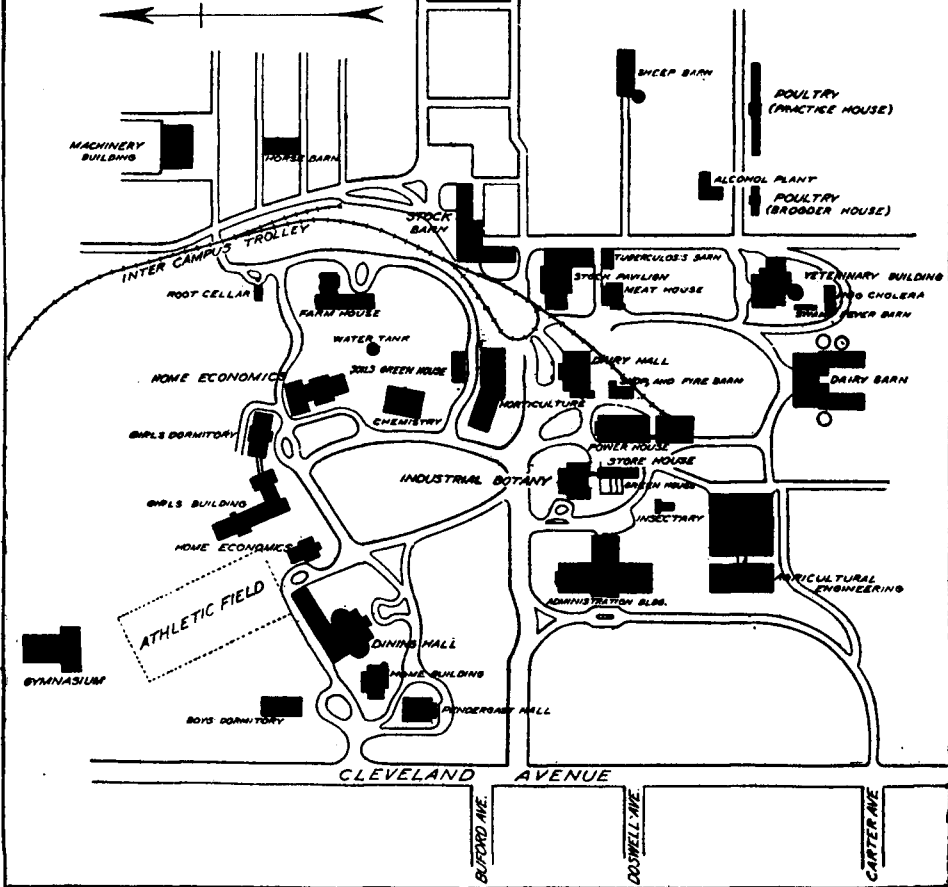
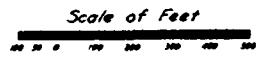


Area of Main Campus, 108.5 acres



UNIVERSITY OF MINNESOTA

MAP OF THE CAMPUS OF THE UNIVERSITY FARM



O. S. Zeller.

Area of University Farm, 422.56 acres

1919							1920														
JULY							JANUARY							JULY							
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	
..	..	1	2	3	4	5	..	..	..	..	1	2	3	..	..	..	..	1	2	3
6	7	8	9	10	11	12	4	5	6	7	8	9	10	4	5	6	7	8	9	10	
13	14	15	16	17	18	19	11	12	13	14	15	16	17	11	12	13	14	15	16	17	
20	21	22	23	24	25	26	18	19	20	21	22	23	24	18	19	20	21	22	23	24	
27	28	29	30	31	..	..	25	26	27	28	29	30	31	25	26	27	28	29	30	31
..	
AUGUST							FEBRUARY							AUGUST							
..	..	..	..	..	1	2	1	2	3	4	5	6	7	1	2	3	4	5	6	7
3	4	5	6	7	8	9	8	9	10	11	12	13	14	8	9	10	11	12	13	14	
10	11	12	13	14	15	16	15	16	17	18	19	20	21	15	16	17	18	19	20	21	
17	18	19	20	21	22	23	22	23	24	25	26	27	28	22	23	24	25	26	27	28	
24	25	26	27	28	29	30	29	..	..	..	..	..	..	29	30	31	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
SEPTEMBER							MARCH							SEPTEMBER							
..	1	2	3	4	5	6	..	1	2	3	4	5	6	..	..	..	1	2	3	4
7	8	9	10	11	12	13	7	8	9	10	11	12	13	5	6	7	8	9	10	11	
14	15	16	17	18	19	20	14	15	16	17	18	19	20	12	13	14	15	16	17	18	
21	22	23	24	25	26	27	21	22	23	24	25	26	27	19	20	21	22	23	24	25	
28	29	30	..	..	..	..	28	29	30	31	..	..	..	26	27	28	29	30	..	..
..	
OCTOBER							APRIL							OCTOBER							
..	5	6	7	1	2	3	4	1	2	3	1	2
12	13	14	15	8	9	10	11	4	5	6	7	8	9	10	3	4	5	6	7	8	9
19	20	21	22	16	17	18	18	11	12	13	14	15	16	17	10	11	12	13	14	15	16
26	27	28	29	23	24	25	..	18	19	20	21	22	23	24	17	18	19	20	21	22	23
..	30	31	25	26	27	28	29	30	..	24	25	26	27	28	29	30
..	31
NOVEMBER							MAY							NOVEMBER							
..	2	3	4	5	6	7	1	..	..	..	..	..	1	..	1	2	3	4	5	6
9	10	11	12	13	14	15	8	2	3	4	5	6	7	8	7	8	9	10	11	12	13
16	17	18	19	20	21	22	15	9	10	11	12	13	14	15	14	15	16	17	18	19	20
23	24	25	26	27	28	29	16	16	17	18	19	20	21	22	21	22	23	24	25	26	27
30	23	23	24	25	26	27	28	29	28	29	30
..	30	30	31
DECEMBER							JUNE							DECEMBER							
..	7	8	9	10	11	12	13	1	2	3	4	5	1	2	3	4
14	15	16	17	18	19	20	14	6	7	8	9	10	11	12	5	6	7	8	9	10	11
21	22	23	24	25	26	27	13	13	14	15	16	17	18	19	12	13	14	15	16	17	18
28	29	30	31	20	20	21	22	23	24	25	26	19	20	21	22	23	24	25
..	27	27	28	29	30	26	27	28	29	30	31	..
..

UNIVERSITY CALENDAR

1919-1920

1919			
September	20	Saturday	Payment of fees closes, except for new students
September	23	Tuesday	Juniors and seniors, School of Mines report for completion of field work
September	24-30	Week	Examinations for removal of conditions, and entrance examinations Registration period, Colleges of Science, Literature, and the Arts, and Agriculture, Forestry, and Home Economics
September	29	Monday	First semester evening extension classes begin
September	29	Monday	School of Agriculture, first term begins
September	29-30		Registration days for all colleges not indicated above
September	30	Tuesday	Payment of fees for new students closes
October	1	Wednesday	Fall quarter begins
October	16	Thursday	Senate meeting, 4:00 p.m.
November	27	Thursday	Thanksgiving Day; a holiday
December	2	Tuesday	Creamery Butter Makers' Short Course (ten days' session) and Cheese Makers' Short Course (three weeks' session) begin
December	18	Thursday	Senate meeting, 4:00 p.m.
December	20	Saturday	School of Agriculture, first term closes
December	23	Tuesday	Christmas vacation begins 9:00 p.m.
December	29	} Week	Farmers' and Home-Makers' Week Short Course
1920	3		
January	2	Friday	Christmas vacation ends 8:30 a.m.
January	2	Friday	Winter quarter begins
January	5	Monday	School of Agriculture, second term begins
January	7	Wednesday	School of Embalming begins
January	23	Friday	First semester evening extension classes close
February	2	Monday	Second semester evening extension classes begin
February	2-6	Week	Merchants' Short Course
February	12	Thursday	Lincoln's Birthday; a holiday
February	19	Thursday	Senate meeting, 4:00 p.m.
March	24	Wednesday	School of Agriculture, second term closes
March	25	Thursday	Winter quarter ends
March	29	} Week	Boys' and Girls' Week, University Farm
April	3		

April	1	Thursday	Spring quarter begins
April	2	Friday	Good Friday; a holiday
May	1	Saturday	Field work, sophomores and juniors in School of Mines begins
May	20	Thursday	Senate meeting, 4:00 p.m.
May	21	Friday	Second semester evening extension classes close
June	13	Sunday	Baccalaureate service
June	16	Wednesday	Spring quarter closes
June	17	Thursday	Forty-eighth Annual Commencement
June	18-19		Registration days for Summer quarter
June	21	Monday	Summer quarter begins
September	3	Friday	Summer quarter closes

Program of Entrance Examinations 1919-20

Entrance examinations for admission to the various colleges of the University will be conducted according to the following schedule, in Room 112, Library Building, unless otherwise specified.

Any student finding a conflict in his program should report to the Registrar for adjustment.

Tuesday,	Sept. 23	9 a.m.	Business Subjects, Elementary Algebra, Plane Geometry
		2 p.m.	Manual Subjects, Domestic Art and Science, Agriculture, Higher Algebra, Solid Geometry
Wednesday,	Sept. 24	9 a.m.	Astronomy, Botany, Geology, Chemistry, Physiography, Zoology, Physics, Physiology
		2 p.m.	American Government, History, Economics, Commercial Geography, History of Commerce, Economic History of England, Economic History of the United States
Thursday,	Sept. 25	9 a.m.	English
		2 p.m.	German, Greek, French, Latin, Scandinavian, Spanish

A representative of each department will be at the office of the head of the department each forenoon of entrance examination week from 9:00 to 12:00 to give information and advice.

Condition Examinations

Examinations for the removal of conditions are given during either the week preceding, or the first week of each quarter. The period selected and the examinations given at each period are determined by the respective colleges. No student may take more than one examination to remove a condition.

SCHEDULE OF EXAMINATIONS

Condition examinations in the Colleges of Science, Literature, and the Arts, Education, Engineering and Architecture, Mines, Chemistry, and Agriculture, Forestry, and Home Economics, for the removal of conditions of the winter and spring quarters will be given according to the following schedule:

Friday,	Sept. 26	9 a.m.	Animal Biology, Botany, Physics, Agronomy and Farm Management, Animal Husbandry, Entomology and Economic Zoology.
		2 p.m.	Astronomy, Chemistry, Agricultural Biochemistry, Bee Culture, Experimental Engineering
Saturday,	Sept. 27	9 a.m.	Economics, Mathematics and Mechanics, History, Education, Agricultural Education, Dairy Husbandry, Farm Engineering, Drainage
		2 p.m.	French, Spanish, Italian, German, Greek, Latin, Scandinavian, Forestry, Home Economics, Drawing and Descriptive Geometry
Monday,	Sept. 29	9 a.m.	Comparative Philology, Rhetoric, English, Horticulture, Plant Pathology, Poultry Husbandry, Rural and Agricultural Journalism, Metallurgical subjects
		2 p.m.	Political Science, Music, Philosophy, Psychology, Sociology and Anthropology, Social and Civic Work, Soils, Veterinary Medicine, Civil, Electrical, Mechanical Engineering and Architectural subjects
Tuesday,	Sept. 30	9 a.m.	Geology and Mineralogy
		2 p.m.	Mining subjects

In case of conflict, special arrangements must be made with the instructor.

Schedules for the remaining schools and colleges will be announced in the fall, and may be secured at the offices of the respective deans.

ORGANIZATION OF THE UNIVERSITY

The University is organized in Schools, Colleges, and Divisions as follows:

THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

THE COLLEGE OF ENGINEERING AND ARCHITECTURE

THE DEPARTMENT OF AGRICULTURE, including—

THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

THE SCHOOLS OF AGRICULTURE, including—

THE CENTRAL SCHOOL, UNIVERSITY FARM

THE NORTHWEST SCHOOL, CROOKSTON

THE WEST CENTRAL SCHOOL, MORRIS

THE AGRICULTURAL EXPERIMENT STATIONS, including—

THE STATE EXPERIMENT STATION, UNIVERSITY FARM

THE NORTHWEST EXPERIMENT STATION, CROOKSTON

THE NORTH CENTRAL EXPERIMENT STATION, GRAND RAPIDS

THE WEST CENTRAL EXPERIMENT STATION, MORRIS

THE NORTHEAST DEMONSTRATION FARM AND EXPERIMENT STATION, DULUTH

THE SOUTHEAST DEMONSTRATION FARM AND EXPERIMENT STATION, WASECA

THE FRUIT BREEDING FARM, ZUMBRA HEIGHTS

THE STATE TREE STATION, OWATONNA

THE FOREST EXPERIMENT STATIONS, ITASCA AND CLOQUET

THE AGRICULTURAL EXTENSION DIVISION

THE SHORT COURSES IN AGRICULTURE

THE LAW SCHOOL

THE MEDICAL SCHOOL, including—

THE SCHOOL OF EMBALMING

THE SCHOOL FOR NURSES

THE COLLEGE OF DENTISTRY

THE SCHOOL OF MINES, including—

MINNESOTA SCHOOL OF MINES EXPERIMENT STATION

THE COLLEGE OF PHARMACY

THE SCHOOL OF CHEMISTRY

THE COLLEGE OF EDUCATION

THE GRADUATE SCHOOL

THE SCHOOL OF BUSINESS

THE UNIVERSITY EXTENSION SERVICE, including—

GENERAL EXTENSION DIVISION

AGRICULTURAL EXTENSION DIVISION

THE BOARD OF REGENTS

The Hon. FRED B. SNYDER, Minneapolis, President of the Board	-	-	-	-	-	1922
MARION LEROY BURTON, Minneapolis	-	-	-	-	-	<i>Ex officio</i>
The President of the University						
The Hon. J. A. A. BURNQUIST, St. Paul	-	-	-	-	-	<i>Ex officio</i>
The Governor of the State						
The Hon. J. M. McCONNELL, St. Paul	-	-	-	-	-	<i>Ex officio</i>
The State Superintendent of Education						
The Hon. W. J. MAYO, Rochester	-	-	-	-	-	1919
The Hon. MILTON M. WILLIAMS, Little Falls	-	-	-	-	-	1919
The Hon. JOHN G. WILLIAMS, Duluth	-	-	-	-	-	1920
The Hon. GEORGE H. PARTRIDGE, Minneapolis	-	-	-	-	-	1920
The Hon. A. E. RICE, Willmar	-	-	-	-	-	1921
The Hon. CHARLES L. SOMMERS, St. Paul	-	-	-	-	-	1921
The Hon. PIERCE BUTLER, St. Paul	-	-	-	-	-	1922
The Hon. C. W. GLOTFELTER, Waterville	-	-	-	-	-	1922

EXECUTIVE OFFICERS

MARION LEROY BURTON, Ph.D., D.D., LL.D., President
ERNEST B. PIERCE, B.A., Registrar
GEORGE H. HAYES, University Comptroller
JAMES T. GEROULD, B.A., Librarian
OSCAR L. BUHR, Executive Secretary and Secretary of the Board of Regents
JOHN B. JOHNSTON, Ph.D., Dean of the College of Science, Literature, and the Arts
ROYAL R. SHUMWAY, B.A., Assistant Dean of the College of Science, Literature, and the Arts
JOHN R. ALLEN, M.E., Dean of the College of Engineering and Architecture
ROSCOE W. THATCHER, M.A., Dean and Director of the Department of Agriculture
EDWARD M. FREEMAN, Ph.D., Dean of the College of Agriculture, Forestry, and Home Economics
WILLIAM R. VANCE, Ph.D., LL.D., Dean of the Law School
ELIAS POTTER LYON, Ph.D., M.D., Dean of the Medical School
RICHARD O. BEARD, M.D., Assistant Dean and Secretary of the Medical School
ALFRED OWRE, B.A., M.D., C.M., D.M.D., Dean of the College of Dentistry
WILLIAM R. APPLEBY, M.A., Dean of the School of Mines
FREDERICK J. WULLING, Ph.D., LL.M., Dean of the College of Pharmacy
LAUDER W. JONES, Ph.D., Dean of the School of Chemistry
LOTUS D. COFFMAN, Ph.D., Dean of the College of Education
GUY STANTON FORD, Ph.D., Dean of the Graduate School
EDWARD E. NICHOLSON, M.A., Dean of Student Affairs
RICHARD R. PRICE, M.A., Director of University Extension
GERTRUDE H. BEGGS, Ph.D., LL.D., Dean of Women

THE UNIVERSITY OF MINNESOTA

DESCRIPTION OF DEPARTMENTS

THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS offers a four-year course of study leading to the degree of Bachelor of Arts. The work is elective under certain limitations intended to secure a proper balance between breadth of foundation and liberal culture on the one hand and specialized training on the other.

Course in training for State and Federal Administration.—A four-year course leading to the degree of Bachelor of Arts. Students whose programs satisfy the requirements of the Graduate School may receive the degree of Master of Arts at the end of the fifth year.

Course in training for Municipal Administration and Engineering.—A four-year course leading to the degree of Bachelor of Arts. Students whose programs satisfy the requirements of the Graduate School may receive the degree of Master of Arts at the end of the fifth year.

Course in training for Diplomatic and Consular Service.—A four-year course leading to the degree of Bachelor of Arts. At the end of the fifth year students whose programs satisfy the requirements of the Graduate School may receive the degree of Master of Arts.

Course in training for Social and Civic Work.—This is a five-year course. During the first four years the student secures a broad education with special attention to history, economics, political science, and sociology. The fifth year is devoted to technical subjects with professional training in social work. The B.S. degree is given at the end of four years and either a special certificate or the M.A. degree upon the completion of the fifth year.

Course in Military Science and Tactics.—A four-year course leading to the degree of Bachelor of Arts with special training in military science and tactics.

Course in Arts and Music.—A four-year course leading to the degree of Bachelor of Music in which the theoretical and practical work in music is combined with the study of acoustics, psychology, modern languages, English literature, and history. The object is to provide a well-rounded cultural course for those who are preparing for professional work in Music.

Combined courses in Arts and Medicine.—A seven-year course leading to the degrees of Bachelor of Science and Doctor of Medicine and an eight-year course leading to the degrees of Bachelor of Arts and Doctor of Medicine.

Combined course in Arts and Law.—A six-year course leading to the degrees of Bachelor of Arts and Bachelor of Laws.

Combined course in Arts and Dentistry.—A six-year course leading to the degrees of Bachelor of Arts and Doctor of Dental Surgery.

Combined course in Arts and Chemistry.—A five-year course leading to the degrees of Bachelor of Arts and Bachelor of Science in Chemistry.

Americanization training course.—A four-year course, with graduate studies possible, consisting largely of technical courses and field work. The course is a practical application of anthropological knowledge of modern and advanced peoples, and deals with adult immigrants more than with any other people in America. Fundamental courses in economics, history, language, political science, and sociology form an important part of the course of study. The course leads to the B.S. degree at graduation, and to an M.A. or special certificate on the completion of a fifth year.

Combined Course in Arts and Nursing.—A five-year course leading to the degree of Bachelor of Science and a certificate in nursing. The first two years and a summer quarter are spent in the College of Science, Literature, and the Arts. The third and fourth years are spent in hospital work, and the fifth year in both hospital and class work.

Combined courses in Arts and Architecture.—A four-year course in architecture and decoration leading to the degree of Bachelor of Science. A six-year course in Arts and Architecture leading to the degree of Bachelor of Science at the end of four years and to an advanced degree at the end of six years.

Pre-professional training.—In this College are given also the two years of college work required for admission to the Law School, the School of Business, and the College of Education, and various non-professional subjects required in other schools and colleges of the University.

Vocational guidance for women.—Women students may consult the Vocational Adviser for Women for information in regard to the selection of courses, the choice of a vocation, and the means of securing professional training. The office in Shevlin Hall is open from 9:00 to 12:00 during the week preceding the opening of the University, and from 8:30 to 5:00 during the entire academic year. A collection of training school bulletins and general information in regard to topics related to women's occupations is available for use by the students. Women are urged to make appointments with the Vocational Adviser, and to consult the collection of occupational information.

Journalism.—Courses in journalism, including reporting, copy reading, editorial writing and administration, business administration, rural and agricultural journalism, are offered at present. Several of these courses are open to students in the college of Science, Literature, and the Arts, and it is expected that additional courses will be added as students are prepared for the advanced work.

THE COLLEGE OF ENGINEERING AND ARCHITECTURE offers courses of study of five years each, in Civil, Mechanical, and Electrical Engineering, and Architecture, leading to the degrees of Civil, Mechanical, and Electrical Engineer, and Architect. The degrees of Bachelor of Science in Engineering and Bachelor of Science in Architecture are conferred at the end of the fourth year. This college also offers work in the Graduate School leading to the degree of Master of Science.

Engineering for manufacturers, contractors, and administrators.—The four-year course in General Engineering, leading to the degree of

Bachelor of Science in Engineering, is an excellent preparation for careers in certain business fields akin to engineering. These semi-engineering activities in part are: the operation of such public utilities as light and power plants, traction companies, railway and irrigation systems; the management of manufacturing establishments, such as automobile factories, locomotive works, flour and saw mills; the direction of construction in contracting work; salesmanship in the materials of construction including water wheels, electrical and other machinery. The course includes the mathematics, shop work, physics, mechanics, and chemistry of the standard Engineering course. It includes liberal electives for such specialized work as will fit men for the particular fields which they expect to enter. Such subjects as economics, sociology, psychology, business management, accounting principles, banking, public utilities, and business law may be taken as supplementary to the technical subjects.

In the course in Civil Engineering, a period of five weeks is spent in camp. This summer survey work is required of all students in this course in the vacation following the junior year.

Excellent facilities exist in the College for practicing engineers to carry on graduate work in engineering and architecture.

THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS offers four-year courses in Agriculture and Home Economics leading to the degree of Bachelor of Science. The work in Agriculture includes general courses in agricultural education, manual training, agronomy and farm management, dairy husbandry, animal husbandry, and horticulture. Special agricultural science courses are also offered in agricultural chemistry, agricultural economics, entomology, plant pathology, and soils.

The courses in Home Economics include a general course, a teachers' course in the general field of home economics, special teachers' courses in textiles and clothing, and foods-management, a course for dietitians, and one for institutional managers.

The work in Forestry includes courses in technical forestry, commercial lumbering, and wood pulp and distillation products. In addition to the work given at the University Farm, six months' work, two freshman and four junior, is given at Itasca State Park, where a well-equipped demonstration forest is available as a laboratory.

The College offers to all students in Agriculture and Home Economics the courses necessary for the University Teachers' Certificate and the Minnesota Teachers' Industrial Certificate in preparation for teaching in secondary schools.

Graduate work is offered in all special lines of Agriculture. The special problems are for the most part correlated with work in the Experiment Station.

The Schools of Agriculture offer three-year courses of study adapted especially to the needs and opportunities of farm boys and girls. They offer courses of special training for practical farm life and home economics. The Central School is located at St. Anthony Park; the Northwest School, at Crookston; and the West Central School, at Morris.

The Dairy Short Courses.—The purpose of the courses is to offer an opportunity to young men and women to become more thoroly trained in the science and the art of breeding, feeding, and managing dairy herds; conducting cow-testing associations and making the largest quantity of butter and cheese of the highest possible quality; and to encourage them to greater community usefulness.

The Dairy Short Courses include a two weeks' course for Creamery Butter Makers, a three weeks' course for Cheese Makers, and a one week course for Ice-cream Makers during December and during January and February, a two months' elementary course for those interested in dairying.

The Farmers' and Home-Makers' Week is held early in January. Instruction in agriculture and home economics is offered in regular classes, important conferences are held, and many agricultural organizations of the state hold their sessions at this time.

The School of Traction Engineering is a five weeks' course of practical instruction in the operation and handling of traction engines and other farm machinery. Engineers' licenses of different grades are given according to previous experience. This course is given in May.

The Editors' Short Course, held in May, is devoted to instruction in the conduct of the affairs of the rural newspaper and consideration of the problems of the rural press.

The Boys' and Girls' Week Short Course, held early in April, gives instruction in farm animals, field and garden crops, cooking, sewing, garment making, and home nursing.

The Experiment Station conducts experiments along the various lines of agriculture which are of interest to farmers. It is closely correlated with the collegiate work of the department. Its object is the solution of agricultural problems of importance to Minnesota. It offers, secondarily, educational and research advantages to undergraduate and graduate students of the College of Agriculture, Forestry, and Home Economics. The main station is located at St. Anthony Park; substations are located at Crookston, Grand Rapids, and Morris. Demonstration experimental farms are also located at Waseca and Duluth. Forest experiment stations have been established at Cloquet and Itasca Park.

The Extension work of the Department of Agriculture aims to bring to the farmers of the state information leading to the improvement of the farm and home. It reaches farmers through institutes, lectures, demonstrations, and demonstration farms, industrial and agricultural contests, a press bureau, and by correspondence and personal visits.

THE LAW SCHOOL offers a course covering a period of three academic years, leading to the degree of Bachelor of Laws. Candidates for admission to the Law School must have completed at least two years of work in the College of Science, Literature, and the Arts of the University of Minnesota, or in some other college or university of equal grade. A special pre-legal course of two years, covering those subjects which are particularly desirable as preliminary to the study of law, is offered by

the College of Science, Literature, and the Arts. Seniors in that College are permitted to take the work of the first-year class in law and count the same as the equivalent of one year's work towards their Academic degree. This provision enables students to obtain the degrees of Bachelor of Arts and Bachelor of Laws in six years. The so-called "case system" method of teaching law, approved by the leading law schools of the country, is employed.

THE MEDICAL SCHOOL requires for admission the completion of two years of collegiate work in Science, Literature, and the Arts at this University, or other college or university of equal rank.

All students are required to secure the B.S. or B.A. degree before receiving the degree of Doctor of Medicine. Admission to the senior class of the Medical School is conditioned upon the possession of this degree. Sixty semester credits (ninety quarter credits) and a corresponding number of honor points earned in prescribed medical subjects, in addition to the necessary equal number of academic credits and honor points, are prerequisite to the degree. The College of Science, Literature, and the Arts and the Medical School unite in offering the following courses of study:

1. A combined course leading to the degrees of Bachelor of Science and Doctor of Medicine and consisting of: (a) two years of work in the College of Science, Literature, and the Arts, including certain required subjects (see page 28); (b) two years in the scientific departments of the Medical School, at the end of which the B.S. degree is granted; (c) two years in the practical or clinical departments of the Medical School; (d) one year in a hospital internship or in advanced laboratory study or research. At the end of this period the M.D. degree is granted.

2. A combined course leading to the degrees of Bachelor of Arts and Doctor of Medicine. Students who present three years of properly selected work in the College of Science, Literature, and the Arts, including the required subjects noted, may elect the first year in medicine in their senior academic year, receiving the B.A. degree at its close and the M.D. degree upon the successful completion of the remaining four years in medicine.

3. *The School of Embalming* offers an annual course of study, covering a period of three months. A certificate covering the successful completion of the work is granted, which is accepted by the State Board of Health, in lieu of examination for an embalmer's license.

4. *The School for Nurses* is conducted in connection with the Medical School and with the University Hospital service. It offers a three-year course, the first six months occupied in preliminary study, the remaining two and one-half years in residence and in hospital and out-patient training. Applicants must present credentials covering a four years' course in an accepted high school, together with evidences of social, physical, and moral fitness.

5. *A course in Public Health Nursing* covers a period of four months. It is preliminary to a projected and more extended course of one year

to which it will contribute. It is conducted by the School for Nurses with the assistance of the Departments of Education, Sociology, and Psychology, and of a number of social service organizations which provide ample opportunities of field work.

6. *A combined course* five years in length is offered by the College of Science, Literature, and the Arts and the School for Nurses, leading to the degree of Bachelor of Science and a certificate in nursing. The first two years and a summer quarter are spent in the College of Science, Literature, and the Arts. The third and fourth years are spent in hospital work, and the fifth year in both hospital and class work.

7. Graduate and research work is offered to qualified students. (See page 18.)

THE COLLEGE OF DENTISTRY offers for the last time a four-year course of study leading to the degree of Doctor of Dental Surgery, and also an optional five-year course. The five-year course only will be offered in 1920-21. The University offers an optional six-year course of study leading to the degrees of Bachelor of Science and Doctor of Dental Surgery at the end of the six-year course.

THE SCHOOL OF MINES offers three regular courses, namely, Mining Engineering, Mining Engineering (specializing in Geology), and Metallurgy, leading to the degrees of Engineer of Mines (E.M.), Engineer of Mines (in Geology) [E.M. (Geology)], and Metallurgical Engineer (Met.E.), respectively. These courses may be completed in four years. Freshmen will be divided into two classes, as follows:

A. Those entering with credits in higher algebra and solid geometry.

B. Those entering without credits in higher algebra and solid geometry. Students in Class B will carry a special course in mathematics during their freshman year.

Courses in the School are designed for the purpose of preparing men to enter their profession with a thoro grounding in mathematics, in the sciences, and in the fundamental principles of mining engineering and metallurgy. A system of apprenticeship during summer vacations has been inaugurated. This work has become a regular part of the curriculum and is required of all students who are candidates for degrees.

THE COLLEGE OF PHARMACY offers a regular three-year course leading to the degree of Pharmaceutical Chemist (Phm.C.). A four-year course leading to the degree of Bachelor of Science in Pharmacy (B.S. in Phm.) is also offered. This course includes all of the Pharmaceutical Chemist course and the equivalent of one year in the College of Science, Literature, and the Arts. Two graduate courses, leading to the degrees respectively of Master of Science in Pharmacy and Doctor of Science in Pharmacy, are open to those who have the Bachelor's degree in Pharmacy, and who have shown exceptional scholarship and ability.

THE SCHOOL OF CHEMISTRY offers three courses. Two of these, the four-year course in Chemistry and the five-year course in Arts and Chemistry, are designed for those who wish to become teachers of chemistry, to take positions as assistants in research, or to hold positions

in chemical industries not requiring special engineering training. The four-year course in Chemistry leads to the degree of Bachelor of Science in Chemistry, while the Arts and Chemistry Course leads to the degree of Bachelor of Arts after four years and Bachelor of Science in Chemistry at the end of the fifth year.

The third or Applied Course extends over five years, leading to the degree of Bachelor of Science at the end of four years and Chemical Engineer at the end of the fifth year. These courses aim to give the student a broad foundation in chemistry and some of the allied sciences.

THE COLLEGE OF EDUCATION offers a practical and a theoretical training for prospective high-school teachers and principals, for principals of elementary schools, for supervisors of special studies, and for superintendents of school systems.

Students are admitted to the College only after the completion of at least two full years of college work, during which time they should have pursued at least one course in general psychology, and prospective high-school teachers should have given especial attention to one or more of the subjects which they expect to teach. The two-year course of study, beginning with the junior year, leads to the degree of Bachelor of Arts in Education (Bachelor of Science in Education beginning with the year 1920-21). A third year leads to the degree of Master of Arts, including advanced studies in education and philosophy, and in one or more of the subjects of the secondary curriculum, at the option of the candidate.

THE GRADUATE SCHOOL gathers into a single organization and unites for the purpose of administration all the activities of the University in all its schools and colleges in so far as they relate to advanced instruction offered for the second or higher degrees, viz., Master of Arts, Master of Science, and Doctor of Philosophy. The privileges of this School are in general open to all who have received Bachelors' degrees from reputable colleges and universities, based on courses substantially equivalent to those at this University.

Graduate work in medicine is maintained jointly by the Medical School and the Mayo Foundation for Medical Education and Research. The degree of B.S. (or equivalent) and M.D. and one year of intern service in an acceptable hospital are prerequisites for admission to the clinical departments. Properly qualified students may be admitted to the medical laboratory departments (Anatomy, Physiology, Bacteriology, and Pathology) without the medical degree and internship. A number of fellowships and scholarships are provided for selected students undertaking graduate courses in chosen specialties in medicine (see page 53). These courses cover a period of three years and lead to the degree of M.S. or Ph.D. in the various fields.

The School of Business recognizes the professional status of the business executive. It aims to give prospective executives thoro training for the work they are to undertake. Professional education rather than detailed drill in narrow technical processes is the object toward which instruction is directed. Scientific method in analyzing business data, trained

intelligence in dealing with the human relationships of which business is made up, and a well developed sense of moral responsibility will be the foundations of business effectiveness in the future. The School of Business combines with a well-rounded university education the kind of training that will prepare students to analyze business situations accurately and to bring together results of analysis into practical working plans.

The educational as distinguished from informational emphasis in the work of the School determines the selection of subjects. The student in the pre-business course in some measure will have learned to use those common intellectual tools needed for his later study and his business dealings. He also should have acquired an approach to scientific method and some insight into the relation of business to society as a whole. After entrance into the School of Business, elective courses will offer opportunity for continuing work in fields like economics, political science, law, and other subjects which constitute a part of the executive's general equipment. In the two-year course leading to the first degree of the School of Business, the student will proceed to a more intensive study of business and later to specialization in particular branches of business, such as organization and management, accounting, finance, merchandising, selling, production, employment, and other subjects which have to do with specialized business functions.

In the third or graduate year of the business course, specialization will be carried further with the purpose of mastering in principle and in detail some particular business problem in a restricted field. The work of students during this year will be under the individual direction of members of the Faculty who are specialists in the field in which the student is studying. Systematic provision will also be made for definite contact with some appropriate business concern.

Candidates who have met the conditions for entrance to the School of Business having satisfactorily completed the work covered in the pre-business course at the University of Minnesota, should normally be able to qualify for the degree of Bachelor of Science in Business at the end of the two full academic years of study in the School of Business.

If within a reasonable time after admission to the School, a student's work does not give promise of effectiveness in the business field, he will be discouraged from continuing the course, even tho he may have received passing grades in the subjects taken. It is expected that students will meet the requirements imposed with the same professional spirit and measure of precision demanded in well-regulated business houses, and students who fail to come up to this standard will not be recommended for the degree. The degree is not awarded merely as the result of pursuing a specified number of courses.

The degree of Master of Science in Business may be obtained upon the completion of a fifth year's work.

THE UNIVERSITY SUMMER SESSION is organized for six weeks (eleven weeks beginning in 1920) in June and July under the authority of the Board of Regents as a regular part of the University. Courses carrying

university credit, including all the subjects of the state professional certificate, are offered for college students, experienced teachers, and others who desire the opportunity for advanced study. Students may secure not more than six semester credits (nine quarter credits) at one six weeks' session, except by special permission.

On the main campus, courses are offered in the Colleges of Science, Literature, and the Arts, Education, Engineering, Law, and Dentistry, and the Medical and Graduate Schools. In the College of Agriculture, Forestry, and Home Economics courses are offered in Agriculture and Home Economics adapted to the needs of teachers and others not in attendance during the regular college session, and also to regular students. The State Teachers' Training School is held at the same time and place. For a special circular of summer work inquire at the Registrar's office.

SPECIAL COURSES.—In practically all of the colleges, students of mature age and adequate preparation are permitted to pursue, under the direction of the Faculty, one or two distinct lines of study.

UNIVERSITY EXTENSION.—All extension work of the University of Minnesota has been established as an organic unit of the University under the title of Extension Service. The Extension Service is organized in two divisions, each under its own director, the General Extension Division and the Agricultural Extension Division.

The work of the Agricultural Extension Division is indicated on page 15. The General Extension Division conducts evening classes and correspondence courses, provides communities with Faculty lectures and lyceum courses of popular lectures and entertainments, maintains a municipal reference bureau and a lantern-slide loan system, fosters debating in the public schools, holds annual short courses in merchandising, offers guidance for the development of community centers, and gives advice to schools, and other organizations on the selection and production of plays. Bulletins of evening classes, correspondence, and lecture courses may be had upon request. Address the General Extension Division.

THE UNIVERSITY LIBRARY

The purpose of the University Library is to supply books and to teach students to use them with the minimum waste of time and effort and the maximum profit. The collections in the General Library and the college libraries are maintained to supplement and to facilitate the work of all departments, and familiarity with their resources should be acquired early. Intelligent use of the libraries is essential for the successful pursuit of every college course.

The General Library contains a miscellaneous collection of books relating to all fields of learning but is especially adapted to meet the needs of students in the Academic department. The college libraries contain collections of technical books, periodicals and transactions of learned societies relating to the work of the particular college to which they belong.

Registration automatically entitles students to library privileges.

Library assistants are at all times ready to help students in obtaining references and in directing them in the use of catalogs and indexes.

THE STUDENT HEALTH SERVICE

A health fee of two dollars each quarter is paid by each student of the University for the maintenance of the Students' Health Service. This entitles the student to physical examination, and medical service and care when needed.

The offices of the Health Service and the Students' Hospital and Dispensary are located in Pillsbury Hall, first floor. The services of the hospital and dispensary are available at all hours of the day and night. The telephone call is University of Minnesota (East 2760), Station 168.

Physicians of the Health Service will be in attendance daily. Their office hours will be announced.

The facilities of the Dispensary are such that one hundred students a day can be given attention.

The normal capacity of the Hospital is twenty-five beds. In emergencies, the capacity can be increased. Ample provisions are made for the isolation of communicable diseases.

All services to students are absolutely free, and students are urged to consult the Health Service frequently in any and all things pertaining to health.

The Health Service has been established for the purpose of safeguarding the health of students. Its aims are: (1) to help each student entering the University of Minnesota to possess a healthy, vigorous, active, and harmoniously developed body, thereby contributing much to his success while in college and in later life; (2) to reduce to the very minimum that prodigious academic and economic loss due to indisposition and illness of students. Positive health is its goal.

There are three main lines to the activities of the University Health Service: (1) personal attention, (2) sanitation, and (3) education.

1. The personal division is concerned with the physical examinations of students. Complete physical records of all students are kept. From each record can be determined, in a large measure, what procedure is essential to keep the student in the best physical condition during his academic life. The following are some of the phases of the work in the personal division:

(a) Provisions for maintaining the health of normal, physically sound students. Coöperation with the Department of Physical Education regarding physical exercise. Education along lines of right living. Guarding environment.

(b) Protection of the physically sound student from communicable diseases that are continually creeping into the University. Early detection and isolation of all cases of communicable diseases—tuberculosis, diphtheria, scarlet fever, measles, typhoid fever, smallpox, mumps, etc.

(c) Provisions for the care and treatment of such cases of communicable diseases. Isolation Hospital.

(d) Treatment and care of all students who are ill or in need of medical advice or treatment.

(e) Reconstruction and reclamation. Corrections of defects, advice and treatment of all subnormals.

2. Division of Sanitation: The student's environment must be made as hygienic as possible. Hence this division concerns itself with the sanitary conditions both on and off the campus. Rooming and boarding houses must be both inspected and regulated.

3. Education: Finally every student in the University must be made familiar with the fundamentals of both personal and public hygiene. Through courses in this subject, daily bulletins, exhibits, public lectures, etc., education in hygiene and right living will be conducted.

MILITARY SCIENCE AND TACTICS

REQUIRED WORK

All physically fit male students are required to take military training during the first two undergraduate years of their course unless they have secured such training at an approved institution endorsed by the Military Department. No credits are allowed for this work.

ELECTIVE WORK

(a) Any student, having completed the two years of required Military Training, may continue the work for credit in the third and fourth years. Credit for such work is allowed in practically all of the colleges of the University.

(b) Juniors and seniors who have completed two years of drill may register for the course required by General Orders No. 49 of the War Department for members of the Reserve Officers' Training Corps. Such students must pass a physical examination, must be selected for the work by the president of the institution, and the professor of military science and tactics, and must sign a written agreement to continue in this corps for the remainder of the college course. The completion of this work is a prerequisite to appointment.

Juniors and seniors who take the course required by General Orders No. 49, which includes two courses in camp training, will receive an allowance of thirty cents a day for subsistence while pursuing the course and will have all expenses paid to and from the encampments. They are also eligible for appointment as temporary second lieutenants in the infantry branch of the Regular Army for six months with a salary of one hundred dollars per month upon graduation and commission in the Reserve Corps. The Reserve Corps furnishes officers for citizens' training camps in time of peace and commissions in the United States Volunteers in time of war, such officers having preference for commissions in the volunteers immediately below experienced officers in the federal service.

ADMISSION

GENERAL REQUIREMENTS

Admission to the colleges or schools of the University which accept students directly from the high school is either by examination or certificate. The candidate must offer fifteen units of high-school work so chosen as to include those subjects required by the college or school which he desires to enter. No candidate will be admitted with less than fifteen units. In case the candidate did not have an opportunity to take all the required subjects, the Registrar, may, however, authorize substitutions in the list of required subjects to the extent of one unit, unless otherwise stated in the requirements of the individual college or school.

Candidates who do not hold a diploma from an approved preparatory school must enter by examination in all the fifteen units required, regardless of the fact that some of these may have been completed in such a school.

All colleges will admit freshman students at the opening of the fall quarter. In addition, freshman students will be admitted at the opening of the winter and spring quarters in the Colleges of Science, Literature, and the Arts; Agriculture, Forestry, and Home Economics; Engineering and Architecture; and in the College of Dentistry provided they have had the necessary prerequisites for the subjects they desire to take. In the School for Nurses they will be admitted at the opening of the spring quarter. All other students admitted at this time must present credentials of advanced standing from other colleges showing their qualification to continue the work of the winter or spring quarter.

Under List of Entrance Subjects is shown the minimum and maximum number of units of any one subject that will be accepted by the various colleges of the University. For a statement of the specific units required in any subject or group, see Requirements of Individual Colleges, pages 26-31.

ADMISSION BY EXAMINATION

Entrance examinations are offered at the University during the opening week, September 23 to 25. Candidates entering by this method must pass examination in fifteen units so chosen as to satisfy the specific requirements of the college to which entrance is desired. (See Requirements of Individual Colleges.) Certificates from the College Entrance Examination Board, from the Minnesota State High School Board, or from the New York Regents' Examinations are accepted in lieu of examinations in the subjects they represent. Those desiring to take examinations should notify the Registrar in writing not later than September 1. See schedule of examinations, page 8.

ADMISSION BY CERTIFICATE

Only *graduates* of *approved* schools are admitted by certificate. Graduates of the following schools, provided their preparation satis-

fies the specific requirements of the college they desire to enter, may be admitted to the freshman class upon presentation of credentials in proper form. See Registration below.

1. Minnesota state high schools or other accredited schools in the state.

2. Schools in any other state accredited by the state university of that state.

3. Minnesota state normal schools and normal schools of other states having similar courses.

The student who does not hold a diploma from an approved school may gain admission by examination as indicated above.

For list of accredited schools in Minnesota see pages 33-35.

REGISTRATION

The applicant for admission should request the principal or superintendent to forward to the Registrar of the University a complete transcript of his high-school or preparatory-school record showing the number of weeks and hours a week spent upon each study, with the grades entered as *passed*, *passed with credit*, or *passed with honor*. Credential blanks prepared by the University must be used. These blanks may be secured upon application at the Registrar's office. Upon receipt of the credentials at the University the Registrar will notify the applicant with regard to his admission, and will send directions for registration.

Students who were in attendance the preceding year are required to pay fees ten days before classes begin. Bills of fees are mailed from the Registrar's office in ample time. Those not receiving the material by September 1 should notify the Registrar at once. See calendar, page 7, and penalty fees, page 43.

LIST OF ENTRANCE SUBJECTS

The term *unit* means not less than five recitations of forty minutes each week for a school year of at least thirty-six weeks. In manual subjects and kindred courses, it means the equivalent of ten recitation periods a week for thirty-six weeks.

GROUP A: ENGLISH

English, four units.

- (a) Principles of rhetoric
- (b) Practice in written expression in each of the years of the course, on an average of not less than one hour a week
- (c) Classics

GROUP B: LANGUAGES

Latin—

- Grammar, one unit
- Caesar, four books, one unit
- Cicero, six orations, one unit
- Virgil, six books, one unit

German—

- Grammar, one unit
- Literature, one, two, or three units

Greek—

Grammar, one unit
Anabasis, four books, one unit

Spanish—

Grammar, one unit
 Literature, one, two, or three units

GROUP C: HISTORY AND SOCIAL SCIENCES

History—

Ancient to Charlemagne, one unit
 Modern, from Charlemagne, one unit
 English, one-half or one unit
 Senior American, one-half unit

Social Sciences

American government, one-half or one unit

GROUP D: MATHEMATICS

Elementary algebra, one unit
 Plane geometry, one unit
 Higher algebra, one-half unit

GROUP E: NATURAL SCIENCES

Physics, one unit
 Chemistry, one unit
 Botany, one-half or one unit
 Zoology, one-half or one unit

French—

Grammar, one unit
 Literature, one, two, or three units

Scandinavian Languages—

Grammar, one unit
 Literature, one, two, or three units

Elementary economics, one-half unit

Commercial geography, one-half or one unit

History of Commerce, one-half or one unit

Economic history of England, one-half unit

Economic history of the United States, one-half unit

Solid geometry, one-half unit
 Trigonometry, one-half unit

Physiology, one-half unit

Astronomy, one-half unit

Geology, one-half unit

Physiography, one-half unit

GROUP F: VOCATIONAL AND MISCELLANEOUS SUBJECTS

Not more than four units in studies of this group may be counted towards admission. The subjects are no longer designated by the University. The applicant is free to present in this division such studies as are not listed in Groups A, B, C, D, and E, but which are certified by the superintendent or principal as being of acceptable nature and counted towards graduation.

REQUIREMENTS OF THE INDIVIDUAL COLLEGES

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

1. *Regular Bachelor of Arts Course**

(1) English, four units; or three units of English accompanied by four units of one foreign language, or two units in each of two foreign languages.

(2) Mathematics: elementary algebra, one unit; plane geometry, one unit.

(3) Enough additional work to make in all fifteen units of which not more than four may be in Group F.

2. *Graduates of Minnesota State Normal Schools*

Graduates of the Advanced Graduate course of a Minnesota state normal school are admitted with advanced standing equivalent to one year's credit, and receive the degree of Bachelor of Arts upon completing in this college ninety credits provided they comply with the usual requirements for graduation. Such students will not be permitted to elect the following courses for credit: Education 1, or Psychology 1-2.

Individual graduates of the Advanced Latin course (five years) or of the Advanced English course (five years) of a Minnesota state normal school, who, on the basis of maturity and ability, present from the president of the normal school certificates of special fitness, will be admitted with advanced standing under the same regulations and proviso.

3. *Unclassed Students*

Unclassed students are: (1) persons of mature years engaged in teaching or other occupation, but registered in this College without having satisfied the entrance requirements in full; (2) all others who have been permitted to register for less than eleven hours of work. Only by permission of the Administrative Board and upon the presentation of satisfactory reasons for not taking the regular course will an applicant be admitted as an unclassified student. Unless he takes the same examinations or presents the same credentials as are required of those who enter the freshman class he can be admitted only upon vote of the Faculty. A new application must be made each quarter.

COLLEGE OF ENGINEERING AND ARCHITECTURE

Including Courses in Civil, Electrical, Mechanical, and General Engineering, and Architecture

1. English, four units; or English, three units, and foreign language, two units.

2. Mathematics: elementary algebra, one unit; plane geometry, one unit.

3. Enough additional work to make in all fifteen units, of which not more than four may be in Group F.

* Also courses in training for Social and Civic work, State and Federal Administration, Municipal Administration and Engineering, Diplomatic and Consular Service, Americanization work, Military Science and Tactics, as well as the combined courses in Arts and Medicine, Arts and Law, Arts and Music, Arts and Chemistry, Arts and Dentistry, Arts and Nursing, Arts and Architecture, and the Pre-Business Course.

High-school students desiring to enter this College are urged to take advanced algebra, solid geometry, and chemistry in high school. Students entering with deficiencies in these subjects will be required to take courses covering these deficiencies in the University before they can proceed with other work which depends upon these subjects.

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Students entering this college should submit their credentials to the enrollment committee, University Farm, St. Paul.

1. English, four units; or three units accompanied by four units of one foreign language, or two units in each of two foreign languages.

2. Mathematics: elementary algebra, one unit; plane geometry, one unit.

3. Enough additional work to make in all fifteen units, of which not more than four may be in Group F.

Every prospective student in Agriculture is also urged to obtain at least six months' practical experience on a farm before entering college. Those whose farm experience credentials are not satisfactory will be examined as to their familiarity with farm practices, and farm experience will be required during the college course in accordance with the results of these examinations.

Prospective students in Home Economics are urged to elect biology, physiology, chemistry, and physics, as a part of their high-school course.

Schools of Agriculture

The schools are not of collegiate grade. For further information, see special bulletins.

LAW SCHOOL

Regular Students

Students desiring to enter the Law School must first complete two full years (not less than fifty-eight semester credits or the equivalent, eighty-seven quarter credits) of collegiate work in science, literature, and arts at this or some other university or college of equal rank. See admission to the College of Science, Literature, and the Arts, page 26. Such candidates may be admitted upon presenting their credentials to the Registrar.

A special pre-legal course is offered by the College of Science, Literature, and the Arts covering those subjects which are particularly desirable as preliminary to the study of law.

The Law Faculty recommends that prospective law students devote the major part of their time while in high school to the study of the following subjects: English, Latin, history, mathematics, French or German, and science.

Special Students

Applicants who are twenty-one years of age and have preliminary education sufficient at least to entitle them to admission to the College of

Science, Literature, and the Arts, may, upon furnishing satisfactory evidence of their ability to pursue the law course with profit to themselves and without hindrance to the regular students, in the discretion of the Faculty, be admitted to the Law School as special students. Such special students are not candidates for a degree.

Special students entering with fifty-two academic semester credits (seventy-eight quarter credits) may become regular students by complying with the requirements for admission before the beginning of their second year in the Law School, *provided* they have passed all the subjects required of the first-year law class.

MEDICAL SCHOOL

Registration of students entering the Medical School is limited to ninety. Applicants will be selected on the basis of preliminary training, general ability, and physical fitness. Physical and psychological examinations are held and the results considered in connection with scholastic records in selecting candidates for the freshman class in Medicine.

The sixty college credits* required must include six credits each in rhetoric, physics,† general chemistry and qualitative analysis,‡ organic chemistry, and zoology. In addition, candidates must have a satisfactory reading knowledge of scientific French or German. The last prerequisite will usually require two years of college work in addition to high-school credits in the language selected. Tests of this reading knowledge are required.

The degree of Doctor of Medicine is conferred only upon those who have received the Bachelor's degree in Arts or Science from this or some other recognized university or college. Combined courses are offered by the College of Science, Literature, and the Arts and by the Medical School, which lead to either of the Bachelor's degrees and, subsequently, to the degree in Medicine.

Those who at the time of entrance into the Medical School have a Bachelor's degree from an approved institution other than the University of Minnesota may be allowed reasonable deviation from the exact credits mentioned above. But thoro college courses in physics, chemistry, and biology and a reading knowledge of a modern language (German or French) are indispensable as preparation for medical study.

Special Students

Physicians and others who would profit by the work may be admitted as special students. Such students are not candidates for the degree.

School of Embalming

One year of high-school work or its equivalent in some other satisfactory preparatory school is a prerequisite for admission. Applicants must

* The word credits is here to be understood as semester credits. In order to convert semester credits into quarter credits they must be multiplied by 3/2.

† In this University, Physics 21, 22, 41, 42, 61, 62 required, equals 15 quarter credits.

‡ In this University, students who enter from high school with good preparation in chemistry take Chemistry 4-5-11, 12 quarter credits. Those entering without high-school chemistry take Chemistry 1-2-3-11, 16 quarter credits.

submit credentials covering this work and satisfactory evidence of good character. The course begins January 7. Examinations are held at the close of the course and, successfully passed, entitle the student to a certificate.

School for Nurses

Graduation from an approved high school or other preparatory school on the accredited list is a prerequisite for admission. Preference, however, will be given to women of superior preliminary training. Applicants must not be less than twenty, nor more than thirty-five, years of age. They must submit to the committee satisfactory evidence of physical and mental fitness and of good character and will undergo a general physical examination by the school physician.

Upon receipt of credentials at the Registrar's office, applicants will be notified with regard to the details of registration.

All applicants matriculated will be required to take the preliminary course of instruction covering a period of six months, and must pass the examinations at its close. This period will be one, not only of preliminary training, but of probation. The Faculty reserves the right to pass upon the general fitness of the student to enter the hospital service at the close of that time.

The course in Public Health Nursing is offered to graduate nurses or to members of senior classes of recognized schools for nurses who are recommended by their teaching staffs.

COLLEGE OF DENTISTRY

1. English, three units.
2. Mathematics: elementary algebra, one unit; plane geometry, one unit.
3. Chemistry, one unit.
4. Enough additional work to make in all fifteen units, of which not more than four may be in Group F. Manual training is recommended.

On account of the limited capacity of the College of Dentistry not more than ninety freshmen can be admitted. Applications for admission should be in the Registrar's office not later than July 25.

Candidates will be selected according to quantity and quality of preparation, and when necessary their fitness shall be determined by competitive examination and conference with the Student Work Committee.

All other qualifications being equal, residents of Minnesota will be given prior consideration for vacancies existing at the date of their application.

SCHOOL OF MINES

1. English, three units.
2. Mathematics: elementary algebra, one unit; plane geometry, one unit.
3. Enough additional work to make in all fifteen units, of which not more than four may be in Group F.

It is recommended that students who desire to enter this School take higher algebra and solid geometry in high school. Those entering without credits in these subjects will be required to carry a special course in mathematics during their freshman year.

COLLEGE OF PHARMACY

1. English, four units; or English, three units, and a foreign language, two units.
2. Mathematics: elementary algebra, one unit; plane geometry, one unit.
3. Latin, one unit.
4. Enough additional work to make in all fifteen units, of which not more than four may be in Group F.

Prospective students in Pharmacy are urged to secure high-school preparation in each of physics, chemistry, botany and physiology.

SCHOOL OF CHEMISTRY

Arts and Chemistry Course (five years)

Students entering this five-year course in Arts and Chemistry matriculate in the College of Science, Literature and the Arts and must meet the requirements for entrance to that College.

Analytical Course (four years) and *Applied Course (five years)*

1. English, three units.
2. Mathematics: elementary algebra, one unit; plane geometry, one unit.
3. Enough additional work to make in all fifteen units, of which not more than four may be in Group F.

High-school students desiring to enter this College are urged to take higher algebra. If they enter the University with a deficiency in this subject they will be required to take the course in the University without credit before they can proceed with the work that depends upon it. Physics and one-half unit of solid geometry are also recommended.

COLLEGE OF EDUCATION

Applicants for admission to this College must present credentials showing:

1. The completion of a regular four-year high-school course.
2. The completion of two full years of collegiate work (not less than fifty-six semester credits) in science, literature, and arts at this or some other college or university of equal rank.

Graduation from Advanced Graduate normal courses (two years beyond the high school) is considered equivalent to (1) and (2) above.

Graduates of a five-year normal course, if individually recommended by the normal-school president, are allowed forty-two semester credits and are admitted to the College as unclassified students pending the completion of eighteen additional credits.

Graduates of the three-year course in the state normal schools of Minnesota may receive not more than seventy-five semester credits in

the College of Education at the University of Minnesota; credits earned in the three-year normal school course shall be applied in case they are deemed of equivalent merit, in the College of Education, to courses leading to certificates for supervisors in elementary grades, as principals in state graded schools, as teachers in junior high schools or in normal school departments in high schools; students coming from the three-year course in normal schools shall not receive certificates in high-school subjects from the University without completing the prescribed courses of the University of Minnesota for such certificates.

SCHOOL OF BUSINESS

Candidates for admission to the degree courses offered by the School of Business must either be graduates of a university or college of approved standing or they must have completed the two-year pre-business course in the College of Science, Literature, and the Arts or its equivalent. The requirements for admission to the pre-business course are the same as those for admission to the College of Science, Literature, and the Arts.

Regularly enrolled students in other schools or colleges of the University may be admitted to courses in the School of Business for which they have the prerequisites. Such students are urged to select their business subjects in accordance with a definite plan and as far as possible to complete a systematic course of business study.

Mature persons who have had considerable business experience may be admitted to the School as special students. In order to become candidates for a degree in the School of Business, such students must satisfy all the requirements for admission to the degree course.

Appropriate credit in the School of Business may be given for work of a similar character done in other approved colleges and universities, but no student may become a candidate for a degree in the School of Business who has not completed at least one full academic year or credit under the Faculty of that School.

ADMISSION AS UNCLASSED STUDENTS

Only by permission of the proper officers and upon the presentation of satisfactory reasons for not taking the regular course will an applicant be admitted as an unclassified student. He must take the same examinations or present the same credentials as are required of those who enter as regular students. Exceptions can be made only upon vote of the appropriate faculty. A new application must be made each quarter to the committee in charge. No unclassified student shall be admitted to the School of Mines.

ADMISSION TO ADVANCED STANDING

1. *From Other Colleges*

This University accepts credits from all reputable colleges and universities toward advanced standing. Such credits are accepted as far as

they represent courses equivalent to the work done in this institution. In bringing or sending records from other institutions, the certificate must be upon the official blank of the institution granting the certificate and should show:

- (a) The subject studied; catalog course number and descriptive title.
- (b) The number of weeks and hours a week spent upon each subject.
- (c) The value of the course expressed in credits.
- (d) The result. The exact grades should be stated, accompanied by an explanation of the marking system employed.
- (e) A letter or statement of honorable dismissal.

Upon receipt of the student's credentials the Registrar will notify the applicant concerning his classification and will send directions for registration.

All statements concerning advanced standing and classification are provisional, subject to the satisfactory completion of one year's work at the University by the applicant.

Candidates wishing to gain advanced standing by examination are allowed examinations without charge, provided such be taken within six weeks after matriculation.

2. *From Minnesota Normal Schools*

Graduates of the Advanced Graduate course of a Minnesota State Normal School are admitted to the College of Science, Literature, and the Arts with one year (thirty semester credits) of advanced standing. Graduates of such advanced courses are admitted to the College of Education with an allowance of sixty semester credits towards graduation.

Individual graduates of the Advanced Latin course (five-year) or of the Advanced English course (five-year) of a Minnesota state normal school who, on the basis of maturity and ability present certificates of special fitness from the president of the normal school, will be admitted with thirty semester credits of advanced standing. Graduates of such courses are admitted to the College of Education with an allowance of forty-two semester credits towards graduation.

Graduates of the three-year course in the state normal schools of Minnesota may receive not more than seventy-five credits in the College of Education at the University of Minnesota; credits earned in the three-year normal school course shall be applied in case they are deemed of equivalent merit, in the College of Education, to courses leading to certificates for supervisors in elementary grades, as principals in state graded schools, as teachers in junior high schools or in normal school departments in high schools; students coming from the three-year course in normal schools shall not receive certificates in high-school subjects from the University without completing the prescribed courses of the University of Minnesota for such certificates. No credit is allowed for this course in the College of Science, Literature, and the Arts.

State Normal Schools at the following places are recognized: Duluth, Mankato, Moorhead, St. Cloud, Winona, Bemidji.

3. *Junior Colleges*

In accordance with the policy of the University to encourage able schools to give one or two years of college work, the University Senate has prescribed conditions under which such work may be recognized for advanced standing. Copies of these standards may be had upon inquiry at the Registrar's office. The following schools in Minnesota have complied with the requirements and are offering either one or two years of collegiate study: Concordia College, St. Paul; Hibbing Junior College; Park Region Luther College, Fergus Falls; Rochester Junior College; St. John's College, Collegeville; Stanley College, Minneapolis; Villa St. Scholastica, Duluth; Augsburg Seminary, Minneapolis; St. Benedict's College, St. Joseph; St. Mary's Hall, Faribault; Eveleth Junior College.

4. *Miscellaneous*

Credit in shop work and drawing will be given in the College of Engineering for work in manual training, or for practical experience, provided the applicant gives evidence of proficiency in such work, and is qualified to pursue advanced work. The student must register for the regular work and at the same time make application to the department concerned for advanced credit.

LIST OF ACCREDITED PREPARATORY SCHOOLS

Graduates of the following Minnesota state high schools will be admitted to the University of Minnesota without conditions, provided their credentials satisfy the specific requirements of the college to which entrance is desired:

Ada	Biwabik	Coleraine
Adrian	Blackduck	Greenway
Aitkin	Blooming Prairie	Olcott
Akeley	Blue Earth	Cottonwood
Albert Lea	Brainerd	Crookston
Alden	Breckenridge	Crosby-Ironton
Alexandria	Brown Valley	Dassel
Amboy	Buffalo	Dawson
Annandale	Buhl	Deer River
Anoka	Caledonia	Delano
Appleton	Cambridge	Detroit
Argyle	Canby	Dodge Center
Arlington	Cannon Falls	Duluth
Atwater	Carlton	Central
Aurora	Cass Lake	Denfeld
Austin	Chaska	Eagle Bend
Bagley	Chatfield	East Grand Forks
Barnesville	Chisholm	Elbow Lake
Belle Plaine	Clarkfield	Elk River
Bemidji	Cleveland	Elmore
Benson	Cloquet	Ely
Bird Island	Cokato	Eveleth

Excelsior	Lakefield	Norwood-Young
Fairfax	Lake Park	America
Fairmont	Lamberton	Olivia
Faribault	Lanesboro	Ortonville
Farmington	Le Roy	Osakis
Fergus Falls	Le Sueur	Owatonna
Fertile	Le Sueur Center	Park Rapids
Fosston	Litchfield	Paynesville
Frazee	Little Falls	Pelican Rapids
Fulda	Long Prairie	Perham
Gaylord	Luverne	Pine City
Gilbert	Lyle	Pine Island
Glencoe	McIntosh	Pine River
Glenwood	Mabel	Pipestone
Glyndon	Madelia	Plainview
Graceville	Madison	Preston
Grand Meadow	Mahnomen	Princeton
Grand Rapids	Mankato	Red Lake Falls
Granite Falls	Mantorville	Red Wing
Hallock	Maple Lake	Redwood Falls
Halstad	Mapleton	Renville
Harmony	Marshall	Rochester
Hastings	Melrose	Roseau
Hawley	Milaca	Royalton
Hayfield	Minneapolis	Rush City
Hector	Central	Rushford
Henderson	East	St. Charles
Herman	North	St. Cloud
Heron Lake	South	St. James
Hibbing	West	St. Louis Park
Hinckley	Minneota	St. Paul
Hopkins	Montevideo	Central
Houston	Montgomery	Humboldt
Howard Lake	Monticello	John A. Johnson
Hutchinson	Moorhead	Mechanic Arts
International Falls	Mora	St. Peter
Ivanhoe	Morris	Sandstone
Jackson	Morristown	Sauk Center
Janesville	Morton	Sauk Rapids
Jordan	Mountain Iron	Shakopee
Kasota	Mountain Lake	Sherburn
Kasson	Nashwauk-Keewatin	Slayton
Kenyon	New Prague	Sleepy Eye
Kerkhoven	New Richland	South St. Paul
Lake Benton	New Ulm	Springfield
Lake City	Northfield	Spring Grove
Lake Crystal	North St. Paul	Spring Valley

Staples	Wabasha	Wheaton
Stephen	Wadena	White Bear
Stewartville	Walker	Willmar
Stillwater	Warren	Windom
Thief River Falls	Waseca	Winnebago
Tracy	Waterville	Winona
Two Harbors	Wayzata	Winthrop
Tyler	Welcome	Worthington
Villard	Wells	Zumbrota
Virginia	West Concord	

Graduates of the following private schools will be admitted to the freshman class under the regulations governing admissions of high-school graduates:

Collegeville	Moorhead
St. John's College	Concordia College
Duluth	Northfield
Cathedral High School for Boys	St. Olaf College, Preparatory Department
Cathedral High School for Girls	Owatonna
Villa Sancta Scholastica	Pillsbury Academy
Faribault	Red Wing
St. Mary's Hall	Academy of the Red Wing Seminary
Shattuck Military Academy	Luther Ladies' Seminary
Fergus Falls	St. Joseph
Park Region Luther College	Convent of St. Benedict
Frontenac	St. Paul
Villa Maria	Bethel Academy
Graceville	St. Joseph Academy
St. Mary's Academy	St. Paul Academy
Hutchinson	St. Thomas College
Danish-Norwegian Seminary	The Backus School for Girls
Minneapolis	The College of St. Catherine
Blake School for Boys	Visitation Convent
Northrop Collegiate Institute	Summit School
Minnehaha Academy	St. Peter
Minnesota College	Academy, Gustavus Adolphus College
St. Margaret's Academy	Winona
Stanley Hall	Cathedral High School
Montevideo	Cotter Commercial High School
Windom Institute	St. Claire Seminary
	St. Mary's College

DESCRIPTION OF SUBJECTS ACCEPTED FOR ADMISSION

The following statements indicate in a general way the preparation which the University expects in the various subjects accepted for admission. The number of units in parentheses following each subject indicates the maximum credit accepted by any one college of the University and does not mean that all colleges will accept the maximum stated. See pages 26 to 31 for statements of the requirements of the individual colleges.

GROUP A. ENGLISH

(Three or four units)

In order to secure a definite plan of study and unity of method on the part of preparatory schools, the entrance requirement in English is outlined below somewhat in detail. To satisfy this requirement a course of not less than four hours a week must be pursued during the time specified above. The headings under which instruction will naturally fall are:

- I. The principles of rhetoric.
- II. Practice in written expression.
- III. English classics.

I

The work in the principles of rhetoric should include the principles and technical terms of ordinary texts upon the subjects, whether acquired by the direct study of such text or mainly by the study of selected English masterpieces. It should not be forgotten that this is not an end in itself, but simply a means of teaching the student the correct use of English.

II

Not less than an hour a week in each of the four years of the course should be devoted to work in composition, which should be criticized both orally and in writing by the teacher. Such subjects should be chosen as will best make this written work an expression of the lives and interests of the students, who should be taught to observe accurately, think logically, and write correctly and forcefully.

III

The preparation in English Literature should consist in the study of a limited number of English classics and in the reading of a larger number. The following lists of books, headed respectively *reading* and *study*, are quoted from the report of the National Conference on Uniform Entrance Requirements in English. They will be found suggestive to those preparing students for the University. In connection with both lists, the student should be trained in reading aloud and be encouraged to commit to memory some of the more notable passages both in verse and in prose. As an aid to literary application, he is further advised to acquaint himself with the most important facts in the lives of the authors whose works he reads and with their place in literary history.

A. READING.—The aim of this course is to foster in the student the habit of intelligent reading and to develop a taste for good literature, by giving him a first-hand knowledge of some of the best authors. He should read carefully the selections prescribed, but should not concentrate his attention upon details to the neglect of the main purpose and charm of what he reads.

With a view to large freedom of choice, the books provided for reading are arranged in the following groups, from which at least ten units are to be selected, two from each group:

Group 1. The *Old Testament*, comprising at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings, and Daniel, together with the books of Ruth and Esther; the *Odyssey*, with the omission, if desired, of Books I, II, III, IV, V, XV, XVI, XVII; the *Iliad*, with the omission, if desired, of Books XI, XIII,

XIV, XV, XVII, XXI; Virgil's *Aeneid*. The *Odyssey*, *Iliad*, and *Aeneid* should be read in English translations of recognized literary excellence.

For any unit of this group a unit from any other group may be substituted.

Group 2. *Shakespeare*.—*Midsummer Night's Dream*; *Merchant of Venice*; *As You Like It*; *Twelfth Night*; *The Tempest*; *Romeo and Juliet*; *King John*; *Richard II*; *Richard III*; *Henry V*; *Coriolanus*; *Julius Caesar*; * *Macbeth*; * *Hamlet*.*

Group 3. *Prose Fiction*.—Two to be selected.—Malory's *Morte d'Arthur* (about 100 pages); Bunyan's *Pilgrim's Progress*, Part I; Swift's *Gulliver's Travels* (voyages to Lilliput and to Brobdingnag); De Foe's *Robinson Crusoe*, Part I; Goldsmith's *Vicar of Wakefield*; Frances Burney's *Evelina*; Scott's novels (any one); Jane Austen's novels (any one); Maria Edgeworth's *Castle Rackrent*, or *The Absentee*; Dickens' novels (any one); Thackeray's novels (any one); George Eliot's novels (any one); Mrs. Gaskell's *Cranford*; Kingsley's *Westward Ho!* or *Hereward, the Wake*; Reade's *The Cloister and the Hearth*; Blackmore's *Lorna Doone*; Hughes' *Tom Brown's School-days*; Stevenson's *Treasure Island*, or *Kidnapped*, or *Master of Ballantrae*; Cooper's novels (any one); Poe's selected *Tales*; Hawthorne's *The House of the Seven Gables*, or *Twice-Told Tales*, or *Mosses from an Old Manse*; a collection of *Short Stories* by various standard writers.

Group 4. *Essays, Biography, etc.*—Two to be selected.—Addison and Steele's *The Sir Roger de Coverley Papers*, or selections from the *Tatler* and the *Spectator* (about 200 pages); Boswell's selection from the *Life of Johnson* (about 200 pages); Franklin's *Autobiography*; Irving's *Sketch Book* (about 200 pages), or *Life of Goldsmith*; Southey's *Life of Nelson*; Lamb's *Essays of Elia* (about 100 pages); Lockhart's *Life of Scott* (about 200 pages); Thackeray's lectures on Swift, Addison, and Steele in the *English Humorists*; Macaulay's *Lord Clive*, *Warren Hastings*, *Milton*, *Addison*, *Goldsmith*, *Frederick the Great*, *Madame d'Arbly* (any one); Trevelyan's *Life of Macaulay* (about 200 pages); Ruskin's *Sesame and Lilies*, or selections (about 150 pages); Dana's *Two Years before the Mast*; selections from Lincoln, including at least the two *Inaugurals*, the speeches in Independence Hall and at Gettysburg, the *Last Public Address*, and the *Letter to Horace Greeley*, together with a brief memoir or estimate; Parkman's *The Oregon Trail*; Thoreau's *Walden*, Lowell's *Selected Essays* (about 150 pages); Holmes's *The Autocrat of the Breakfast Table*; Stevenson's *An Inland Voyage*, and *Travels with a Donkey*; Huxley's *Autobiography*, and selections from *Lay Sermons*, including the addresses on *Improving Natural Knowledge*, *A Liberal Education*, and *A Piece of Chalk*; a collection of essays by Bacon, Lamb, De Quincey, Hazlitt, Emerson, and later writers; a collection of letters by various standard writers.

Group 5. *Poetry*.—Two to be selected.—Palgrave's *Golden Treasury (First Series)*, Books II and III with special attention to Dryden, Collins, Gray, Cowper, and Burns; Palgrave's *Golden Treasury (First Series)* Book IV, with special attention to Wordsworth, Keats, and Shelley (if not chosen for study under B); Goldsmith's *The Traveler* and *The Deserted Village*; Pope's *The Rape of the Lock*; a collection of English and Scottish *Ballads*, as, for example, some *Robin Hood* ballads. *The Battle of Otterburn*, *King Estmere*, *Young Beichan*, *Bewick and Grahame*, *Sir Patrick Spens*, and a selection from later ballads; Coleridge's *The Ancient Mariner*, *Christabel*, and *Kubla Khan*; Byron's *Childe Harold*, Canto III or IV, and *The Prisoner of Chillon*; Scott's *The Lady of the Lake*, or *Marmion*; Macaulay's *The Lays of Ancient Rome*, *The Battle of Naseby*, *The Armada*, *Ivry*; Tennyson's *The Princess*, or *Gareth and Lynette*; *Lancelot and Elaine*, and *The Passing of Arthur*; Browning's *Cavalier Tunes*, *The Lost Leader*, *How They Brought the Good News from Ghent to Aix*, *Home Thoughts from Abroad*, *Home Thoughts from the Sea*, *Incident of the French Camp*, *Hervé Riel*, *Pheidippides*, *My Last Duchess*, *Up at a Villa—Down in the City*, *The Italian in England*, *The Patriot*, *The Pied Piper*, "*De Gustibus*"—, *Instans Tyrannus*; Arnold's *Sohrab and Rustum*, and *The Forsaken Merman*; selections from *American Poetry*, with special attention to Poe, Lowell, Longfellow, and Whittier.

* If not chosen for study under (B).

B. STUDY.—This part of the requirement is designed to insure a natural and logical continuation of the student's earlier reading, with greater stress laid upon form and style, the exact meaning of words and phrases, and the understanding of allusions. The books provided for study are arranged in four groups, from each of which one selection is to be made.

(1) Shakespeare's *Julius Caesar*, *Macbeth*, *Hamlet*.

(2) Milton's *L'Allegro*, *Il Penseroso*, and either *Comus* or *Lycidas*; Tennyson's *The Coming of Arthur*, *The Holy Grail*, and *The Passing of Arthur*; the selections from Wordsworth, Shelley, and Keats, in Book IV or Palgrave's *Golden Treasury (First Series)*.

(3) Burke's *Speech on Conciliation with America*; Macaulay's *Two Speeches on Copyright* and Lincoln's *Speech at Cooper Union*; Washington's *Farewell Address* and Webster's *First Bunker Hill Oration*.

(4) Carlyle's *Essay on Burns*, with a selection from Burns's *Poems*; Macaulay's *Life of Johnson*; Emerson's *Essays on Manners*.

GROUP B. LANGUAGES

Latin

1. Work of the first year should comprise: drill in the fundamentals of grammar as contained in any good first-year Latin book; forms to be thoroly mastered; constant practice in pronunciation and training for the ear; attention called to English words derived from the Latin words studied.

2. Work of the second year should consist at first of easy passages of continuous prose such as the extracts from Eutropius and the *Viri Romae* in the Beason and Scott or any good second-year Latin book. This may be followed by extracts from Caesar judiciously selected by the teacher. The text from Caesar may be varied by selections from Nepos or Ovid. The use of a good second-year book is recommended rather than a straight text of Caesar. Elementary composition should be given during the year and the relation between Latin and English emphasized. The total amount of text for the year might approximate the amount contained in the first three books of Caesar.

3. The third year may be well spent on Cicero's *Orations* with perhaps some of his selected letters. The amount usually covered may be indicated by saying that any six from the following list seem satisfactory: *Against Cataline*, *Poet Archeas*, *Ligarius*, *Marcellus*, *Manillian Law* (to count as two), *The Fourteenth Philippic*.

4. Virgil is usually read the fourth year. If a teacher prefers to read five rather than six books the fifth may be omitted. A pupil's feeling for adequate renderings of the poetic expression of the Latin should be cultivated. Constant metrical reading of the text is advocated as soon as the mechanics of the meter have been mastered.

In place of the above, the University will accept the work recommended in the report of the Cleveland Commission on College Entrance Requirements in Latin.

Greek

Greek Grammar (one unit).—The work of the first year should include the study of forms inflection, word formation, principles of syntax, elementary composition and reading. The contents of White's *First Greek Book* represents approximately the ground which the student is expected to cover.

Xenophon's Anabasis (one unit).—The work of the second year should comprise a careful reading of four books of the *Anabasis*, or an equivalent amount of Greek prose, together with the study of syntax, etymology, and the irregular verb. Emphasis should also be laid upon a correct pronunciation.

German (four units)

In the first year the student should acquire:

1. Correctness and ease of pronunciation; the ability to read from the text with the proper sentence accent.

2. A vocabulary of a thousand words in every-day use; facility in expressing his thoughts in simple sentences. As a means to this, at least 150 pages of narrative prose, and some poetry, should be read. Using the subject matter of the daily reading lesson as a basis, the teacher should, through rapid question and answer, develop the student's power of self-expression in the foreign idiom.

3. The essentials of German grammar, to be taught inductively in conjunction with the oral development of the reading lesson indicated in (2). Toward the last of the year the essentials should be reviewed with accuracy and in detail, with the help of sentences and free composition. Some free composition, or written answers to questions, should be required frequently after the first weeks.

In the second year the student should:

1. Read 200-300 pages of prose and poetry. The better students should be encouraged to private reading of simple texts. The use of classics in the second year is discouraged. A very simple text should be chosen for the first weeks to make the transition from the beginning course less abrupt. Other texts should follow of which the language is sufficiently modern to lend itself well to oral treatment of the subject matter in class. This course should continue the effort of the first year to develop, by means of question and answer in German, the accurate and immediate knowledge of the language through direct imitation and spontaneous use of the idiom of the text. This work should be supported by frequent written exercises based upon the text read.

2. Translate selected passages of the text into idiomatic English. To translate sentences which the student already understands is a waste of time. Usually a paraphrase, or a brief explanation in German, of a difficult passage is more satisfactory than translation.

3. Review topically the essentials of German grammar, including the chief rules of orthography and syntax.

Students presenting three or four years of high-school German may enter University courses suited to their degree of advancement. The work of the third and fourth years should secure grammatical accuracy, enlarge the reading and speaking vocabulary, and provide an introduction to the literature. To this end the use of much good narrative prose and selected poetry in the third year is recommended, and the reading and discussion of several dramas including classics, in the fourth year. Selection of too difficult texts is a serious error and should be avoided.

French (four units)

Work of the first year should comprise:

1. Careful drill in pronunciation.
2. Rudiments of grammar, including inflection of the more common irregular verbs.
3. Abundant practice in turning simple English into French.
4. Reading of 100 to 175 pages of simple French, including ample practice in sight translation.
5. Writing of French from dictation.

Work of the second year should comprise:

1. Complete and thoro drill in grammar.
2. Drill in connected prose composition.
3. Reading of 250 to 400 pages of modern prose and poetry.
4. Continued practice in writing French from dictation.
5. Practice in the understanding of simple French when spoken or read.

Work of the third and fourth years: If a third and fourth year are offered, they should consist of (1) advanced connected prose composition, (2) reading of more difficult French with emphasis on the literary side, and (3) oral practice.

Spanish (four units)

Courses in Spanish should follow the same plan as for French.

Scandinavian Languages

Norwegian or Swedish (four units).—The student should acquire the principles of grammar, ability to read and translate ordinary prose and easy poetry, also to translate from English, and a fair acquaintance with the history of the Scandinavian countries. Two additional years' work in literature will be accepted.

GROUP C. HISTORY AND SOCIAL SCIENCES

History

Ancient History (one unit).—This study should begin with a brief survey of the oriental peoples who have most influenced European development, and should be carried down to the establishment of Charlemagne's empire.

Modern History (one unit).—From Charlemagne to the present. It is desirable to give at least one third of the year to the period from 1789.

English History (one-half or one unit).—The Saxon period should be passed over rapidly. In the remainder of the work, besides the narrative, constitutional points should receive attention, and easily accessible documents should receive careful study.

Senior American History (one-half or one unit).—No attempt should be made to cover the whole field in this time. In the study of any period in the nineteenth century special attention should be paid to economic development and the westward movement.

Social Sciences

American Government (one-half or one unit).—This should be a study of our government, national, state, and local, as it is organized and actually operated to-day. The instruction should aim to impart information essential to intelligent, active citizenship, such as the division of the government into departments, their organization and function; the methods of nominating, electing, and appointing men to office; of framing and amending constitutions, city charters, and statutes; of drawing grand and petit juries and the duty of the citizen to serve on them; the distinction between common law, state law, and constitutional law, between equity, civil, and criminal cases.

Elementary Economics (one-half unit).—In the study of Economics it is desirable to avoid two extremes, abstract theory on the one hand, and controversial questions, such as the tariff, trusts, and trade unions, on the other hand. Emphasis should be placed on historical and descriptive matter, especially relating to the economic development of England and the United States. Some good elementary textbook should be mastered and a reasonable amount of collateral reading required.

History of Commerce (one-half or one unit).—This forms the natural introduction to the study of present economic conditions. It would be well to give special attention to the economic history of England and the United States. The work should be based on a textbook, supplemented by carefully directed map work and assigned readings. This should be preceded by a year course of medieval and modern European history.

Commercial Geography (one-half or one unit).—This describes and seeks to explain the commerce of to-day. The work should cover the ways in which commerce depends on nature and on man, the development of means of transportation and communication, and a detailed study of the several commercial regions of the world with reference to resources, industries, transportation facilities, and commerce. It should be based on a textbook supplemented by map work and assigned readings.

GROUP D. MATHEMATICS

Elementary Algebra (one unit).—Positive and negative numbers; addition; subtraction; multiplication; division; factoring; highest common divisor and lowest common multiple by factoring; fractions; equations of the first degree in one, two, and three unknowns, with numerous problems involving such equations; involution (omitting the binomial theorem); evolution (omitting cube root); elementary manipu-

lations of surds; irrational equations that lead to equations of the first degree; pure quadratic equations; affected quadratic equations by the method of completing the square and by factoring, with problems involving such equations.

Higher Algebra (one-half unit).—A review of elementary algebra with more difficult problems and with some demonstrational work; the factor theorem; the binomial theorem for positive integral exponents; cube root; fractional negative, and zero exponents; surds, radicals, and imaginaries; the solution of affected quadratic equations by formula; equations in the quadratic form; simultaneous quadratic equations; arithmetic and geometric progressions. The course in higher algebra should be taken by students in their third or fourth high-school year.

Plane Geometry (one unit).—Any of the standard texts on this subject will furnish the necessary preparation. Isoperimetry, symmetry, and maxima and minima of figures are not required. The exercises requiring solutions and demonstrations should not be omitted.

Solid Geometry (one-half unit).—Any of the standard texts on this subject will furnish the necessary preparation. The exercises requiring solutions and demonstrations should not be omitted.

GROUP E. NATURAL SCIENCES

Physics (one unit).—It is suggested that the year's work be confined to four of the seven subjects mentioned below.

(1) Mechanics of solids, (2) liquids and gases, (3) sound, (4) heat, (5) light, (6) and (7) electricity and magnetism (to count as two subjects, but not to be divided).

Chemistry (one unit).—The full year's work should include a study of both the non-metals and metals with laboratory experiments illustrating the common chemical laws and the commoner chemical reactions.

Botany (one-half or one unit).—One-half unit: The course should cover the external form and functions of the parts of the flowering plant, including its development from the seed. A part of the work should consist of becoming familiar with the common plants of the neighborhood, both cultivated and native.

One unit: In addition to the work required for one-half unit the course should embrace the microscopic structure of the parts of the flowering plant and a study of selected lower forms. The one year's course should embrace essentially what is covered by *Bergen's Elements of Botany*, *Andrew's Plants the Year Around*, and *J. G. Coulter's Plant Life and Plant Uses*.

Zoology (one-half or one unit).—Animals should be studied as living units in their relation to one another and their environments. This study should include development stages as well as the habits, general structure, and special adaptations of the adult stage. The aim of the teacher should be to foster a love for animate nature and to develop accuracy in observation and description.

Astronomy (one-half unit).—An elementary course in general astronomy as presented in any good modern textbook will satisfy this requirement.

Geology (one-half unit).—These subdivisions should receive special attention: physiographic geology, the building of the land and the evolution of its existing contours; geodynamics, the modifying of the earth by atmosphere, water, terrestrial heat, plants, and animals, and a brief survey of historical geology.

Physiography (one-half unit).—The following topics should be emphasized: meteorology, the leading facts relating to the atmosphere and its phenomena, including some acquaintance with the work of the United States weather bureau; land sculpture, as it treats of the origin, development, and degradation of land forms; and the influence of these processes on the physical environment of man.

GROUP F. VOCATIONAL AND MISCELLANEOUS SUBJECTS

The studies of Group F are no longer designated by the University. This group contains all subjects not listed in the Groups A, B, C, D, and E, which are certified by the high-school superintendent as of acceptable nature and counted towards the graduation of the student.

DEGREES

The candidate for a degree must complete the requirements for graduation in his course. Any person may undergo, at a suitable time, an examination in any subject, and if such person pass in all the studies and exercises of the course, he is entitled to the appropriate degree; provided, however, that at least one full year (the one immediately preceding the granting of the degree) is spent at the University, before such degree is granted, and provided further that the examination, in every case, is held before a committee of the Faculty appointed for that purpose.

For detailed information concerning requirements, see pages 12-20. also the bulletin of the appropriate college or school.

THE UNIVERSITY STATE TEACHERS' CERTIFICATE

The University State Teachers' Certificate is granted to all graduates of the College of Education and to those graduates of the Colleges of Agriculture, Forestry, and Home Economics, and of Science, Literature, and the Arts who satisfy the requirements as stated in the bulletins of those colleges.

This certificate by state law authorizes students to teach in the public schools of Minnesota for two years from date of issue. After that time, upon satisfactory evidence of the student's successful teaching experience, the certificate may be made permanent by the endorsement of the Superintendent of Education and the President of the University.

THE MINNESOTA TEACHERS' INDUSTRIAL CERTIFICATE

The Colleges of Agriculture, Forestry, and Home Economics, and Education offer the courses necessary to obtain from the State Department of Education an Industrial Certificate authorizing the holder to teach agriculture in a high school receiving state aid for maintaining a department of agriculture. They also offer courses necessary to obtain from the same source an Industrial Certificate authorizing the holder to teach home economics in a high school receiving state aid for maintaining a department of home economics.

EXPENSES

FEEES

DEPOSIT FEE

The period formerly known as the "college year" extending from October to June has now been divided into three terms called "quarters," with the Summer Session as the fourth quarter. The tuition fee is expressed in quarter units. At the student's first registration each year, in addition to the tuition fee a deposit fee of \$5 (Medicine and Dentistry \$10) is required of every student to cover the following possible charges:

Change of registration.....	\$2.50
Examination for removal of condition at set time or postponed physical examination	\$1.00
Rental of post-office box, University post-office (required of all)	\$0.50 a year
Locker rental, locker key deposit.....	\$0.50 to \$1.00 a year
Case-book deposit (Law School), laboratory breakages, or damage to University property.	

Penalties for late registration or late payment of fees.

A penalty fee of five dollars (\$5.00) must be paid by all students who register or pay fees after the prescribed time. (See calendar, page 7.) After the day previous to that on which classes begin, the penalty for delay increases at the rate of one dollar a day.

The unused balance of the deposit fee will be returned at the end of each year. If, at any time during the college year, the charges against a student shall warrant a renewal of the deposit, a second fee of five dollars (\$5.00) will be required.

SPECIAL FEES

The following special items may be included in the expenses of a student:

Minnesota Union membership (required of men)....	\$0.70 a quarter
Shevlin Hall fee (required of women).....	.50 a quarter
Health fee (required of everyone).....	2.00 a quarter
Special examination for removal of condition, at other than the set time†	\$5.00
Examination on subject taken out of class†.....	5.00
(No fee for such examination on first entering the Univer- sity, if taken within the first six weeks.)	
Gymnasium suit, men and women (approximately).....	5.00

INCIDENTAL FEES

The quarterly tuition fee, which includes all laboratory charges, is payable at the beginning of each quarter. Cards entitling the student to admission to classes will not be issued until the fees have been paid.

† Such an examination may be taken only upon approval of the appropriate committee.

Science, Literature, and the Arts:

Quarterly tuition fee, resident.....	\$ 14.00
Quarterly tuition fee, non-resident.....	28.00
Health fee	2.00
Gymnasium suit, men and women (approximately).....	5.00
Elective	
Music, instrumental and vocal (one lesson a week), fall and winter quarters	24.00
Music, instrumental and vocal (two lessons a week), fall and winter quarters.....	48.00
Music, instrumental and vocal (one lesson a week), spring and summer quarters.....	22.00
Music, instrumental and vocal (two lessons a week), spring and summer quarters.....	44.00

College of Engineering and Architecture:

Quarterly tuition fee, resident and non-resident.....	\$ 20.00
Health fee	2.00

College of Agriculture, Forestry, and Home Economics:

Quarterly tuition fee, resident.....	\$ 14.00
Quarterly tuition fee, non-resident.....	28.00
Itasca Park fee, freshman year (for Forestry students).....	3.00
junior year	5.00

Law School:

Quarterly tuition fee.....	\$ 22.00
Health fee	2.00

Medical School:

Quarterly tuition fee.....	\$ 50.00
Health fee	2.00
Course for Embalmers.....	50.00
School for Nurses, preliminary course, tuition fee.....	25.00
Health fee	2.00
Junior and senior years, health fee.....	2.00

College of Dentistry, Four-Year Course:

Quarterly tuition fee, first year.....	\$ 33.00
Quarterly tuition fee, second, third, and fourth years.....	60.00
Health fee	2.00
Instruments and appliances (estimated).....	350.00
Books (estimated)	75.00

School of Mines:

Freshman Year

Quarterly tuition fee.....	\$ 18.00
Health fee	2.00
Books (estimated)	25.00
Draughting instruments (estimated).....	15.00
Note books and supplies (estimated).....	5.00

Sophomore Year

Quarterly tuition fee.....	\$ 18.00
Health fee	2.00
Field work { Surveying }	.....100.00 to 150.00
May 1 to July 1 { Geological }	
Books (estimated)	15.00
Note books and supplies (estimated).....	5.00

Junior Year

Quarterly tuition fee.....	\$ 18.00
Health fee	2.00
Field work { Metallurgy }	.....175.00 to 250.00
May 1 to July 1 { Mining }	
Books (estimated)	30.00
Note books and supplies (estimated).....	5.00

Senior Year

Quarterly tuition fee.....	\$ 18.00
Health fee	2.00
Books (estimated)	15.00
Note books and supplies (estimated).....	5.00

College of Pharmacy:

Quarterly tuition fee.....	\$ 18.00
Health fee	2.00

School of Chemistry:

Quarterly tuition fee.....	\$ 18.00
Health fee	2.00

College of Education:

Quarterly tuition fee, resident.....	\$ 14.00
Quarterly tuition fee, non-resident.....	28.00
Health fee	2.00

The School of Business:

The tuition fee in this School has not been determined at the present date. Announcement will be made later. The remaining items of expense will be similar to those in the College of Science, Literature, and the Arts.

The Graduate School:

Quarterly tuition fee.....	\$ 10.00
Health fee	2.00

STUDENTS EXEMPT FROM FEES

All fellows, scholars, assistants, and instructors, and all members of the teaching staff and scientific bureaus or experiment stations when regularly enrolled as students in the Graduate School, shall not be required to pay tuition fees.

FEES FOR STUDENTS OF ONE COLLEGE TAKING WORK IN ANOTHER

Where a student of a given college or school elects courses in another, such courses being accepted by the college in which the student is registered as a part of its curriculum, the tuition shall be that of the college in which he is registered.*

If, at any time, such student desires credit for this course towards the degree offered by the second college, he shall pay such additional tuition as is required by the second college, charged in accordance with the schedule indicated below.

FEE SCHEDULE FOR STUDENTS CARRYING LESS THAN FULL WORK

Students carrying less than the complete schedule of work may pay fees on a credit-hour basis. The following table indicates the charge for each college, also the minimum amount that may be paid by any student.

COLLEGE OR SCHOOL	Credit Hour Fee	Minimum Total
Science, Literature, and the Arts.....	\$1.75	\$ 5.00
Engineering and Architecture.....	2.25	10.00
Agriculture, Forestry, and Home Economics.....	1.75	5.00
Law	3.00	10.00
†Medicine	2.00	10.00
†Dentistry, freshmen	1.50	10.00
sophomores, juniors, and seniors.....	3.00	10.00
Mines	2.00	10.00
†Pharmacy	1.00	10.00
Chemistry	2.00	10.00
Education	1.75	5.00
Graduate School	1.25	5.00

LIVING EXPENSES

BOARD AND ROOM

Women.—Sanford Hall, the one dormitory for women, accommodates eighty-seven girls, about one third of whom may be freshmen. The charge for room and board is \$250 for the University year. Applications should be sent to the Director of Sanford Hall, University of Minnesota, before June 1.

Four coöperative cottages, each in charge of a chaperone, offer comfortable homes to about sixty girls of small means. By assisting with the work of the houses the students are able to keep expenses within moderate bounds. In assigning students to these cottages, preference is

* A student paying full fees in a given college, electing courses in a lower-fee college, shall pay no additional fees for the work so elected, but if electing in a higher-fee college may have the option of paying the pro rata fees of both or the full fees of the first and pro rata fees of the second.

† In these three colleges the prorating is on the basis of clock hours.

given to girls earning a part of their expenses. Application may be made to the Dean of Women.

Home Management Houses.—Two residences for women, located near the Agricultural College campus, are maintained by the Division of Home Economics, furnishing accommodations for a small number of students. The charge is \$85 for each quarter, payable in advance. This covers the cost of living in the houses with the exception of luncheons for the first five days of the week. Applications should be sent to the Chief of the Division of Home Economics, University Farm, St. Paul. A deposit fee of \$10.00 is required when a room is reserved.

About fifty affiliated houses are approved by the University as residences for women. For further information and list of addresses application may be made to the Dean of Women.

Attention is called to the ruling of the Board of Regents that women students are not allowed to reside in any house which is not on the approved list except by special arrangement with the Dean of Women. Women students do not reside in any house where men are taken as roomers.

Luncheons on the cafeteria plan are served daily in Shevlin Hall.

Men.—A list of approved boarding and rooming places may be had upon request at the Bureau of Information and Employment.

At the Minnesota Union, the men's club house on the campus, three meals a day are served on the cafeteria plan at practically cost prices. Last year the average price paid for breakfast was 14 cents, luncheon 23 cents, dinner 24 cents. Board by the week varied from four to five dollars.

All students.—The expense of living at the University varies greatly according to individual habits and tastes. In general the scale of expenses is below rather than above that of similar institutions in the middle west, and is considerably lower than that of most institutions situated in the eastern states.

GENERAL EXPENSES—ESTIMATED ON THE BASIS OF THREE QUARTERS

Formerly the "college year" extended from September to June, covering approximately nine months. Since the adoption of the quarter system and the introduction of the Summer Quarter, what was known as the "college year" is now embraced in *three quarters*, and as this period will for many students still be their "college year," expenses have been estimated on that basis.

The following tables give estimates of the freshman students' expenses in college, omitting clothing, railroad fare, and vacation expenditures. To live within the minimum rate, a student must forego all luxuries and economize in every expenditure.

COLLEGES OF SCIENCE, LITERATURE AND THE ARTS; EDUCATION; AGRICULTURE,
FORESTRY, AND HOME ECONOMICS

	Minimum	Average	Liberal
†Tuition fee	\$42.00	\$42.00	\$42.00
Deposit fee	5.00	5.00	5.00
Health fee	6.00	6.00	6.00
Minnesota Union fee.....	2.10	2.10	2.10
Shevlin Hall fee.....	1.50	1.50	1.50
Gymnasium suit (approximately).....	5.00	5.00	5.00
Books	15.00	20.00	25.50
Laundry	18.00	31.50	45.00
Room rent	54.00	90.00	108.00
Board	144.00	180.00	225.00
Incidentals	50.00	180.00	270.00
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	\$342.60	\$563.10	\$735.10

† Tuition fee for undergraduate students residing outside of the state of Minnesota is \$84.00.

Funds absolutely necessary for immediate expenses upon entering these colleges, including two weeks' board and first month's room rent in advance: minimum, \$75.00; average, \$80.00.

COLLEGE OF ENGINEERING AND ARCHITECTURE

	Minimum	Average	Liberal
Tuition fee	\$60.00	\$60.00	\$60.00
Deposit fee	5.00	5.00	5.00
Health fee	6.00	6.00	6.00
Minnesota Union fee.....	2.10	2.10	2.10
Books and instruments.....	30.00	36.00	37.50
Laundry	18.00	31.50	45.00
Board	144.00	180.00	225.00
Room rent	54.00	90.00	108.00
Incidentals	50.00	180.00	270.00
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	\$369.10	\$590.60	\$758.60

Necessary for immediate expenses upon entering this College, including two weeks' board and first month's room rent in advance: minimum, \$100.00; average, \$115.00.

LAW SCHOOL

	Minimum	Average	Liberal
Tuition fee	\$66.00	\$66.00	\$66.00
Deposit fee	5.00	5.00	5.00
Health fee	6.00	6.00	6.00
Minnesota Union fee.....	2.10	2.10	2.10

EXPENSES

	Minimum	Average	Liberal
Books and notebooks.....	10.00	16.50	18.50
Laundry	18.00	31.50	45.00
Room rent	54.00	90.00	108.00
Board	144.00	180.00	225.00
Incidentals	50.00	180.00	270.00
	\$355.10	\$577.10	\$745.60

Necessary for immediate expenses upon entering this School, including two weeks' board and first month's room rent in advance: minimum, \$65.00; average, \$70.00.

MEDICAL SCHOOL, FIRST YEAR

	Minimum	Average	Liberal
Tuition fee	\$150.00	\$150.00	\$150.00
Deposit fee	10.00	10.00	10.00
Health fee	6.00	6.00	6.00
Minnesota Union fee.....	2.10	2.10	2.10
Books and instruments.....	27.50	33.00	50.00
Laundry	18.00	31.50	45.00
Room rent	54.00	90.00	108.00
Board	144.00	180.00	225.00
Incidentals	50.00	180.00	270.00
	\$461.60	\$682.60	\$866.10

Necessary for immediate expenses upon entering this College, including two weeks' board and first month's room rent in advance: minimum, \$110.00; average, \$130.00.

COLLEGE OF DENTISTRY

	Minimum	Average	Liberal
Tuition fee	\$99.00	\$99.00	\$99.00
Deposit fee	10.00	10.00	10.00
Health fee	6.00	6.00	6.00
Minnesota Union fee.....	2.10	2.10	2.10
Books and instruments.....	130.00	147.50	175.00
Laundry	18.00	31.50	45.00
Room rent	54.00	90.00	108.00
Board	144.00	180.00	225.00
Incidentals	50.00	180.00	270.00
	\$513.10	\$746.10	\$940.10

Necessary for immediate expenses upon entering this College, including two weeks' board and first month's room rent in advance: minimum, \$200.00; average, \$220.00.

SCHOOL OF MINES

	Minimum	Average	Liberal
Tuition fee	\$54.00	\$54.00	\$54.00
Deposit fee	5.00	5.00	5.00
Health fee	6.00	6.00	6.00
Minnesota Union fee.....	2.10	2.10	2.10
Books, etc.	22.00	27.50	27.50
Laundry	18.00	31.50	45.00
Room rent	54.00	90.00	108.00
Board	144.00	180.00	225.00
Incidentals	50.00	180.00	270.00
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	\$355.10	\$576.10	\$742.60

Necessary for immediate expenses upon entering this College, including two weeks' board and first month's room rent in advance: minimum, \$90.00; average, \$105.00.

COLLEGE OF PHARMACY

	Minimum	Average	Liberal
Tuition fee	\$54.00	\$54.00	\$54.00
Deposit fee	5.00	5.00	5.00
Health fee	6.00	6.00	6.00
Minnesota Union fee.....	2.10	2.10	2.10
Books and instruments.....	21.00	24.00	24.00
Laundry	18.00	31.50	45.00
Room rent	54.00	90.00	108.00
Board	144.00	180.00	225.00
Incidentals	50.00	180.00	270.00
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	\$354.10	\$572.60	\$789.10

Necessary for immediate expenses upon entering this College, including two weeks' board and first month's room rent in advance: minimum, \$87.00; average, \$100.00.

SCHOOL OF CHEMISTRY

	Minimum	Average	Liberal
Tuition fee	\$54.00	\$54.00	\$54.00
Deposit fee	5.00	5.00	5.00
Health fee	6.00	6.00	6.00
Minnesota Union fee.....	2.10	2.10	2.10
Gymnasium suit	5.00	5.00	5.00
Books and instruments.....	15.00	17.00	19.00
Laundry	18.00	31.50	45.00
Room rent	54.00	90.00	108.00
Board	144.00	180.00	225.00
Incidentals	50.00	180.00	270.00
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	\$353.10	\$570.60	\$739.10

Necessary for immediate expenses upon entering this School, including two weeks' board and first month's room rent in advance: minimum, \$87.00; average, \$100.00.

SCHOOL OF BUSINESS

The tuition fee in this School has not been determined at the present date. Announcement will be made later. The remaining items of expense will be similar to those in the College of Science, Literature, and the Arts.

SELF-SUPPORT

The Bureau of Employment is maintained for the purpose of assisting all students who seek employment, and of developing in all proper ways opportunities for self-help. The opportunities for men are necessarily more varied than those for women. Communications from students and graduates in regard to obtaining employment should be addressed to this bureau. Students or prospective students applying for the first time must appear at the office in person.

For the benefit of those who are without support of any kind it may be said that a number of students, with the aid of the money saved during the summer, are earning all of their college expenses. Some are able to meet their expenses during the college year, but this can be done only by students of unusual force and adaptability, or with exceptional opportunities. The average student must meet stern competition; he must live economically; he must guard his health while preserving a fair balance between time given to studies and to outside work.

It is not a good policy to begin life in a new community entirely without resources. A prospective student should have at least \$150 or the equivalent in addition to tuition fees; even then it will be necessary for him to do outside work and live very economically. Before he can place himself in a self-supporting position he may have to try again and again, and meanwhile his living expenses will be accumulating. An adequate reserve fund under such conditions will secure peace of mind, health of body, and the benefits of the college year.

The Twin Cities offer exceptional opportunities to the self-supporting student. Students are employed in housework, in the care of children, and as clerks, bookkeepers, stenographers, salesmen, and saleswomen, solicitors, telegraph operators, mechanics, assistants, musicians, librarians, waiters, laborers, janitors, telephone operators, and in many other capacities. Considerable work can be secured within walking distance.

Applicants for employment should bear in mind that, while every effort is made to secure work for all who need it, positions can not be assigned in the order in which applications are made. The places available are of so varied a nature that it would be impossible to assign them in order, without regard to the ability and qualifications of different applicants. The employer must be given the best person for his particular position. This means that fitness must be the first consideration. Whenever possible, however, the order of applications is followed.

Those who find themselves without funds at the beginning of the college year should register in some of the evening Extension Courses and seek employment during the day rather than to run the risk of not being able to finance themselves while carrying regular university work. By choosing extension courses for which university credit is allowed, students can make their future university work much easier and give themselves more time for outside work. The correspondence courses offered by the Extension Division are open to all except resident students. Students who can meet the usual requirements for college entrance are allowed university credit for the most of these courses.

SCHOLARSHIPS, LOANS, AND PRIZES GRADUATE FELLOWSHIPS AND SCHOLARSHIPS

Shevlin Fellowships

The University of Minnesota offers four Shevlin Fellowships of \$500 each for the year 1919-20. They are open to graduate students, one each in the Colleges of Agriculture, Chemistry, Medicine, and Science, Literature, and the Arts. Applications for these fellowships must be made on or before March 1. Blank applications can be obtained from the Dean of the Graduate School.

Assistants and Scholars

The following Assistantships and Scholarships are also open to graduate students. They carry stipends ranging from \$225 to \$1,000 with remission of tuition in the Graduate School. Appointments are made upon the recommendation of the departments concerned. Applications may be made through the Dean of the Graduate School.

Agriculture	16 Assistants
Animal Biology.....	{ 2 Teaching Fellows 3 Scholars
Astronomy	1 Scholar
Botany	{ 2 Teaching Fellows 2 Scholars
Chemistry	13 Assistants
Comparative Philology.....	1 Scholar
Economics	{ 2 Teaching Fellows 1 Scholar
Education	{ 1 Assistant 1 Scholar
English	{ 1 Assistant 2 Scholars
Geology and Mineralogy.....	2 Scholars
German	2 Scholars
History	{ 2 Teaching Fellows 2 Assistants 2 Scholars
Mathematics	{ 2 Assistants 1 Scholar
Medical School.....	{ 10 Teaching Fellows 50 Mayo Fellows 2 Special Fellows 5 Scholars 12 Assistants
Philosophy	1 Scholar
Physics	{ 2 Teaching Fellows 2 Scholars
Political Science.....	{ 1 Teaching Fellow 2 Scholars
Psychology	{ 1 Teaching Fellow 1 Scholar
Romance Languages.....	{ 3 Teaching Fellows 1 Scholar
Scandinavian	1 Scholar
Sociology and Anthropology....	2 Scholars

* Special requirements. Address inquiries to Dean of the Graduate School.

The Albert Howard Scholarship Fund

This scholarship, amounting to \$120 a year, is awarded to graduate students in the College of Science, Literature, and the Arts.

Class of 1890 Fellowship

As a gift of the class of 1890 the annual income from the sum of \$2,500 will be available in September, 1917, to a graduate of the College of Science, Literature, and the Arts or the College of Engineering and Architecture who has shown distinguished ability and initiative as a student and who desires to make further preparation for public service.

United States Radiator Corporation Scholarship

A scholarship of \$500 is given by the United States Radiator Corporation for special research work in heating. This scholarship is for graduate students in Engineering who have taken work in heating and ventilating and is given for research work in these lines. The holder of this scholarship submits a thesis and the approval of his work comes under the Graduate School.

UNDERGRADUATE SCHOLARSHIPS

The Moses Marston Scholarship in English

The annual income of \$1,000 is to be used to further English study. The scholarship is awarded by the English Department as a recognition of special capacity for literary and linguistic studies.

National City Bank Scholarships

The National City Bank of New York City offers to students of the University one or more scholarships each year for the purpose of training young men in banking and foreign trade. The arrangements will include certain periods of practical work and study in the National City Bank. Detailed announcement will be made later.

The St. Paul College Club Scholarships

The St. Paul College Club offers annually three scholarships of \$150 each, two to be awarded to incoming freshmen women and one to a woman in the junior or senior class. Applications may be made to the Dean of Women before May 1.

The Minneapolis College Women's Club Scholarship

The Minneapolis College Women's Club offers annually one scholarship of \$150, to be awarded to a woman in the junior or senior class. Applications may be made to the Dean of Women before May 1.

The W. S. G. A. Scholarship

The Women's Self-Government Association of the University offers annually a scholarship of \$100, to be awarded to a woman of the junior or senior class. Applications may be made to the Dean of Women before May 1.

The Faculty Women's Club Scholarship

The Student Section of the Faculty Women's Club offers annually a scholarship of \$100, to be awarded to some woman student. Applications may be made to the Dean of Women before May 1.

The Nina Morais Cohen Scholarship

The Nina Morais Cohen Scholarship of \$100 is awarded annually to some woman student of Jewish descent. Applications may be made to the Dean of Women before May 1.

The George H. Partridge Scholarships

Through the generosity of Mr. George H. Partridge several scholarships, amounting to \$500 annually, have been available in past years for young women of high scholarship and fine character. These scholarships have been awarded by selection without special application.

The Mrs. Elbert L. Carpenter Scholarships

Through the generosity of Mrs. Elbert L. Carpenter scholarships, amounting to \$150 annually, have been available in past years for young women of high scholarship and fine character. These scholarships have been awarded by selection without special application.

The Mrs. G. C. Christian Scholarship

Through the generosity of Mrs. G. C. Christian a scholarship, amounting to \$100 annually, has been available in past years for young women of high scholarship and fine character. This scholarship has been awarded by selection without special application.

Minnesota State Pharmaceutical Association Scholarship

The Minnesota State Pharmaceutical Association at its last meeting voted the sum of \$75 to be awarded annually to that student who is a citizen of the United States and who has resided in Minnesota for at least five years and has earned the highest general rating in the work of the second year of the regular course in the College of Pharmacy. If such student should discontinue attendance at the College, the said sum is to be awarded to the student next highest in standing who meets the other requirements.

The Fairchild Scholarship

Mr. Samuel W. Fairchild offers a scholarship in the sum of \$300 to be awarded to that first-year student in any of the colleges holding membership in the American Conference of Pharmaceutical Faculties who has had two years of drug store experience, is a high-school graduate, and who passes the best competitive examination to be conducted by or under the auspices of a committee made up of members appointed jointly by the American Pharmaceutical Association, the American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy. Fuller particulars may be had from the Dean of the College.

The Get Together Club Scholarship

For the year 1919-20 a scholarship of \$50 is available to students of the Division of Home Economics. In awarding it, the character, the scholarship, and the need of the applicants will be considered. Preference will be given to students in the junior and senior classes. Applications for this scholarship may be made to the Chief of the Division of Home Economics.

The Phi Upsilon Omicron Scholarship in Home Economics

For the year 1919-20 a scholarship of \$50 is available to students of the Division of Home Economics. Any student in the division will be eligible but preference will be given to freshmen and sophomores. The award will be in the hands of a Faculty committee; applications should be made to the Chief of the Division of Home Economics. This scholarship is offered by the Twin City Chapter of Phi Upsilon Omicron.

STUDENT EMERGENCY FUND

The Faculty Women's Club Emergency Fund

The Faculty Women's Club established in the fall of 1918 a small Emergency Fund to be used for assisting women students. It is intended that this fund should give help to students who are embarrassed by inability to meet incidental expenses. Applications may be made to the Dean of Women at any time.

STUDENT LOAN FUNDS

Unless otherwise stated, all applications for loans should be made to the Secretary to the President.

The Gilfillan Trust Fund

The annual income from this fund of \$50,000 is at the disposal of the Executive Committee of the Board of Regents either as a gift or a temporary loan to worthy students of the University who are residents of Minnesota. The income of \$2,000 is loaned to students on their notes in amounts not exceeding \$200 to any one person in one year, at the rate of five per cent per annum. The regulations governing the administration of the income from the fund may be learned by addressing the President of the University.

The Elliot Scholarship Loan Fund

The income from this fund of \$5,000 is loaned students in the School of Mines. The financial needs of the applicant, his scholarship, moral character, enthusiasm shown in his work, and promise of usefulness in his profession will be taken into consideration. When money is available, it may be loaned to pay expenses of worthy students during sickness. The loans are to be repaid, without interest, at the earliest convenience of the recipients.

School of Agriculture—Class of 1902 Trust Fund

A fund of \$100 is available for temporary loans to deserving students needing such help who are not below the junior class in the School of Agriculture. Applications should be made to the Principal of the School.

The Ludden Estate Loan Fund

Six hundred and twenty-five dollars is annually available for short or temporary loans in limited amounts, to students in any department of the University.

The Ludden Real Estate Loan Fund

The sum of \$3,000 is available for loans to students in any department of the University.

The Loan Fund for Women Students of the University

This fund was established by Mrs. George Edgar Vincent and the Faculty Women's Club, and is periodically increased by contributions from the Faculty Women's Club. Small loans from this fund are available for women students of high scholarship and fine character. Applications may be made to the Dean of Women at any time.

The Home Economics Self-Government Association Loan Fund

The sum of \$250 is available for small emergency loans to women in the Division of Home Economics whose character and scholarship recommend them for assistance. Applications may be made to the Dean of Women at any time.

The Minneapolis Colony of New England Women Loan Fund

A loan of \$100 is available annually for a woman student of New England birth or ancestry who is a member of the junior or senior class. Applications may be made to the Dean of Women before May 1.

The Minnesota Federation of Women's Clubs Loan Funds

The Minnesota Federation of Women's Clubs has charge of three loan scholarships which provide money to be loaned to young women of the state; the sum borrowed not to exceed \$250, to be paid without interest on or before three years from date of loan; rate of interest after maturity to be 4 per cent per annum. These loan scholarships are as follows:

(a) The Lydia Phillips Williams Memorial Scholarship, to be loaned to a woman student in any department of any college of the state.

(b) The Professor Maria Sanford Scholarship, to be loaned to a woman student in some college of the University of Minnesota.

(c) The Annabelle Collins Coe Scholarship, to be loaned to a woman student at the University of Minnesota or any college of the state.

Before making a request for these loans applicants should obtain consent of parents or guardians.

The Duluth Branch of the Association of Collegiate Alumnae Loan Fund

The Duluth Branch of the Association of Collegiate Alumnae loans each year a scholarship of \$300 to a woman student selecting a course which leads to a Bachelor's degree in arts, philosophy, science, literature, or education. This loan scholarship is not restricted to students in institutions of this state. Applications should be sent to the Dean of Women early in the year so that they may be forwarded to the Duluth Branch of the Association of Collegiate Alumnae.

PRIZES

The John S. Pillsbury Prize

Three prizes of one hundred, fifty, and twenty-five dollars each, have been awarded annually for the best work in the Department of Rhetoric and Public Speaking, as evidenced finally by an oration in public.

The Frank H. Peavey Prize

This prize of \$100 is awarded to the members of the team winning the annual freshman-sophomore debate.

The Ludden Trust Prize

The sum of \$100 is available to furnish prizes for the winners of the first three places in the freshman-sophomore oratorical contest.

The Frank O. Lowden Prize

The annual income from \$3,000 is available to orators competing in the Northern Oratorical League. A prize of \$100 will be given to the orator winning the first place and \$50 to the winner of second place.

The '89 Memorial Prize in History

A prize of \$50 each year is given for the best thesis in history, written from the sources, by a member of the graduating class.

The Journal Prizes in History

The Minneapolis Journal offers each year a first prize of \$50 and a second prize of \$25 for the two best papers in history written by undergraduates. Literary form will be taken into prominent consideration.

The William Jennings Bryan Prize

A prize of \$50 will be awarded every fourth year to the writer of the best essay upon a topic in Political Science to be announced. The essay, which is limited to ten thousand words, must be handed to one of the instructors in Political Science by May 1. The next award will be made in 1921.

The Alumni Weekly Gold Medal

This medal is awarded annually by the Faculty Committee on Debate and Oratory, to that member of the graduating class who has, in the

judgment of the Committee, made the best record in forensics during his college course. The medal is awarded only to a student who has shown himself broad-minded, unselfish, industrious, and willing to work courteously and enthusiastically with others so as to serve the highest interests of Public Speaking in the University.

The Rollin E. Cutts Prize in Surgery

The income from \$500 is awarded in the form of a gold medal to that member of the senior class of the Medical School who presents the best thesis showing original work upon a surgical subject.

The Edwin Ames Jaggard Prize in Legal History

A prize of \$50 is awarded each year to the student in the Law School whose contributions to the pages of the *Minnesota Law Review* during such year shall be adjudged by the Law Faculty to be most meritorious.

The American Law Book Company Prize

A complete set of the *Cyclopedia of Law and Procedure* is awarded by the Law Faculty to that student in the third-year class who shall have maintained the highest grade of scholarship throughout the three-years' course leading to the LL.B. degree.

The Briggs Prize in Foundry Practice

Seventy-five dollars annually, in two prizes, accompanied by gold medals, will be awarded to sophomores in the College of Engineering for the best essays relative to foundry practice. No prize will be awarded if less than five essays are submitted in competition. Essays should contain about 3,000 words, and must be submitted to the instructor in Rhetoric on or before May 1.

ORGANIZATIONS AND PUBLICATIONS

SELF-GOVERNMENT ORGANIZATIONS

The Minnesota Union was organized in the spring of 1908 "to promote the best interests and welfare of the University of Minnesota, and comradeship among its members, and to erect and maintain a suitable club house for such purposes." All men students of the University are active members of the Union and are assessed a membership fee of seventy cents a quarter, payable at the time of registration. The Legislature gave the Chemistry Building for the use of the Union and appropriated \$17,500 for remodeling.

The dining room, operated on the cafeteria plan, serves three meals a day at practically actual cost. Students are advised to ascertain the Union prices for board before making arrangements elsewhere.

The Minnesota Union maintains for the convenience of its members, a pool- and billiard-room, smoking-rooms, writing- and study-rooms, barber shop, game-rooms, private dining-rooms for student and Faculty luncheons, ball-rooms, Little Theater.

The Union gives periodical social activities in the nature of an open house. Reservations for rooms are made through the Manager or through the Information Bureau.

The Women's Self-Government Association is open to all women students of the University. Its purpose is to create a sense of unity and fellowship among the women, to promote and maintain the highest standards of University life and to regulate all matters of student conduct not falling under the jurisdiction of the Faculty. The headquarters of the Association are in Shevlin Hall. Members of the Association will be in readiness during the opening days to meet new students and to serve them in every way possible. The dues are fifty cents a year.

The All-University Council is composed of representatives elected from the senior class of each college or school. Its function is mainly that of a student self-governing body, representing the student body in matters affecting student interest, controlling their activities to a large extent, and endeavoring to unify the spirit and promote the best possible welfare of the University.

College councils.—Several of the colleges of the University have their own councils articulating with the All-University Council and having similar functions.

MISCELLANEOUS ORGANIZATIONS

There are at the University more than two hundred student organizations representing religious, ethical, literary, scientific, dramatic, athletic, social, and other activities. A complete list of these organizations with brief statements concerning each is given in the Minnesota Blue Book and Students' Social Register. A copy may be obtained at the Registrar's office.

PUBLICATIONS

The Bulletin of the University of Minnesota includes the reports of the President and of the Board of Regents, the Register, the Bulletin of General Information, the annual announcements of the individual colleges of the University, announcements of special courses of instruction, reports of University officers, etc.

Research Publications of the University of Minnesota contain the results of original investigations by members of the University. They appear in the form of several series of studies, which offer opportunity for the publication of large monographs and of papers of special importance to the people of this state.

Current Problems Series contains papers of general interest in relation to various lines of work.

School of Mines Experiment Station Bulletins contain reports of results of investigations conducted by the State Mining Experiment Station.

Bulletins of the Minnesota Geological Survey include reports of work done in Minnesota by the Minnesota Survey in coöperation with the United States Geological Survey; also, preliminary reports published independently by the Minnesota Survey in order to prevent loss by delaying the use of information of economic value. The most recent reports are on *Surface Formations and Agricultural Conditions of Northwestern, of Northeastern, and of Southern Minnesota; Preliminary Report on the Clays and Shales of Minnesota, and Geology and Ore Deposits of the Cuyuna Iron Range.*

Minnesota Botanical Studies.—A series of technical papers, appearing at irregular intervals, giving the reports of the Botanical Survey of Minnesota, and the results of botanical investigations by students and members of the Staff of the Department of Botany.

Minnesota Plant Studies.—A series of semi-popular booklets, designed primarily for the use of students and the people of the state who are interested in knowing the plants of their neighborhood.

List with prices of preceding publications will be furnished by the Librarian.

Agricultural Experiment Station Bulletins give the results of experiments carried on at University Farm and at the substations at Duluth, Crookston, Grand Rapids, Morris, and Waseca, as rapidly as such work is completed, or as soon as conclusions of economic value are reached. At least four such bulletins are published annually. The *Annual Report of the Agricultural Experiment Station* summarizes the business and work of the Agricultural Experiment Station and substations each year.

Minnesota Farmers' Library and *Special Bulletins* are series of popular instructive bulletins issued by the Agricultural Extension Division designed to inform the farmers of the state as to methods tried out at the Experiment Station and substations, or on demonstration farms, and approved as good practice for Minnesota farmers. *University Farm Press*

News is a semi-monthly clip-sheet containing brief instructive articles, designed for reprinting by the newspapers of the state.

The Visitor is a news letter issued monthly by the Division of Agricultural Education of the College of Agriculture, Forestry, and Home Economics. It is sent principally to teachers of agriculture, superintendents of schools, and to students of education in the College of Agriculture, Forestry, and Home Economics.

The Minnesota Daily, the University newspaper, is published five times each week during the University year by the Minnesota Daily Association. Its staff is composed entirely of students.

The Minnehaha is an illustrated monthly of satire and humor edited by and circulated among the students of the University. Because of war conditions this publication has been temporarily amalgamated with *The Minnesota Daily*.

The Minnesota Magazine is a publication which strives to represent the best literary efforts of the University. Owing to peculiar conditions arising from the war situation, the magazine has for the past year been published as a section of *The Minnesota Daily*.

The Minnesota Farm Review is a weekly owned by the alumni of the School of Agriculture, but operated under the direction of a committee representing the Faculty, the alumni, and the students of the School of Agriculture and the College of Agriculture, Forestry, and Home Economics, and edited by the Division of Publications and Journalism, as a laboratory for students in Journalism.

The Junior Annual, "The Gopher," is a book published annually by the junior class of the University.

The Agrarian is a book published annually by the senior class of the School of Agriculture.

The Minnesota Alumni Weekly is issued each Monday during the University year. It is published in the interests of the alumni and the University.

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SUMMARY OF ATTENDANCE—1918-19

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

	MEN	WOMEN	TOTAL
Senior Class	48	243	291
Junior Class	94	225	319
Sophomore Class	211	285	496
Freshman Class	449	405	854
Unclassed	34	84	118
Arts and Music Course—			
Senior Class .....	...	18	18
Junior Class .....	...	8	8
Sophomore Class .....	...	18	18
Freshman Class	3	23	26
	839	1,309	2,148

COLLEGE OF ENGINEERING AND ARCHITECTURE

	MEN	WOMEN	TOTAL
Post-Senior Class—			
Mechanical	3	...	3
	3	...	3
Senior Class—			
Civil	8	...	8
Electrical	22	...	22
Mechanical	11	...	11
Architecture	10	...	10
General	5	...	5
	56	...	56
Junior Class—			
Civil	22	...	22
Electrical	36	...	36
Mechanical	14	...	14
Architecture	5	2	7
General	7	...	7
	84	2	86
Sophomore Class—			
Civil	42	...	42
Electrical	65	...	65
Mechanical	29	...	29
Architecture	8	4	12
General	7	...	7
	151	4	155

DEGREES GRANTED IN 1918

TOTAL—793

THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS—2,148

BACHELOR OF ARTS—237

Esther Abbetmeyer	Marian Alice Cuvellier
Alma Pauline Abrahamson	Lenora Daly
Victor Albjerg	Alice Eunice Daily
Mary Elizabeth Aldrich	Bernice Eugenia Daniels
Adeline Janet Anderson	Pearl Davist
Mary Evelyn Andrews	Edythe Marie de Carle
Anna Maude Angst	Leo De Moully*
Livia Appel	Alice Bristol Denny
Hazel Lucile Applegate	Nona Elizabeth Doyle
Emily Atwater Babcock	Avis Elizabeth Durant
Myrtle Carolyn Bacon	Hjalmar Eclov†
Hugh Barber*†	Ethel Elliott
Blanche Marie Barker	Edwin Julian Erickson
Juliet Amos Barker	Ethel Nora Erickson
Carolyn Baston†	Wilma Emily Eustis
Corda Baumhoefener	Muriel Fairbanks
Ralph Bigelow Beal*†	Marguerite Louise Fehrer
Bess Benham†	Clarence Lee Finger*
Margaret Lenore Besnah	Harlan Roth Finley*
Gladys Augusta Blain	Katherine Evaline Fobes
Dorothy Mary Blakey	Regina Elizabeth Foley
Audrey Annette Borden	Lucius Haynes Fowler
Regina Marie Bowe	Myrtle Amy Frederickson
Julia Linsly Bowers	Mary Antoinette Freeman
John Whelan Boyle	Irving Mitchell Frisch
Katherine Lord Brewster	Margaret Elizabeth Furst
Cleo Buck	Hilde Gale
Mathilde Sophia Buechler	Philip James Geib
Kathleen Carling	Florence Marguerite Gerlach
Sigrid Elizabeth Carlson	Lucy Gibbs
Paul Sherman Carroll*	Harold William Gillen*
Abigail Carufel	Margaret Graham
Evan Cary*	Walter Noel Greaza
Geraldine Mary Cassilly	Marian Grace Greene
Elizabeth Cauley	Marion Estelle Greenman
Ruth Leora Coe	Clarence William Greenwaldt
Florence Marie Cook	Ruth Griffith
Grace Cook	Valborg Genevieve Grimsgard
Ethel Jane Cormier	Ethel Hallberg
Claire Cowperthwait†	Elma Hario
Esther Abbott Crandall	Julia Harrison†
Ruth Creglow	Gertrude Clara Hartman
Wanda Harriet Cupp†	

* In military or naval service.

† Degree conferred after commencement, 1918.

Walter Henry Hartung
 Mary Hathaway
 Louis Arthur Hauser†
 Hazel Georgia Haywood
 Neil Currie Head*†
 Dorothy Ray Heath
 Hilda Marie Hellriegel
 Alexander Helmick*†
 Caroline Elizabeth Helmick
 Minnie Helstein
 Edna Helweg
 Sidney Brown Heywood*
 Albert Eaton Hill†
 Marie Hinderer
 Alexander Hirsh
 John Wesley Hoffmann*
 Ella Marguerite Hoiland
 Doris Holt
 Ruth Elizabeth Howard
 Edna Louise Hubbell
 Gertrude Helen Huntley
 Marjorie Seaman Hurd
 Blanche Husby
 Mattie Wilson Huston†
 Ruth Adelma Jacobs
 John Alfred Janzen*
 Doris Ruth Jenkins
 Carey Morgan Jensen
 Helen Catherine Jenswold
 Ruth Theresa Johnson
 Voyle Clark Johnson
 Willis Ernest Johnson
 Ethel Jones†
 Florence Marie Jules
 Mary Catherine Kealy
 Irene Olive Keyes
 Bessie King
 Ione Delore Kirscher
 Faith Knickerbocker
 Marion Paul Kruse
 Frank Kuehn
 Elsner Godfrey Kuhn
 Julien Alf Selmer Kvam*
 Gladys Corsey Lamson
 George Marius Landrock
 Nita Lange
 Clarence Melvin Larsen*
 Gladys Nita Leathers
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 Louise Maxey Leonard
 Josie Lundquist
 Elinor Lynch†
 Mary Lyons†
 John Eugene Lysen*
 Catherine Carol McClure

Clara McCluskey
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 Dorothy McGraw
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 Flora Jane Macdonald
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 Olive Marie O'Neill
 Paul Henry Oldenburg
 Ward Hubbell Olmsted*†
 Jemima Elizabeth Olson
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 Margaret Lambert Peterson
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 Anna Cornelia Rathburn
 Gail Sweeney Reeves
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 Leonard John Rice
 Vivien Adelia Constance Rice
 Ada Richards
 Fred Eugene Ringham
 Frank Lester Roberts
 Mary Terese Roberts
 Catherine Rokey
 Julia Rybak
 Crystal Theresa Sailor
 Lucile Mary Saxton
 Charles Schaufuss
 Jennie Marie Schober
 Anne Schwensen
 Clark Daniel Shaughnessy
 Edith Grace Shelp
 Clare Mary Constance Shenehon
 Mary King Shepardson
 Oliver Thone Skellet*
 Aurilla Lucretia Smith

* In military or naval service.

† Degree conferred after commencement, 1918.

Kathleen Smith
 Gladys Florence Speaker
 Matilda Sprung
 Helen Jane Stanton
 Richard Steele*
 Viva Josephine Stephenson
 Vodica Mae Stevens
 Joseph Struett†
 Lenore Stuart
 Leo Charles Studness
 Emma Bernice Sullivan
 Helen Louise Sullivan
 Mary Aileen Sullivan
 Esther Louise Swanson
 Mary Adeline Taylor
 Madeline Elizabeth Thompson
 Willis Irving Thomson*
 Lucie Evna Tomlinson
 Faith Boyden Torinus
 Lillian Turner

Florence Evelyn Vest
 Carolyn Wallace
 Charles Thomas Wangersteen*
 Marian Dorothy Webster
 Helen Maurine Wedum
 William August Emil Weiss
 Elizabeth Wellington
 Ethel Marie Werder
 Louise Bessie Wheeler
 Marie Freeman Wichman
 Elmer Reno Wilk*†
 George Elmer Williams†
 Ethel Williams
 Effie Mae Wilson
 Yuan Dau Wong†
 Henry Fukon Woo
 Constance Woodford
 Katharine Borland Yerxa
 Bernard Cyril Zalkind

BACHELORS OF ARTS *in Music*—2

Esther Mary Cronan

Irene Marie Friedl

BACHELORS OF SCIENCE—55

David Derricks Anderson
 Carl Arvidson†
 Frederick William Behmler
 Walter Benjamin
 Martin Bergheim, B.A.
 Alloys Branton
 Walter Stephen Broker
 Harry Walter Christianson, B.Ph.m.
 Arthur Colberg
 Roger Simmons Countryman
 John Maurice Culligan, B.L.
 Harry Anthony Daniels
 Irl Randall Davis
 Walter Wisner Denny, B.A.†
 Claude Joseph Ehrenberg†
 Albert Edward Flagstad
 Charles Flocken, V.S.†
 Frances Ford, B.S. in H.E.†
 John Henry Gammell, B.S. in Eng., M.E.†
 Silas Waldemar Giere
 Aloys Thomas Haas
 Myron Ormell Henry
 Max Harold Hoffman
 Arthur Charles Johnson
 Ellsworth Johnson
 Herman Morlock Juergens
 Roger Louis Joseph Kennedy
 Theodore Christian Lund

Helen Adams Mackeen
 Lillian Margaret Mayer
 John Mills
 Herman John Moersch
 Harold Edward Morrison
 Leo Thomas Murphy
 Rolf Nannestad
 Anton Neradt
 Arthur Pedersen†
 Nellie Cecilia Elaine Pederson
 Willard Carl Peterson†
 Frieda Jeannette Radusch, B.A.
 Christian Roholt†
 Burton Isaac Rosenholtz
 George Runnerstrom†
 Adam Moffat Smith
 Arthur Francis Smith
 Ralph Anders Soderlind
 Leon Steffens†
 George Frederic Strong†
 Raymond Sullivan
 Oscar Highland Ternstrom
 Leon Tibert†
 Arthur Elliott Vik
 Wilford Widen
 Henry George Zanger
 Arthur Adalbert Zierold, D.D.S.

* In military or naval service.

† Degree conferred after commencement, 1918.

THE COLLEGE OF ENGINEERING AND ARCHITECTURE

ELECTRICAL ENGINEER—1

Ray McKibben, B.S.

MECHANICAL ENGINEERS—2

Irving Nelson Eustis, B.S.*

Cirilo Luis Romero y Perez, B.S.

BACHELORS OF SCIENCE *in Engineering*—29

Howard Benjamin Abrahamson
 Hilder Alvin Anderson*
 Leon Battles*†
 George Henry Bierman
 Harold Lee Brooke*
 Herbert Dell Chamberlain*
 Richard Elliott Deutsche*
 Sigurd Eliassen
 Paul Edgerton Francis
 Clayton Tupper Gibbs
 Reed Douglas Gould
 Morris Greenberg
 Oliver Summers Hagerman
 Henry Edward Hartig*
 Fred Wesley Hotchkiss

Ray Charles Kivley
 Nicholas Konstantinopoulos
 Jake Mose Levin*
 Carl Christ Müller*
 Neal Clinton Nickerson*
 Harold Robert Peterson
 George William Putnam*
 Russell Harding Ross
 Hugo Schlenk, Jr.*
 Cedric Burnett Smith, B.A.*
 Donald Smith
 Hugh Adams Smith
 Martinian Gabrielovitch Smolensky
 Thomas Franklin Talbot*

BACHELORS OF SCIENCE *in Architecture*—4

Enock Forsberg*
 Seeman Kaplan*

Harvey King*
 Albert Juon Moorman

THE COLLEGE OF AGRICULTURE, FORESTRY, AND
HOME ECONOMICSBACHELORS OF SCIENCE—*Course in Agriculture*—34

Harold Aase
 Seward Allen Aldrich
 Raymond Ellsworth Arp
 William Edwin Brohaugh
 Frank Ludwig Brunkow
 Ferdinand Albert Collatz
 Leo Walter Dahms
 Frank Frolik
 Leon Forrest Gates
 George Girrback*
 Albert Gonska*
 Thor Wilhelm Gullickson
 Henry William Hartle
 Herman Julius Hookom
 Frederick Samuel Idtse
 George Henry Ilse*
 Arthur Marvin Jacobson

Glenn Ivan Johnson
 Charles Basil Kaercher
 Joseph Howard Kalash
 Fred Alfred Krantz
 Mark Anthony McCarty
 Frederick Miller*
 Kenneth Sinclair Morrow
 Cletus Frank Murphy
 Allan Goodrich Newhall
 Victor Emanuel Nylin
 Robert Walter Olson*
 Walter Carl Pfaender
 George Augustus Pond
 George Patrick Sanders*
 Parker David Sanders
 Herbert William Talbot
 Frank Albert Tibbetts*

BACHELORS OF SCIENCE—*Course in Forestry*—5

Robert Orval Danson
 Leland Leonard de Flon*
 George Wesley Hauser*

Earl Sheridan Pendergast
 Herbert Walter Swanson*

* In military or naval service.

† Degree conferred after commencement, 1918.

BACHELORS OF SCIENCE—*Course in Home Economics*—76

Priscilla Fentham Adams	Alice Wise Humphrey
Delphine Lucile Esther Anderson	Florence Jepsont†
Hildure Elvira Anderson	Beatrice Lizette Johnson
Ruth Gertrude Anderson	Monica Evelyn Jones
Isabel Birnberg†	Katherine Howland Knowles
Mabel Antoinette Borgman *	Ruth Dorothy Kolling
Hazel Vivian Boss	Clara Gertrude Ladner
Agnes Broberg	Alpha Katherine Larson
Luella Brohaugh	Carrie Louise Lauer
Genevieve Marie Brown	Katherine Leahy
Clarice Beatrice Butler	Blanche Lee†
Marie LaZetta Callan	Fanny Lippitt†
Mary Kate Campbell	Nettie Irene Little
Rosella Cashman	Alice Berniece Ludwig
Josephine Catherwood	Eunice McBridet†
Gertrude Anna Chamberlain	Jessie Margaret McQueen
Mary Wright Chapin	Erma Lavena Madera
Florence Adelia Cheadle	Cora Attielee Martin
Helen Frances Clark	Eunice Pearson Mason
Ruby May Coon	Julia Louise Mills
Dorothy Dodge†	Marie DeRue Morrison
Margaret Cecelia Doyle	Cora Nannestad
Gail Coreine Dykeman	Marie Hilda Nelson
Mabel Evelyn Emmons	Grace Mabel Oberg
Mary Alvina Falk	Hazel Olson†
Augusta Filberg†	Lillie Ann Olson
Irma Mandeville Forbes	Ruby Anne Orth
Winifred Bernice Frasier	Corinne Montez Parish
Gladys Goodnough	Florence Esther Penhall
Mildred Aurelia Grahn	Harriet Mary Piercet†
Charlotte Louise Graner	Vera Katherine Reyeraft
Flora Minnetta Guy	Rhobie Langdon Sargent
Harriet Hanson†	Mabeth Sterritt
Mary Hartney	Mabel Irene Swedberg
Agnes Marie Heinen	Kathryn Temmey
Gertrude Hoffman†	Pearl Thom†
Minnie Lydia Horn	Janet Smith Thomson
Elsie May Horton	Agnes Hulda Vig

THE LAW SCHOOL

BACHELORS OF LAWS—18

Charles Herbert Bolsta	John MacVeigh Regan*
John Edwin Dalton, B.A.	Martin Benjamin Rustan, B.A.
John Harold Farley	Louis Sachs*
David Harry Fullerton	John Lloyd Scriven
Bernard Daniel Grogan, B.A.*	Lewis Shepley
Quincy Harold Hale, B.A.*	William Stradtman*
Harold William Johnston	Sivert Thompson, B.A.*
Clarence Oliver Lande*	Paul Grovum Thonn*
Joseph Lowe	Dwight Williams, B.A.

* In military or naval service.

† Degree conferred after commencement, 1918.

THE MEDICAL SCHOOL

DOCTORS OF MEDICINE††—40

Allen Richard Anderson, B.S.	Cecile Rose Moriarty, B.S.
Oscar John Reuben Freed, B.S.	Clara Adams Nutting, B.S.
Otto Andrew Groebner, B.S.	Fritz Richard Pearson, B.S.
Rolf Hovde, B.S.	Charles Edward Proshok, B.S.
John Asdal Kittelson, B.S., M.A.	Howard Lee Sargeant, B.S.
William Winfred Klima, B.S.	Morse Joseph Shapiro, B.S.*
John Aloysius Lepak, B.S.	Jerome Francis Smersh, B.S.*
George Vincent Lynch	John William Stuhr, B.S.
George LeRoy Merkert, B.S.	Edwin Oscar Swanson
Herbert August Molander, B.S.	Florien Vaughn, B.A.

BACHELORS OF MEDICINE—58

Edward Dyer Anderson, B.A.‡	Rudolph Charles Otto Logefiel, B.S.
Hilding Cornelius Anderson, B.S.	Thomas Lowe, B.S.†¶
Alfred Tennyson Baker	Elmer Ferdinand Lundquist, B.S.
Egbert Borgeson, B.S.†¶	Donald McCarthy, B.S.‡
Fred Bregel†¶	George Elmer McGeary, B.S.
Walter Broker, B.S.†	John Charnley McKinley, B.S., M.A.†
Herbert Henry Charles Buscher, B.S.	Frank Beattie Morrissey, B.S.
Kenneth Simms Caldwell, B.A.‡	John Mulder, B.S.
Leroy Adelbert Calkins, B.S.	Morris Nathanson, B.S.
Woodard Lester Colby, B.S.‡	Nellie Pederson, B.S.†
Wyman Charles Cole, B.S.	John Nelson Perkins, B.S.
Harold Diehl, B.A.†¶§	William Thomas Peyton, B.S.
Solomon Fineman, B.S.	Arthur Plankers, B.S.†¶
Clifford Ekelund, B.S.†¶	Frieda Radusch, B.A., B.S.†
Ruben Columbus Fjellman, B.S.	Christian Roholt, B.S.†
Joseph William Gamble, B.S.	Lloyd Howard Rutledge, B.A., M.A.
Selmer Gausemel, B.S.†¶	William August Sawatzky, B.A.
William Winthrop Hall, B.S.‡	Harry Scholtes, B.S.†¶
Everett Hartley, B.A.†¶	Virgil Joseph Schwartz, B.S.
Stillman John Hathaway, B.S.	Edward Phelan Slater, B.S.
Arthur David Hawkins, B.S.	Albert Markley Snell, B.S.‡
Edgar Thomas Herrmann, B.S.	Julius Sturre, B.S.†¶
Hillard Herman Holm, B.S.	Carl Swendsén, B.S.
David Kadesky, B.S.†¶	Hjalmar Waldemar Sybilrud, B.S.
Harry Tilden Kennedy, B.S.**	John Adolph Timm, B.S.
William Kennedy, B.S.†¶	John Henry Wallinga, B.S.
Herman John Kooiker, B.S.‡	Samuel Arthur Weisman, B.S.
Arnold Larson, B.S.†	Laurits Ylvisaker, B.A.
Charles Louis Lick, B.S.	Arthur Zierold, B.S., D.D.S.†

* In Military or Naval Service.

† Degree conferred after commencement, 1918.

‡ These students have taken commissions in the United States Naval Medical Reserve Corps, have entered active service, and are therefore awarded the degrees of Bachelor of Medicine and Doctor of Medicine at this time.

†† Degrees conferred as of June, 1917.

** Died March 4, 1918. Degree of Doctor of Medicine granted *post obitum*.

¶ These students were members of Base Hospital 26, entered active service, and were therefore awarded the degrees of Bachelor of Medicine and Doctor of Medicine after commencement, 1918.

§ Honorable mention of this candidate for his thesis involving original investigation.

GRADUATES IN NURSING—13

Marjorie Adams, B.A.
 Esther Marie Andraesen
 Esther Louise Berg
 Elizabeth Chaffee
 Irma Lula Flinn
 Lucile Mina Gerry
 Amanda Marie Hilmen

Inez Harriet Johnson
 Effie Alinda Larsen
 Alice Eleanor Ostergren
 Augusta Rood
 Elva Mabel Runnerstrom
 Mabel Olive Semling

THE COLLEGE OF DENTISTRY

DOCTORS OF DENTAL SURGERY—80

Oscar Abrahams
 Arnold William Albrecht
 Carl Oscar Anderson
 Ernest Jerome Anderson
 Gustave Ricard Anderson
 Raymond Harris Anderson
 Isadore Sherman Beckenstein
 Frank Peter Brady
 George Brandenborg
 Wesley Buck
 Melvin Horace Carlson
 George John Dwire
 Conrad Lawrence Eklund
 Ernest Arthur Farmer†
 Neil Alden Faus
 Roscoe Laurence Finnegan
 Carl Robert Flandrick
 Lloyd Irvin Gilbert
 Ingeman Otto Gullings
 Gudrun Gundersen
 Warner Valentine Hagberg
 Jorgen Halvorsen†
 Elmer Theodore Haugberg
 Harvey Hicks†
 Gerhard Hiebert
 Raymond Morris Hoitomt
 August Herman Francke Homme
 George Johnson
 Harvey Johnson
 Herbert Edward Johnson
 Raymond Edward Johnson
 Clarence William Kelsey
 Frederick Kirkpatrick
 Virgil LeRoy Kirkpatrick
 Jacob Krisheff
 John George La Frieniere
 Vernon George Lauer
 Cloyde Williams Lee
 Ernest Thomas Lee
 Arthur Earl Lucian

James Arthur McGinn
 Walter Harold McKinny
 Lloyd Fletcher Meacham
 Oscar August Melander*
 Clayton Miner
 Louis Charles Moos
 Earl Gardner Nash
 Joy Orlando Nellerroe
 Carl Wilhelm Nelson
 John William Nelson
 Hans Bugge Ness*
 Ivan Herbert Northfield*
 Fred Claude Obermeyer
 Raymond Clifford Olson
 Clarence Walter Passer
 Walter Henry Pattridge
 Edward Henry Pearson
 Julius Adrian Peterson
 Leonard Charles Peterson
 Earl Wilber Plonty
 Leo Rudolph Priske
 George Logan Robb
 Stephen Joseph Roelike†
 Will Samuel Shaw
 Victor Lawrence Silver
 Albert Frank Simon
 Charles Edward Snyder
 Victor Henry Storberg
 Harold Goodman Swennes
 Clifford Richard Swenson
 Harold Elijah Thomas
 Ingram Thornby
 Adolph Thorson
 Wesley Rudolph Wachtler
 Herbert Walter Wellman, B.S.
 Conrad Olof Werner
 Sigfred Gust Williams
 Harold Sutherland Woodruff
 Lorenz Fredrick Woods
 Emanuel Zimmerman

* In military or naval service.

† Degree conferred after commencement, 1918.

THE ANNUAL REGISTER

THE SCHOOL OF MINES

ENGINEERS OF MINES—6

Harold Kerr Armstrong*
 Percy Garrett Cowin*
 Chung Hsieh

Walther Jerrard*
 John August Moga*
 Harry William Strand

ENGINEERS OF MINES *in Geology*—4

Lyndon Lyman Foley
 Roger Webb Gannett

Guy Ernest Ingersoll
 Howard Edmund Quinn

METALLURGICAL ENGINEERS—4

Raymond Wallace Allard*
 Ralph Lewis Dowdell

Yih Kun Kwong, E.M.
 Liang Lee†

THE COLLEGE OF PHARMACY

DOCTOR OF SCIENCE IN PHARMACY—1

Charles Herbert Rogers, B.S. in Phm., M.S. in Phm.

BACHELOR OF SCIENCE *in Pharmacy*—1

Muying Sup Lee

PHARMACEUTICAL CHEMISTS—4

Earl Greenberg, Phm.G.
 Margaret Helen O'Connell, Phm.G.

Abraham Strimling, Phm.G.
 William Strimling, Phm.G.

GRADUATES IN PHARMACY—9

Philip Blanchette
 Claire Flanders†
 Cora Berdina Fossen
 Frances Mary Gardner
 Selma Evelyn Larson

Earl Bud Lindoo
 Elmer Petersen
 Cecil James Shea
 Louis Sidney Stein

THE SCHOOL OF CHEMISTRY

CHEMICAL ENGINEER—1

Foster Alonzo Burningham, B.S.

BACHELORS OF SCIENCE—5

Max Donauer
 Thorfin Hogness
 Donald Lee Johnson†

Herbert Kessel
 Christ Neilson*

BACHELORS OF SCIENCE *in Chemistry*—4

Goodwin Joselowitz†
 Leo Kesselman

Harry Godfrey Nelson
 Wen Ping Pan

* In military or naval service.

† Degree conferred after commencement, 1918.

‡ Died June 22, 1918. Degree conferred *post obitum*.

THE COLLEGE OF EDUCATION

BACHELORS OF ARTS in *Education*—43

Arthur Anderson†	Louis Leonard Landberg
Frances Lucille Anderson	Helen Ingeborg Larson
Clifford Otto Bemis	Georgina Louisa Lommen†
Ralph Hammett Boothroyd	Lucile McKnight
Harriet Ione Bozarth†	Mabel Fredrika Main
Joseph James Brom†	Elmire Moosbrugger
Grace Leona Covell†	Joseph Frederick Muench†
Margaret Helen Darling	Adeline Beatrice Murnik
Ruth Elsie Deloria	Ruth O'Brien
Marie Harriet Derdowska	Sarah Teresa O'Meara
Frances Shannon Ek	Marguerite Frances Ober
Cordelia Essling	Dorothy Isabelle Patton
Antoinette Elizabeth Ford	Arthur Carl Selke†
Annie Ginsberg	Marion Alice Shepard
Alma Grasby	Ambrose Spencer
Ethel Gertrude Graves	Georgina Talbot
Mary Hazel Haley†	Frances Thorstad
Mabel Ruth Hart	Julia Caroline Tisdale
Ivy Cecilia Husband	Ruth Elinor Underwood
Lorraine Elizabeth Joyce†	Lucy Mary Victoria Will
May Lou Ella Kellerhals	Marie Louise Young
Esther Ellen Kleist	

THE GRADUATE SCHOOL

MASTERS OF ARTS—32

Fred Lyman Adair	Sally Elizabeth Carlson
B.S. '98, Minnesota	B.S. '17, Minnesota
M.D. '01, Rush Medical	Major, Mathematics
Major, Anatomy	Minor, Physics
Minor, Pathology	Thesis, An Analytic Geometry Treatment of the Nature of Conics Generated by Projective Ranges and Pencils
Thesis, Studies on the Anatomy of the Female Pelvis in the Human Fetus	
Anne Gertrude Benton	Mary Carufel
B.A. '08, Wellesley	B.A. '15, Minnesota
Major, Bacteriology	Major, Psychology
Minor, Chemistry	Minor, Education
Thesis, The Proteolytic Activity of Various Pathogens	Thesis, A Study in Mental Testing Involving the Principle of Generalization
Louis Angelo Boettiger	Mary Ellen Chase
B.A. '14, Illinois	B.A. '09, Maine
Major, Sociology	Major, English
Minor, Economics	Minor, Rhetoric
Thesis, Armenian Legends and Festivals	Thesis, A Comparative Study of Two Versions of Thomas Hardy's Novel, <i>The Well-Beloved</i>
Margery Lorraine Brown	
B.A. '16, Radcliffe	
Major, Romance	
Minor, English	
Thesis, An Index of Anglo-Norman Verse	

† Degree conferred after commencement, 1918.

- Herbert Cleffton
 B.A. '17, Minnesota
 Major, Romance (French)
 Minor, Romance (Spanish)
 Thesis, Byronism in Alfred de Musset
- Amelia Mary Doyle
 B.A. '17, Minnesota
 Major, Romance (French)
 Minor, Romance (Spanish)
 Thesis, The Women of the Early
 Comedies of Corneille
- Ruth Elizabeth Fairbank
 B.A. '14, Mt. Holyoke
 Major, English
 Minor, Rhetoric
 Thesis, The Epistles of Burns
- Alice Helen Felt
 B.A. '13, Knox
 Major, History
 Minor, Political Science
 Thesis, Minnesota and the Financial
 Situation, 1857-1873
- Antonio Gervasi
 B.A. '17, New York University
 Major, Romance (French)
 Minor, Romance (Italian)
 Thesis, The Influence of Guarini's
Pastor Fido on Alexandre Hardy
 and Pierre Corneille
- Camila Salomé Henríquez-Ureña
 D.L. '17, Havana, Cuba
 Major, Romance (Spanish)
 Minor, Romance (French)
 Thesis, Introducción al Estudio de
Los Pastores de Belén, Pastoral
 Sacra de Lope de Vega
- Beatrice Annie Hunter
 B.A. '17, Boston
 Major, Education
 Minor, English
 Thesis, Psychological Tests—Diagnosis
 for Fitness in a Type Study of
 Salesmanship
- Gertrude Anna Jacobsen
 B.A. '17, Minnesota
 Major, History
 Minor, Latin
 Thesis, The Attitude of the Conserva-
 tives toward England's Foreign
 Policy, 1895-1914
- Ada Frances Johnson
 B.A. '17, Bryn Mawr
 Major, Physics
 Minor, Chemistry
 Thesis, Diffusion of Ions
- Willis Ernest Johnson
 Ph.B. '00, M.A. '09, Illinois Wesleyan
 Major, Education
 Minor, Sociology
 Thesis, The Formation of Standards
 of Educational Achievements for a
 State
- Benjamin Karpman
 B.A. '15, North Dakota
 Major, Psychology
 Minor, Physiology
 Thesis, Olfactory Adaptation
- Frances Elizabeth Kelley
 B.A. '17, Minnesota
 Major, Education
 Minor, Psychology
 Thesis, A History of School Support
 in Minnesota
- Otto Fred Kuhlmann
 B.A. '14, Wartburg
 Major, German
 Minor, Middle High German
 Thesis, Der Poetische Realismus bei
 Otto Ludwig
- Barbara Lee Lund
 Ph.B. '11, Hamline
 Major, Animal Biology
 Minor, Chemistry
 Thesis, The Toxic Action of KNC
 in Its Relation to the State of
 Nutrition and Age of the Cell as
 Shown by Paramecium and Didim-
 nium
- Ernest Alfred Lussky
 B.A. '03, Concordia, Ft. Wayne, Ind.
 Major, Latin
 Minor, Latin
 Thesis, Virgil's Employment of Super-
 natural Agencies Guiding Aeneas to
 Italy
- Mary Agnes Maier
 B.A. '17, Minnesota
 Major, Social and Civic Work
 Minor, Sociology
 Thesis, The Home Conditions of
 Minneapolis City Hospital Child
 Patients
- Earl Edin Nordberg
 B.A. '12, Augsburg
 Major, Scandinavian
 Minor, Comparative Philology
 Thesis, The Influence of Peasant Life
 of Norway on Björnson's Early
 Novel

- Emily Helen Payne
B.S. '15, Macalester
Major, Animal Biology
Minor, Anatomy
Thesis, The Omentum of the Rabbit
with Special Reference to the Origin
and Structure of Plasma Cells
- Sister Eleanore Michel
B.A. '14, St. Catherine
Major, German
Minor, Comparative Philology
Thesis, Stimmungskunst in the Early
Novellen of Theodor Storm
- Sister Mary Aquinas Norton
B.A. '14, St. Teresa
Major, History
Minor, English
Thesis, Jesuit Missions of the North-
west
- Sister Ste. Hélène Guthrie
B.A. '07, Minnesota
Major, Education
Minor, English
Thesis, The Mental and Educational
Diagnosis of the Derham Hall High
School Pupils
- Thomas Jenkins Smart
B.A. '14, Minnesota
Major, Education
Minor, Psychology
Thesis, Analyses of the Curriculums
of Teacher-Training Departments
- Paul Sydney Smith
B.A. '17, Knox
Major, History
Minor, Education
Thesis, Party Politics in Minnesota,
1865-1871
- Tony Ullereng
B.A. '15, St. Olaf
Major, Scandinavian
Minor, Comparative Philology
Thesis, Wergeland and the Awaken-
ing of National Consciousness of
the New Norway
- Warren Leslie Wallace
B.A. '07, Michigan
Major, American History
Minor, European History
Thesis, Political History of Minne-
sota Territory, 1849-1853

MASTERS OF SCIENCE—9

- Albert Cedric Army
B.S. in Agr. '09, Minnesota
Major, Agronomy
Minors, Soils
Thesis, Variation and Correlation in
Wheat with Special Reference to
Weight of Seed Planted
- John White Bushnell
B.S. in Agr. '16, Missouri
Major, Horticulture
Minor, Agronomy
Thesis, The Isolation of Types in the
Hubbard Squash
- John Gillilan
B.S. '16, Minnesota
Major, Agricultural Economics
Minor, Farm Management
Thesis, Land Settlement in the Cut-
over Lands of Northern Minnesota
- Paul Atwood Harvey
B.S. '16, Oregon State Agricultural
College
Major, Botany
Minor, Biochemistry
Thesis, A Morphological Study of the
Receptacle of *Anemone patens* var.
wolfgangiana
- Godfrey Richard Hoerner
B.S. '16, Oregon State Agricultural
College
Major, Plant Pathology
Minor, Mycology
Thesis, Infection Capabilities of
Crown Rust of Oats
- Beatrice Larson
B.A. '17, Minnesota
Major, Botany
Minor, Biochemistry
Thesis, The Embryology of *palus-
tris* L.
- Julian Gilbert Leach
B.S. '17, Tennessee
Major, Plant Pathology
Minor, Biochemistry
Thesis, A Comparative Study of the
Parasitism of *Puccinia graminis*
tritici and *Puccinia graminis tritici-
compacti*

Jouette Clark Russell

B.S. '11, McPherson College

Major, Soils

Minor, Biochemistry

Thesis, The Relation of Certain
Physical and Chemical Properties
to the Soil Class

Peter Daniel Schultz

B.A. '14, Bethel College

Major, Chemistry

Minor, Mathematics

Thesis, The Imbibition of Various
Liquids by Vulcanized Caoutchouc

MASTER OF SCIENCE *in Orthopedic Surgery*—1

Henry William Meyerding

B.S. '07, M.D. '09, Minnesota

Major, Surgery

Minor, Bacteriology

Thesis, Cystic and Fibrocystic Disease
of the Long Bones

MASTERS OF SCIENCE *in Surgery*—4

Alfred Washington Adson

B.S. '10, Nebraska

M.D. '14, Pennsylvania

Major, Surgery

Minor, Pathology

Thesis, Experimental and Clinical
Results of Nerve Anastomoses

Frederick Adolf Olson

B.A. '05, Minnesota

M.D. '08 Rush Medical

Major, Surgery

Minor, Pathology

Thesis, A Study of the Roentgeno-
graphic Findings in Renal Tubercu-
losis

Verne Carlton Hunt

B.S. '10, Iowa

M.D. '13, Rush Medical

Major, Surgery

Minor, Pathology

Thesis, Torsion of Appendices
Epiptoicae

John de Jarnette Pemberton

B.A. '07, North Carolina

M.D. '11, Pennsylvania

Major, Surgery

Minor, Pathology

Thesis, Blood Transfusion

DOCTORS OF PHILOSOPHY—11

Herbert Floyd Bergman

B.S. '05, M.S. '15, Minnesota

Major, Botany

Minor, Chemistry

Thesis, The Relation of Aeration to
the Growth and Activity of Swamp
Plants and Its Influence on Their
Ecesis

Pedro Henriquez-Urefia

B.L. '01, Santo Domingo

LL.B. '14, National University of
Mexico

M.A. '17, Minnesota

Major, Romance (Spanish)

Minor, Romance (Italian)

Thesis, La Versificación Irregular en
La Poesía Castellana

Guy Richard Bisby

B.S. '12, South Dakota State College

M.A. '17, Columbia

Major, Plant Pathology

Minor, Biochemistry

Thesis, Studies on Some Fusarium
Diseases of Potato and Truck Crops

Gwen Ann Jones

B.A. '09, M.A. '14, University of
Wales

Major, English

Minor, Romance

Thesis, Three Welsh Religious Plays

Emerson Dillingham Dodson

B.A. '01, M.A. '08, Harvard

Major, Psychology

Minor, Education

Thesis, An Experimental Study of
the Relative Values of Reward and
Punishment in Habit Formation

Emerson Miller

B.S. '94, M.S. '95, Michigan

Major, Biochemistry

Minor, Chemistry

Thesis, A Chemical Investigation of
the Volatile Oils of Some Species
of the Genus *Pyonanthemum* Michx

Clarence Austin Morrow

B.S. '06, Ohio Wesleyan

M.A. '09, Oberlin

Major, Soils

Minor, Biochemistry

Thesis, The Organic Matter of the Soil: a Study of the Nitrogen Distribution in Different Soil Types

Earl Pettijohn

B.A. '06, B.S. '10, M.S. '12, Minnesota

Major, Chemistry

Minor, Physics

Thesis, Studies of Adsorption

Clayton Ord Rost

B.S. '11, M.A. '12, Nebraska

Major, Soils

Minor, Geology

Thesis, Parallelism of Soils Developed on the Gray Drifts of Minnesota

Woldemar Markovitch Sternberg

B.S. in Chem. Eng. '08, Petrograd, Russia

Major, Chemistry (Physical)

Minor, Chemistry (Analytical)

Thesis, Equilibria in Systems Containing Paraldehyde, Salts and Water

Guy Haines Woollett

B.S. '10, M.S. '16, Minnesota

Major, Chemistry

Minor, Physics

Thesis, Further Studies on Catalytic Decompositions of Phenol Salts

HONORS AND PRIZES

HONORS

THE WESTERN INTERCOLLEGIATE CONFERENCE MEDAL

George Wesley Hauser

THE ALUMNI WEEKLY GOLD MEDAL

Paul Kenneth Abrahamson, L. '20

THE AMERICAN INSTITUTE OF ARCHITECTS MEDAL

Seeman Kaplan

HONOR GRADUATE OF THE MILITARY DEPARTMENT TO BE REPORTED
TO THE ADJUTANT GENERAL OF THE UNITED STATES ARMY AND
THE ADJUTANT GENERAL OF THE MINNESOTA NATIONAL GUARD

Lieutenant Colonel

James Earl Mulligan, R. O. T. C.

THE EINAR HOIDALE PUBLIC SPEAKING CERTIFICATES

Paul Kenneth Abrahamson, L. '20

William Benitt, A. '19

Walter Beaumont Heyler, A. '19

Cecil William Johnson, A. '19

Samuel Henry Maslon, A.L. '20

Eli Leslie Oliver

DEGREES WITH HONORS

In History

Wilma Emily Eustis

In Latin

Robert Wesley Moore

In Sociology and Anthropology

Lillian Turner

MINNEAPOLIS COLLEGE WOMAN'S CLUB SCHOLARSHIP

Elizabeth Marie Lynskey, A. '19

ST. PAUL COLLEGE WOMAN'S CLUB SCHOLARSHIP

Leila Elizabeth Munson, A. '19

MINNEAPOLIS WOMEN'S SCHOLARSHIPS

Hertha Henrietta Rumsch, A. '19

Gudrun Gabrielsen, A. '19

THE WOMEN'S SELF-GOVERNMENT ASSOCIATION SCHOLARSHIP

Elizabeth Bailey, A. '20

HONORS AND PRIZES

85

THE GET TOGETHER CLUB SCHOLARSHIP

Minerva Kellogg, Ag. '20

THE MOSES MARSTON SCHOLARSHIP

Annette Marie Reynaud, A. '19

THE ALBERT HOWARD SCHOLARSHIP

Abraham Epstein, B.S. '17, Pittsburg

THE SHEVLIN FELLOWSHIPS

Science, Literature, and the Arts

Louise Grace Frary, B.A. '13, Oberlin

Agriculture

Fred Paul Nabenhauer, B.S. '17, Cornell

Medicine

Charles Roys, B.A., Princeton, M.D., Columbia

Chemistry

Alonzo Gustavus Mayers, B.S. '17, Mississippi

PRIZES

THE BRIGGS PRIZE IN FOUNDRY PRACTICE

First Place

George Lew Tuve, E. '20

Second Place

Everett James McCubrey, E. '20

THE FRANK H. PEAVEY PRIZE

First Place

Emanuel Sidney Cook, A. '21

Second Place

Rose Feigelman, A. '21

Third Place

Horace Dauchy, AL. '21

THE LUDDEN TRUST PRIZE

First Place

Samuel Henry Maslon, AL. '20

THE ANNUAL REGISTER

Second Place

Karl Buswell, A. '20

Third Place

Charles Arthur Sawyer, A. '20

THE JOHN S. PILLSBURY PRIZE

First Place

Walter Beaumont Heyler, A. '19

Second Place

Gladys Poole, Ed. '19

Third Place

August Dvorak, A. '19

THE '89 MEMORIAL PRIZE IN HISTORY

Wilma Emily Eustis

Thesis, The Policies of France and Prussia after the War of 1866

THE EDWIN AMES JAGGARD PRIZE

Ivan Oscar Hansen, B.A. '14, M.A. '15, Minnesota

SUMMARY OF ATTENDANCE

281

Freshman Class—

Civil	73	...	73
Electrical	91	...	91
Mechanical	54	...	54
Architecture	21	2	23
General	15	...	15
Undecided	6	...	6
S. A. T. C. only	387	...	387
	647	2	649
Irregular Students	8	1	9
	949	9	958

DEPARTMENT OF AGRICULTURE

	MEN	WOMEN	TOTAL
College of Agriculture, Forestry, and Home Economics—			
Agricultural Course:			
Senior Class	21	1	22
Junior Class	34	...	34
Sophomore Class	37	1	38
Freshman Class	45	...	45
Unclassed	9	...	9
	146	2	148
Forestry Course:			
Senior Class	3	...	3
Junior Class	5	...	5
Sophomore Class	3	...	3
Freshman Class	7	...	7
	18	...	18
Home Economics Course:			
Senior Class .....	...	50	50
Junior Class .....	...	68	68
Sophomore Class .....	...	48	48
Freshman Class .....	...	70	70
Unclassed .....	...	13	13
	...	249	249
Total for College Year.....	164	251	415
College Summer Session.....	21	115	136
Total Collegiate	185	366	551
Duplicates registered 1918-19.....	4	28	32
Net registration	181	338	519

Central School of Agriculture—

Three-Year Course:

Senior Class	57	34	91
Junior Class	100	37	137
Freshman Class	190	47	237
Unclassed	26	2	28

	373	120	493
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Federal Board Men.....	34	...	34
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Normal Course	7	7
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	407	127	534
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Short Courses—

Dairy School:

Butter-Makers' Course	15	...	15
Ice-Cream-Makers' Course	8	...	8
Dairy Short Course.....	14	2	16

	37	2	39
--	----	---	----

Less duplicates	3	...	3
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	34	2	36
--	----	---	----

Extension Gymnasium Courses:

St. Anthony Park Boys' Class.....	13	...	13
United Church Seminary Class.....	28	...	28
St. Anthony Park Women.....	...	30	30
Extension Swimming Course.....	46	...	46

	87	30	117
--	----	----	-----

Less duplicates	3	...	3
-----------------------	---	-----	---

	84	30	114
--	----	----	-----

Teachers' Training School.....	2	346	348
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Consolidated School Principals.....	42	29	71
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Journalism Short Course.....	3	3	6
------------------------------	---	---	---

Grain Elevator Accounting and Management			
--	--	--	--

Short Course	15	...	15
--------------------	----	-----	----

Home Nursing Short Course.....	...	110	110
--------------------------------	-----	-----	-----

	180	520	700
--	-----	-----	-----

Less duplicates	2	...	2
-----------------------	---	-----	---

	178	520	698
--	-----	-----	-----

Total at University Farm.....	778	1,013	1,791
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Less duplicates	25	44	69
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Net total	753	969	1,722
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Northwest School of Agriculture, Crookston—

Three-Year School Course:

Senior Class	7	5	12
Junior Class	30	9	39
Freshman Class	110	22	132

	147	36	183
--	-----	----	-----

Teachers' Training Course.....	...	15	15
--------------------------------	-----	----	----

	147	51	198
--	-----	----	-----

SUMMARY OF ATTENDANCE

283

Short Courses:			
Teachers' Training School.....	3	103	106
Junior Short Course.....	69	54	123
	<hr/>	<hr/>	<hr/>
	72	157	229
	<hr/>	<hr/>	<hr/>
	219	208	427
Less duplicates .....	...	2	2
	<hr/>	<hr/>	<hr/>
	219	206	425
West Central School of Agriculture, Morris—			
Three-Year School Course			
Senior Class	8	6	14
Junior Class	15	17	32
Freshman Class	115	62	177
Advanced	4	...	4
	<hr/>	<hr/>	<hr/>
	142	85	227
Short Courses:			
Teachers' Training School.....	...	70	70
Farm Womens' Short Course.....	...	71	71
Boys' and Girls' Week Short Course.....	99	171	270
	<hr/>	<hr/>	<hr/>
	99	312	411
	<hr/>	<hr/>	<hr/>
	241	397	638
Total, Department of Agriculture.....	1,238	1,618	2,856
Less duplicates	25	46	71
	<hr/>	<hr/>	<hr/>
Net total	1,213	1,572	2,785

LAW SCHOOL

Regular Law

	MEN	WOMEN	TOTAL
Third-Year Class	19	...	19
Second-Year Class	28	3	31
First-Year Class	47	2	49

Special Law

	MEN	WOMEN	TOTAL
Third-Year Class	2	...	2
Second-Year Class	10	...	10
First-Year Class	32	2	34
Unclassed	1	1	2
	<hr/>	<hr/>	<hr/>
	139	8	147

THE MEDICAL SCHOOL

	MEN	WOMEN	TOTAL
Seventh-Year Class	38	2	40
Sixth-Year Class	61	1	62
Fifth-Year Class	60	6	66
Fourth-Year Class	72	2	74
Third-Year Class*	75	8	83
Special Students	12	3	15
	<hr/>	<hr/>	<hr/>
	318	22	340

* Second and First-Year Students are listed in the College of Science, Literature, and the Arts.

The School for Nurses—

Regular Course:			
Seniors .....	...	20	20
Intermediates .....	...	27	27
Juniors .....	...	18	18
Preliminary .....	...	19	19
Accredited .....	...	6	6
Army Training School Affiliates.....	...	4	4
		<hr/>	<hr/>
		94	94
Short Course in Public Health Nursing.....	...	32	32
		<hr/>	<hr/>
		126	126
Short Course in Embalming	15	4	19

THE COLLEGE OF DENTISTRY

	MEN	WOMEN	TOTAL
Senior Class	60	...	60
Junior Class	74	1	75
Sophomore Class	86	3	89
Freshman Class	116	2	118
Specials	5	...	5
	<hr/>	<hr/>	<hr/>
	341	6	347

THE SCHOOL OF MINES

	MEN	WOMEN	TOTAL
Senior Class	7	...	7
Junior Class	13	...	13
Sophomore Class	17	...	17
Freshman Class	43	...	43
First-Year Class	26	...	26
Special	1	...	1
	<hr/>	<hr/>	<hr/>
	107	...	107

THE COLLEGE OF PHARMACY

	MEN	WOMEN	TOTAL
Fourth-Year Class	2	1	3
Third-Year Class	10	3	13
Second-Year Class	11	10	21
First-Year Class	59	17	76
	<hr/>	<hr/>	<hr/>
	82	31	113

THE SCHOOL OF ANALYTICAL AND APPLIED CHEMISTRY

	MEN	WOMEN	TOTAL
Post-Senior Class	3	...	3
Senior Class	11	1	12
Junior Class	20	...	20
Sophomore Class	35	3	38
Freshman Class	66	7	73
Specials	5	1	6
	<hr/>	<hr/>	<hr/>
	140	12	152

SUMMARY OF ATTENDANCE

285

THE COLLEGE OF EDUCATION

	MEN	WOMEN	TOTAL
Senior Class	13	25	38
Junior Class	8	26	34
Unclassed	25	124	149
	<hr/>	<hr/>	<hr/>
	46	175	221
Course in Art Education			
Senior Class .....	...	1	1
Junior Class .....	...	10	10
Sophomore Class .....	...	11	11
Freshman Class .....	...	19	19
Unclassed .....	...	24	24
	<hr/>	<hr/>	<hr/>
	...	65	65
	<hr/>	<hr/>	<hr/>
	46	240	286
University High School—			
Senior Class	18	15	33
Junior Class	16	31	47
Sophomore Class	37	35	72
Freshman Class	21	38	59
	<hr/>	<hr/>	<hr/>
	92	119	211

THE GRADUATE SCHOOL

	MEN	WOMEN	TOTAL
Registration	206	110	316

THE UNIVERSITY SUMMER SESSION, 1918

	MEN	WOMEN	TOTAL
Minneapolis Campus—			
Academic	142	465	607
Less duplicates registered 1918-19.....	62	131	193
	<hr/>	<hr/>	<hr/>
	80	334	414
Engineering	35	2	37
Less duplicates registered 1918-19.....	25	...	25
	<hr/>	<hr/>	<hr/>
	10	2	12
Education	34	161	195
Less duplicates registered 1918-19.....	7	26	33
	<hr/>	<hr/>	<hr/>
	27	135	162
Graduate	45	56	101
Less duplicates registered 1918-19.....	28	9	37
	<hr/>	<hr/>	<hr/>
	17	47	64
Dentistry	58	2	60
Less duplicates registered 1918-19.....	43	2	45
	<hr/>	<hr/>	<hr/>
	15	0	15
Medicine	110	10	120
Less duplicates registered 1918-19.....	84	7	91
	<hr/>	<hr/>	<hr/>
	26	3	29
Total	424	696	1,120
Less duplicates	249	175	424
	<hr/>	<hr/>	<hr/>
	175	521	696

University Farm:

Registration	21	115	136
Less duplicates	4	28	32
	<hr/>	<hr/>	<hr/>
	17	87	104
Total for session	445	811	1,256
Less duplicates	253	203	456
	<hr/>	<hr/>	<hr/>
Net total	192	608	800

STUDENTS' ARMY TRAINING CORPS, 1918

Section A (Collegiate), October 9, 1918, to December 21, 1918:

	ARMY	NAVY	MARINES	TOTAL
Approved and War Programs.....	3,030	144	78	3,252

Section B (Vocational), April 8, 1918, to December, 1918.

Engineering Department

	AUTO MECHANICS	BLACK- SMITHS	MACHIN- ISTS	RADIO MEN	TEL. ELECT.	TOTAL
June 15 to August 15	260	23	32	49	...	364
August 15 to October 15.....	270	..	..	65	99	434
October 15 to December 21....	...	..	..	..	183	183
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	530	23	32	114	282	981
Machinists' Mates (in four groups, July 1, 1918 to — ...	...	..	..	...	...	322
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	530	23	32	114	282	1,303

University Farm:

	BLACK- SMITHS	CARPEN- TERS	BENCH WOOD WORKERS	ELEC- TRICIANS	TOTAL
April 8 to June 11.....	100	80	201	123	504
June 15 to August 15.....	107	87	215	145	554
August 15 to October 15.....	107	232	85	146	570
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	314	399	501	414	1,628
Grand total (Section A and B).....					6,183

GENERAL EXTENSION DIVISION

	MEN	WOMEN	TOTAL
Minneapolis Business Courses	358	160	518
Minneapolis Collegiate Courses	159	629	788
Minneapolis Engineering Courses	118	18	136
	<hr/>	<hr/>	<hr/>
	635	807	1,442
St. Paul Business Courses	72	21	93
St. Paul Collegiate Courses	100	16	116
	<hr/>	<hr/>	<hr/>
	172	37	209
Duluth Business Courses	53	11	64
Duluth Collegiate Courses	27	..	27
	<hr/>	<hr/>	<hr/>
	80	11	91

SUMMARY OF ATTENDANCE

287

Merchants' Short Course.....	157	11	168
Course in Methods of Teaching Trade and Industrial Subjects:			
Minneapolis	28	2	30
St. Paul	26	1	27
Duluth	16	..	16
Virginia	23	1	24
	<hr/>	<hr/>	<hr/>
Training Course for Volunteers in Social Service Work	93	4	97
Short Courses in Dentistry.....	..	25	25
	74	..	74
	<hr/>	<hr/>	<hr/>
Correspondence Courses	324	40	364
	190	210	400
	<hr/>	<hr/>	<hr/>
Total for Extension Division.....	1,320	1,186	2,506

SUMMARY OF TOTALS

Students of Collegiate Grade

College	MEN	WOMEN	TOTAL	TOTALS
College of Science, Literature, and the Arts..	839	1,309	2,148	
College of Engineering and Architecture.....	949	9	958	
College of Agriculture, Forestry and Home Economics	164	251	415	
Law School	139	8	147	
Medical School	318	22	340	
School for Nurses.....	..	126	126	
College of Dentistry.....	341	6	347	
School of Mines.....	107	..	107	
College of Pharmacy.....	82	31	113	
School of Analytical and Applied Chemistry...	140	12	152	
College of Education.....	46	240	286	
Graduate School	206	110	316	
	<hr/>	<hr/>	<hr/>	
Total	3,333	2,122	5,455	
Less duplicates, 1918-19.....	79	30	109	
	<hr/>	<hr/>	<hr/>	
Net total	3,254	2,092	5,346	5,346
S. A. T. C. (Collegiate Section).....	3,252	..	3,252	3,252
	<hr/>	<hr/>	<hr/>	
Total	6,506	2,092	8,598	
Less duplicates, 1918-19.....	2,019	..	2,019	
Net total	4,487	2,092	6,579	6,579
Summer Session, Minneapolis Campus (less duplicates, 1918-19).....	175	521	696	696
Summer Session, University Farm Campus (less duplicates, 1918-19).....	17	87	104	104
	<hr/>	<hr/>	<hr/>	
Total students of collegiate grade.....	4,679	2,700	7,379	7,379

Students of Subcollegiate Grade

Schools:	MEN	WOMEN	TOTAL	TOTALS
Central School of Agriculture.....	407	127	534	
Northwest School of Agriculture, Crookston	147	51	198	
West Central School of Agriculture, Morris	142	85	227	
University High School.....	92	119	211	
	<hr/>	<hr/>	<hr/>	
Total for Subcollegiate Schools.....	788	382	1,170	1,170

Short Courses:

Central School of Agriculture:

Dairy School	34	2	36	
Gymnasium Extension Classes.....	84	30	114	
Teachers' Training School.....	2	346	348	
Consolidated School Principals.....	42	29	71	
Journalism Short Course.....	3	3	6	
Grain Elevator Accounting and Management Short Course.....	15	...	15	
Home Nursing Short Course.....	...	110	110	
Total	180	520	700	
Less duplicates	2	...	2	
Net total	178	520	698	698

Northwest School of Agriculture:

Junior Short Course.....	69	54	123	
Teachers' Training School.....	3	103	106	
Total	72	157	229	229

West Central School of Agriculture:

Teachers' Training School.....	...	70	70	
Farm Women's Short Course.....	...	71	71	
Junior Short Course.....	99	171	270	
Total	99	312	411	411
School of Embalming.....	15	4	19	19
Total for Short Courses.....	364	993	1,357	1,357

S. A. T. C. (Vocational Sections):

Engineering Department	1,303	...	1,303	
University Farm	1,628	...	1,628	
Total	2,931	...	2,931	2,931
Total students of subcollegiate grade....	4,083	1,375	5,458	
Less duplicates	2	...	2	
Net total students of subcollegiate grade	4,081	1,375	5,456	5,456

SUMMARY OF TOTALS BY DIVISIONS

Divisions:	MEN	WOMEN	TOTAL
Collegiate Students	4,679	2,700	7,379
Subcollegiate Students:			
Subcollegiate Schools	788	382	1,170
Short Courses	364	993	1,357
S. A. T. C. (Vocational Sections).....	2,931	...	2,931
Total	4,083	1,375	5,458
Less duplicates	2	...	2
Net total	4,081	1,375	5,456
Total for resident students.....	8,760	4,075	12,835
Less duplicates	13	16	29
Net total	8,747	4,059	12,806

SUMMARY OF ATTENDANCE

289

Extension Division	1,320	1,186	2,506
Grand total	10,067	5,245	15,312
Less duplicates	19	50	69
Net grand total	10,048	5,195	15,243

SUMMARY OF TOTALS BY DEPARTMENTS

	MEN	WOMEN	TOTAL
College of Science, Literature, and the Arts.....	839	1,309	2,148
College of Engineering and Architecture.....	949	9	958
Department of Agriculture	1,213	1,572	2,785
Law School	139	8	147
Medical School (including School for Nurses and Course in Embalming).....	333	152	485
College of Dentistry	341	6	347
School of Mines	107	...	107
College of Pharmacy	82	31	113
School of Chemistry.....	140	12	152
College of Education (including University High School)	138	359	497
Graduate School	206	110	316
Minneapolis Summer Session (net).....	175	521	696
S. A. T. C. (net).....	4,164	...	4,164
Total	8,826	4,089	12,915
Less duplicates	79	30	109
Net total for resident students.....	8,747	4,059	12,806
Extension Division	1,320	1,186	2,506
Grand total registration for University.....	10,067	5,245	15,312
Less duplicates	19	50	69
Net grand total	10,048	5,195	15,243

THE COLLEGE OF
SCIENCE, LITERATURE,
AND THE ARTS

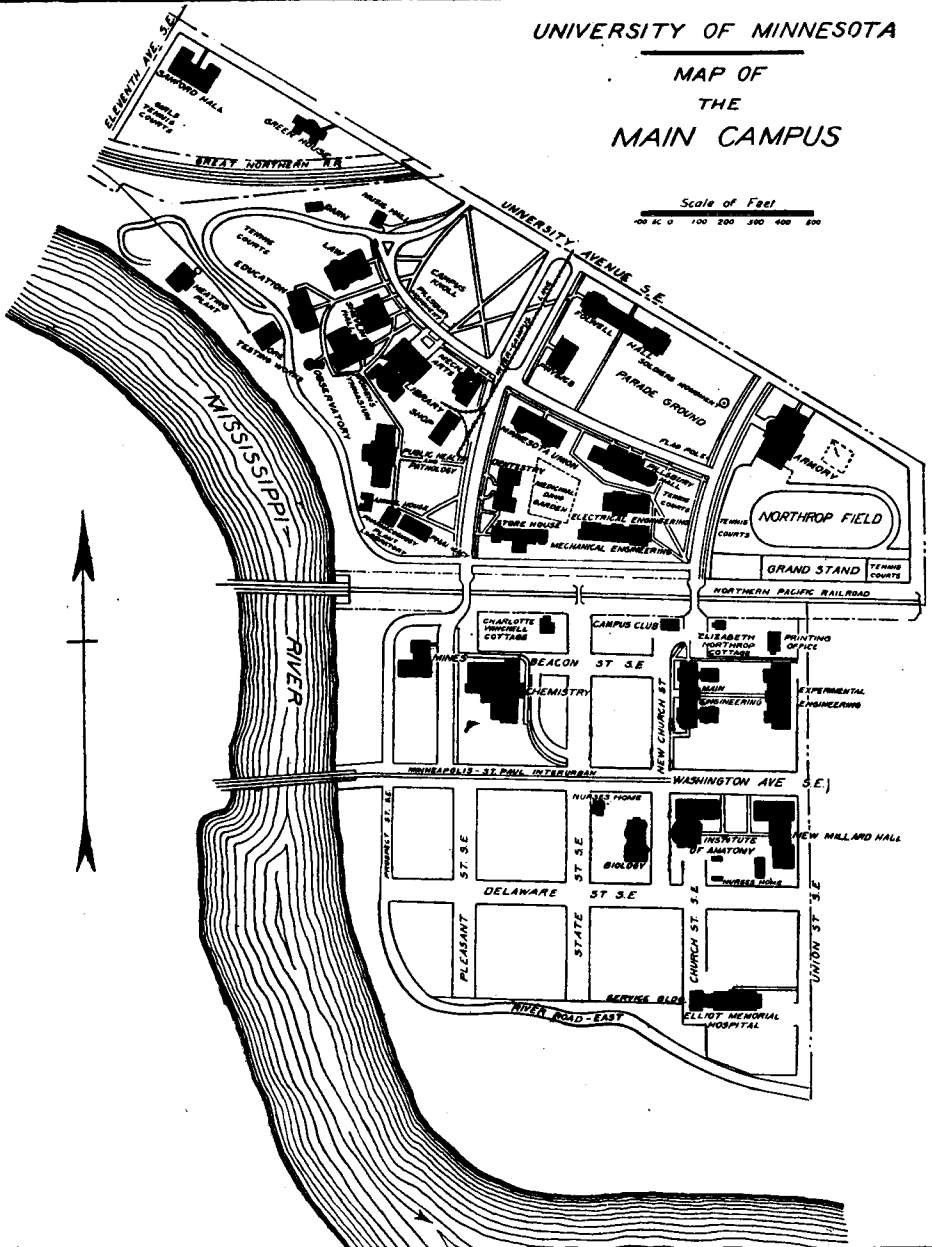
ANNOUNCEMENT OF COURSES
FOR THE YEAR

1919-1920

UNIVERSITY OF MINNESOTA

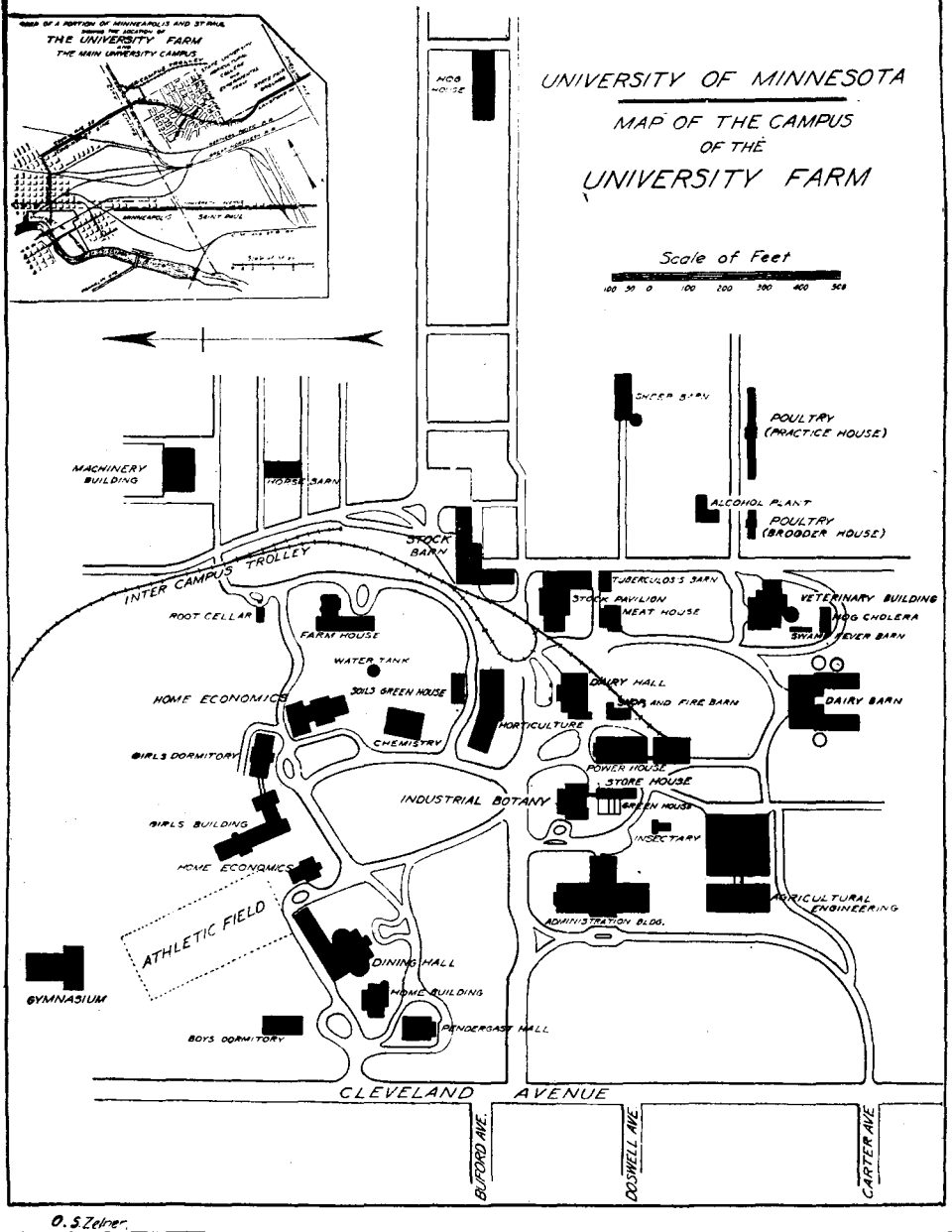
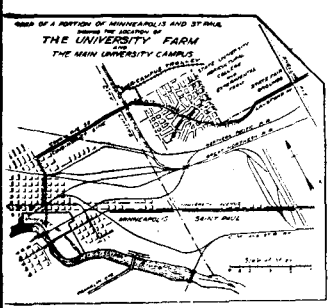
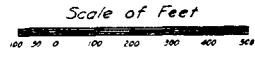
MAP OF
THE
MAIN CAMPUS

Scale of Feet
0 50 100 200 400 600 800



Area of Main Campus. 108.5 acres

UNIVERSITY OF MINNESOTA
MAP OF THE CAMPUS
OF THE
UNIVERSITY FARM



O. S. Zehner

Area of University Farm, 422.56 acres

1919							1920													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	1	2	3	4	5	..	..	..	..	1	2	3	..	..	..	..	1	2	3
6	7	8	9	10	11	12	4	5	6	7	8	9	10	4	5	6	7	8	9	10
13	14	15	16	17	18	19	11	12	13	14	15	16	17	11	12	13	14	15	16	17
20	21	22	23	24	25	26	18	19	20	21	22	23	24	18	19	20	21	22	23	24
27	28	29	30	31	..	..	25	26	27	28	29	30	31	25	26	27	28	29	30	31
..
AUGUST							FEBRUARY							AUGUST						
..	..	..	..	..	1	2	1	2	3	4	5	6	7	1	2	3	4	5	6	7
3	4	5	6	7	8	9	8	9	10	11	12	13	14	8	9	10	11	12	13	14
10	11	12	13	14	15	16	15	16	17	18	19	20	21	15	16	17	18	19	20	21
17	18	19	20	21	22	23	22	23	24	25	26	27	28	22	23	24	25	26	27	28
24	25	26	27	28	29	30	29	..	..	..	..	..	..	29	30	31	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
SEPTEMBER							MARCH							SEPTEMBER						
..	1	2	3	4	5	6	..	1	2	3	4	5	6	..	1	2	3	4	5	6
7	8	9	10	11	12	13	7	8	9	10	11	12	13	5	6	7	8	9	10	11
14	15	16	17	18	19	20	14	15	16	17	18	19	20	12	13	14	15	16	17	18
21	22	23	24	25	26	27	21	22	23	24	25	26	27	19	20	21	22	23	24	25
28	29	30	..	..	..	..	28	29	30	31	..	..	..	26	27	28	29	30	..	..
..
OCTOBER							APRIL							OCTOBER						
..	..	1	2	3	4	..	..	..	..	..	1	2	3	..	..	..	..	..	1	2
5	6	7	8	9	10	11	4	5	6	7	8	9	10	3	4	5	6	7	8	9
12	13	14	15	16	17	18	11	12	13	14	15	16	17	10	11	12	13	14	15	16
19	20	21	22	23	24	25	18	19	20	21	22	23	24	17	18	19	20	21	22	23
26	27	28	29	30	31	..	25	26	27	28	29	30	..	24	25	26	27	28	29	30
..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	..	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER						
..	2	3	4	5	6	1	..	..	..	..	..	..	1	..	1	2	3	4	5	6
9	10	11	12	13	14	15	2	3	4	5	6	7	8	7	8	9	10	11	12	13
16	17	18	19	20	21	22	9	10	11	12	13	14	15	14	15	16	17	18	19	20
23	24	25	26	27	28	29	16	17	18	19	20	21	22	21	22	23	24	25	26	27
30	..	..	..	..	..	..	23	24	25	26	27	28	29	28	29	30	..	..	..	..
..	..	..	..	..	..	..	30	31	..	..	..	..	..	..	..	..	..	..	..	..
DECEMBER							JUNE							DECEMBER						
..	1	2	3	4	5	6	..	..	1	2	3	4	5	..	..	..	1	2	3	4
7	8	9	10	11	12	13	6	7	8	9	10	11	12	5	6	7	8	9	10	11
14	15	16	17	18	19	20	13	14	15	16	17	18	19	12	13	14	15	16	17	18
21	22	23	24	25	26	27	20	21	22	23	24	25	26	19	20	21	22	23	24	25
28	29	30	31	..	..	..	27	28	29	30	..	..	..	26	27	28	29	30	31	..
..

UNIVERSITY CALENDAR

1919-1920

1919			
September	20	Saturday	Payment of fees closes, except for new students
September	24-30	Week	Examinations for removal of conditions, and entrance examinations Registration period, Colleges of Science, Literature, and the Arts, and Agriculture, Forestry, and Home Economics
September	29	Monday	First semester evening extension classes begin
September	29-30		Registration days for all colleges not indicated above
September	30	Tuesday	Payment of fees for new students closes
October	1	Wednesday	Fall quarter begins
October	16	Thursday	Senate meeting, 4:00 p.m.
November	27	Thursday	Thanksgiving Day; a holiday
December	18	Thursday	Senate meeting, 4:00 p.m.
December	23	Tuesday	Christmas vacation begins 9:00 p.m.
January	2	Friday	Christmas vacation ends 8:30 a.m.
January	2	Friday	Winter quarter begins
January	23	Friday	First semester evening extension classes close
February	2	Monday	Second semester evening extension classes begin
February	2-6	Week	Merchants' Short Course
February	12	Thursday	Lincoln's Birthday; a holiday
February	19	Thursday	Senate meeting, 4:00 p.m.
March	25	Thursday	Winter quarter ends
April	1	Thursday	Spring quarter begins
April	2	Friday	Good Friday; a holiday
May	20	Thursday	Senate meeting, 4:00 p.m.
May	21	Friday	Second semester evening extension classes close
June	13	Sunday	Baccalaureate service
June	16	Wednesday	Spring quarter closes
June	17	Thursday	Forty-eighth Annual Commencement
June	18-19		Registration days for Summer quarter
June	21	Monday	Summer quarter begins
September	3	Friday	Summer quarter closes

SCHEDULE OF EXAMINATIONS

Condition examinations in the Colleges of Science, Literature, and the Arts, Education, Engineering and Architecture, Mines, Chemistry, and Agriculture, Forestry, and Home Economics, for the removal of conditions of the winter and spring quarters will be given according to the following schedule:

Friday,	Sept. 26	9 a.m.	Animal Biology, Botany, Physics, Agronomy and Farm Management, Animal Husbandry, Entomology and Economic Zoology
		2 p.m.	Astronomy, Chemistry, Agricultural Biochemistry, Bee Culture, Experimental Engineering
Saturday,	Sept. 27	9 a.m.	Economics, Mathematics and Mechanics, History, Education, Agricultural Education, Dairy Husbandry, Farm Engineering, Drainage
		2 p.m.	French, Spanish, Italian, German, Greek, Latin, Scandinavian, Forestry, Home Economics, Drawing and Descriptive Geometry
Monday,	Sept. 29	9 a.m.	Comparative Philology, Rhetoric, English, Horticulture, Plant Pathology, Poultry Husbandry, Rural and Agricultural Journalism, Metallurgical subjects
		2 p.m.	Political Science, Music, Philosophy, Psychology, Sociology and Anthropology, Social and Civic Work, Soils, Veterinary Medicine, Civil, Electrical, Mechanical Engineering and Architectural subjects
Tuesday,	Sept. 30	9 a.m.	Geology and Mineralogy
		2 p.m.	Mining subjects

In case of conflict, special arrangements must be made with the instructor.

Schedules for the remaining schools and colleges will be announced in the fall, and may be secured at the offices of the respective deans.

THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

FACULTY

- MARION LEROY BURTON, Ph.D., D.D., LL.D., President
CYRUS NORTHRUP LL.D., President Emeritus
JOHN B. JOHNSTON, Ph.D., Dean, Professor of Neurology
EDWARD E. NICHOLSON, M.A., Dean of Student Affairs, Assistant Professor
of Chemistry
ROYAL R. SHUMWAY, B.A., Assistant Dean, Associate Professor of Mathe-
matics
CEPHAS D. ALLIN, LL.B., M.A., Professor of Political Science, Chair-
man of the Department of Political Science
WILLIAM ANDERSON, Ph.D., Assistant Professor of Political Science
FRANCIS B. BARTON, Docteur de l'Université de Paris, Assistant Professor
of Romance Languages
RALPH M. BARTON, B.A., Assistant Professor of Mathematics
²GEORGE N. BAUER, Ph.D., Professor of Mathematics
JERE BAXTER, Major, Assistant Professor of Military Science and Tactics
JOSEPH W. BEACH, Ph.D., Associate Professor of English
RICHARD O. BEARD, M.D., Associate Professor of Physiology
LUTHER L. BERNARD, Ph.D., Associate Professor of Sociology
HENRY C. BERTELSON, 1st Lieut., U. S. Army, Assistant Professor of Mili-
tary Science and Tactics
GUY R. BISBY, B.S., Assistant Professor of Plant Pathology and Botany
JOHN D. BLACK, Ph.D., Associate Professor of Economics
ROY G. BLAKEY, Ph.D., Professor of Economics
GISLE C. BOTHNE, M.A., Professor of Scandinavian Languages and Liter-
atures, and Head of the Department of Scandinavian Languages
¹RAYMOND W. BRINK, Ph.D., Assistant Professor of Mathematics
THOMAS M. BRODERICK, Ph.D., Assistant Professor of Geology
¹CARLETON BROWN, Ph.D., Professor of English
SOLON J. BUCK, Ph.D., Associate Professor of History
OSCAR C. BURKHARD, Ph.D., Assistant Professor of German
FRANK H. BURTON, Colonel, U.S.A., Professor of Military Science and
Tactics
RICHARD BURTON, Ph.D., Professor of English Literature
SAMUEL C. BURTON, M.A., Assistant Professor of Architecture
WILLIAM H. BUSSEY, Ph.D., Associate Professor of Mathematics, Chair-
man of the Department of Mathematics
FREDERIC K. BUTTERS, Ph.D., Associate Professor of Botany

¹Absent on leave, 1919-20.

²Absent on leave till January 1.

- ROYAL N. CHAPMAN, Ph.D., Assistant Professor of Animal Biology
 ARTHUR E. CLARK, Captain, U.S.A., Assistant Professor of Military
 Science and Tactics
 LOTUS D. COFFMAN, Ph.D., Professor of Education, Head of the Department of Education
 LILLIAN COHEN, Ph.D., Assistant Professor of Chemistry
 LOUIS JOSEPH COOKE, M.D., Director of Physical Education for Men
 WILLIAM S. COOPER, Ph.D., Assistant Professor of Botany
 WILLIAM W. CUMBERLAND, Ph.D., Associate Professor of Economics
 R. E. CUSHMAN, Ph.D., Associate Professor of Political Science
 JAMES DAVIES, Ph.D., Assistant Professor of German
 WILLIAM STEARNS DAVIS, Ph.D., Professor of Ancient History
 HERMIONE L. DEALEY, Ph.D., Assistant Professor of Educational Psychology
 Z. CLARK DICKINSON, Ph.D., Assistant Professor of Economics
 HAL DOWNEY, Ph.D., Professor of Animal Biology
 GEORGE W. DOWRIE, Ph.D., Professor of Economics, Head of the Department of Economics
¹ EDWARD DANA DURAND, Ph.D., Professor of Economics
 ELIAS J. DURAND, D.Sc., Professor of Botany
 RICHARD M. ELLIOTT, Ph.D., Associate Professor of Psychology and
 Chairman of the Department of Psychology
 MANUEL C. ELMER, Ph.D., Associate Professor of Sociology
 WILLIAM H. EMMONS, Ph.D., Professor of Geology, Head of the Department of Geology and Mineralogy
 CHARLES A. ERDMANN, M.D., Associate Professor of Applied Anatomy
 HENRY ANTON ERIKSON, Ph.D., Professor of Physics, Chairman of the
 Department of Physics
 DONALD N. FERGUSON, B.A., Assistant Professor of Pianoforte
 MABEL R. FERNALD, Ph.D., Assistant Professor of Psychology
 ROSS L. FINNEY, Ph.D., Assistant Professor of Educational Sociology
¹ OSCAR W. FIRKINS, M.A., Professor of English
 DANIEL FORD, M.A., Assistant Professor of Rhetoric
 GUY STANTON FORD, Ph.D., Professor of History, Chairman of the Department of History
 JAMES H. FORSYTHE, M.A. in Architecture, Assistant Professor of Architecture
 WILLIAM K. FOSTER, LL.M., Assistant Professor of Physical Education for Men
 WILLIAM S. FOSTER, Ph.D., Associate Professor of Psychology
 GEORGE BELL FRANKFORTER, Ph.D., Professor of Chemistry
 EDWARD M. FREEMAN, Ph.D., Professor of Plant Pathology and Botany
 JULES T. FRELIN, B.A., Assistant Professor of Romance Languages
 ROBERT W. FRENCH, B.S. in C.E., Assistant Professor of Drawing and
 Descriptive Geometry

¹Absent on leave, 1919-20.

- FREDERICK B. GARVER, Ph.D., Associate Professor of Economics
 ISAAC W. GEIGER, Ph.D., Assistant Professor of Chemistry
 HARRIET I. GOLDSTEIN, Associate Professor of Drawing and Design
 JOHN EVERSON GRANRUD, Ph.D., Professor of Latin
 NORMAN SCOTT BRIEN GRAS, Ph.D., Professor of Economic History
 JOHN HENRY GRAY, Ph.D., Professor of Economics
 FRANK F. GROUT, Ph.D., Professor of Geology and Mineralogy
 MELVIN E. HAGGERTY, Ph.D., Professor of Educational Psychology
 ALVIN HARVEY HANSEN, Ph.D., Associate Professor of Economics
 WILLIAM L. HART, Ph.D., Assistant Professor of Mathematics
 ARTHUR T. HENRICI, M.D., Assistant Professor of Bacteriology and Immunology
- ² CYRIL A. HERRICK, B.A., Assistant Professor of Rhetoric
 JAMES T. HILLHOUSE, Ph.D., Assistant Professor of Rhetoric
 CLARENCE L. HOLMES, M.A., Assistant Professor of Economics
 RALPH E. HOUSE, Ph.D., Associate Professor of Romance Languages
 CHARLES W. HOWARD, B.A., M.S., Assistant Professor of Entomology
 NED L. HUFF, M.A., Assistant Professor of Botany
 WILLIAM H. HUNTER, Ph.D., Associate Professor of Chemistry
 CLARENCE MARTIN JACKSON, M.S., M.D., Professor of Anatomy and Director of the Department
- DUNHAM JACKSON, Ph.D., Professor of Mathematics
 WEST C. JACOBS, Lt. Colonel, U.S.A., Assistant Professor of Military Science and Tactics
- ALBERT C. JAMES, M.B.A., Assistant Professor of Economics
 ALBERT ERNEST JENKS, Ph.D., Professor of Anthropology, Chairman of the Department of Anthropology and Director of the Americanization Training Course
- ¹ A. WALFRED JOHNSTON, M.A., Assistant Professor of Geology and Mineralogy
- LAUDER W. JONES, Ph.D., Professor of Chemistry, Head of the Department of Chemistry
- ROY C. JONES, M.S. in Architecture, Assistant Professor of Architecture
 OSCAR W. JUNEK, Ph.D., Assistant Professor of Americanization
 FRANCIS B. KINGSBURY, Ph.D., Assistant Professor of Physiology
 WILLIAM H. KIRCHNER, B.S., Professor of Drawing and Descriptive Geometry and Head of the Department of Drawing and Descriptive Geometry
- MAY S. KISSOCK, B.A., Assistant Professor of Physical Education for Women
- FREDERICK KLAEBER, Ph.D., Professor of Comparative and English Philology, Head of the Department of Comparative Philology
 LEE I. KNIGHT, Ph.D., Professor of Botany
 ALFRED E. KOENIG, M.A., Dr. Theol., Assistant Professor of German

¹Absent on leave, 1919-20.

²Absent on leave, fall quarter 1919.

- AUGUST CHARLES KREY, Ph.D., Associate Professor of History
 SAMUEL KROESCH, Ph.D., Assistant Professor of German
 WINFORD P. LARSON, M.D., Professor of Bacteriology and Immunology
² KARL S. LASHLEY, Ph.D., Assistant Professor of Psychology
 FRANCIS P. LEAVENWORTH, M.A., Professor of Astronomy, Head of the
 Department of Astronomy
 IRVILLE C. LECOMPTE, Ph.D., Professor of Romance Languages
 THOMAS G. LEE, B.S., M.D., Professor of Comparative Anatomy
 RUPERT C. LODGE, M.A., Assistant Professor of Philosophy
 ELMER J. LUND, Ph.D., Associate Professor of Zoology
 GUSTAV A. LUNDQUIST, M.A., Assistant Professor of Rural Sociology
 ELIAS P. LYON, Ph.D., Professor of Physiology and Director of the De-
 partment of Physiology
 JESSE F. MCCLENBON, Ph.D., Associate Professor of Physiology
 FRANK H. MACDOUGALL, Ph.D., Associate Professor of Chemistry
 FREDERICK M. MANN, M.S. in Arch., Professor of Architecture
 WILFORD S. MILLER, Ph.D., Associate Professor of Education
¹ RAYMOND MOLEY, Ph.D., Associate Professor of Political Science
 CECIL A. MOORE, Ph.D., Associate Professor of English
 WILLIAM MOORE, B.A., Associate Professor of Entomology
 JOHN B. MORGAN, Ph.D., Assistant Professor of Psychology
 BRUCE D. MUDGETT, Ph.D., Associate Professor of Economics
 WALTER R. MYERS, Ph.D., Assistant Professor of German
 HENRY F. NACHTRIEB, B.S., Professor of Animal Biology, Head of the
 Department of Animal Biology and Director of the Zoological
 Museum
 ALLEN T. NEWMAN, M.A., Captain, U.S.A., Assistant Professor of Mili-
 tary Science and Tactics
 CHARLES W. NICHOLS, Ph.D., Assistant Professor of Rhetoric
 HOWARD S. NOBLE, M.B.A., Assistant Professor of Economics
 J. ANNA NORRIS, M.D., Director of Health and Physical Education for
 Women
 GEORGE NORTON NORTHROP, M.A., Assistant Professor of English
 WALLACE NOTESTEIN, Ph.D., Professor of History
 ERNEST A. NUOFFER, 2nd Lieutenant, U.S.A., Assistant Professor of Mili-
 tary Science and Tactics
 OSCAR W. OESTLUND, Ph.D., Assistant Professor of Animal Biology
 EVERETT WARD OLMSTED, Ph.D., Professor of Romance Languages, Head
 of the Department of Romance Languages
 E. MAUD PATCHIN, B.S., Assistant Professor of Home Economics
 CHAUNCEY J. V. PETTIBONE, Ph.D., Assistant Professor of Physiological
 Chemistry
 ANNA A. H. PHELAN, Ph.D., Assistant Professor of Rhetoric
 RUTH SHEPARD PHELPS, M.A., Associate Professor of Italian

¹Absent on leave, 1919-20.

²Absent on leave, fall quarter 1919.

- JOSEPH BROWN PIKE, Ph.D., Professor of Latin, Head of the Department of Latin
- CHESSLEY JUSTIN POSEY, M.S., Assistant Professor of Geography
- NORMAN J. RADDER, B.A., Assistant Professor of Journalism
- ALBERT WILLIAM RANKIN, B.A., Professor of Education
- FRANK M. RARIG, M.A., Associate Professor of Education
- ANDREW T. RASMUSSEN, Ph.D., Assistant Professor of Neurology
- WILLIAM A. RILEY, Ph.D., Professor of Entomology
- THOMAS S. ROBERTS, M.D., Professor of Ornithology and Associate Director of the Zoological Museum
- CARL OTTO ROSENDAHL, Ph.D., Professor of Botany, Chairman of the Department of Botany
- CLARE L. ROTZEL, C.P.A., Associate Professor of Accounting, General Extension Division
- ARTHUR G. RUGGLES, M.A., Associate Professor of Entomology
- MARTIN B. RUUD, Ph.D., Assistant Professor of Rhetoric
- CHARLES ALBERT SAVAGE, Ph.D., Professor of Greek
- RICHARD E. SCAMMON, Ph.D., Professor of Anatomy
- CARL SCHLENKER, B.A., Professor of German, Chairman of the Department of German
- CARLYLE M. SCOTT, Professor of Music, Chairman of the Department of Music
- FREDERICK H. SCOTT, Ph.D., M.B., D.Sc., Professor of Physiology
- COLBERT SEARLES, Ph.D., Professor of Romance Languages
- LESTER BURRELL SHIPPEE, Ph.D., Assistant Professor of History
- CHARLES F. SIDENER, B.S., Professor of Chemistry
- CHARLES PETER SIGERFOOS, Ph.D., Professor of Zoology
- EDWARD H. SIRICH, Ph.D., Assistant Professor of Romance Languages
- M. CANNON SNEED, Ph.D., Associate Professor of Chemistry
- ELVIN C. STAKMAN, M.A., Professor of Plant Pathology and Botany
- CLINTON RAYMOND STAUFFER, Ph.D., Professor of Geology
- J. WARREN STEHMAN, M.A., Assistant Professor of Economics
- ELMER E. STOLL, Ph.D., Professor of English, Chairman of the Department of English
- ANDREW ADIN STOMBERG, M.S., Professor of Scandinavian Languages and Literatures
- WILLIAM FRANCIS G. SWANN, Ph.D., Professor of Physics
- DAVID F. SWENSON, B.S., Professor of Philosophy
- FLETCHER HARPER SWIFT, Ph.D., Professor of Education
- JOHN T. TATE, Ph.D., Professor of Physics
- JOSEPH M. THOMAS, Ph.D., Professor of Rhetoric, Chairman of the Department of Rhetoric and Public Speaking
- JOSEPHINE E. TILDEN, M.S., Professor of Botany
- ¹ ARTHUR J. TODD, Ph.D., Professor of Sociology, Chairman of the Department of Sociology and Director of the Social and Civic Training Course

¹Absent on leave, 1919-20.

- MASON WHITING TYLER, Ph.D., Assistant Professor of History
 ANTHONY LISPENARD UNDERHILL, Ph.D., Assistant Professor of Mathematics
- MARVIN J. VAN WAGENEN, Ph.D., Assistant Professor of Educational Psychology
- ELIZABETH VERMILYE, B.A., Assistant Professor of Foods and Cookery
 FREDERIC L. WASHBURN, M.A., Professor of Entomology
 MILDRED WEIGLEY, B.S., Professor of Home Economics and Chief of the Division of Home Economics
- ALBERT BEEBE WHITE, Ph.D., Professor of History
 FRANK C. WHITMORE, Ph.D., Assistant Professor of Chemistry
 HELEN A. WHITNEY, M.A., Assistant Professor of Rhetoric
 M. RUSSEL WILCOX, M.D., Assistant Professor of Physiology
 NORMAN WILDE, Ph.D., Professor of Philosophy, Head of the Department of Philosophy
- HERBERT WOODROW, Ph.D., Associate Professor of Psychology
 QUINCY WRIGHT, Ph.D., Assistant Professor of Political Science
 JEREMIAH S. YOUNG, Ph.D., Professor of Political Science
 ANTHONY ZELENY, Ph.D., Professor of Physics
 FRANK J. BRUNO, B.A., B.D., Lecturer in Sociology
 JOHN O. CEDERBERG, JR., Special Lecturer in Architecture
 OTTO W. DAVIS, B.A., Lecturer in Sociology
 JOHN FRANKLIN EBERSOLE, M.A., Ph.B., Professorial Lecturer in Economics
- NATHANIEL E. GRIFFIN, Ph.D., Professorial Lecturer in English
 LOUALLEN F. MILLER, M.A., Professorial Lecturer in Physics
 JOHN H. SHERMAN, B.A., Professorial Lecturer in Economics
 ARTHUR H. TAYLOR, M.A., Lecturer in Social and Civic Work
 MABEL S. ULRICH, M.D., Lecturer in Social and Civic Work
 EDWARD F. WAITE, B.A., LL.B., Lecturer in Social and Civic Work
 JEAN H. ALEXANDER, M.A., Instructor in Education
 GEORGE D. ALLEN, Ph.D., Instructor in Animal Biology
 LEON ARCHIBALD, B.Sc., Instructor in Drawing and Descriptive Geometry
 GERTRUDE A. BAKER, Instructor in Physical Education for Women
 HELEN A. BARR, B.A., Instructor in Physical Education for Women
 WILLIAM O. BEAL, M.A., M.S., Assistant Astronomer
 CECIL C. BEAN, M.A., Ph.B., Instructor in Rhetoric
 CAROLINE BEDFORD, B.A., Supervisor of Practice Field Work in Social and Civic Work
- ANNE BENTON, M.A., Instructor in Bacteriology
 JOHN J. BOWENS, Sergeant, U.S.A., Instructor in Military Science and Tactics
- E. S. BROWN, M.D., Instructor in Physical Education for Men
 ELIZABETH H. BUCK, M.A., Instructor in Rhetoric
 THOMAS S. BUSSOM, B.A., Instructor in Romance Languages
 BERTHA W. CLARK, M.A., Instructor in Americanization
 HERBERT E. CLEFTON, M.A., Instructor in Romance Languages

- NELSON F. COBURN, M.A., Instructor in Romance Languages
ELBRIDGE COLBY, M.A., Instructor in Rhetoric
FRANK CRAIN, Sergeant, U.S.A., Instructor in Military Science and Tactics
JOSEPH E. CUMMINGS, M.A., Instructor in Economics
ROBERT C. DAHLBERG, B.S., Instructor in Agricultural Botany
JOSEPHINE M. DE BOER, B.S., Instructor in Romance Languages
SOLOMON M. DELSON, Ph.B., Instructor in Romance Languages
CARL O. DUNBAR, Ph.D., Instructor in Geology
GEORGE H. FAIRCLOUGH, Instructor in Music
ELDEN R. FOSSEY, Sergeant, U.S.A., Instructor in Military Science and Tactics
THADDEUS P. GIDDINGS, Instructor in Public School Music
PERCY C. GLIDDEN, Instructor in Physical Education for Men
VETTA GOLDSTEIN, Instructor in Drawing and Design
ESTHER M. GREISHEIMER, B.S. in E., Instructor in Physiology
MARGUERITE GUINOTTE, Brevet Supérieur, Certificat d'Aptitude Pédagogique, Instructor in Romance Languages
JEFFERSON M. HAMILTON, Instructor in Architecture
JOSEPH HAVLICEK, Sergeant, U.S.A., Instructor in Military Science and Tactics
LAWRENCE M. HENDERSON, Ph.D., Instructor in Chemistry
LEWIS B. HESSLER, Ph.D., Instructor in Rhetoric
GERTRUDE R. HULL, Instructor in Voice
SIGURD B. HUSTVEDT, Ph.D., Instructor in Rhetoric
ELIZABETH JACKSON, Ph.D., Instructor in Rhetoric
ARTHUR M. JOHNSON, Ph.D., Instructor in Botany
HARRISON WALL JOHNSON, Instructor in Music
HERBERT KETTLE, Sergeant, U.S.A., Instructor in Military Science and Tactics
VALERIA G. LADD, B.A., Instructor in Physical Education for Women
ALVIN H. LARSON, B.S. in Agr., Instructor in Plant Pathology and Botany
CHARLES F. LINDSLEY, M.A., Instructor in Rhetoric
ALBERT J. LOBB, Ph.B., LL.B., Instructor in Political Science
WINSLOW H. LOVELAND, M.A., Instructor in Rhetoric
FRANCES E. LOWELL, Ph.D., Instructor in Psychology
MABEL C. McDOWELL, Instructor in Home Economics
ARIEL MACNAUGHTON, M.A., Instructor in Rhetoric
THOMAS R. MATHER, M.A., Instructor in Rhetoric
ALLEN G. NEWHALL, B.S., Instructor in Botany and Plant Pathology
WILLIAM G. PALMS, Sergeant, U.S.A., Instructor in Military Science and Tactics
VICTOR H. PELZ, M.S., Instructor in Economics
ABE PEPINSKY, Instructor in Violin
JAMES T. PETERKIN, B.S., Instructor in Architecture
ETHEL L. PHELPS, B.S., Instructor in Textiles and Clothing
WILLIAM D. REEVE, B.S., Instructor in Mathematics and Education

GERTRUDE REEVES, Instructor in Pianoforte
 ADOLPH RINGOEN, Ph.D., Instructor in Animal Biology
 CARL B. ROEMER, Instructor in Physical Education for Men
 STANLEY I. RYPINS, Ph.D., Instructor in Rhetoric
 KARL SCHEURER, Instructor in Music
 MINNA J. SCHICK, M.A., Instructor in Mathematics
 GERTRUDE B. SCHILL, B.A., Instructor in Physical Education for Women
 GEORGE MALCOLM STEPHENSON, Ph.D., Instructor in History
 LAVINIA STINSON, B.A., Instructor in Home Economics
 EMERSON G. SUTCLIFFE, Ph.D., Instructor in Rhetoric
 MARION TEBBETS, B.A., Supervisor of Practice Field Work in Social and
 Civic Work, Director of Hospital Social Service Department
 ELLA A. M. THORP, B.A., Instructor in Mathematics
 ARTHUR J. TIEJE, Ph.D., Instructor in Geology
 ALICE J. HOPKINS TOLG. M.D., Instructor in Physical Education for
 Women
 GUSTAVE VAN ROOSBROECK, M.A., Instructor in Romance Languages
 SAMUEL VASCONCELOS, LL.B., Abogado, Instructor in Romance Languages
 HOWARD T. VIETS, M.A., Instructor in Rhetoric
 GUY H. WOOLLETT, Ph.D., Instructor in Chemistry
 CHESTER H. YEATON, Ph.D., Instructor in Mathematics

ASSISTANTS AND SCHOLARS

1919-1920

ANIMAL BIOLOGY

JOHN A. CEDERSTROM, Ph.B., Assistant
 EMILY H. PAYNE, M.A., Assistant
 CAROL YOUNG, Assistant
 ROLAND F. HUSSEY, B.A., Teaching Fellow
 ETHEL SLIDER, B.A., Technician

ANTHROPOLOGY

ALONZO GRACE, B.A., Scholar

BOTANY

ANNA P. FESSENDEN, Teaching Fellow
 EDNA SONTAG, B.A., Teaching Fellow
 EARL B. WORKING, Teaching Fellow

ENGLISH

DOROTHY HUDSON, Assistant
 ALEXANDER R. COWIE, B.A., Scholar
 MARGARET E. FOGUE, Scholar

GEOLOGY

M. J. VAN DER LINDEN, Scholar

FACULTY

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GERMAN

ESTHER HENDRICKSON, B.A., Scholar
ESTHER STRAND, B.A., Scholar

HISTORY

MILDRED HARTSOUGH, B.A., Assistant
BERTHA HINSHAW, Assistant
CHARLOTTE R. FARRINGTON, Teaching Fellow
GERTRUDE A. JACOBSEN, M.A., Teaching Fellow
LOUISE M. LEONARD, B.A., Teaching Fellow
GEORGINA TALBOT, Teaching Fellow
FAITH THOMPSON, M.A., Teaching Fellow
PAUL ABRAHAMSON, Scholar
ARTHUR J. NELSON, Scholar

MATHEMATICS

CAREY M. JENSEN, M.A., Scholar

MUSIC

HELEN SCHMIDT, B.A., Assistant

PHYSICS

FRANCES JOHNSON, M.A., Teaching Fellow
ARCHIE DAYTON POWERS, M.A., Teaching Fellow
JAMES W. BROXON, B.A., Teaching Assistant
KATHERINE VINA DOWNEY, M.A., Teaching Assistant
GERHARD ELLESTAD, B.A., Teaching Assistant
JOSEPH VALASEK, B.A., Teaching Assistant
CHRISTINA JOY HAMRIN, B.A., Teaching Assistant
JOHN OSCAR JOHNSON, B.A., Teaching Assistant

POLITICAL SCIENCE

C. W. GREENWALDT, Scholar
J. A. STRUETT, Scholar

PSYCHOLOGY

MARGARET KINCAID, Teaching Fellow
H. R. MAYBERRY, Teaching Fellow
OSCAR P. PEARSON, Teaching Fellow
CALVIN P. STONE, Teaching Fellow
PAUL T. YOUNG, Teaching Fellow

RHETORIC

MARY ELLEN CHASE, M.A., Assistant
GUY L. DIFFENBAUGH, M.A., Assistant
FRANCES ELIZABETH KELLEY, M.A., Assistant

ROMANCE LANGUAGES

ETHEL M. ELLIOTT, B.A., Teaching Fellow
PAUL KRAMER, B.A., Teaching Fellow
OLIVE NOTT, B.A., Teaching Fellow
CAMILA HENRIQUEZ URENA, M.A., Teaching Fellow

SOCIOLOGY

ALMENA DAWLEY, M.A., Teaching Fellow
ANNE VAN DER HAGEN, B.A., Scholar

GENERAL INFORMATION

ADMISSION

Admission is either by certificate or by examination. Candidates must have completed the equivalent of a four-year high-school course and must present:

1. Four units of English; or three units of English and four units of a foreign language; or three units of English and two units in each of two foreign languages.
2. One unit of algebra and one unit of plane geometry.
3. Enough additional work to make in all fifteen units, of which not more than four may be in Group F.

A detailed statement of admission requirements may be found in the Bulletin of General Information.

Attention is called to the following rules governing students entering with advanced standing:

Credits of advanced standing are to be provisional and finally adjusted upon the following basis: Any student who, after one year's residence, has failures in at least nine credits shall lose all advanced credit except in those courses which have been continued in this College with a grade of at least C. Credits forfeited in this way can be secured only by special examination.

Students entering with advanced standing must earn an average of one honor point per credit for all work taken in this College which is to be counted toward a degree.

A student entering the Senior College, who at the end of the first quarter, does not meet the requirement of one honor point per credit carried, will be enrolled in the Junior College.

For admission to Senior College courses, such students must have had a standing in their previous work equivalent to that required of students who take the freshman and sophomore work in this College.

CLASS ROUTINE AND SCHOLASTIC REQUIREMENTS

Classes are held every week-day except Saturday afternoon. Recitation periods are fifty minutes long and begin at eight-thirty, nine-thirty, ten-thirty, one-thirty, two-thirty, three-thirty, and four-thirty. A general assembly of Faculty and students is held at eleven-thirty on certain Thursdays.

In the Junior College, courses of instruction are normally five credit courses. In the Senior College one, two and three credit courses are also given.

Examinations are held at the close of each quarter. A student's grade is based upon his class work and examinations. Four grades, A, B, C, and D, are given for work done satisfactorily. Work not done satisfactorily is marked E (condition), or F (failure). Work of a satisfactory character, but not completed is marked I (incomplete). An "incom-

plete" must be removed within one month after the opening of the following quarter; otherwise it becomes a "condition." A "condition," if not removed before the opening of the corresponding quarter of the following year becomes a "failure." A "failure" in a subject required of a student must be removed by pursuing the work again in class the next time the course is offered.

Requirements for graduation are expressed in credits, indicating amount of work; and in honor points, indicating grade of work. Each credit demands on the average three hours a week of the student's time; that is, one recitation with two hours of preparation, or three hours of laboratory work. Honor points are computed as follows; each credit with the grade of A carries three honor points; each credit with the grade of B, two honor points; each credit with the grade of C, one honor point.

Continued residence in the College is conditioned on reasonable advance toward graduation. The Administrative Board may at any time drop from the rolls of the College any student who does not make such reasonable advance. A student so dropped will not be allowed to reënter the University until a full quarter has elapsed.

No student will be considered to have a wholly satisfactory standing who fails to secure, in the course of any year, the normal advance of one honor point for each credit for which he is registered. Students who fall below this normal standard will be subject to special consideration as individual cases by the Administrative Board.

Any student who, either in speaking or in writing, habitually uses bad English will be reported by his instructor to the Dean with all available evidence. If this evidence seems to the Dean sufficient he will require the student to take without credit such further work in Rhetoric as the head of the Rhetoric Department may designate.

THE JUNIOR AND SENIOR COLLEGES

1. The College distinguishes between the Junior College, consisting of the first two years, and the Senior College, consisting of the third and fourth years.

2. All courses which are open to freshmen or sophomores are designated Junior College courses. All courses which are open primarily to juniors, seniors, or graduates are designated Senior College courses.

Senior College courses are open to sophomores who have an average of one honor point per credit hour in all their work and in the prerequisite courses, upon the approval of the department concerned and the Administrative Board.

3. Senior College courses shall have as prerequisites courses amounting to six credits when the department is not open to freshmen, or to nine credits when the department itself, or the department which offers the prerequisite courses, is open to freshmen. Certain Senior College courses are designated by the departments concerned as starred courses.

4. Students registered in combined courses shall secure forty-five credits and forty-five honor points per year (three quarters) of work required in this College before being recommended for entrance to the

work of the professional school. In order that such students may receive the bachelor's degree after completion of the required professional work the Faculty of the professional school shall certify that they have maintained an equivalent standing in the work of the professional school which is counted toward the degree given by this College.

5. Any student who fails to complete the Junior or Senior College requirements within the normal period will, in order to complete the work, be required to continue in that college for one or more University sessions. During this period, such students will be required to secure an average of one honor point for every credit of work for which he is registered.

FACULTY ADVISERS FOR STUDENTS

Every freshman student is assigned to an Adviser whose duty is to give information and help in all matters pertaining to the Collège work. The work of sophomore, junior, and senior students is also under the direction of the committee of advisers until their choice of a major interest brings them under the direction and control of a department in which that special work is done.

The Adviser discusses with the student the selection of studies and approves his program and registration; gives information or sends the student to the best source of information about the choice of a vocation and the preparation for it; helps the student to understand the proper sequence of studies and the relationship of various fields of study to the main purpose toward which the student is aiming. Living conditions, methods of study, and the other activities of the student strongly influence college work and are subjects for consideration by the Advisers.

The general purpose of the Advisers is to help the student to get the best out of his college course, to develop his responsibility for planning his work, and to encourage him to make the most of his own powers.

The special efforts made to aid and advise the student call for prompt response on his part. Every student is required to attend conferences when notified and to follow the instructions of his Adviser.

COURSES OF STUDY

A student may, while registered in the College of Science, Literature, and the Arts, pursue one of the following courses:

Courses given within this College:

1. A general course leading to the degree of Bachelor of Arts.
2. An intensive course leading to the degree of Bachelor of Arts with Honors.
3. A four-year course leading to the degree of Bachelor of Music.
4. A four-year course in Architecture and Decoration leading to the degree of Bachelor of Science.
5. A four-year course in Americanization Training Work leading to the degree of Bachelor of Science.
6. A five-year course in Training for Social and Civic Work leading to the degree of Bachelor of Science.
7. A five-year course in Training for Diplomatic and Consular Service leading to the degree of Bachelor of Science.
8. A five-year course in Training for State and Federal Administration leading to the degree of Bachelor of Arts.
9. A five-year course in Training for Municipal Administration and Engineering leading to the degree of Bachelor of Science.
10. A two-year Business Course for admission to the School of Business.

In each of the five-year courses the student may become a candidate for the Master's degree under the regulations of the Graduate School.

Combined arts and professional courses:

A six-year course leading to the degrees of Bachelor of Arts and Bachelor of Laws.

A five-year course leading to the degrees of Bachelor of Arts and Bachelor of Science in Chemistry.

An eight-year course leading to the degrees of Bachelor of Arts and Doctor of Medicine.

A seven-year course leading to the degrees of Bachelor of Science and Doctor of Medicine.

A six-year course leading to the degrees of Bachelor of Arts and Doctor of Dental Surgery.

A five-year course leading to the degree of Bachelor of Science and Certificate in Nursing.

A four-year course leading to the degree of Bachelor of Arts with special training in Military Science and Tactics

A six-year course leading to the degree of Bachelor of Science and the appropriate degree in Architecture.

REGULATIONS APPLYING TO ALL COURSES

Military Drill is required of all freshman and sophomore men and Physical Education of all freshman men and all freshman and sophomore women.

Rhetoric-English A-B-C is required of all freshmen and sophomores. No student may elect work in any quarter in more than five departments.

Students, except those in the third and fourth years of the Honors Course, must elect at least thirteen credits a week. Permission to take less than that number must be secured from the Administrative Board.

Students may ordinarily elect not more than seventeen credits. After the freshman year a student who has an average of one and one-half honor points per credit for the previous quarter, or the previous two quarters, and who has no condition or failure the previous quarter, may elect eighteen credits.

I. GENERAL COURSE LEADING TO THE DEGREE OF BACHELOR OF ARTS

The degree of Bachelor of Arts will be conferred by the College of Science, Literature, and the Arts, upon any student who fulfils all the requirements stated below.

AMOUNT AND GRADE OF WORK

1. During his entire course the student must earn one hundred and eighty credits and one hundred and eighty honor points.
2. No student may receive credit for more than two beginning modern language courses except upon the recommendation of a department in which the student requires such additional languages for his advanced work.
3. At least forty-five credits must be earned in residence at this College. If the term of residence is only one year, that year must be the senior year; and, in any case, at least half of the work of the senior year must be done in residence.

GROUP REQUIREMENTS

At least twenty credits in each of the following groups of subjects are required for graduation. Students are strongly advised to meet these requirements as early in their course as possible.

GROUP A	GROUP B	GROUP C
Ancient and modern languages	History	Mathematics
English	Anthropology	Animal Biology
Rhetoric	Economics	Botany
Public Speaking	Philosophy	Chemistry
	Political Science	Physics
	Sociology	Astronomy
		Geology and Mineralogy
		Psychology

DISTRIBUTION OF WORK

Junior College

During the first two years the student must complete the following required subjects:

- a. Rhetoric-English, fifteen credits.
- b. History, ten credits.
- c. Laboratory science (Chemistry, Physics, Botany, Animal Biology), ten credits.
- d. A foreign language, ten to fifteen credits according to the amount of high-school preparation as follows:

High-school work less than two units of one foreign language; College requirements fifteen credits. High-school work two or more units of one foreign language: College requirements ten credits if the same language is pursued in College, otherwise, fifteen credits.

Two of these required subjects must be begun the first quarter and the other two not later than the fourth quarter of a student's course.

When a required subject is begun, it must be continued for at least two quarters.

Senior College

For admission to the Senior College (junior and senior years), eighty-four credits and eighty-four honor points are required. Beginning with the class which enters the Junior College in the fall of 1919, ninety credits and ninety honor points will be required.

The work in the Senior College must include at least forty-five credits in starred courses at least eighteen of which must be in one department.

ELECTION OF SUBJECTS IN OTHER COLLEGES OR SCHOOLS

Certain courses given in other colleges or schools of this University are open to junior and senior students of this College who have the specified prerequisites. Provided no duplication of subjects occurs, these courses may be taken on the same terms as courses given in this College and will count toward the B.A. degree. Such courses are listed in the program.

EXTENSION COURSES

Credits received in University Extension courses are counted as credits in this College only after the student has completed one year of work in the College and has met the requirements of the department concerned.

CORRESPONDENCE COURSES

The equivalent of some of the introductory courses in various departments is offered by correspondence under the auspices of the Extension Division. Those desiring information regarding such courses should consult the Extension Division.

THE UNIVERSITY STATE TEACHERS' CERTIFICATE

Beginning with the year 1919-20, students entering the junior class who expect to receive the teacher's certificate from the University of Minnesota at the end of a four-year college course must register in the College of Education. Students registered in this College who expect to graduate in 1919-20 may secure the teacher's certificate at the time of graduation from the College of Science, Literature, and the Arts.

For information regarding the requirements for the certificate, they should consult the Bulletin of the College of Education.

SCHOOL OF BUSINESS

In place of the course in Business Education, there has been organized a School of Business which will offer a three years' course. Two years of work in the College of Science, Literature, and the Arts is required for admission to the School.

II. COURSE LEADING TO THE DEGREE OF BACHELOR OF ARTS WITH HONORS

The degree of Bachelor of Arts with Honors is given upon the completion of a specialized and intensive course of study.

Students who desire this degree are strongly advised to register for it and seek the advice of the major department as early in their course as possible. The election of the honors course must be made and the major subject chosen before the end of the sophomore year.

Students electing the honors course must present at the end of the sophomore year ninety credits and one hundred and thirty-five honor points and must demonstrate to the major department their ability to use one or more foreign languages specified by the department.

The honors course requires one hundred and fifty-eight credits in class work and a satisfactory thesis in the major subject. The student must maintain an average standing of B in the major subject and also in the work of the junior and senior years, and must be recommended for graduation by the staff of the major department.

A student in good standing in the honors course may transfer to the general course, and a student who at any time falls below the standing required in the honors course will be transferred to the general course by the Administrative Board. The conditions of the transfer in all cases are to be determined by the Board.

OUTLINE OF COURSE

The requirements in the freshman and sophomore years are the same as for students in the general course.

The requirements for the junior and senior years are as follows:

1. Major Subject

The student shall devote half his time during these two years to work defined by the major department and approved by the Advisory Committee. All such courses must rest on sophomore work as prerequisites. The departments shall provide for an advancing sequence in the student's work during the junior and senior years. At least one year (nine credits) must consist of individual work in advanced courses whose object is to prepare the student for independent investigation. The thesis shall be prepared in connection with this work and under the direction of the instructor.

The thesis shall give evidence of ability to use successfully the laboratory and library materials and methods required in the subject and a thoro command of present knowledge on the topic selected.

2. Electives

In addition to the major, the student shall complete enough elective courses to make a total of one hundred and fifty-eight credits. The student is advised to take from twenty-four to thirty credits in his junior year.

III. FOUR-YEAR COURSE IN ARTS AND MUSIC LEADING TO THE DEGREE OF BACHELOR OF MUSIC

The University of Minnesota offers a four years' course leading to the degree of Bachelor of Music.* The aim of this course is two-fold: to provide the best available training in practical music, and to lay the foundation for a true understanding of music as literature—that is, as a vital element in modern culture. For the attainment of the first end, thoro courses in the theory, history, and the appreciation of music are required; to achieve the second, the student is given a background of history, literature, and science, these courses being in many cases especially arranged by the faculties of the various departments to parallel and supplement the work given by the Department of Music. The course is designed to meet the requirements of students who wish the cultural benefits of a college education, but whose aptitude in music would lead them to forego these benefits if music were not made a primary interest in their work.

In the field of practical music the greatest pains are expended in developing the individual student's talent. But the University recognizes the fact that many students who have neither the desire nor the capacity for the arduous career of concert performers are much better fitted than the average practical musician for the work of teaching. For such students unique opportunities for study in the special fields of public school music are provided together with practical instruction in instrumental teaching. The University thus, at a charge considerably smaller than is asked by private instructors of the first rank or in conservatories of music, not only offers every facility for practical music study, but prepares its students to occupy the position of broadly educated and influential members of the musical community in which they shall find themselves after graduation.

The requirements for admission are the same as for admission to the freshman class in the General Course together with one of the following requirements in Music, according to the instrument selected:

Pianoforte: Candidate must be able to play Czerny's *School of Velocity*, and the easier Haydn and Mozart sonatas.

* The degree of Bachelor of Music will not be given until 1921. Until then students in Music will earn the degree of Bachelor of Arts in Music.

Violin: Candidate must be able to play the first ten studies of the Kayser *Etudes*.

Voice: Candidate must possess good natural equipment, and have some previous musical training.

Orchestral Instruments: Candidate must pass entrance examinations equal to the grade required of candidates who wish to select violin. Students from high schools granting credit in music toward graduation may present four units in music for entrance.

The number of credits required for the degree in Music is one hundred and eighty, not counting Military Drill or Physical Education, which are required the same as for the B.A. degree. During the four years the student must earn one hundred and eighty honor points, including forty-eight honor points in applied music.

The one-half hour lessons, plus twelve to fifteen hours' practice a week for one quarter are required in order to gain four credits in applied music.

Students who elect voice as their major study must earn thirty credits and, by special permission of the Faculty of the Department, may be allowed to earn thirty-six credits in voice during the four years. During each of the first two years six credits must be earned in voice and six in piano. In the junior year the student may be permitted, and in the senior year will be expected, to take additional work in voice in place of the instrumental work.

Students who elect other subjects than voice as their major must earn thirty-six credits in the chosen subjects, specializing in the junior and senior years.

OUTLINE OF COURSE

Freshman Year

(Not less than fifteen credits each quarter)

1. Elect four credits from A, or four from B, including Voice

A

- Piano (4)
- Violin (4)
- Cello (4)
- Organ (4)

B

- Piano (2)
- Violin (2)
- Voice (2)
- Cello (2)
- Organ (2)

2. Harmony (3)
3. Rhetoric (3)
4. History (3)
5. Physical Education (no credit)
Elective, Orchestra (1), Choir (1)

Sophomore Year

(Not less than fifteen credits each quarter)

1. Elect four credits from A, or four credits from B, including Voice

A

Piano (4)
Violin (4)
Cello (4)
Organ (4)

B

Piano (2)
Violin (2)
Voice (2)
Cello (2)
Organ (2)

2. Counterpoint (2)
3. Psychology (3) first and second quarters; Acoustics (3) third quarter
4. Modern language (5)
5. Appreciation of Music (1)
6. Ear Training (no credit)
Elective, Orchestra (1), Choir (1)

Junior Year

(Not less than sixteen credits each quarter)

1. Elect four credits from A, or four from B, including Voice

A

Piano (4)
Violin (4)
Voice (4)
Cello (4)
Organ (4)

B

Piano (2)
Violin (2)
Voice (2)
Cello (2)
Organ (2)

2. History of Music (3)
3. Normal Piano (3), or Public School Music (3)
4. Ear Training (no credit)
5. History of Education (3) first quarter
Educational Psychology (3) second quarter
Technique of Teaching (3), or Social Aspects (3) third quarter
6. Elective (3)
Elective Orchestra (1), or Choir (1), Composition (1)

Senior Year

(Not less than fourteen credits each quarter)

1. Elect four credits from A, or four credits from B, including Voice.

A

Piano (4)
Violin (4)
Voice (4)
Cello (4)
Organ (4)

B

Piano (2)
Violin (2)

2. Bach and Beethoven, first and second quarters; Wagner and Brahms, third quarter (2)
3. Normal Piano (3) or Public School Music (3).
4. Ensemble (1)
5. Analysis (1)
6. Elective (3)
Elective, Orchestra (1), Choir (1)

IV. FIVE-YEAR COURSE IN SOCIAL AND CIVIC WORK, LEADING TO THE DEGREE OF BACHELOR OF SCIENCE AND MASTER OF ARTS

This course is organized in response to a demand for distinctive technical training for professional social service. It covers both undergraduate and graduate work. Satisfactory completion of the four-year course leads to the B.S. degree. A fifth year's work is designed leading primarily to a special certificate of proficiency; but students whose programs satisfy the requirements of both the training course and the Graduate School may receive the M.A. degree in addition to the special certificate.

The organization of the course of study aims to give the undergraduate the fundamentals of a broad modern education with considerable emphasis upon history, economics, political science, psychology, and language. To this end all intensive specialization is reserved for the fourth and later years of study.

The fourth year includes comparatively few required courses, but a long list of advised electives, for which other electives may be substituted, according to the individual student's needs. While the four-year course as arranged should confer upon the student a certain degree of familiarity with the problems of social and civic work, really adequate professional preparation demands at least one year of graduate study. With this professional instruction in view, during the fifth and later years of study only an irreducible minimum of specified courses is required; the emphasis is laid upon providing individual programs to meet the student's special inclination, aptitudes, or need.

REQUIRED

Rhetoric, modern language, science, and History to meet requirements of the Arts College.

Attendance (without credit) at a series of lectures on graphic methods.

ELECTIVE

Courses open to freshmen in languages, History, science, or Mathematics.

SECOND-YEAR STUDIES

REQUIRED

Modern language or English, and science to meet requirements of the Arts College.

Sociology and Anthropology

Introduction to Sociology and Anthropology

Psychology

General Psychology

Economics

General Economics

Political Science

American Government

ELECTIVE

Sociology and Anthropology

Cultural Anthropology

Modern Social Reform Movements

Philosophy

Logic or Ethics

Courses in History of Philosophy

THIRD-YEAR STUDIES

REQUIRED

Sociology and Anthropology
 Treatment of Defectives and Dependents
 Treatment of Delinquents
 Child Welfare
 Housing
Economics
 Labor Problems
Political Science
 American Municipal Administration
 (European Municipal Administration should be elected if possible)

ELECTIVE

Courses in English, modern language, or History
Education
 Social Aspects of Education
 History of Education
Sociology and Anthropology
 Rural Sociology
 Social Psychology
 State Care of Dependents, Defectives, and Delinquents
 Physical Anthropology
 The Negro
Economics
 Socialism
 Wages
 Trade Unions
Political Science
 State and Local Government
 Business Law
Bacteriology
 General Bacteriology
 Courses on Public Health

FOURTH-YEAR AND GRADUATE STUDIES

REQUIRED

Sociology and Anthropology
 Social Psychology (if not already elected)
 Social and Industrial Legislation
 Social Statistics and Social Surveys
 The Family
 Social Progress
 Methods of Community Organization and Social Work in Small Towns and Country

(SPECIAL NOTE)

For a fifth year's work consisting of 9 hours' class work and 12 hours of supervised field work per week for three quarters the student will receive a special certificate. He will be eligible for the Master's degree if his program is approved by the Graduate School and if he prepares a satisfactory thesis in addition to the work required for the special certificate.

ELECTIVE

Sociology and Anthropology
 The American People
 Field Work in Hospital Social Service
 Charitable Administration, Finance, and Publicity
 Technique of Family Treatment
 Juvenile Courts and Probation
 Settlement and Social Center Work
 The Immigrant
 Seminars in Sociology and Anthropology
 Courses on Recreation and Playground Work
 Courses on Public Health
Economics
 Public Finance
 Principles of Accounting
Political Science
 Constitutional Law
 Legislative Power and Methods
 Police Power
Animal Biology
 Eugenics
Psychology
 Abnormal Psychology
 Mental Retardation
 Child Development
 Courses in Education if not already elected
Physical Education
 Hygiene of the Family
 Courses in Home Economics (especially Dietetics and Household Administration)
 Sanitary Engineering

V. FOUR YEARS' COURSE IN AMERICANIZATION TRAINING
 WORK LEADING TO THE DEGREE OF
 BACHELOR OF SCIENCE

FRESHMAN YEAR

REQUIRED	CREDITS
Rhetoric	15
Modern European History (1-2)...	10
American History	5
General Zoology	10
Introduction to Anthropology.....	5

SOPHOMORE YEAR

REQUIRED	CREDITS	ELECTIVES
Modern language	9 or 15	English Survey
American History (continued). 5		Public Speaking
American Government	5	Modern language
General Anthropology.....	3	Geography
General Immigration.....	3	Modern Social Reform Movements
General Psychology	9	Cultural Anthropology
Electives	9 to 18	Elements of Educational Psychology
		Food Preparation
		Elementary Dietetics

JUNIOR YEAR

In the Senior College (junior and senior years) the electives of individual students will vary much, depending on the phases of work and the groups of peoples in which the student is specializing. All electives must be approved by the Director.

REQUIRED	CREDITS	ELECTIVES
American People	9	Supervised Americanization Work
Methods and Organization of Americanization Work ¹	9	Municipal Government
General Economics	10	State and Local Government
Electives	18 to 23	Immigrant Woman
Aliens' Viewpoints		Race Leaders and Programs
Special lectures by race leaders		Labor Problems
		Statistics
		Elementary Dietetics
		Housing Problems
		Home Management
		Social Psychology
		History of Education
		Social Aspects of Education
		Physical Anthropology
		Political and Social Ethics

SENIOR YEAR

REQUIRED	CREDITS	ELECTIVES
American Negro	3	Negro and Immigrant Adjustments
Government and the Immigrant....	3	Slavic Culture
Supervised Americanization Work (if not previously elected) ¹	9	Slavic Oral Language ¹
		Genetics and Eugenics

¹ These courses are open only to students who are specializing in the Americanization work.

SENIOR YEAR--Continued

REQUIRED--Continued		ELECTIVES--Continued
Race Leaders and Programs (if not previously elected) ¹	6	Social Statistics Socialism Child Welfare Philippine Peoples Municipal Problems Mental Diagnosis

For the requirements for teachers' certificate in Americanization Training, see Bulletin of College of Education.

For courses in Home Economics open to students in Americanization course, see statement of Department of Home Economics.

¹ These courses are open only to students who are specializing in the Americanization Work.

VI. A FIVE-YEAR COURSE IN TRAINING FOR DIPLOMATIC AND CONSULAR SERVICE

The degree of Bachelor of Science² is conferred at the end of four years. Students whose programs satisfy the requirements of the Graduate School may receive the degree of Master of Arts at the end of the fifth year.

FIRST YEAR

	Credits
Rhetoric-English	15
Modern language	15
History	10
American Government	5
	45

SECOND YEAR

	Credits
Comparative European Government.....	5
Language	10
Economics	10
Laboratory science	10
Commercial Geography	5
Electives	5
	45

THIRD AND FOURTH YEARS

During the junior and senior years, students will take eighteen credits in starred courses in Political Science, fifteen credits in Economics, fifteen credits in History, and twelve credits in Law.

In foreign languages, 15 credits

Other electives, 15 credits of which 5 must be from the science group.

² Students may obtain the Bachelor of Arts degree by meeting its requirements.

The selection of these courses will be made under direction of the chairman of the committee in charge of the course.

FIFTH YEAR

Research in Economics for the Consular Service
 Research in History or Political Science for the Diplomatic Service
 Additional starred courses in History, Economics, Law, or Political Science, or work in the Research Bureau.

VII. A FIVE-YEAR COURSE OF TRAINING FOR STATE AND FEDERAL ADMINISTRATION

The degree of Bachelor of Science² is conferred at the end of four years. Students whose programs satisfy the requirements of the Graduate School may receive the degree of Master of Arts at the end of the fifth year.

FIRST YEAR

	Credits
Rhetoric-English	15
Modern language	10 or 15
American Government	5
History	10
Electives	5 or 0

45

SECOND YEAR

	Credits
Laboratory science	10
General Economics	10
State and Local Government, or Comparative European Government	5
Municipal Government	5
American History	10
Electives	5

45

THIRD AND FOURTH YEARS

POLITICAL SCIENCE	ECONOMICS
Select 45 credits including courses marked ¹	Select 18 credits
Constitutional Law ¹ (Federal or State)	Public Finance ¹
Legislative Power and Methods ¹	State and Local Taxation ¹
Comparative Administration ¹	Labor Problems
Political Parties	Railway Problems
Principles of Political Science	Statistics
Colonial Government	Business and Government
	Public Utilities
	Financial History of the U. S.

¹ Required work.

² Students may obtain the Bachelor of Arts degree by meeting its requirements.

THIRD AND FOURTH YEARS—Continued

POLITICAL SCIENCE—Continued

Comparative Federal Government
 Elementary Law or Business Law
 Political Power
 Contemporary Political Problems
 Seminar

HISTORY

Select 9 credits
 Economic History of the U. S.
 Recent American History
 History of Minnesota
 History of the West

OTHER ELECTIVES

Select 18 credits
 Introduction to Sociology
 American People
 State Care of Dependents
 Modern Social Reforms
 Public Service Corporations
 Elementary Educational Administration
 Advanced Educational Administration
 General Electives

FIFTH YEAR

Research (Seminar)
 Research Bureau

Courses selected from the above list for the third and fourth years.

VIII. A FIVE-YEAR COURSE OF TRAINING FOR MUNICIPAL ADMINISTRATION AND ENGINEERING

The degree of Bachelor of Science is conferred at the end of four years. Students whose programs satisfy the requirements of the Graduate School may receive the Master's degree at the end of the fifth year.

FIRST YEAR

	Credits
Rhetoric-English	15
Modern language	10
Engineering Mathematics	10 or 15
American Government	5
Electives	5 or 0
	45

SECOND YEAR

	Credits
Municipal Government	5
General Economics	10
History	10
Physics	10
Drawing	5
Electives	5
	45

No.	Credits	Title	Offered to	Prereq. courses
*164	...	Police Power.....	See Pol. Sci.	
*165	...	Law of Labor.....	See Pol. Sci.	
*169	3	Labor and Reform Move- ments.....	Jr., sr., grad.	*161
*173	3	Railway Problems.....	Jr., sr., grad.	*54
*191-2	6	Public Finance.....	Jr., sr., grad.	3-4 or 5, 6
*193	3	State and Local Taxation....	Jr., sr. grad.	*191-2
*195-6-7	6	Seminar in Business Finance.	Sr., grad.	18 cr. incl., *143-4

1-2. INTRODUCTION TO ECONOMIC HISTORY WITH SPECIAL EMPHASIS ON THE UNITED STATES. Lectures and section work. A general survey of the development of agriculture, manufacture, transportation, storage, and the exchange of goods; economic crises; land, capital, management, and labor; the interplay of economic and political forces. GRAS, DICKINSON, and others.

3-4. PRINCIPLES OF ECONOMICS. Principles that underlie the present industrial order. Application of principles to economic problems such as labor, insurance, finance, transportation, industrial combination, government control. HANSEN and others.

5. GENERAL ECONOMICS. Principles of economics combined with the necessary descriptive facts, as relating to economic life in general and to agriculture and forestry, in particular. HOLMES.

6. AGRICULTURAL ECONOMICS. Principles of agricultural economics with especial emphasis upon production. HOLMES.

11-12. STATISTICS. Principles of collection, tabulation, and interpretation of statistical material, illustrated by present-day statistical data. Lectures, assigned readings, and special investigations by individual members of the class. MUDGETT.

14. STATISTICS. See statement for 11-12.

15-6-7. MODERN ECONOMIC PROBLEMS FOR ENGINEERS. Effect of industrial development; international commerce; corporation organization and finance; banking and credit; public ownership and finance; trusts, monopolies; transportation problems, insurance, conservation, labor problems. Lectures, textbook, talks by men actively engaged in fields studied. BLAKEY.

18. PROBLEMS IN AGRICULTURAL ECONOMICS. The economic facts and principles underlying the practical problems confronting the farmer as producer, consumer, and citizen, such as what to produce, intensity of cultivation, farm labor, tenancy, land settlement, farm credit, marketing, and taxation. BLACK.

19. PRINCIPLES OF AGRICULTURAL MARKETING. The organization and methods of marketing; the functions of middlemen; the costs of marketing various products; cooperative marketing.

20. PROBLEMS IN RURAL ECONOMICS. A survey of the economic aspects of the important problems of rural life, such as rural population, rural migration, tenancy, agricultural labor, marketing of farm products, coöperation, rural credit, land settlement. CUMBERLAND.
23. PRINCIPLES OF ORGANIZATION AND MANAGEMENT. Organization: principles applying to business in general and to particular concerns; evolution, functional divisions; specialization—functional and other forms; standardization. Management: personnel, information, coördination of functions, planning, external versus internal factors. PELZ.
- 25-6. PRINCIPLES OF ACCOUNTING. The purpose and principles of account classification; capital and revenue; accruals; valuation; depreciation; preparation and interpretation of balance sheets, income accounts and other statements; corporation accounts. A laboratory course with supplementary lectures. SANDERS and others.
41. FINANCIAL HISTORY OF THE UNITED STATES. American financial legislation from colonial times with special emphasis upon the distinction between maintaining a standard of value and the provision of a revenue for the needs of government. BLAKEY.
- *51-2-3. BUSINESS LAW. See Political Science 51-2-3.
- *54. CORPORATION FINANCE. The organizing, financing, and managing of corporations. A study of corporate securities for purposes of promotion and reorganization and of facilities for marketing them. STEHMAN.
- *55. ADVANCED CORPORATION FINANCE. A study of the financial history of certain typical corporations with special reference to their promotion and reorganization. STEHMAN.
- *59. LIFE INSURANCE. Life insurance companies; types of policies and their uses, premiums, reserve, surrender values, dividends, and rights and obligations of the policy holder. Analysis and discussion of War Risk Insurance. JAMES.
- *60. FIRE INSURANCE. Basic theory and critical examination of fire insurance policy. Study of organization of stock and mutual companies, the agency system; reserves, rate making and fire prevention. Special attention to laws of Minnesota and neighboring states. JAMES.
- *61. GENERAL INSURANCE. A study of basic principles and critical analysis of accident and health insurance, marine, plate glass window, burglary, credit, boiler, and factory mutuals. JAMES.
- *76. COMMERCIAL POLICIES. Theory of international commerce; free trade, reciprocity and protection, with special emphasis on the tariff history and policy of the United States; commercial treaties and foreign politics. Lectures, assigned readings, and reports. BLAKEY.

- *77. FOREIGN TRADE. Nature and methods of foreign trade. Present foreign trade situation with special reference to the United States. BLAKEY.
- *81-2-3. ECONOMIC HISTORY OF EUROPE AND THE UNITED STATES, 1750 TO THE PRESENT. Graduates taking the course will be required to do some special work. (Not given in 1919-20.) GRAS.
- *85. PRINCIPLES OF MARKETING. Domestic merchandising methods of manufacturers. Problems of wholesalers and commission men; distributing system and market organization; price policies. SHERMAN.
- *86. ADVERTISING AND SELLING. Functions and principles of advertising; advertising media; planning and executing an advertising campaign. Copy. Sales management and personal salesmanship. PELZ, SHERMAN.
- *88. RETAIL MARKETING. Problems and methods of the so-called regular retailer, department stores, and chain stores. Development of retail trade centers. Coöperation between the retailer and the local board of trade. The retailer and the consumer. SHERMAN.
- *95-6. OFFICE MANAGEMENT. The function of the office in business, showing principles of efficiency applied to daily routine; the layout, equipment and flow of work in an office; standardization of stenographic work; filing; proofreading; practice with modern office appliances. SYKES.
- *97. SEMINAR IN SECRETARIAL ADMINISTRATION. SYKES.
- *100-1-2. ECONOMIC HISTORY OF EUROPE, 1300-1750. The chief interests are the manor; the town; the metropolis; national economic regulation; developments in agriculture, commerce, manufacture, and economic thought, leading up to the Industrial Revolution. GRAS.
- *103-4. VALUE AND DISTRIBUTION. An advanced course in economic theory devoted chiefly to a study of recent theories of distribution. Assigned readings, reports and discussions. GARVER.
- *105. HISTORY OF ECONOMIC IDEAS. History of economic thought; scope and logical methods, relation to other social sciences; methods of investigation and instruction. Assigned readings, reports, and class discussions. GARVER.
- *107. LAND TENURE. A study of several problems arising out of the land basis of civilization, such as property in land, land utilization, land classification, land settlement, status of the agricultural classes, farm labor, farm ownership and tenancy. BLACK.
- *108. AGRICULTURAL STATISTICS. Study and practice of the special methods of statistical investigation, analysis and presentation which have

- been developed for agriculture, together with descriptive statistics of agriculture. BLACK.
- *109. ECONOMICS OF CONSUMPTION. Nature of human wants; standards of living; cost of living; income, administration of income; nature of demand; demand and price; relation of consumption and the population problem.
- *110. FARM MARKETING PROBLEMS. Studies in the methods of private and cooperative marketing of selected farm products.
- *112. ADVANCED STATISTICS. Dealing with more advanced problems connected with assembling, tabulating, interpreting, and using statistical information. As far as practicable the data used will be drawn from business. (Not given in 1919-20.) MUDGETT.
- *116-7-8. ADVANCED PROBLEMS IN AGRICULTURAL ECONOMICS. Economic theory of production, consumption, exchange, and value and distribution applied to agriculture. BLACK, CUMBERLAND, HOLMES.
- *119-20-21. SEMINAR IN AGRICULTURAL ECONOMICS. Subjects for group study selected from the following; Competition of types of farming; markets and transportation of farm products; farmers' cooperation; prices of farm products; rural credit; land valuation; land settlement; land taxation. BLACK, CUMBERLAND, HOLMES.
- *126-7-8. SPECIAL RESEARCH PROBLEMS IN AGRICULTURAL ECONOMICS. Intensive individual research work on problems not being studied in the seminar during the quarter. BLACK, CUMBERLAND, HOLMES.
- *131. COST ACCOUNTING. Principles determining costs; elements of cost; use of data in establishing standards; methods of arriving at costs, and of distribution of overhead; operation reports and statistics; elimination of waste, etc. Lectures and assigned problems. NOBLE.
- *132-3. INDUSTRIAL ACCOUNTING. A continuation of cost accounting; a critical study of various methods applied to particular types of industry; practical experience through constructive work in advance; preparation of accounting systems with provision for adequate operating reports and statistics. NOBLE.
- *134-5-6. AUDITING. Preparation for, and conduct of, an audit; the auditor's report and certification, and legal responsibilities. Textbook, assigned readings, class discussions, and lectures. ROTZEL.
- *137-8-9. ACCOUNTING PRACTICE AND PROCEDURE. Intensified study of numerous subjects discussed in Principles' course. First quarter, treats partnerships, municipal accounts, bankruptcy, etc.; second quarter, corporation accounts in all phases; third quarter, retail, wholesale, department store, branch, commission, and consignment accounts. SANDERS.

- *143-4. MONEY AND BANKING. Relation to industrial system. Monetary principles with special reference to United States. American banking and bank organization, principles of commercial banking, non-commercial banking, relation of government to banking, comparative study of leading foreign systems. DOWRIE, EBERSOLE, STEHMAN.
- *145. INTERNATIONAL EXCHANGE. Theory of international exchange, pars of exchange with gold, silver, and paper standard countries; the rates of exchange, financing imports and exports; bankers' bills; futures; arbitrage; specie movements; the present foreign exchange situation. DOWRIE.
- *146. INVESTMENTS. The social process of saving and investment; government, municipal, corporation, and real estate loans; stock exchange operations and money market influences as they affect the prices and net yield of prime securities. EBERSOLE.
- *147. BANK ADMINISTRATION. The modern commercial bank from the manager's point of view. Legal problems, department functions, profit-making methods, credits. Adjustment of bank policy to prospective business conditions. Lectures, and laboratory work in local banks. EBERSOLE.
- *149. BUSINESS CYCLES. American business conditions since 1890 with regard to the great cycles of alternate prosperity and depression, and financial panics. Critical examination of all the available business barometers designed to forecast similar conditions. EBERSOLE.
- *150. FARM FINANCE. The financial needs of typical farmers. Present facilities for supplying them—institutions, their organization and operation, interest rates, defects and proposed remedies. The financing of the various farmers' organizations. The farmer as an investor. DOWRIE.
- *153. THE MODERN BUSINESS CORPORATION. Social and legal aspects of the corporation. The development of the trust and the regulatory policy of the government. GRAY.
- *154. PUBLIC UTILITIES. Economic and legal bases of classification. Relative advantages of public ownership and regulation. Central and municipal regulation compared. The basis of rates; relative rates; rates and service. Different theories of valuation. GRAY.
- *155. BUSINESS AND GOVERNMENT. Business expansion, diversification, and conflicting interests. Laissez-faire versus regulation. Enforcement of minimum standards. Administration of business legislation. Coöperation between government and business. Public coördination of business forces. Reaction of war emergency measures on permanent policy. (Not offered 1919-20.)

- *156-7-8. SEMINAR IN BUSINESS POLICY. Individual investigations and reports upon fundamental questions of business policy. The investigations will have to do with the public relations of particular concerns and with their relations to customers, creditors, competitors, and employees. (Not offered 1919-20.)
- *160. ECONOMIC MOTIVES. Incentives to work, to accumulation, to consumption. Necessary adjustments between industrial processes and human nature. DICKINSON.
- *161. LABOR PROBLEMS. Modern labor problems; woman and child labor, industrial hygiene, welfare work, profit-sharing, coöperation, labor unions, strikes, boycotts, conciliation, and arbitration; economic causes and effects of immigration. HANSEN.
- *162. TRADE UNIONISM. Development and activities of American trade unions. Economic and legal aspects of collective bargaining, closed shops, strikes, and boycotts. Employers' associations. Conciliation and arbitration. Social significance and probable future of trade unionism. HANSEN.
- *164. POLICE POWER. See Political Science *157.
- *165. LAW OF LABOR. See Political Science *175.
- *167. INDUSTRIAL RELATIONS. Relation of employer and worker in industrial enterprises; theory and mechanism of collective bargaining; joint agreements; shop committees; other plans for workers' participation in management; development in industrial government. (Not offered 1919-20.)
- *169. LABOR AND REFORM MOVEMENTS. A study of various proposals for economic reform. The growth and tactics of Socialist party in Europe and the United States, communism and the communistic experiments, the Single Tax, profit sharing in industry, social insurance. HANSEN.
- *173. ECONOMICS OF TRANSPORTATION. The theory and practice of rate making. Government regulation, the conflict between states and federal authorities and suggested improvements in control of transportation agencies. GRAY.
- *191-2. PUBLIC FINANCE. Public expenditures; public debt; budgetary legislation; tax systems. BLAKEY.
- *193. STATE AND LOCAL TAXATION. Problems of state and local taxation. Historic survey of various taxes and examination of present procedure in taxing different kinds of property; tax reforms. Particular attention given to conditions in Minnesota. BLAKEY.
- *195-6-7. SEMINAR IN BUSINESS FINANCE. The various unsettled monetary and banking problems of the United States will furnish topics for individual investigation. DOWRIE, EBERSOLE, STEHMAN.

- *210-1-2. SEMINAR IN ECONOMIC HISTORY. Some limited field or single topic in American or English economic history. Intended primarily as a training course in the methods and problems of economic history. GRAS.
- *259-60. SEMINAR IN CORPORATIONS AND PUBLIC UTILITIES. Independent investigation by each student, under the guidance of the instructor, of some specific problem pertaining to corporations and public utilities. GRAY.
- *261-2-3. SEMINAR FOR GRADUATES EXCLUSIVELY. Research to be arranged with individual instructors in the various fields of economics. Prerequisites; twelve credits in starred courses and the approval of the Department. Members of the Department.

EDUCATION

DEPARTMENT OF EDUCATIONAL ADMINISTRATION AND SUPERVISION

Professors LOTUS D. COFFMAN, Dean, LEONARD V. KOOS; ALBERT W. RANKIN, FLETCHER H. SWIFT; Associate Professor WILFORD S. MILLER; Assistant Professor ROSS L. FINNEY.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
3	3	Social Aspects of Education..	Jr., sr.	10 cr. in Psychol.
20	3	High-School Curriculum	Jr., sr.	10 cr. in Psychol.
5s	3	American School	Jr., sr.	10 cr. in Psychol.
113	3	High-School Problems	Sr., grad.	
119-120	6	School Curricula	Sr., grad.	1 or 101-102 and 3
121	3	School Organ. and Admin.	Sr., grad.	1 or 101-102 and 3
124-125-126	9	Educational Admin.	Sr., grad.	121
141	3	School Sanitation	Sr., grad.	1 or 101-102 and 3
142	3	Industrial Education	Sr., grad.	1 or 101-102 and 3
160-161-162	6	Theory of Supervision	Sr., grad.	1 or 101-102 and 3
164	3	Problems of High-School Administration	Sr., grad.	1 or 101-102 and 3
167	3	Junior High School	Sr., grad.	1 or 101-102 and 3

NOTE.—Certain courses in Secondary Education will be added later.

3. SOCIAL ASPECTS OF EDUCATION. The school as a community factor; the present peculiar relation of the school to social problems; the function of the school in these relations.
5. THE AMERICAN SCHOOL. A brief survey of the factors determining the problem of public education in America, followed by a brief account of the development and organization of typical state school systems.
20. HIGH-SCHOOL CURRICULUM. Types of curricula, constants and variables, sequences, time limits, distribution of subject-matter by years and by units.

113. **SECONDARY EDUCATION MOVEMENTS.** Some of the movements considered are: changed concepts of method, reorganization as affecting the grades below the high school and work beyond the four years of high school, supervised study, socialization of curricula, public control.
- 119-120. **SCHOOL CURRICULA.** Study of the ideas implicit in a democratic society and an attempt to apply those ideas in the selection of material of school curricula. Involves some consideration of the constructive aims and methods of education.
121. **SCHOOL ORGANIZATION AND ADMINISTRATION.** An introductory course in school administration for students of teaching experience and for those looking forward to work as principals and superintendents.
- 124-125-126. **EDUCATIONAL ADMINISTRATION.** An interpretation of present tendencies in the administration of state and city school systems.
141. **SCHOOL SANITATION.** A course in school hygiene in its broader aspects. Designed for all teachers and supervisors who are responsible for the health of school children. Treats of medical supervision and other problems arising from school environment.
142. **INDUSTRIAL EDUCATION.** Existing types of industrial and vocational schools and systems of training. Comparison of conditions in America and foreign countries. Organization of course of study.
- 160-161-162. **THEORY OF SUPERVISION.** The problems involved in the training of teachers in service; studies of qualities of merit in teachers; factors in service; factors in selecting teachers; the distribution of subject-matter by grades; time allotment of studies.
164. **PROBLEMS OF HIGH-SCHOOL ADMINISTRATION.** A study of the types of secondary schools, units of administration, costs, forms of organization, graduation requirements, and extra-curricular activities.
167. **JUNIOR HIGH SCHOOL.** The history of the junior high school movement, its purposes and results, changes in curriculum and in methods of instruction, special groups appealed to, modifications in plant and equipment.

DEPARTMENT OF HISTORY AND PHILOSOPHY OF EDUCATION

Professor FLETCHER H. SWIFT; Instructor JEAN H. ALEXANDER.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
1	5	Brief Course in History of Education.....	Jr., sr.	10 credits in Psychol. of which 5 may be in Educ. Psychology

No.	Credits	Title	Offered to	Preq. courses
101	3	Foundations of Modern Education.....	Jr., sr., grad.	10 credits in Psychol. of which 5 may be in Educ. Psychol. and 9 cr. in Dept. of History
102	3	History of Modern Secondary and Higher Education....	Jr., sr., grad.	10 credits in Psychol. of which 5 may be in Educ. Psychol. and 9 cr. in Dept. of Hist.
103	3	History of Modern Elementary Education.....	Jr., sr., grad.	Same as 101 and 102
129-130	6	Educational Classics.....	Jr., sr., grad.	1 or 101-102-103
131-132	6	Comparative School Systems	Jr., sr., grad.	1 or 101-102-103
146	3	History and Principles of Religious Educ.....	Jr., sr., grad.	Same as for 1
148	3	History of Education in the United States.....	Jr., sr., grad.	Same as for 1
211-212-213	6	Seminar in History of Education.....	Grad.	101-102-103 or its equivalent including 6 cr. in Dept. of History.

1. BRIEF COURSE IN HISTORY OF EDUCATION. Current school problems and educational theories in the light of their history. Emphasis upon secondary education and those aspects of education of most immediate concern to high-school teachers.

101. FOUNDATIONS OF MODERN EDUCATION. Historical analysis and interpretation of the more important elements in modern education derived from the Hebrews, Greeks, Romans, Middle Ages, and Renaissance.

102. HISTORY OF MODERN SECONDARY AND HIGHER EDUCATION. A survey of existing types of American and European secondary and higher schools, followed by a historical study of their origin, aims, growth.

103. HISTORY OF MODERN ELEMENTARY EDUCATION. The institutions, theories, and problems of modern elementary education in the light of their history. Emphasis upon the rise of state systems and upon the history of modern educational reform.

129-130. EDUCATIONAL CLASSICS. An intensive study of selected writings of educational leaders: first quarter, Plato, Aristotle, Quintilian, Comenius, Locke; second quarter, Rousseau, Pestalozzi, Herbart, Froebel, and Dewey. Students may register for either quarter.

131-132. COMPARATIVE SCHOOL SYSTEMS. A survey of the existing school systems of France, England, Germany, Denmark. Emphasis upon present problems. Special reference to educational conditions in the United States. Students may register for either quarter.

146. HISTORY AND PRINCIPLES OF RELIGIOUS EDUCATION. Influence of religion and religious education as social and spiritual forces among

certain selected types. Principles of education as applied to religious instruction and training.

148. HISTORY OF EDUCATION IN THE UNITED STATES. Evolution of American ideals, institutions, and practices in elementary and secondary education. Emphasis upon movements of the early nineteenth century. Development of state school systems and the rise of the high school.
- 211-212-213. SEMINAR IN HISTORY OF EDUCATION. Historical investigation of educational problems. Designed to train students in methods of historical investigation; problems to be selected somewhat upon the basis of students' interest.

DEPARTMENT OF THEORY AND PRACTICE OF TEACHING

Associate Professor WILFORD S. MILLER.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
11	3	Technique of Teaching.	Jr., sr.	10 credits in Psychology of which 5 may be in Educational Psychol.
15	5	Practice Teaching.	Sr., grad.	See statement
11.		TECHNIQUE OF TEACHING. Types of classroom exercises; preparation of teaching plans; hygiene of instruction; classroom management; the professional ethics of teaching; observation of high-school work.		
15.		PRACTICE TEACHING. Teaching under supervision in the University High School and in the Minneapolis city schools, in the regular secondary school subjects. The course calls for one period daily at the school where the work is assigned.		

ENGLISH, RHETORIC, AND PUBLIC SPEAKING

Chairman for English, ELMER E. STOLL; Chairman for Rhetoric and Public Speaking, JOSEPH M. THOMAS.

Professors CARLETON BROWN,¹ RICHARD BURTON, FREDERICK KLAEBER, ELMER E. STOLL, JOSEPH M. THOMAS; Associate Professors JOSEPH W. BEACH, CECIL A. MOORE, FRANK M. RARIG; Assistant Professors DANIEL FORD, CYRIL A. HERRICK, JAMES T. HILLHOUSE, CHARLES W. NICHOLS, GEORGE N. NORTHRUP, ANNA H. PHELAN, MARTIN B. RUUD, HELEN A. WHITNEY; Professorial Lecturer NATHANIEL E. GRIFFIN; Instructors CECIL C. BEAN, ELIZABETH H. BUCK, ELBRIDGE COLBY, LEWIS B. HESSLER, SIGURD B. HUSTVEDT, ELIZABETH JACKSON, CHARLES F. LINDSLEY, WINSLOW H. LOVELAND, ARIEL MACNAUGHTON, THOMAS R. MATHER, STANLEY RYPINS, EMERSON G. SUTCLIFF, HOWARD T. VIETS; Assistants MARY ELLEN CHASE, GUY L. DIFFENBAUGH, FRANCES KELLEY.

¹ Absent on leave, 1919-20.

REQUIREMENTS OF THE DEPARTMENT

For *B.A. with Honors in English*, the general requirements; thirty-six credits in English, a reading knowledge of French, German, Italian, Greek, or Latin, and a final year's work in seminar for which a sequence shall have been specially arranged.

For *B.A. with Honors in Rhetoric*, the general requirements; a reading knowledge of either Latin, French, or German; at least twenty-four credits in starred courses in Rhetoric, including Course 201-202-203.

COURSES IN ENGLISH

No.	Credits	Title	Offered to	Prereq. courses
A-B-C	15	Freshman English	All	None
1-2-3 ²	9	General Survey of English Literature	Soph., jr., sr.	Rhet. 1-2-3. See note
4 ³	4	Old English	Jr., sr.	1-2-3. See note
6 ³	4	Chaucer	Jr., sr.	1-2-3. See note
8 ³	4	Shakespeare	Jr., sr.	1-2-3. See note
27	2	History of the English Language	Jr., sr.	1-2-3, 4.
40 ⁴	3	Bible as Literature	Soph., jr., sr.	1-2-3. See note
*51	4	Spenser	Jr., sr.	1-2-3
*53	4	Seventeenth Century Lyrists	Jr., sr.	1-2-3
*54	4	American Literature	Jr., sr.	1-2-3
*58-59	6†	Nineteenth Century Prose	Jr., sr.	1-2-3
*64	4	Bacon	Jr., sr.	1-2-3
*66	4	English Novel	Jr., sr.	1-2-3
*103	4	Beowulf	Jr., sr., grad.	1-2-3, 4, and from credits below 10.
*105-106	6†	Eighteenth Century Poetry	Jr., sr., grad.	1-2-3, and eight credits in courses below 10.
*110	4	Romantic Movement	Sr., grad.	1-2-3, and eight credits in courses below 10.
*111-112	6†	Seventeenth Century Prose	Sr., grad.	1-2-3, and eight credits in courses below 10.
*129	4	Modern Drama	Sr., grad.	1-2-3, 8, and four credits in courses below 10.
*136 ⁴	4	Advanced Shakespeare	Jr., sr., grad.	1-2-3, 8, and four credits in courses below 10. See note.
*140 ⁶	4	Advanced Chaucer	Jr., sr., grad.	1-2-3, 6, and four credits in courses below 10. See note.
*141-142-143	6†	Historical Grammar of Eng. Language	Sr., grad.	1-2-3, 4, and four credits in courses below 10.
*146-147	6†	Metrical Romances	Jr., sr., grad.	1-2-3, 6, and four credits in courses below 10.

† This course must be completed in order to secure credit for any quarter.

² This course will not be given after 1919-20.

³ These courses may be taken at the same time with English 1-2-3.

⁴ This course may be taken at the same time with Eng. 1.

⁵ Students receiving grade of B in English 8 may enter this course without the other prerequisites.

⁶ Students receiving grade of B in English 6 may enter this course without the other prerequisites.

COURSES IN RHETORIC

No.	Credits	Title	Offered to	Prereq. courses
A-B-C	15	Freshman English	All	None
4-5-6	9	Composition for Technical Students	All	None
11-12-13	9	Exposition, Description, Narration	Soph., jr., sr.	1-2-3, or 4-5-6
15-16-17	9	Exposition and Argument	Soph., jr., sr.	1-2-3, or 4-5-6
31	3	Technical Writing	Soph., jr., sr.	4-5-6
*103-104				
105	9	Studies in Structure and Style	Jr., sr., grad.	11-12-13, or 15-16-17
*107 ¹	4	Imitative Writing	Jr., sr., grad.	See note
*109-110 ¹	6†	Short-Story Writing	Jr., sr., grad.	See note
*111-112				
113	9	Essay Writing	Jr., sr., grad.	11-12-13, or 15-16-17
*119-120-				
121 ²	9	Seminar in Writing	Sr., grad.	See note
*201-202-				
203 ²	9	Graduate Seminar	Sr., grad.	See note

† Both quarters must be completed before credit is given.

¹ Open to those who have taken 11-12-13 or 15-16-17 and have received a grade of A or B in at least two quarters.

² Open with special permission to seniors and graduates. Prerequisites: Courses 1-2-3, 11-12-13, and nine additional credits in Rhetoric.

³ Open to graduates and to seniors taking the Honors Course. Prerequisites: Courses 11-12-13 or 15-16-17 and nine additional credits in Rhet.

COURSES IN PUBLIC SPEAKING

No.	Credits	Title	Offered to	Prereq. courses
41-42-43	9 or 15	General Course in Public Speaking	Soph., jr., sr.	1-2-3, or 4-5-6
*55-56-57	9	Argumentation and Debating	Jr., sr.	41-42-43
*81-82-83	9	Interpretative Reading	Jr., sr.	41-42-43
*85-86-87	9	Advanced Public Speaking	Jr., sr.	41-42-43
*91-92-93 ¹	9	Play Production	Sr.	See note
*97 ²	3	Intercollegiate Debate and Oratory	Jr., sr.	See note

¹ Open to those who have had Public Speaking 41-42-43 and who have taken or are taking English 8.

² Open to juniors and seniors who are awarded places on the intercollegiate debating squad, or are chosen to represent the University in the Northern Oratorical League contest.

COURSES IN ENGLISH

A-B-C. FRESHMAN ENGLISH. The study of the fundamental principles of composition; training in the art of writing; an historical survey of the classics of English literature. THOMAS, Director of the course.

1-2-3. GENERAL SURVEY OF ENGLISH LITERATURE. Lectures, recitations, and assigned readings. Designed to prepare for more minute study of special periods. STOLL, BEACH, MOORE, NORTHROP, GRIFFIN.

4. OLD ENGLISH. The language, with reading of representative selections of Old English prose and poetry. The relation to modern English is particularly emphasized. First quarter, GRIFFIN; third quarter, KLAEBER.

6. CHAUCER. Reading of Tales from the Canterbury collection, with introduction dealing with the grammar and literary forms of fourteenth century English. First quarter, BEACH; second quarter, GRIFFIN.
8. SHAKESPEARE. An introductory study of Shakespeare's development as a poet and dramatist up to *King Lear*, with reading of representative plays. First quarter, STOLL; second quarter, NORTHROP.
27. HISTORY OF THE ENGLISH LANGUAGE. Outlines of the history of the language. Lectures and assigned readings. KLAEBER.
40. THE BIBLE AS LITERATURE. A literary study of the Old Testament with special attention to forms and the critical study of selected readings. BURTON.
- *51. SPENSER. The forms and literary influences in the Elizabethan period illustrated in the poetry of Edmund Spenser, with brief readings from the minor poems and extended study of *The Faerie Queene*. STOLL.
- *53. SEVENTEENTH CENTURY LYRISTS. The tradition of the Elizabethan lyric traced in the work of the metaphysical and cavalier schools of poetry. NORTHROP.
- *54. AMERICAN LITERATURE. Lectures on American literature, with extensive readings from the principal poets and prose writers of the United States. MOORE.
- *58-59. NINETEENTH CENTURY PROSE. Studies in the more important prose writers of the nineteenth century, with reference to their styles, personalities, opinions, and relations to their period. Readings by students, and essays on approved topics. BEACH.
- *62. MILTON. A special study of Milton, with some consideration of his contemporaries. (Not given in 1919-20.) MOORE.
- *64. BACON. A study of Bacon as an essayist and as a promoter of learning. NORTHROP.
- *65. BROWNING AND TENNYSON. A reading of the representative work of the two major poets of the Victorian era, in order to show their quality and contrasted power. (Not given in 1919-20.) BURTON.
- *66. THE ENGLISH NOVEL. Principles and personalities in the evolution of the English novel. Written reports on selected novels. BURTON.
- *101. INTRODUCTION TO MIDDLE ENGLISH. An outline of Middle English grammar, including the interpretation of selected texts. (Not given in 1919-20.) KLAEBER.

- *103. BEOWULF. An introduction to the Old English poem, with reading of considerable portions of the text. KLAEBER.
- *105-106. EIGHTEENTH CENTURY POETRY. The rise of naturalism and romanticism. Eighteenth century poetry from Pope to Burns, with special reference to the rise and growth of naturalism and romanticism. MOORE.
- *107-108. EIGHTEENTH CENTURY PROSE. Lectures on eighteenth century prose and prose writers; readings by the students and essays on approved topics; special study of fiction and the essay. (Not given in 1919-20.) MOORE.
- *109-110. THE ROMANTIC MOVEMENT. The Romantic school of poets from Wordsworth to Keats and the influence of the French revolution. (Only the second half of this course given in 1919-20.) BEACH.
- *111-112. SEVENTEENTH CENTURY PROSE. General survey of the prose of the century to 1660. Course 3-4 in History is a desirable prerequisite. NORTHROP.
- *123-124. STUDIES IN VICTORIAN NOVELISTS. George Meredith; or in alternate years, Thomas Hardy and Henry James. (Not given in 1919-20.) BEACH.
- *129. MODERN DRAMA. Contemporary drama from 1870 to the present; the new impulse in dramatic literature under the stimulus of latter-day thought. BURTON.
- *133. THE ENGLISH AND SCOTTISH POPULAR BALLADS. The study of a large number of traditional ballads, English and foreign, and the study of ballad style and origins. (Not given in 1919-20.) SROLL.
- *136. ADVANCED SHAKESPEARE. Shakespeare's development traced to the end. A careful analysis of four plays. Problems in the interpretation of Shakespeare's dramatic methods. STOLL.
- *140. ADVANCED CHAUCER. A study of the more important of Chaucer's poems aside from *The Canterbury Tales*, with consideration of critical problems relating to the sources and chronology of Chaucer's work. GRIFFIN.
- *141-142-143. HISTORICAL GRAMMAR OF THE ENGLISH LANGUAGE. This course is identical with Comparative Philology 142-142-143. KLAEBER.
- *145. MEDIEVAL ALLEGORY. A general introduction to the allegory as a type of literature, with special consideration of the more important examples, both religious and secular, in Middle English. (Not given in 1919-20.) BROWN.
- *146-147. THE METRICAL ROMANCES. A study of the more important Middle English romances: designed as an introduction to the great

stories of love and chivalry current in the Middle Ages, particularly those connected with Arthur and the Round Table. GRIFFIN.

COURSES IN RHETORIC

- A-B-C. FRESHMAN ENGLISH. The study of the fundamental principles of composition; training in the art of writing; an historical survey of the classics of English Literature. THOMAS, Director of the course.
- 4-5-6. COMPOSITION FOR TECHNICAL STUDENTS.
- 11-12-13. EXPOSITION, DESCRIPTION, AND NARRATION. Principles and practice; analysis of specimens; short themes and fortnightly essays, with emphasis on planning and amplification; literary criticism, the first quarter; description, the second; and narration, the third. Number in each section limited to twenty. HILLHOUSE, PHELAN, RUUD, WHITNEY, BUCK.
- 15-16-17. EXPOSITION AND ARGUMENT. Exposition during the first quarter, followed by argument. The study of a text and the analysis of specimens, accompanied by weekly essays, and shorter themes. Number in each section limited to twenty. FORD, JACKSON.
31. TECHNICAL WRITING. See program for College of Engineering.
- *100-101. VERSIFICATION. The nature of poetry and a detailed analysis of English meters and the various English verse forms. The theory accompanied by criticism of current poetry and practice in writing verse. (Not given in 1919-20.) NICHOLS.
- *103-104-105. STUDIES IN STRUCTURE AND STYLE. Theory of structure and style; rhetorical analysis of standard English prose; themes based on personal observation, current reading, and investigation; preparation of essays with particular classes of readers in view. FORD.
- *107. IMITATIVE WRITING. The principles of structure, diction, and style, which underlie the work of leading English writers; application of these principles in both imitative and original compositions. THOMAS.
- *109-110. SHORT-STORY WRITING. The technique of the short story accompanied by constructive work in story writing. THOMAS.
- *111-112-113. ESSAY WRITING. Practice in writing didactic, biographical, critical, informal essays. Extended composition. Two essays a semester. Individual aid in gathering of material, planning of papers, and criticism of essays. Analysis of a considerable body of modern essays.
- *115-116-117. DRAMATIC TECHNIQUE. Principles of plotting, characterization, climax, dialogue, and scenario-making. Writing of three plays—two original, one dramatized short story. Required readings, laboratory work, criticisms of local productions. (Not given in 1919-20.)

- *119-120-121. SEMINAR IN WRITING. Open to advanced students who write with facility and who desire personal direction. Criticism of manuscripts submitted. Lectures on fundamental principles of English composition. THOMAS.
- *201-202-203. GRADUATE SEMINAR. (Required of seniors taking the Honors Course.) Lectures, discussions, and reports. Study of critical theory beginning with Plato and Aristotle and emphasizing more important English and French writers. (Not given in 1919-20.) THOMAS.

COURSES IN PUBLIC SPEAKING

Honorable Mention in Public Speaking.—Students who have won honors in debate or oratory, if the department deems them worthy, may receive honorable mention on the commencement program. To be eligible for such distinction a student must (1) have represented his class in the freshman-sophomore debate, or won a place in the freshman-sophomore oratorical contest; (2) have taken part in an intersociety debate; (3) have represented the University in an intercollegiate debate, or won a place in the Pillsbury oratorical contest.

- 41-42-43. A GENERAL COURSE IN PUBLIC SPEAKING. Fundamentals of effective speaking; breathing, voice-production, enunciation, and action; delivery of extracts from the works of well-known writers and speakers; principles underlying speech making applied in both oral and written composition. Each section limited to twenty-five. RARIG, LINDSLEY.
- *55-56-57. ARGUMENTATION AND DEBATING. Analysis, gathering of evidence, briefing. Critical study of models, including Lincoln-Douglas debates. Principles governing persuasive speaking applied in practice debates. Students in extension debating must register for this course to get credit for their work. LINDSLEY.
- *81-82-83. INTERPRETATIVE READING. The interpretation and expression of the various forms of literature, such as the essay, the short story, lyric and narrative poetry, and the drama. RARIG.
- *85-86-87. ADVANCED PUBLIC SPEAKING. The distinctive characteristics of oratorical style; analysis of the styles of representative orators. Written and extemporaneous speeches. Individual criticism and direction. Those desiring to prepare for the Pillsbury contest should register for this course. RARIG.
- *91-92-93. PLAY PRODUCTION. Principles and practice of play production; studies of the various aspects, such as the reading of lines, characterization, action, and stage business, settings, and lighting; the coaching of plays.

- *97. INTERCOLLEGIATE DEBATE AND ORATORY. The question for intercollegiate debate studied and briefed, and frequent practice debates held. RARIG, LINDSLEY.

GEOLOGY AND MINERALOGY

Professors WILLIAM H. EMMONS, Chairman; CLINTON R. STAUFFER, FRANK F. GROUT; Assistant Professors CHESSLEY J. POSEY, A. WALFRED JOHNSTON, THOMAS M. BRODERICK; Instructor CARL O. DUNBAR.

REQUIREMENTS OF THE DEPARTMENT

For B.A. with Honors, Courses 11, 29, 105, 111, 124, and a field course; and fifteen credits selected from the following courses:

57, 58, 59, 107, 108, 109 in Paleontology
 106, 131, 132, 133, 140, 141, 166, 167 in Petrology
 61, 65, 106, 112, 113, 137, 166, 167 in Mineralogy
 112, 113, 125, 137, 140, 141, 144, 145, 166, 167 in Economic Geology
 36, 37, 39, 116, 118, 119 in Geography

COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2	10†	General Geology	Soph., jr., sr.	None
*5-6	6†	Economic Geology	Jr., sr.	2
7-8	2	General Geology Laboratory.	Soph., jr., sr.	Supports 1-2
*11-12-13	9	Index Fossils of North America	Jr., sr.	2
15	1	Minerals and Rocks	Jr., sr.	1 or 29
19	5	Elements of Paleontology	Soph., jr., sr.	1
21-2	10†	Essentials of Mineralogy	Soph., jr., sr.	Some course in chemistry
23-4-5	9†	Elements of Mineralogy	Soph., jr., sr.	Some course in chemistry
27	1	Outlines of Mineralogy	Jr., sr.	None
29	5	General Physiography	Soph., jr., sr.	None
30	5	Principles of Geography	Soph., jr., sr.	None; 1 or 29 desirable
34	3	Meteorology	Soph., jr., sr.	1 or 29
*36	3	Geography of North America.	Jr., sr., grad.	9 credits from 1 or 29, 30, 34, 37, 5
37	5	Economic and Commercial Geography	Fr., soph., jr.	None
*39	3	Geographic Influences	Jr., sr.	9 credits from 1 or 29, 30, 34, 37, 5; 36 desirable
*55	3	Teachers' Course in Geography	Jr., sr., grad.	36 or 116 or 118
*57-8-9	9	Paleontology	Jr., sr.	2
*61	3	Physical Mineralogy	Jr., sr.	22 or 25
*65	3	Crystallography	Jr., sr.	22 or 25
*85	6	Field Work in Northern Minnesota	Jr., sr.	2
*101	3	Sedimentation	Jr., sr., grad.	24-25
*105	3	Elements of Rock Study	Jr., sr., grad.	22 or 25
*106	3	Petrography	Jr., sr., grad.	105
*107-8-9	9	Paleontologic Practice	Jr., sr., grad.	59

† All quarters must be completed before credit is given for any one quarter.

No.	Credits	Title	Offered to	Prereq. courses
*111	3	Ore Deposits.....	Sr., grad.	2, 105
*112	3	Advanced Economic Geology	Sr., grad.	111
*113	3	Problems in Ore Deposits....	Sr., grad.	112
*116	3	Geography of South America	Jr., sr., grad.	Same as for 36
*118	3	Geography of Europe.....	Jr., sr., grad.	Same as for 36
*119	3	Geography of Asia.....	Jr., sr., grad.	Same as for 36
*124-5	6	Structural and Metamorphic Geology.....	Sr., grad.	2, 105
*131-2-3	9	Advanced Petrology.....	Jr., sr., grad.	106
*137	3	Testing Economic Minerals..	Jr., sr., grad.	2, 105
*140-1	6	Applied Petrography.....	Jr., sr., grad.	131
*144-5	6	Const. and Inter. of Geologic Maps.....	Jr., sr., grad.	2
*150	10	Field Geology (Black Hills)..	Jr., sr., grad.	See members of Dept.
*151-2-3	9	Advanced General Geology..	Jr., sr., grad.	2
*166-7	6	Mineralogy.....	Sr., grad.	111

- 1-2. GENERAL GEOLOGY. A synoptical treatment of materials of the earth and of geologic processes. Physiographic, dynamic, structural, and historical geology. Lectures, laboratory work, field excursions, map study, and conferences. EMMONS, JOHNSTON, DUNBAR.
4. GEOLOGY OF MINNESOTA. The physical geography and geologic history of Minnesota. The relations of industrial development to geological features, the principles of pre-Cambrian geology as exemplified in Minnesota. (Not offered in 1919-20.) JOHNSTON.
- *5-6. ECONOMIC GEOLOGY. The mineral resources of the United States. The origin, distribution, and uses of the important minerals and mineral fuels. Lectures and field excursions.
- 7-8. GENERAL GEOLOGY LABORATORY. Supplements Course 1-2 with study of rocks and ores, topographic and geologic maps, fossils, and reference reading.
- 11-12-13. INDEX FOSSILS OF NORTH AMERICA. A study of fossils and their uses in correlation. A course intended primarily for mining geologists. STAUFFER.
15. MINERALS AND ROCKS. An outline study of general principles of petrography; classification of minerals and rocks and practice in their identification. GROUT.
19. ELEMENTS OF PALEONTOLOGY. An introduction to the study of fossil organisms. Lectures supplemented by field excursions. STAUFFER.
- 21-22. ESSENTIALS OF MINERALOGY. Crystal systems, morphological, physical, and chemical character of minerals. Occurrence, genesis, and uses of minerals of economic value. Determinative work, blowpipe analysis, sight identification. GROUT, BRODERICK.
- 23-24-25. MINERALOGY. The crystal systems; morphological, physical, and chemical characters of minerals; occurrence, genesis, and uses of

- minerals; classification and description of common minerals; rock minerals, and common rocks. Determinative work in laboratory, blowpipe analysis, sight identification. BRODERICK, GROUT.
27. OUTLINES OF MINERALOGY. A course designed especially for teachers. Methods of identification of minerals, laboratory practice, conferences, reference reading. GROUT.
29. GENERAL PHYSIOGRAPHY. Principles of earth sculpture; physiographic changes in progress, and agencies causing them; hydrography and oceanography; planetary relations; climatology. POSEY.
30. PRINCIPLES OF GEOGRAPHY. A study of the life reactions to the major types of geographic environment; treats of the influence of climate, topography, soil, and mineral resources upon human affairs. POSEY.
34. METEOROLOGY. The properties and phenomena of the atmosphere, including composition, temperature, pressure, and circulation; the work of the Weather Bureau; the major climatic divisions of the earth and their climates. POSEY.
- *36. GEOGRAPHY OF NORTH AMERICA. The regional geography of the United States and Canada; their physiography, climate, natural resources, and people. The utilization and conservation of natural resources emphasized. POSEY.
- 37s. ECONOMIC AND COMMERCIAL GEOGRAPHY. A study of the geographic factors influencing production and trade. Natural resources in their relation to commerce and industry and the major trade routes will be emphasized. POSEY.
- *39. GEOGRAPHIC INFLUENCES. A study of the influence of geographic factors of location, topography, climate, and natural resources upon the economic, social, and political development of America. POSEY.
- *55 TEACHERS' COURSE IN GEOGRAPHY. A critical study of the materials and methods of teaching secondary school geography. POSEY.
- *57-8-9. PALEONTOLOGY. A study of fossil forms with special reference to those of geological importance. Faunas and their correlation. STAUFFER.
- *61. PHYSICAL MINERALOGY. The form, optical and physical properties of minerals; expansion and conductivity; pyro-electricity; hardness, percussion, and etch figures; cleavage and gliding planes. BRODERICK.
- *65. CRYSTALLOGRAPHY. Projection and geometric relations of crystal planes; crystal nomenclature; the relation of special properties to morphology. A study of crystal models, crystal drawing, identification of minerals from crystal measurements, and mathematical calculations. BRODERICK.

- *85. **FIELD WORK.** About two weeks in June are spent in geologic mapping of selected areas in the iron districts of Minnesota. Involves preparation of geologic maps and written reports.
- *101. **PRINCIPLES OF SEDIMENTATION.** Origin and structures of sedimentary deposits, with a view to the interpretation of the physical, physiographic, and climatic conditions of deposition, as recorded in the sedimentary rocks of the past. DUNBAR.
- *105. **ELEMENTS OF ROCK STUDY.** The occurrence and genesis of igneous, sedimentary, and metamorphic rocks; their mineral and chemical composition; their structure, texture, and alteration. The classification and description of rocks. GROU, BRODERICK.
- *106. **PETROGRAPHY.** The identification and study of minerals and rocks by optical methods; the study of igneous rocks, crystalline schists, and metamorphic rocks. The origin and classification of rocks. GROU, BRODERICK.
- *107-8-9. **PALEONTOLOGIC PRACTICE.** The collection, preparation, and study of materials, with a view to gaining a working knowledge of groups of fossils and the use of literature. STAUFFER.
- *111. **ORE DEPOSITS.** The nature, distribution, and genesis of ore deposits of the United States; relations of ore deposits to geologic structure; the deformation and superficial alteration of ore deposits. EMMONS.
- *112. **ADVANCED ECONOMIC GEOLOGY.** First part of course treats deposits of metals, giving special attention to those outside of United States. Second half treats the nature, origin, and distribution of petroleum and discusses various oil fields of the world. EMMONS.
- *113. **PROBLEMS IN ORE DEPOSITS.** Field excursions, map work, lectures on field and laboratory methods. EMMONS.
- *116. **GEOGRAPHY OF SOUTH AMERICA.** Regional geography of the South American countries; their geology, topography, climate, natural resources, people. Trade relations between South American countries and the United States given special attention. POSEY.
- *118. **GEOGRAPHY OF EUROPE.** Regional geography of Europe; the geology, topography, climate, natural resources, people, industries, and trade of these countries. POSEY.
- *119. **GEOGRAPHY OF ASIA.** The regional geography of Asia in its physical, economic, commercial, and political aspects. POSEY.
- *124-5. **STRUCTURAL AND METAMORPHIC GEOLOGY.** The conditions, processes, and results of metamorphism; structural features resulting from deformation under varying conditions of load. JOHNSTON.

- *131-2-3. **ADVANCED PETROLOGY.** Advanced optical methods. Criteria for rapid identification of minerals and rocks. The uses of schedules and tables. Standard rock types. Regional and genetic studies. Petrographic reports. GROUPE.
- *137. **TESTING ECONOMIC MINERALS.** Methods of determining quality of mineral deposits, described and illustrated by laboratory tests of coal, oil, building stone, and metallic ores. GROUPE.
- *140-1. **APPLIED PETROGRAPHY.** Determination of ores and gangue minerals. Microscopic studies of paragenesis of ores and other mineral associations. Practical problems in mining and geology, settled by microscopic and optical examinations. GROUPE.
- *144-5. **CONSTRUCTION AND INTERPRETATION OF GEOLOGIC MAPS.** Methods of geological examination; study and problems in construction and interpretation of geologic maps.
- *150. **FIELD GEOLOGY.** Detailed, systematic work conforming with official surveys. Geologic maps, structure sections, reports; paragenesis of ores and their relations to geologic structures. Field for 1920, Black Hills, South Dakota. Reports to be written week before college opens in fall. EMMONS, JOHNSTON.
- *151-2-3. **ADVANCED GENERAL GEOLOGY.** Geologic processes and their results; development of the North American continent. STAUFFER.
- *166-7. **MINERALOGRAPHY.** Methods of studying opaque minerals and the application of the methods to problems in ore genesis and history. BRODERICK.

• GERMAN

Professor CARL SCHLENKER, Chairman; Assistant Professors OSCAR C. BURKHARD, JAMES DAVIES, ALFRED E. KOENIG, SAMUEL KROESCH, WALTER R. MYERS.

REQUIREMENTS OF THE DEPARTMENT

For *B.A. with Honors*, the general requirements; a reading knowledge of one other foreign language. In the junior year Courses 65, 66, 67, 56, 57, 58; in the senior year at least two courses numbered between 100 and 300, with total of 18 credits, or more; and the special thesis to be completed under the instructor in charge of either of the latter courses.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
1	5	Beginning.....	All	None
2	5	Beginning, Intermediate.....	All	1 or 1 yr. prep. German
3	5	Beginning, Advanced.....	All	2

No.	Credits	Title	Offered to	Prereq. courses
4-5-6	9†	Beginning, Chemists.....	Chemists	None
7	3	Intermediate, Chemists.....	Chemists only	6 or 1 yr. prep. German
9	3	Prose and Poetry.....	All	Old No. 8 See note below
10	5	Rapid Reading.....	All	3
11	5	Advanced Rapid Reading....	All	10
12	5	Narrative Prose.....	All	2 yrs. prep. German
13	5	Advanced Narrative Prose...	All or 3 years prep. German	12 or Old No. 7. See note below
14	5	Prose and Poetry.....	All	13 or 4 yrs. prep. German
15	4	Narrative Prose for Chemists and Pre-medics.....		2 yrs. prep. German
25-26	6†	Elementary Scientific.....	Chemists	7
28-29	6†	Adv. Chemical German.....	Chemists	15
31-32	6†	Medical German.....	Premedics	10 or 12
40-41	6†	Commercial German.....	All	10 or 13
*50-51-52	3†	Composition.....	Soph., jr., sr.	11 or 14
*53-54-55	3†	Conversation.....	Soph., jr., sr.	See note below. 11 or 14
*56-57-58	6†	Essay Writings.....	Jr., sr.	See note below. 52
*59-60-61	6†	Oral Diction.....	Jr., sr.	55
*62	3	German Comedies.....	Soph., jr., sr.	11 or 14. See note below
*63	3	Modern Drama.....	Soph., jr., sr.	11 or 14. See note below
*64	3	Classic Drama.....	Soph., jr., sr.	62 or 63
*65	3	Survey through Reformation	Jr., sr.	6 starred credits
*66	3	Survey 18th Century.....	Jr., sr.	3 starred credits. See note below.
*67	3	Survey 19th Century.....	Jr., sr.	3 starred credits. See note below.
*71	3	Teachers' Course.....	Jr., sr.	52 and 55 or 6 starred credits
*72-73	6	Drama since 1880.....	Jr., sr.....	9 starred credits
*77	3	Faust, Part I.....	Jr., sr.	6 starred credits. See note below
*100-1-2	9†	Middle High German.....	Sr., grad.	9 starred credits
*103	3	Phonetics.....	Sr., grad.	9 starred credits in mod- ern langs.
*104-5-6	9†	History of the German Lan- guage.....	Sr., grad.	9 starred credits
*126-7-8	9†	Grillparzer.....	Sr., grad.	9 starred credits
*150-1-2	9†	Novelle.....	Sr., grad.	9 starred credits
*160-1-2	9†	Lyric.....	Sr., grad.	9 starred credits
*225-6-7	9†	Literary Problems.....	Grad. Honors	

† All quarters must be completed before credit is given.

NOTE: Adjustments permitted, for the year 1919-20 only, on account of the changes in the curriculum.

Students with credit for Course 7-8-9 (old numbering), Prose and Poetry, may register for Courses 62, 63, 64.

Students with credit for Course 10-11-12 (old numbering), Drama, may register for Courses 65, 66, 77. They must not register for Courses 62, 63, 64.

Students with credit for Course 24-5-6 (old numbering), Elementary Composition, may register for Course 50-1-2.

Students with credit for Course 27-8-9 (old numbering), Elementary Conversation may register for Course 53-4-5.

Students with credit for the first quarter only of Course 7-8-9 (old numbering) should register for Course 13 to obtain the year's credit.

Students with credit for two quarters of Course 7-8-9 (old numbering) must register for Course 9 to complete credit.

SEQUENCES

For Pre-medics

Without entrance German	Courses 1, 2, 3, 10, 31-32.
With one year entrance German	Courses 2, 3, 10, 31-32.
With two years entrance German	Courses 12, 31-32.

For Chemists

Without entrance German	Courses 4-5-6, 7, 25-26.
With one year entrance German	Courses 7, 25-26.
With two years entrance German	Courses 15, 28-29.

For Business

Without entrance German	Courses 1, 2, 3, 10, 40-41.
With one year entrance German	Courses 2, 3, 10, 40-41.
With two years entrance German	Courses 12, 13, 40-41.

For Teachers' Certificate.—Minor Recommendation. Courses 50-1-2, 53-4-5, 71. Major Recommendation, Courses 50-1-2, 53-4-5, 71, 66, 67, 56-7-8 and three other starred credits.

1. BEGINNING. Pronunciation, conversation, grammar and composition; selected readings in easy prose and verse. MYERS.
2. BEGINNING, INTERMEDIATE. Continuation of Course 1. KROESCH, MYERS.
3. BEGINNING, ADVANCED. Selected texts from modern writers. SCHLENKER, KROESCH.
- 4-5-6. BEGINNING FOR CHEMISTS. Pronunciation, conversation, grammar and composition; selected readings in easy prose. DAVIES, KOENIG.
7. INTERMEDIATE FOR CHEMISTS. Continuation of Course 4-5-6. DAVIES.
9. PROSE AND POETRY. Selected reading texts from modern writers; lyrics and ballads. Offered to those who were unable to complete Course 7-8-9, in 1918-19. Offered only for the first quarter, 1919-20.
10. RAPID READING. Modern narrative prose. SCHLENKER, KROESCH.
11. ADVANCED RAPID READING. Continuation of Course 10. Selected dramas from the eighteenth and nineteenth centuries. KROESCH.
12. NARRATIVE PROSE. Reading texts selected from modern prose writers. Grammar review and composition. DAVIES.
13. ADVANCED NARRATIVE PROSE. Continuation of Course 12. DAVIES, KOENIG.
14. PROSE AND POETRY. Narrative readings and selected poetry. Composition.
15. NARRATIVE PROSE FOR CHEMISTS AND PRE-MEDICS. Reading, grammar review. DAVIES, KOENIG.

- 25-26. **ELEMENTARY SCIENTIFIC.** For chemists. Reading from simple expository. German. Selections from works on chemistry. DAVIES.
- 28-29. **ADVANCED CHEMICAL GERMAN.** Selections from more difficult works on chemistry. MYERS.
- 31-32. **MEDICAL GERMAN.** Readings from general works on physiology, anatomy, and bacteriology. BURKHARD.
- 40-41. **COMMERCIAL GERMAN.** Vocabulary of commerce, business forms; reading of texts on economics. BURKHARD.
- *50-51-52. **COMPOSITION.** Aims to develop grammatical correctness. Translations from English selections. Essay writing on assigned subjects. MYERS.
- *53-54-55. **CONVERSATION.** Aims to develop ease and correctness of oral expression. Organized on the laboratory basis—one hour credit with two hours of recitation and one hour of outside reading. MYERS.
- *56-57-58. **ESSAY WRITING.** Discussion of the principles of structure and style; criticism of essays on assigned subjects. BURKHARD.
- *59-60-61. **ORAL DICTION.** Oral exercises based upon studies in German cultural life; critical analysis of various works of German literature; argumentation and debate. KOENIG.
- *62. **GERMAN COMEDIES.** Reading of the best comedies of the eighteenth and nineteenth centuries. DAVIES, MYERS.
- *63. **MODERN DRAMA.** Plays of modern dramatists, Hauptmann, Sudermann, Fulda, and others. DAVIES.
- *64. **CLASSIC DRAMA.** Plays of Lessing, Goethe, and Schiller. DAVIES.
- *65. **SURVEY OF GERMAN LITERATURE THROUGH THE REFORMATION PERIOD.** Lectures, assigned readings, reports. BURKHARD.
- *66. **SURVEY OF GERMAN LITERATURE OF THE EIGHTEENTH CENTURY.** Lectures, assigned readings, reports. BURKHARD.
- *67. **SURVEY OF GERMAN LITERATURE OF THE NINETEENTH CENTURY.** Lectures, assigned readings, reports. BURKHARD.
- *71. **TEACHERS' COURSE.** Lectures, readings, and reports; observation of classes.
- *72-73. **DRAMA SINCE 1880.** Assigned readings, reports; occasional lectures. SCHLENKER.
- *77. **GOETHE'S FAUST, PART I.** Reading and interpretation of the text; genesis of the work; the Faust legends, Faust books, puppet plays, Marlow's *Faustus*. SCHLENKER.

- *100-101-102. MIDDLE HIGH GERMAN. Phonology, morphology, and syntax. Translation into the modern German. *Der arme Heinrich, Das Nibelungenlied*, selected poems of Walther. KROESCH.
- *103. PHONETICS. A study of speech sounds, and the nature of their production with special reference to English, French, and German. Open to students of the modern languages. KROESCH.
- *104-105-106. HISTORY OF THE GERMAN LANGUAGE. Lectures, discussions, assigned readings. This course is identical with Comparative Philology. KLAEBER.
- *107. HISTORICAL GERMAN GRAMMAR. Phonology, inflection, word formation, syntax. Intended primarily for prospective teachers of German. (Not offered in 1919-20.) KROESCH.
- *120. DRAMA OF KLEIST. In addition to the study of the technique especial attention is given to the subjective character of Kleist's works. (Not offered in 1919-20.) MYERS.
- *121-122. DRAMA OF HEBBEL. Hebbel's development of the dramatic theory. (Not offered in 1919-20.) MYERS.
- *123-124-125. DRAMA OF SCHILLER. A study of Schiller's development in theory and technique of the drama from the Storm and Stress to the Classic Period. (Not offered in 1919-20.) MYERS.
- *126-127-128. GRILLPARZER AND THE AUSTRIAN SCHOOL. An intensive study of the works of Grillparzer and one other Austrian dramatist. MYERS.
- *150-151-152. DIE NOVELLE. A study of the technique and development. Assigned readings and reports. BURKHARD.
- *153-154-155. ASPECTS OF GERMAN LITERATURE OF THE NINETEENTH CENTURY. The subject of the course will be announced from year to year. Subject for 1920-21: the development of realism in the nineteenth century. (Not offered in 1919-20.) BURKHARD.
- *160-161-162. LYRIC POETRY OF THE EIGHTEENTH AND NINETEENTH CENTURIES. Historical review of the best lyric poetry and chief writers. DAVIES.
- *225-226-227. LITERARY PROBLEMS. Subject for 1919-20; romanticism in German literature. SCHLENKER.

GREEK

Professor CHARLES ALBERT SAVAGE.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2-3	15†	First-Year Greek	All	None
4-5-6	10 or 15	History and Epic Poetry	All	1-2-3
*51	3	Philosophy	Jr., sr.	4-5, or 4-6, or 5-6
*52	3	Oratory	Jr., sr.	4-5, or 4-6, or 5-6
*53	3	Dramatic Poetry	Jr., sr.	51, or 52
*101	3	Lyric Poetry	Sr., grad.	51 and 53, or 52 and 53
*102	3	Advanced Drama	Sr., grad.	53 or 101
*103	3 ¹	Advanced Epic Poetry	Sr., grad.	101 or 102
*104	3 ¹	New Testament	Jr., sr., grad.	51 and 52
<i>Courses open to all. No knowledge of Greek required.</i>				
59	2	Architecture	Jr., sr.	None
60	2	Sculpture	Jr., sr.	None
61	2	Drama	Jr., sr.	None
62	2	Literature and Life	Jr., sr.	None
63	2	Mythology	Jr., sr.	None

† All quarters must be completed before credit is given for any one quarter.

¹ Courses 103 and 104 are offered alternately.

1-2-3. FIRST-YEAR GREEK. General principles, inflections, word-formations, syntax, elementary readings, composition. SAVAGE.

4-5-6. HISTORY AND EPIC POETRY. First quarter, selections from Xenophon's *Anabasis*, or from other historical prose; second quarter, selections from Herodotus; third quarter, selections from the *Iliad*; syntax, irregular verbs, dialectical forms; two quarters to be completed before credit is given. SAVAGE.

*51. PHILOSOPHY. Plato's *Apology*, and selections from other dialogues of Plato, or from Xenophon's *Memorabilia*. SAVAGE.

*52. ORATORY. Selections from Lysias and Demosthenes; lectures on Greek oratory. SAVAGE.

*53. DRAMATIC POETRY. One play of Euripides. Introductory course in the drama. Special attention given to mythology and literary style. SAVAGE.

*101. LYRIC POETRY. Selections from the elegiac, iambic, lyric, and bucolic poets. SAVAGE.

*102. ADVANCED DRAMA. Aeschylus, Sophocles, or Aristophanes. Special attention given to the development of the drama, and to the literary form and dramatic representation of the plays read. SAVAGE.

*103. ADVANCED EPIC POETRY. A course of rapid readings in the *Iliad* or the *Odyssey*. The object of this course is to secure as intimate an acquaintance as possible, at first hand, with Homer. SAVAGE.

*104. THE NEW TESTAMENT. Especially intended for those who are preparing for the ministry, or for some other form of religious work. Alternates with 103. SAVAGE.

COURSES OPEN TO ALL. NO KNOWLEDGE OF GREEK REQUIRED

59. GREEK ARCHITECTURE. Textbook work and illustrated lectures on Greek architecture from earliest times; stereopticon views of temples, theaters, houses, altars, tombs, and other monuments; discussion of such topics as decoration, principles of proportion, and architectural style. SAVAGE.
60. GREEK SCULPTURE. The development of Greek sculpture from its beginnings will be traced; famous statues, friezes, and reliefs will be shown and described; the personalities of the great sculptors, and their special contributions to art, will be considered. SAVAGE.
61. GREEK DRAMA. The reading and interpretation of representative Greek plays; lectures dealing with the origin, growth, character, and influence of the Greek drama; special stereopticon illustrations. Students taking this course may not receive credit for Course 62. SAVAGE.
62. GREEK LITERATURE AND LIFE. Lectures, textbook work, illustrative and assigned readings; special lectures illustrated by stereopticon views. Recommended to those who intend to teach Greek, Latin, English, or ancient history. SAVAGE.
63. GREEK MYTHOLOGY. Lectures, textbook work, and illustrative readings, supplemented by occasional stereopticon views. Recommended to those specializing in languages, literature, or philosophy. SAVAGE.

HISTORY

Professors GUY S. FORD, Chairman; ALBERT B. WHITE, WALLACE NOTE-STEIN, WILLIAM S. DAVIS; Professor of Economic History NORMAN S. B. GRAS; Associate Professors AUGUST C. KREY, SOLON J. BUCK; Assistant Professors LESTER B. SHIPPEE, MASON W. TYLER; Instructor GEORGE M. STEPHENSON.

For B.A. with Honors, see general statement.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2	10	The Modern World, 1648-1918	All	None
3-4	10	English History, 1066 to Present.....	All	None
5-6	10	American History.....	Soph., jr., sr.	10 cr.
7-8	10	English History, 1815-1918..	Soph., jr., sr.	10 cr.
9-10	10	Introd. to Economic History..	Soph., jr., sr.	10 cr.
11-12-13	9	Medieval History.....	See statement	None
14	5	Europe, 1100-1648.....	Soph., jr., sr.	Hist. 1-2
*56	3	Teachers' Course.....	Seniors	See statement
*61	5	Recent American History....	Jr., sr.	15 cr. including 5-6
*71	5	Outlines of Greek History...	Jr., sr.	15 cr.
*101	3	French Revolution.....	Jr., sr., grad.	15 cr.
*103	5	Near East, Old Orient.....	Jr., sr., grad.	15 cr.
*104	5	Near East, Modern.....	Jr., sr., grad.	15 cr.

No.	Credits	Title	Offered to	Prereq. courses
*105	3	Military History	See statement	
*107-8	8	Europe, 1848-1914.	Jr., sr., grad.	15 cr.
*111	5	European Background of American Immigration	Jr., sr., grad.	15 cr.
*112	5	History of American Immi- gration.	Jr., sr., grad.	15 cr.
*115-6-7	9	Economic History, 1300-1750	Jr., sr., grad.	See statement
*121-2	6	English Backgrounds of American History	Jr., sr., grad.	15 cr. or 10 cr. and Pol. Sci. 1
*125 ¹				
(Pol. Sci.)	5	American Diplomatic History	Jr., sr., grad.	10 cr. in Pol. Sci. or Hist.
*133-4-5	9	Ancient Civilization	Jr., sr., grad.	See statement
*141	3	The West to 1815	Jr., sr., grad.	15 cr. including 5-6
*142	3	The West, 1815-1865.	Jr., sr., grad.	15 cr. including 5-6
*153	5	The West since 1865.	Sr., grad.	20 cr. including 5-6
*155	5	The United States, 1850-1865	Sr., grad.	20 cr. (inc. 5-6)
*157-8	10	Selected Topics Modern Euro- pean Hist.	Sr., grad.	See statement
*162-3-4	9	Selected Topics Medieval His- tory	Sr., grad.	See statement
*177	5	Anglo-German Relations	Sr., grad.	20 credits
*183	5	Stuart Period	Sr., grad.	20 cr. (inc. 3-4)

¹ Offered also in the Dept. of Pol. Sci.

- 1-2. THE MODERN WORLD, 1648-1918. An historical survey of the last three centuries dealing chiefly with those political, social, and economic movements which have combined to create the present-day world. FORD, KREY, TYLER.
- 3-4. ENGLISH HISTORY, 1066 TO THE PRESENT. General political history of England since the Norman Conquest, with special reference to development of governmental institutions. Serves as an introduction to further work in English history, literature, and politics, and to American history. NOTESTEIN, WHITE.
- 5-6. AMERICAN HISTORY. A general survey of the national period of American history, with a brief consideration of the revolutionary period as an introduction. If possible, Political Science 1 should accompany or follow this course. Prerequisite, History 1-2 or 3-4. SHIPPEE.
- 7-8. ENGLISH HISTORY, 1815-19. Assigned readings and lectures. Emphasis placed upon party history, the colonies, foreign relations, the social-democratic movement, and especially British foreign policy preceding the Great War. Prerequisite, 10 credits. NOTESTEIN.
- 9-10. INTRODUCTION TO ECONOMIC HISTORY, with special emphasis on the United States. Lectures and section work. A general survey of the development of agriculture, manufacture, transportation, storage, and the exchange of goods; economic crises; land, capital, management, and labor; the interplay of economic and political forces. Prerequisite, History 1-2 or 3-4. GRAS, DICKINSON, et al.

- 11-2-3. **MEDIEVAL HISTORY THROUGH THE REFORMATION.** Development of Europe from the fall of the Roman Empire in the West with special reference to social, intellectual, and artistic movements of the period. Open only to students of Schools of Music and Architecture. KREY.
14. **EUROPE, 1100 TO 1648.** The middle period of European history including the later Middle Ages, Renaissance, Reformation, and Religious Wars. Prerequisites History 1-2. KREY.
- *56. **THE TEACHING OF HISTORY AND GOVERNMENT.** Open only to those students who have at least eighteen credits in History. Practical problems of teaching history and government in the secondary schools. KREY, et al.
- *61. **RECENT AMERICAN HISTORY.** A study of American development from 1876 to the present time. Particular attention is paid to the economic, social, and international aspects of the period. Prerequisites, 15 credits including 5-6. SHIPPEE.
- *71. **OUTLINES OF GREEK HISTORY.** Emphasis upon those phases of Greek history contributing most to development of later civilization and national life. Especial attention to Sparta, Athenian Constitution, Persian Wars, conquests of Alexander. Prerequisites, 15 credits. DAVIS.
- *72. **OUTLINES OF ROMAN HISTORY.** Roman institutions which became permanent and affected later history. Conquest of Mediterranean world by Rome, founding of the Empire; early Empire also examined. Useful to prospective teachers in ancient history. Prerequisite, 15 credits. (Not offered in 1919-20.) DAVIS.
- *81-2-3. **ECONOMIC HISTORY OF EUROPE AND THE UNITED STATES, 1750 to the present.** Graduates taking this course will do some special work. (Not offered in 1919-20.)
- *101. **THE FRENCH REVOLUTION.** French conditions in the eighteenth century before 1774; events between 1774 and 1789 which precipitated revolution in France; reform work of the early revolution. Prerequisite, 15 credits. Reading knowledge of French desirable. FORD.
- *103. **THE NEAR EAST, OLD ORIENT.** Origin of Egyptians, Babylonians, Assyrians, and Persians, and main features of their political history and civilization. History of the Hebrews discussed so far as it bears upon general oriental problems. Prerequisite, 15 credits. DAVIS.
- *104. **THE NEAR EAST, MODERN.** Turkey, the Balkan States, and European diplomacy in the East since 1453, with special reference to the causes of the War of 1914. Prerequisite, 15 credits. DAVIS.
- *105. **MILITARY HISTORY.** Survey of the history of the art of war with especial reference to the history and politics of the United States

and their bearing upon present-day problems. Some study of the "Great War" will be attempted. Open to juniors and seniors, members of R. O. T. C. Others admitted only by consent of instructor. DAVIS.

- *107-8. EUROPE, 1848-1914. The development of Europe in its various phases—political, social, and economic—from the Revolution of 1848 to the outbreak of the War of 1914. Prerequisite, 15 credits. A reading knowledge of French or German will be helpful. TYLER.
- *111. EUROPEAN BACKGROUND OF AMERICAN IMMIGRATION. The history of the movement of population from Europe to America, with especial emphasis on the political, economic, social, and religious forces. Prerequisite, 15 credits. STEPHENSON.
- *112. HISTORY OF AMERICAN IMMIGRATION. Settlement, development, and Americanization of typical racial stocks, in America; chapter in history of American society. Contributions of European immigrants to American life; their social, political, and religious activity; their reaction to American conditions, etc. Prerequisite, 15 credits. STEPHENSON.
- *115-6-7. ECONOMIC HISTORY OF EUROPE, 1300-1750. The chief interests are the manor, the town, the metropolis; national economic regulation; developments in agriculture, commerce, manufacture, and economic thought, leading up to the Industrial Revolution. Prerequisite, 15 credits in history or economics, or history and economics combined. GRAS.
- *121-2. ENGLISH BACKGROUNDS AND THE AMERICAN COLONIES. Studies in the transfer of English civilization, and its early modifications and development in America. Some account taken of the contrasting French settlements. Prerequisite, 15 credits in history or 10 credits in history and 5 credits in American Government. WHITE.
- *125. (Pol. Sci.) AMERICAN DIPLOMATIC HISTORY. Attention to the principles and policies guiding American diplomacy in its stages of development as well as to the methods pursued and the personality of American diplomats. Prerequisites, 10 credits in Political Science or History 5-6. WRIGHT.
- *133-4-5. ANCIENT CIVILIZATION. First quarter, Greece; second quarter, Rome. Social and intellectual life of antiquity. A working knowledge of the political history assumed. Prerequisites, eighteen credits in History, or a major in Greek or Latin and six credits in History. DAVIS.
- *137. ENGLISH CONSTITUTIONAL HISTORY. Origin and early development of the English government, with emphasis upon judicial institutions. (Not offered in 1919-20.) WHITE.

- *141. THE WEST IN AMERICAN HISTORY TO 1815. The westward movement of population and civilization; its political, economic, and social aspects; effects upon national development. Prerequisites, 15 credits including 5-6. BUCK.
- *142. THE WEST IN AMERICAN HISTORY, 1815-65. The settlement of the Mississippi Valley, and the beginnings of Pacific coast expansion; significance in general American development. This course, while offered separately, follows, and is calculated to form a natural sequence to History 141. Prerequisites, 15 credits, including 5-6. SHIPPEE.
- *144-5. HISTORY OF MINNESOTA. The settlement and development—political, economic, and social—of a typical American commonwealth. (Not offered in 1919-20.) BUCK.
- *153. THE WEST IN AMERICAN POLITICS SINCE 1865. An intensive study of independent parties and radical or progressive political movements. Prerequisite, History 5-6. BUCK.
- *155. THE UNITED STATES, 1850-1865. An intensive study of the period beginning with the Compromise of 1850 and extending through the Civil War; consideration of social and economic questions as well as political issues. SHIPPEE.
- *156. THE RECONSTRUCTION PERIOD. An intensive study of the period after the close of the Civil War. This course follows History 155 as a natural sequence. (Not offered in 1919-20.) SHIPPEE.
- *157-8. SELECTED TOPICS IN NINETEENTH CENTURY HISTORY. A detailed study of selected topics in the history of the nineteenth century. Discussion based on a wide range of reading. Prerequisites, 20 credits including History 107-8 or Pol. Sci. 131-3. A reading knowledge of French or German will be required. FORD, TYLER.
- *162-3-4. STUDIES IN THE TWELFTH AND THIRTEENTH CENTURIES, the problems centering mainly in the beginnings of Parliament and the Crusades. Prerequisites: eighteen credits in History, and, for the language requirements, the approval of the instructors. WHITE, KREY.
- *177. ANGLO-GERMAN RELATIONS, 1900-1914. Prerequisite, 18 credits. NOTESTEIN.
- *183. THE STUART PERIOD. Emphasizes selected problems connected with the Long Parliament. Prerequisites, 18 credits including 3-4. NOTESTEIN.
- *201-2-3. HISTORICAL BIBLIOGRAPHY AND CRITICISM. Required of candidates for advanced degrees in History who do not present evidence of similar training elsewhere. FORD, WHITE, et al.

*205-6-7. SEMINAR IN ECONOMIC HISTORY. Some limited field or single topic in American or English economic history. Intended primarily as a training course in the methods and problems of economic history. GRAS.

*208-9-10. SEMINAR IN AMERICAN HISTORY. GRAS, BUCK, SHIPPEE.

HOME ECONOMICS

Professor MILDRED WEIGLEY, Chief; Associate Professors HARRIET GOLDSTEIN, MARION WELER; Assistant Professors ALMA BINZEL, AMY P. MORSE, E. MAUD PATCHIN, ELIZABETH VERMILYE; Lecturer in Hygiene MARTHA B. MOORHEAD; Instructors CARLOTTA M. BROWN, HALLY J. FISHER, VETTA GOLDSTEIN, RUTH LINDQUIST, MABEL C. McDOWELL, MARGARET K. MUMFORD, ETHEL L. PHELPS, LAVINIA STINSON.

COURSES

No.	Credits	Title	Offered to	Prerequisites
3	5	Textiles.....	All	None
3	3	Textiles.....	All	None
11	3	Garment Making.....	All	None
13	5	Dressmaking.....	Soph., jr., sr.	1, 11
23	5	Foods and Cookery.....	Soph., jr., sr.	Biol. 9, 10; Chem. 3, or equiv. parallel
23	3	Foods and Cookery.....	Soph., jr., sr.	Biol. 9, 10; Chem. 3, or equiv. parallel
37	3	Home Care of the Sick.....	Jr.	Chem. 3, 7 or 21; Bact. 58
34	3	Home Management: Operation and Maintenance.....	Jr., sr.	Economics
51	3	Drawing and Design.....	All	None
52	3	Art History and Appreciation.....	Jr., sr.	51
53	3	Advanced Design.....	Soph., jr., sr.	51
32	5	Home Equipment.....	Jr., sr.	53
123	5	Clothing Economics.....	Sr., grad.	13, Econ.
17		Advanced Clothing Construction.....		13, Econ.
22	5	Food Economics.....	Soph., jr., sr.	21 or 23
70 (Course I)		Food Preparation in Relation to Social Work.....	(Jr., sr.) ¹	General Zoology General Chemistry desired
71 (Course I)		Elementary Dietetics for the Social Worker.....	(Jr., sr.) ¹	Food Preparation (70) General Physiology pre-req. or parallel
72		Home Management Problems for the Social Worker.....	(Jr., sr.) ¹	Courses 70 and 71 Prereq. or parallel General Econ.
40	3	Child Training.....	Sr.	Psychology

¹ Students in Sociology and Americanization by consent of dept.

3. TEXTILES. A study of textile fibers, their structure, properties, and chemical reactions; of fabrics, their structure and processes of manufacture; of art and economic considerations in selection and pur-

- chase of materials for clothing and household furnishing. WELLER, McDOWELL.
11. GARMENT MAKING. Instruction and laboratory practice in hand sewing; in the reading and adaptation of commercial patterns; in the construction and use of the sewing machine; in designing, cutting, and making simple outer garments from washable materials. PHELPS.
 13. DRESSMAKING. Consideration of quality, suitability, and cost of materials adapted to technique involved in construction of simple wool and silk dresses; adaptation of art principles in selection of designs; instruction and practice in methods of construction. PHELPS.
 23. FOODS AND COOKERY. A course following the same general outline as 21a, but including a more detailed study of each topic. STINSON.
 34. HOME MANAGEMENT: OPERATION AND MAINTENANCE. Lectures. The family budget for varying incomes, and for the "Home Management House"; household accounts. VERMILYE, MUMFORD.
 37. HOME CARE OF THE SICK. (a) First aid; communicable diseases; their transmission and prevention; hygiene of infancy, maidenhood, maturity. (b) The care of the sick room; observation and care of the patient; elementary symptomatology. MOORHEAD, FISHER.
 51. DRAWING AND DESIGN. Composition, perspective; principles of design and color harmony applied to live and area designs, dress designs, and interiors. HARRIET AND VETTA GOLDSTEIN.
 52. ART HISTORY AND APPRECIATION. The historical development of art, architecture, decoration, furniture, and costume studied with special emphasis on design and influence upon modern styles. HARRIET AND VETTA GOLDSTEIN.
 53. ADVANCED DESIGN. Problems in design for house furnishings and for costume, including dress modeling. HARRIET AND VETTA GOLDSTEIN.
 32. HOME EQUIPMENT. Problems in house planning, house furnishing and equipment for various sums. Types of domestic architecture; choice of site; floor-plans; building materials; details of construction; heating; ventilating; lighting; plumbing; walls; rugs; furniture; color; hangings; pictures; gardens. MORSE.
 123. CLOTHING ECONOMICS. General consideration of the economic problems in clothing production; woman's responsibility for conditions in textiles and clothing industries; study of budget for clothing and household textiles, hygiene and standardization of dress. WELLER.
 17. ADVANCED CLOTHING CONSTRUCTION. Laboratory course involving the application of principles of costume modeling in the construction of one high grade garment, suit, coat, or dress. One day a week will be given to a millinery problem. WELLER, BROWN.

22. **FOOD ECONOMICS.** Cost and nutritive value of typical foods; the study of dietaries; preparation and serving of meals, the cost bearing a definite relation to the family budget. STINSON, VERMILYE.
70. **FOOD PREPARATION IN RELATION TO SOCIAL WORK.** A study of the principles underlying cookery with special emphasis on the preparation of foods to be used in the homes with limited incomes. LINDQUIST.
71. **ELEMENTARY DIETETICS FOR THE SOCIAL WORKER.** Involves principles underlying adequate feeding. Food habits of different economic and racial groups forming the basis for actual planning and preparation of meals. MUMFORD.
72. **HOME MANAGEMENT PROBLEMS.** Involves the making of sound budgets. Studies are based upon racial groups and the size of the family together with the income. VERMILYE.
40. **CHILD TRAINING.** A course dealing with application of modern science in rearing, training, and educating children. Emphasis is placed on the physical care of the baby; infant feeding; infant diseases; early training; obligation of the home; the obligation of the nation. BINZEL, FISHER.

HUMAN ANATOMY

THE MEDICAL SCHOOL

Professors CLARENCE M. JACKSON, Chairman; JOHN B. JOHNSTON, THOMAS G. LEE, RICHARD E. SCAMMON; Associate Professors CHARLES A. ERDMANN; Assistant Professor ANDREW T. RASMUSSEN.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
5-6	16	Gross Human Anatomy	Jr., sr.	An. Biol. 1-2
*103	8	Human Histology	Jr., sr.	An. Biol. 152-3-4
*107	5	Human Embryology	Jr., sr.	An. Biol. 152-3-4
*111	5	Human Neurology	Jr., sr.	103 and 107 or equivalent
*121	4	Anatomical Technique	Jr., sr.	Permission by instructor
*129-130-131	6	Topographic Anatomy	Jr., sr.	5-6
*133	4	Anatomy of the Fetus and Child	Jr., sr.	5-6 and 107 or equivalent
*134	3	Anatomy of the Newborn	Jr., sr.	133 or equivalent
*135	2	Physical Development of Childhood	Jr., sr.	An. Biol. 1-2
*153-4-5-6	Ar.	Advanced Anatomy	Jr., sr.	Permission by instructor
*160-162-163	Ar.	Seminar in Growth of Children	Jr., sr.	135 or equivalent

NOTE: Since the number of places is limited, students must in all cases before registration obtain the written permission of the instructor in charge of the course.

5. GROSS HUMAN ANATOMY. Dissection, including osteology. A disarticulated skeleton issued to every two students. Every student required to dissect lateral half of the body. JACKSON, ERDMANN, et al.
- *103. HUMAN HISTOLOGY. Microscopic study of the various tissues and organs. SCAMMON, LEE, et al.
- *107. HUMAN EMBRYOLOGY. Development of the human body. Required of third-year medical students. SCAMMON, LEE, et al.
- *111. HUMAN NEUROLOGY. A study of the central nervous system and sense organs. JOHNSTON, RASMUSSEN.
- *121. ANATOMICAL TECHNIQUE. Microtechnique, reconstruction, and museum methods, etc. LEE.
- *129-130-131. TOPOGRAPHIC ANATOMY. Based upon a study of serial cross-sections of the human body. JACKSON.
- *133. ANATOMY OF THE FETUS AND CHILD. A survey of prenatal and postnatal human development. SCAMMON.
- *134. ANATOMY OF THE NEWBORN. A detailed laboratory study of the anatomy of the newborn. SCAMMON.
- *135. PHYSICAL DEVELOPMENT OF CHILDHOOD. Lectures, with study of illustrative material. Primarily for students in Education; open to others by permission. SCAMMON.
- *153-154-155-156. ADVANCED ANATOMY. Advanced work, largely individual in character, in gross anatomy, histology, embryology, or neurology. JACKSON, JOHNSTON, LEE, SCAMMON, or RASMUSSEN.
- *160-162-163. SEMINAR IN GROWTH OF CHILDREN. A study with graphic analysis of data on physical development of children of school age. SCAMMON.

HUMAN PHYSIOLOGY

THE MEDICAL SCHOOL

Professors ELIAS P. LYON, Dean; FREDERICK H. SCOTT; Associate Professors RICHARD OLDING BEARD, JESSE F. MCCLENDON; Assistant Professors FRANCIS B. KINGSBURY, CHAUNCEY J. V. PETTIBONE, M. RUSSEL WILCOX; Instructor ESTHER GREISHEIMER; Assistant CHARLES C. GAULT.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2-3	6	Human Physiology	All	Elem. Biol. and Chem.
4	6	Human Physiology	All	Elem. Biol. and Chem.
6	3	Physiologic Chem.	All	Org. Chem.
*100-101-102	12	Physiologic Chem.	Jr., sr.	Org. Chem.

No.	Credits	Title	Offered to	Prereq. courses
*103	8	Physiol. of Muscle, etc.	Jr., sr.	An. Biol. and Org. Chem.
*104	8	Physiol. of Nerv. Syst., etc.	Jr., sr.	An. Biol. and Org. Chem.
*110	3	Physical Ch. of Vital Phenomena	Jr., sr.	An. Biol. and Org. Chem
*111	3	Electro-Physiology	Jr., sr.	110 or ar
*112	3	Vitamines	Jr., sr.	111 or ar
*113	3 or ar	Problems	Jr., sr.	103 or ar
*131	3	Adv. Physiol. Muscle, etc.	Jr., sr.	103
*132	3	Adv. Physiol. Respiration, etc.	Jr., sr.	104
*137	3	Foods and Practical Dietetics	Jr., sr.	162
*138	2	Physiology of Development	Jr., sr.	103
*153	Ar.	Adv. Physiol. Chem.	Jr., sr.	102
*161	3	Urinalysis	Jr., sr.	102
*162	3	Chem. Analysis Blood	Jr., sr.	102
*163	1½ or 3	Metabolism	Jr., sr.	102
*164	Ar.	Quantitative Methods	Jr., sr.	102

† Both quarters required for credit.

- 1-2-3. HUMAN PHYSIOLOGY AND HYGIENE. A course offered especially to teachers, on Saturday mornings. Lectures, demonstrations, and laboratory. Repeated each quarter. LYON, BEARD, and Assistants.
4. HUMAN PHYSIOLOGY. A course offered to academic, agricultural and dental students. Lectures and laboratory work.
6. PHYSIOLOGIC CHEMISTRY. Brief course. PETTIBONE and Assistants.
- *100-101-2. PHYSIOLOGIC CHEMISTRY. The components of the animal body; foods, digestion, the excreta, and metabolism. KINGSBURY, PETTIBONE and Assistants.
- *103. PHYSIOLOGY OF MUSCLE, NERVE, BLOOD, CIRCULATION, AND DIGESTION. SCOTT, LYON, McCLENDON, and Assistants.
- *104. PHYSIOLOGY OF THE NERVOUS SYSTEM AND SPECIAL SENSES; Respiration, Metabolism, Nutrition, and Excretion. SCOTT, LYON, BEARD, McCLENDON, and Assistants.
- *110. PHYSICAL CHEMISTRY OF VITAL PHENOMENA. Osmotic pressure surface tension, electric conductivity, hydrogen-ion concentration. McCLENDON.
- *111. ELECTRO-PHYSIOLOGY. The bio-electric currents, negative osmose, and further work on hydrogen-ion concentration. McCLENDON.
- *112. VITAMINES. Physico-chemical conditions necessary for the preservation of the vitamins during the storage and cooking and other preparation of foods. McCLENDON.
- *113. PROBLEMS IN PHYSIOLOGY. Arranged by instructors with qualified students. Each student will be assigned a topic for special laboratory study, leading in some cases to original investigation. Conference and reading. LYON, SCOTT, McCLENDON.

- *131. ADVANCED PHYSIOLOGY OF MUSCLE, BLOOD, CIRCULATION, AND DIGESTION. Alterations due to physiological conditions. SCOTT.
- *132. ADVANCED PHYSIOLOGY OF RESPIRATION, EXCRETION, METABOLISM, NERVOUS SYSTEM, AND SENSE ORGANS. Conference and laboratory. SCOTT.
- *137. FOODS AND PRACTICAL DIETETICS. A study of human foods and food values; principles of food selection, balanced rations, etc. BEARD, THOMAS.
- *138. PHYSIOLOGY OF DEVELOPMENT. The physiology of the ovum, embryo, fetus; generative functions; functional characteristics of successive ages. BEARD.
- *153. ADVANCED PHYSIOLOGIC CHEMISTRY. Course arranged by instructors with qualified students for special work. PETTIBONE, KINGSBURY.
- *161. URINALYSIS. Advanced methods. PETTIBONE.
- *162. CHEMICAL ANALYSIS OF BLOOD, including total nitrogen, total non-protein nitrogen, urea, uric acid, creatinine, cholesterol, chloride, sugar, and other constituents. PETTIBONE.
- *163. METABOLISM. Lectures and laboratory work on special phases of metabolism. Lectures may be taken alone; number of students unlimited; laboratory course limited to ten students. PETTIBONE.
- *164. QUANTITATIVE METHODS. The estimation of certain important substances in the urine, blood, and other body fluids. KINGSBURY.

JOURNALISM

Assistant Professor NORMAN J. RADDER.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
13-14	10	Reporting	Soph., jr., sr.	Rhet. 1 yr.
15	3	Advanced Reporting	Soph., jr., sr.	13-14
16-17	6	Copy Reading	Jr., sr.	15
18	3	News Editing	Jr., sr.	16-17

- 13-14. REPORTING. Organization, methods and material in newspaper production; newspaper stories; methods of gathering and writing news; laboratory practice by assignments on University publications. Regular new assignments and weekly conference with the instructor required. RADDER.
- 15. ADVANCED REPORTING. Continuation of Course 13-14 with more extended practice in covering new runs. Students are encouraged to act as correspondents for papers. Weekly conferences with instructor required. RADDER.

- 16-17. COPY READING. Instruction and practice in editing copy, correcting proof, writing headlines, make-up, rewriting, and other details of editing; and in the organization and methods of local, state, and national news gathering. RADDER.
18. NEWS EDITING. Continuation of Course 16-17 with detailed attention to make-up, headline writing. State and national papers will be studied from the point of make-up, balance, and arrangement. RADDER.

LATIN

Professors JOSEPH B. PIKE, Head; JOHN E. GRANRUD.

REQUIREMENTS OF THE DEPARTMENT

For *B.A. with Honors in Latin*, the general requirements and a fair reading knowledge of German or French or Greek. Six credits in Latin each quarter during the junior and senior years are to be selected from Courses 121 to 213. Instead of taking all the work indicated above in Latin, the student may substitute 9 credits in Greek (third-year Greek or above) or nine credits in Greek or Roman History or nine credits in Ancient Philosophy.

COURSES

No.	Credits	Title	Offered to	Prerequisites
1-2	10†	Beginning Latin.....	All	None
3	5	Caesar.....	All	1 yr. Latin or Course 1-2
11	5	Selections.....	All	2 or 3 yrs. Latin or Courses 1-3
12	5	Selections.....	All	2 or 3 yrs. Latin or Courses 1-3
13	5	Selections.....	All	2 or 3 yrs. Latin or Courses 1-3
21	5	Livy.....	All	4 yrs. Latin or any two of Courses 11-13
22	5	Plautus & Terence.....	All	4 yrs. Latin or any two of Courses 11-13
23	5	Horace, Odes.....	All	4 yrs. Latin or any two of Courses 11-13
*51	3	Pliny's Letters.....	Soph., jr., sr.	Any two of Courses 21-33 or an equivalent
*52	3	Apuleius, Short Stories.....	Soph., jr., sr.	Any two of Courses 21-33 or an equivalent
*53	3	Suetonius, Selected Lives....	Soph., jr., sr.	Any two of Courses 21-33 or an equivalent
81	3	Teachers' Course.....	Jr., sr.	Courses 51-53 or an equivalent
*131	3	Ovid.....	Jr., sr., grad.	Any two of Courses 51-53 or an equivalent
*132	3	Seneca's Epistles.....	Jr., sr., grad.	Any two of Courses 51-53 or an equivalent
*123	3	Medieval Latin.....	Jr., sr., grad.	Any two of Courses 51-53 or an equivalent
*133	3	Petronius and Vulgar Latin..	Jr., sr., grad.	Any two of Courses 51-53 or an equivalent

† Both quarters must be completed before credit is given for either one.

- 1-2. BEGINNING LATIN. Ten weeks are spent in mastering inflexions, the remainder of the course is devoted to reading easy Latin prose and the study of elementary syntax.
3. CAESAR. Selections from the Gallic War are read. Elementary Latin composition is taken in connection. Students entering with one year of Latin may select this course.
11. SELECTIONS FROM LATIN AUTHORS. An effort is made to give a general view of Roman life and literature.
12. SELECTIONS FROM LATIN AUTHORS. A continuation of Course 3. Students entering at second quarter with two or three years preparation in Latin may select Course 12.
13. SELECTIONS FROM LATIN AUTHORS. A continuation of Course 3. Students entering at third quarter with two or three years preparation in Latin may select Course 13.
21. LIVY. Selections from Books 1 to 10.
22. PLAUTUS AND TERENCE. One play each of Plautus and Terence with a study of the beginnings of Roman drama. Students entering at second quarter with four years preparation in Latin may select Course 22.
23. HORACE, ODES. Selections from the odes and epodes. Alternates with Course 33.
33. HORACE. SATIRES AND EPISTLES. (Not offered in 1919-20.)
- *51. PLINY'S LETTERS. Selected letters of Pliny the Younger with a study of Roman society in his time.
- *52. APULEIUS, SHORT STORIES. Reading of Apuleius' tales and a study of the Roman novel.
- *53. SUETONIUS. Lives of Tiberius, Caligula, Claudius, and Nero.
81. TEACHERS' COURSE. Selected portions of the Gallic War; the principles of indirect discourse; intermediate composition; discussion of various problems connected with secondary school work in Latin.
- *121. ADVANCED VERGIL. Selections from Books 7-12 of the Aeneid. Alternates with Course 131. (Not offered in 1919-20.)
- *131. OVID. Selections from Ovid's works. Alternates with Course 121.
- *122. CICERO'S LETTERS. (Not offered in 1919-20.)
- *132. SENECA'S EPISTLES. Alternates with Course 122.
- *123. MEDIEVAL LATIN. Selected documents illustrating conflict between church and state in Middle Ages. Selections from history of Franks

by Gregory of Tours. Aims to accustom students to handle medieval Latin easily for historical and literary purposes. (Not offered in 1919-20.)

- *133. PETRONIUS AND VULGAR LATIN. Selections from Petronius and the *Peregrinatio Sanctae Silviæ*. The relation of vulgar to literary Latin will be discussed.
- *201-2-3. ANNALS OF TACITUS. Graduate seminar but open to students who register for honors in Latin. Alternates with Course 211-12-13.
- *211-12-13. LUCRETIUS. Graduate seminar but open to students who register for honors in Latin. (Not offered in 1919-20.)

MATHEMATICS

Associate Professor WILLIAM H. BUSSEY, Chairman; Professors GEORGE N. BAUER,¹ DUNHAM JACKSON; Associate Professor ROYAL R. SHUMWAY; Assistant Professors RALPH M. BARTON, RAYMOND W. BRINK,¹ WILLIAM L. HART, ANTHONY L. UNDERHILL; Instructors MINNA SCHICK, ELLA THORP, CHESTER H. YEATON.

REQUIREMENTS OF THE DEPARTMENT

For B.A. with Honors. See the general requirements, page 23. As a part of his major work the student may take advanced courses in Astronomy and Physics subject to the approval of the Department of Mathematics.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
1	5	Higher Algebra.....	All	1 yr. Elem. Alg.
2 ²	5	College Algebra.....	All	1 or Prep. Higher Alg.
6 ²	5	Trigonometry.....	All	1 or Prep. Higher Alg.
16	5	Solid Geometry.....	All	2 and 6
20	5	Mathematics of Investment..	All	2 and 6
30	5	Analytic Geometry.....	All	2 and 6
*50 ³	5	Calculus I.....	Jr., sr.	30
*51 ³	5	Calculus II.....	Jr., sr.	50
*52 ³	5	Calculus III.....	Jr., sr.	51
*54	5	Teachers' Course.....	Jr., sr.	50
*62-63	6	Theory of Equations.....	Jr., sr.	50
*70	3	History of Elementary Math.	Jr., sr.	30
*71	5	Solid Analytic Geometry....	Jr., sr.	50

² Students who have had Course 1 or high-school higher algebra may take College Algebra first and Trigonometry second, or vice versa. Both are required for subsequent courses in Mathematics.

³ Courses 50, 51, 52 constitute a course in differential and integral calculus in three parts. The course is so arranged that the student may discontinue it at the end of Calculus I or the end of Calculus II, but students who expect to do graduate work in Mathematics, Physics, or Astronomy, ought to finish Calculus III.

¹Absent on leave 1919-20.

No.	Credits	Title	Offered to	Prereq. courses
*102-3-4	9	Adv. Anal. and Synthetic Geometry.....	Jr., sr.	50
*106-7-8	9	Adv. Calculus and Differen- tial Eq.....	Jr., sr.	51

Courses in Functions of a Real Variable, Modern Higher Algebra, The Method of Least Squares, Projective Geometry, and Differential Geometry, listed in the Graduate School Bulletin, are open to properly qualified juniors and seniors. For more information consult the Chairman of the Department of Mathematics.

1. HIGHER ALGEBRA. A review and a collegiate treatment of the topics of elementary algebra for those who have had one year of elementary algebra. Not open to those who presented higher algebra for entrance.
2. COLLEGE ALGEBRA. Quadratic equations, equations in the quadratic form, simultaneous quadratic equations, graphical representation, progressions, mathematical induction, the binomial theorem, permutations, combinations, probability, determinants, and the theory of equations with special reference to graphical methods.
6. TRIGONOMETRY. Logarithms and plane trigonometry.
16. SOLID GEOMETRY. A collegiate treatment of solid and spherical geometry intended primarily for those who did not have the subject in high school and who are planning to specialize in Mathematics. Not open to those who presented Solid Geometry for entrance.
20. THE MATHEMATICS OF INVESTMENT. The first principles of the mathematical theory of interest, annuities, amortization, valuation of bonds, sinking funds and depreciation, etc., with a brief discussion of probability and its application to life annuities and some problems in life insurance.
30. ANALYTIC GEOMETRY. The elements of plane analytic geometry including the geometry of the conic sections, with a brief introduction to solid analytic geometry.
- *50. CALCULUS I. Differential Calculus.
- *51. CALCULUS II. Integral Calculus.
- *52. CALCULUS III. Selected topics in differential and integral calculus with special reference to infinite series, partial differentiation, multiple integrals and applications of the calculus.
- *54. TEACHERS' COURSE. For students preparing to become teachers of secondary school mathematics. Lectures, readings, discussions, methods of presentation, assignments, lesson plans, examinations, plans for beginning courses in elementary algebra and plane geometry. Aims and outcomes of education.

- *62-63. **THEORY OF EQUATIONS.** Cubic and biquadratic equations, the solution of numerical algebraic equations, reciprocal equations and the construction of regular polygons, determinants and symmetric functions with applications to systems of linear equations and the theory of elimination.
- *70. **HISTORY OF ELEMENTARY MATHEMATICS.** A brief course in the history of arithmetic, algebra, and geometry intended primarily for those who are preparing to teach high-school mathematics.
- *71. **SOLID ANALYTIC GEOMETRY.** The analytic geometry of space of three dimensions. It should be taken by those who expect to do graduate work in Mathematics, Physics, or Astronomy.
- *102-3-4. **ADVANCED ANALYTIC AND SYNTHETIC GEOMETRY.** An introduction to modern methods of studying the straight line and the conic; the use of imaginaries in geometry; abridged notation; homogeneous coordinates; contact of conics; envelopes; anharmonic ratio; polar reciprocity; projection; inversion.
- *106-7-8. **ADVANCED CALCULUS AND DIFFERENTIAL EQUATIONS.** Selected topics in advanced differential and integral calculus and a study of the more common types of differential equations with emphasis on applications to geometry, elementary mechanics, and physics.

MILITARY SCIENCE AND TACTICS

Professor FRANK H. BURTON, Colonel, Inf., U.S.A., Chairman; Assistant Professors WEST C. JACOBS, Lieutenant-Colonel, C.A., U.S.A., JERE BAXTER, Major, Inf., U.S.A., ARTHUR E. CLARK, Captain, Inf., U.S.A., ALLEN T. NEWMAN, Captain, Inf., U.S.A., HENRY C. BERTELSEN, 1st Lieutenant, Inf., U.S.A., ERNEST A. NUOFFER, 2nd Lieutenant, Inf., U.S.A.; Instructors JOHN J. BOWENS, FRANK CRAIN, ELDEN R. FOSSEY, JOSEPH HAVLICEK, HERBERT KETTLE, WILLIAM G. PALMS, Sergeants, Inf., U.S.A.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2-3	None	Military Drill.....	Fresh.	None
4-5-6	None	Military Drill.....	Soph.	1 year's drill
7-8-9	6	Military Drill and Science... ..	Jr.	2 years' drill
10-11-12	6	Adv. Military Drill and Science.....	Sr.	2 years' drill

1-2-3. **FRESHMAN.** Practical instruction in schools of the soldier, company, and battalion; signals, ceremonies; first aid.

4-5-6. **SOPHOMORES.** Practical and theoretical instruction in schools of the company and battalion; advance and rear guard drill; practical and theoretical instruction in guard duty. Gallery practice. Ceremonies.

7-8-9. May be taken voluntarily by others outside of the freshman and sophomore classes. No credit will be allowed for such drill for less than one year.

10-11-12. MILITARY SCIENCE. Instruction in advance and rear guards, outposts, reconnaissance, camping, duties of company commander, articles of war, records.

MUSIC

Professors CARLYLE SCOTT, Chairman; Assistant Professor DONALD N. FERGUSON; INSTRUCTORS GEORGE FAIRCLOUGH, THADDEUS GIDDINGS, GERTRUDE R. HULL, HARRISON WALL JOHNSON, ABE PEPINSKY, GERTRUDE REEVES, KARL SCHEURER.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2-3	9†	Harmony.....	Fresh. Music	None
*4-5-6	6†	Counterpoint.....	Fresh. Music	1-2-3
7-8-9 ¹	no. cr.	Ear Training.....	Soph. Music	1-2-3
10-11-12 ²	6	Composition.....	Jr., sr.	
*11-12-13	3	Analysis.....	Jr., sr.	1-2-3
14-15-16	9†	History of Music.....	Jr., sr.	None
17-18-19	3†	Appreciation of Music.....	Jr., sr.	None
*20-21-22	6†	Bach and Beethoven.....	Jr., sr.	14-15-16
25-26-27 ³	3	Ensemble.....	Jr., sr.	
28-29-30 ²	6	First-Year Organ.....	Fresh. Music	
31-32-33 ²	6	Second-Year Organ.....	Soph., Music	
34-35-36	6 or 12	Third-Year Organ.....	Jr.	
37-38-39	6 or 12	Fourth-Year Organ.....	Sr.	
39-40-41	6 or 12	First-Year Pianoforte.....	Fresh. Music	
42-43-44	6 or 12	Second-Year Pianoforte.....	Soph. Music	
45-46-47	6 or 12	Third-Year Pianoforte.....	Jr.	
48-49-50	6 or 12	Fourth-Year Pianoforte.....	Sr.	
51-52-53	6 or 12	First-Year Violin.....	Fresh. Music	
54-55-56	6 or 12	Second-Year Violin.....	Soph. Music	
57-58-59	6 or 12	Third-Year Violin.....	Jr.	
60-61-62	6 or 12	Fourth-Year Violin.....	Sr.	
63-63-65	6	First-Year Vocal Training..	Fr. Music	
66-67-68	6	Second-Year Vocal Training..	Soph. Music	
69-70-71	6 or 12	Third-Year Vocal Training..	Jr.	
72-73-74	6 or 12	Fourth-Year Vocal Training..	Sr.	
75-76-77	9†	Public School Music.....	Jr., sr.	
*78-79-80	9†	Advanced Public School Music.....	Sr.	75-76-77
81-82-83	9†	Normal Piano.....	Jr., sr.	
*84-85-86	9†	Advanced Normal Piano....	Sr.	81-82-83
88-89-90 ⁴	no. cr.	Ear Training.....	Jr., Music	7-8-9
91-92-93	3	Orchestra.....	Jr., sr.	
94-95-96	6 or 12	Other Orchestral Instruments	Jr., sr.	
97-98-99 ⁵	3	University Choir.....	Jr., sr.	

† All quarters must be completed before credit is given for any one quarter.

¹ Required of Music students without credit.

² Students must have the permission of the head of the department before registering for this course.

³ Required two periods with one credit.

⁴ Junior Music students may be excused from 88-89-90 if they pass a satisfactory examination at the end of the sophomore year.

⁵ Students must have permission of the Head of the Department before registering for this course.

NOTE: All music courses are open to juniors and seniors of the College of Science, Literature, and the Arts with the required prerequisites.

- 1-2-3. HARMONY. The study of chords, their construction, relations, and progressions. Written exercises on basses, the harmonization of given melodies. SCOTT.
- *4-5-6. COUNTERPOINT. Strict counterpoint up to eight parts; free contrapuntal harmonization of chorales and composition of smaller contrapuntal forms such as inventions. FERGUSON.
- 7-8-9-88-89-90. EAR TRAINING. REEVES.
- 10-11-12. COMPOSITION. For those specializing in music. May be taken only with the consent of the instructor. FERGUSON.
- *11-12-13. ANALYSIS. The analysis of musical works as regards their formal construction: subdivisions of themes into phrases, sections, and motives. Symphonies to be presented by the local orchestra are among the compositions used in this course. SCOTT.
- 14-15-16. HISTORY OF MUSIC. Some account of primitive systems and of the early Christian modal and harmonic developments, leading to a general survey of musical literature from Bach to the present time. FERGUSON.
- 17-18-19. APPRECIATION OF MUSIC. A non-technical course. REEVES.
- *20-21-22. BACH AND BEETHOVEN, WAGNER AND BRAHMS. Critical study of selections from master works of the four greatest composers. Biographical readings, topics, and analyses, giving historical and literary background to culminative periods in composition. FERGUSON.
- 25-26-27. ENSEMBLE. Students sufficiently advanced will be given opportunity for ensemble practice, viz., piano, four and eight hands; string and piano and vocal trios, quartets, etc. SCHEURER.
- 34-35-36. THIRD-YEAR ORGAN. Open to juniors. May be taken only with the consent of the instructor. FAIRCLOUGH.
- 37-38-39. FOURTH-YEAR ORGAN. Open to seniors. May be taken only with the consent of the instructor. FAIRCLOUGH.
- 45-46-47. THIRD-YEAR PIANOFORTE. Open to juniors, who have mastered technical difficulties of the degree of Czerny's *School of Velocity* and the easier Haydn and Mozart sonatas. SCOTT, FERGUSON, JOHNSON, REEVES.
- 48-49-50. FOURTH-YEAR PIANOFORTE. Open to seniors. Same requirements as for 45-46-47. SCOTT, FERGUSON, JOHNSON, REEVES.
- 57-58-59. THIRD-YEAR VIOLIN. Open to juniors. May be taken only with the consent of the instructor. SCHEURER.
- 60-61-62. FOURTH-YEAR VIOLIN. Open to seniors. May be taken only with the consent of the instructor. SCHEURER.

- 69-70-71. THIRD-YEAR VOCAL TRAINING. Open to juniors. May be taken only with the consent of the instructor. HULL.
- 72-73-74. FOURTH-YEAR VOCAL TRAINING. Open to seniors. May be taken only with the consent of the instructor. HULL.
- 75-76-77. PUBLIC SCHOOL MUSIC. Preparation for teachers and supervisors of music in the grades. Piano playing, singing, and ready sight reading prerequisite. Four hours in class and one-half day weekly in public school visiting. Practice teaching demanded. GIDDINGS.
- *78-79-80. ADVANCED PUBLIC SCHOOL MUSIC. Preparation for teachers and supervisors of music in high and normal schools. Four hours in class and one half day weekly in public school visiting. Practice teaching demanded. GIDDINGS.
- 81-82-83. NORMAL PIANO. Special course offered to students desiring to teach pianoforte as a profession. REEVES.
- *84-85-86. ADVANCED NORMAL PIANO. Practice teaching. REEVES.
- 91-92-93. ORCHESTRA. Practical study of orchestral literature, standard symphonies, overtures, concertos, etc., with public performances as frequently as practicable. May be taken a second year with credit. SCHEURER.
- 94-95-96. OTHER ORCHESTRAL INSTRUMENTS.
- 97-98-99. UNIVERSITY CHOIR. Open to juniors and seniors. May be taken only with the consent of the instructor. May be taken a second year with credit. SCOTT.
- 28-29-30. FIRST-YEAR ORGAN. FAIRCLOUGH.
- 31-32-33 SECOND-YEAR ORGAN. FAIRCLOUGH.
- 39-40-41. FIRST-YEAR PIANOFORTE. SCOTT, FERGUSON, JOHNSON, REEVES.
- 42-43-44. SECOND-YEAR PIANOFORTE. SCOTT, FERGUSON, JOHNSON, REEVES.
- 51-52-53. FIRST-YEAR VIOLIN. SCHEURER.
- 54-55-56. SECOND-YEAR VIOLIN. SCHEURER.
- 63-64-65. FIRST-YEAR VOCAL TRAINING. HULL.
- 66-67-68. SECOND-YEAR VOCAL TRAINING. HULL.

PHILOSOPHY

Professors NORMAN WILDE, Head; DAVID F. SWENSON; Assistant Professor RUPERT C. LODGE.

REQUIREMENTS OF THE DEPARTMENT

For *B.A. with Honors*, besides the general requirements, thirty-six credits in starred courses, including one of the following: 120, 124-5, 135, 147, 151-2-3, 161-2-3.

Ten credits in Psychology will be accepted as prerequisites in Philosophy, except where "Cr. in Phil." are required.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
1	5	Problems of Philosophy	Soph., jr., sr.	None
2	5	Logic	Soph., jr., sr. ¹	None
3	5	Ethics	Soph., jr., sr. ¹	None
10	2	Science and Religion	Soph., jr., sr.	10 cr. in Phil. or Psy. or Biol.
*20-21	6	Present-Day Philosophy	Jr., sr.	10 credits
*55	3	Esthetics	Jr., sr.	10 credits
*63	3	Development of Religion	Jr., sr.	10 credits
*100	3	Philosophy of Religion	Jr., sr., grad.	10 credits Phil.
*108-109	6	History of Ethics	Jr., sr., grad.	10 in any social science
*113-4-5	9	History of Philosophy	Jr., sr., grad.	10 credits
*120	3	Scandinavian Philosophy	Jr., sr., grad.	10 credits
*124-5	6	Political and Social Ethics	Jr., sr., grad.	10 cr. in any social science
*135	3	Philosophy of Plato	Jr., sr., grad.	10 credits
*147	3	Advanced Logic	Jr., sr., grad.	10 cr. in Phil., including 2
*151-2-3	6	Kant and his Successors	Sr., grad.	15 cr. in Phil.
*161-2-3	9	Seminar in Philosophy	Sr., grad.	20 cr. in Phil.

¹ Third-quarter freshmen are admitted to this course.

1. **PROBLEMS OF PHILOSOPHY.** A survey course in philosophy, in which the main fields of investigation are mapped out, the permanent problems indicated, and the chief methods employed in their solution are discussed. SWENSON, LODGE.
2. **LOGIC.** The nature of knowledge, the laws of reasoning, the principles and methods of scientific proof. SWENSON, LODGE.
3. **ETHICS.** The principles of morals; sketch of the historical development of morality followed by an analysis of its meaning, and of its basis in human nature. WILDE.
10. **SCIENCE AND RELIGION.** Religious problems as affected by the results of modern science. SWENSON.
- *20-21. **PRESENT-DAY PHILOSOPHY.** An untechnical discussion of the most important types of contemporary philosophy. Among the men and movements included are: Royce, James, Eucken, Bergson, Haeckel, Neo-Realism, Nietzsche. WILDE.
- *55. **ESTHETICS.** An introduction to the history and theory of esthetics, psychological analysis of beauty, and a discussion of the arts. SWENSON.

- *63. DEVELOPMENT OF RELIGION. The development of religious ideas and practices; a summary of the typical historical religions; the chief methods of modern psychological investigation. SWENSON.
- *100. PHILOSOPHY OF RELIGION. Religion as an interpretation and evaluation of life; speculative idealism, the mysticism of Emerson, the estheticism of Nietzsche, the ethics of Carlyle; Christianity as a transcendent ethical religion. SWENSON.
- *105. CRITICAL IDEALISM. A systematic introduction to present-day philosophical construction. (Not given in 1919-20.) LODGE.
- *108-9. HISTORY OF ETHICS. A survey of the chief ideals of conduct and theories of life from Socrates to the present day. Emphasis will be laid, both upon the historical conditions, and also upon the permanent elements of value in the main ethical standpoints. LODGE.
- *113-4-5. HISTORY OF PHILOSOPHY. Outline of the history of thought from the Greeks to Kant. Intended as a cultural course, as well as a preparation for the study of special periods. WILDE.
- *120. SCANDINAVIAN PHILOSOPHY. The philosophical thought of the nineteenth century in Scandinavian countries, including a comparative study of Boström and Kierkegaard. SWENSON.
- *124-5. POLITICAL AND SOCIAL ETHICS. The fundamental aspects of society and the state, considered from the point of view of ethics. WILDE.
- *129. ANCIENT PHILOSOPHICAL THEORIES OF THE STATE. Introduction to the philosophical theory of the state in Greek and medieval thought. Special attention is paid to the theories of Plato and Aristotle. (Not given in 1919-20.) LODGE.
- *135. THE PHILOSOPHY OF PLATO. The reading and discussion of the principal dialogues with a view to understanding the problem and method of Greek philosophy as illustrated in the writings of Plato. LODGE.
- *147. ADVANCED LOGIC. Different topics from year to year, including the organization of the sciences, the presuppositions of knowledge, recent mathematical and symbolic logic, and the pragmatic theory of logic. SWENSON.
- *151-2-3. KANT AND HIS SUCCESSORS. Modern currents of thought from the idealism of Fichte and Hegel, to the philosophy of evolution, pragmatism, and the new realism. LODGE.
- *161-2-3. SEMINAR IN PHILOSOPHY. Individual investigation in philosophy. Studies in either ancient or modern philosophy and ethics; critical and constructive studies of logic, metaphysics, or ethics. Character

of work and general topic for year ascertained by consultation with department. WILDE.

Related courses in other departments: Greek 51; Latin 211-2-3, 132; Psychology 1-2-3, 108; Sociology 101, 102, 103, 108, 119, 120; Political Science 8, 107, 110, 118.

PHYSICAL EDUCATION

FOR WOMEN

Professor J. ANNA NORRIS, Chairman; Assistant Professor MAY S. KISSOCK; Instructors GERTRUDE M. BAKER, HELEN A. BARR, VALERIA G. LADD, GERTRUDE B. SCHILL, ALICE J. H. TOLG.

INTRODUCTORY STATEMENT

This Department aims primarily to promote the health of the women students. It gives physical examination and advice to all on entrance; plans systematically to keep in close touch with them during their first two years in college; conducts yearly consultations with, and examines when necessary, all upper-class students; gives courses in hygiene; organizes physical work to meet the varying needs and physical tastes of students; coöperates closely with the Woman's Athletic Association in encouraging and organizing athletic sports; holds regular office hours for the purpose of consultation with all students who desire its advice.

Work in this Department is required of all newly entering students (see Courses 1-2-3 and 11), of all sophomores (see "Sophomore" courses; sophomores who can not swim must register for Course 43 on entrance), and of all students permitted, for reasons connected with their physical condition, to carry less than the minimum number of credit hours. Physical examinations or consultations required annually of all students.

Elective classes arranged in gymnastics, dancing, swimming, field-hockey, basket-ball, baseball, and other organized games.

For a special four-year professional course designed to prepare graduates for the responsible direction of physical education activities see bulletin of the College of Education. The freshman or sophomore year of this course may be taken in 1919-20. Students desiring to enter the course should consult with the Head of this Department. They should be without organic disease or serious functional disorder, should have a keen sense of rhythm, and should possess qualities of personality which will win the coöperation of others.

Nine credits the maximum number that can be gained by taking courses in exercise (Courses 4-5-6, 7-8-9); only one of these courses may be taken for credit in a quarter.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2-3 ¹	0	Elementary Phys. Train. . . .	Required of all new students	None

¹ The third quarter of these courses is open to students who have not had the first two quarters.

No.	Credits	Title	Offered to	Prereq. courses
4-5-6 ¹	4½	Intermed. Phys. Train.	Jr., sr.	Equivalent of 1-2-3, 52, 53. Permission of director.
7-8-9 ¹	4½	Advanced Phys. Train.	Sr.	4-5-6. Permission of director.
11	0	Preliminary Hygiene.	Required of all new students	None
13	3	Personal Hygiene.	Soph., jr., sr.	Anim. Biol. 1-2
16	3	Anatomy and Kinesiology	Seniors	Anim. Biol. 1-2
17	3	Prin. of Gymnastic Exercise . . .	Sr.	P. E. 4-5-6, 31-32-33, 34-35-36, 13, 16
18	3	Teachers' Course in Play.	Sr.	P. E. 4-5-6, 31-32-33-34-35-36, 13
19-20-21	0	Rhythmic Expression	Fr., jr., sr.	None
31-32-33	0	Folk Dancing and Organ. Games	Fr., jr., sr.	None
34-35-36	0	Hockey, Basket and Baseball . . .	Fr., jr., sr.	Permission of director
45	0	General Swimming	Fr., jr., sr.	None
22-23-24	0	Sophomore Rhythmic Expression	Soph.	Phys. Ed. 1-2-3
37	0	Sophomore Organized Games	Soph.	Phys. Ed. 1-2-3
38	0	Sophomore Folk Dancing.	Soph.	Phys. Ed. 1-2-3
40	0	Sophomore Major Sports.	Soph.	Phys. Ed. 1-2-3
43	0	Sophomore Elementary Swim. . . .	Soph.	Phys. Ed. 1-2-3
44	0	Sophomore Advanced Swimming.	Soph.	Phys. Ed. 1-2-3
52-53	0	Sophomore Physical Training. . . .	Soph.	Phys. Ed. 1-2-3

NOTE: Any course in exercise may be entered any quarter by obtaining permission of the Department.

¹ The third quarter of these courses is open to students who have not had the first two quarters.

1-2-3. ELEMENTARY PHYSICAL TRAINING. Lighter forms of gymnastics, orthopedic exercise, folk dancing, indoor and outdoor games. Study of daily habits of living. Shower bath fee, \$1 per quarter. KISSOCK, BARR, LADD, TOLG.

4-5-6. INTERMEDIATE PHYSICAL TRAINING. Gymnastics, and an election of dancing or a sport. Daily habits of living, and written abstracts. If taken for no credit, no reading or written work will be required. Shower bath fee, \$1 per quarter. KISSOCK.

7-8-9. ADVANCED PHYSICAL TRAINING. Gymnastics, and an election of dancing or a sport. Written abstracts of prescribed reading. If taken without credit, no reading will be required. Shower bath fee, \$1 per quarter. SCHILL.

11. PRELIMINARY HYGIENE. One lecture a week. The most essential aspects of the care of the body. NORRIS.

13. PERSONAL HYGIENE. Care of the personal health; elements of anatomy and physiology. NORRIS.

14. HYGIENE OF THE FAMILY. Eugenics, prenatal care, maternity and infancy, puberty, sex education. (Not offered in 1919-20.) NORRIS.

16. ANATOMY AND KINESIOLOGY. Anatomy of bones, joints, and muscles as it applies to muscular exercise. Study of gymnastic positions and movements from the standpoint of anatomy. TOLG.
17. PRINCIPLES OF GYMNAS TIC EXERCISE. A study of the aims, purposes, and methods of physical education and the arrangement and progression of gymnastic exercises; technique of teaching and practice teaching within the class group. SCHILL.
18. TEACHERS' COURSE IN PLAY. A study of the various play theories, and play periods of childhood and adolescence, also lectures, discussions and actual practice in the building, care, and administration of playgrounds and the conduct of play. KISSOCK.
- 19-20-21. RHYTHMIC EXPRESSION. A scientific, simple, joyous form of exercise with a definite system of technique based upon nature rhythms with the object of eliminating physical tension, self-consciousness, and repression. LADD.
- 22-23-24. SOPHOMORE RHYTHMIC EXPRESSION. Shower bath fee, \$1 per quarter. LADD.
- 31-32-33. FOLK DANCING AND ORGANIZED GAMES. Graded games and folk dances for the school and playground. Two hours a week. KISSOCK.
- 34-35-36. HOCKEY, BASKET-BALL AND BASEBALL. Hockey in the autumn, basket-ball in winter, baseball in spring. Two hours a week. KISSOCK.
37. SOPHOMORE ORGANIZED GAMES. Suitable in strength for C-D girls. Conducted outdoors when weather permits. Shower bath fee, \$1 per quarter. BARR.
38. SOPHOMORE FOLK DANCING. Twice a week. Shower bath fee, \$1 per quarter. BARR.
40. SOPHOMORE MAJOR SPORTS. Suitable in strength for A-B girls. Shower bath fee, \$1 per quarter. KISSOCK.
43. SOPHOMORE ELEMENTARY SWIMMING. For beginners. Shower bath fee, \$1 per quarter. BAKER.
44. SOPHOMORE ADVANCED SWIMMING. Shower bath fee, \$1 per quarter. BAKER.
45. GENERAL SWIMMING. For both beginners and advanced swimmers and divers. Shower bath tickets may be bought of the matron. BAKER.
- 52-53. SOPHOMORE PHYSICAL TRAINING. Floor work, apparatus, and games. Orthopedic and remedial exercise for those not able to take regular class work. Shower bath fee, \$1 per quarter. BARR, SCHILL.

PHYSICAL EDUCATION

FOR MEN

Director LOUIS J. COOKE; Assistant Director WILLIAM K. FOSTER; Instructors CARL B. ROEMER, E. S. BROWN, PERCY C. GLIDDEN; Assistants KARL P. BUSWELL, HARRY GOLDIE.

The purpose of the Department is to provide all men of the University opportunity for exercise in order to maintain and build up their general health. It also provides special training for the correction of physical defects and functional derangements.

A physical examination is required of all new matriculants, and of all others using the Department privileges, at the beginning of the year, and as often during their college course as their physical condition may indicate. Students taking the required work in Physical Education are examined at the close of the year. A study of these records shows a marked improvement in the standard of health of the average student during his college course.

The gymnasium, swimming pool, and baths are open to all students of the University, who are free to use the apparatus and to pursue a course in physical training under the supervision of the Director and his assistants.

Those students, taking the required course in physical education, who can not swim must make a reasonable effort, as determined by the Department, to pass the swimming and life-saving requirements, and will be assigned special hours for instruction.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
1	None	Personal Hygiene.....	Fr.	None
2-3-4	None	Gymnasium and Swimming..	Fr.	None
5-6-7	2†	Advanced Leaders.....	Soph., jr., sr.	Instructor's permission
8-9-10	None	Corrective Gymnastics.....	All	None
11-12	None	Wrestling.....	All	Instructor's permission
13-14-15	None	Intermediate Swimming.....	All	Instructor's permission
16-17-18	None	Advanced Swimming.....	All	Instructor's permission
19-20	None	Boxing.....	Fr.	Instructor's permission
21-22-23	None	Intramural Athletics.....	All	None

† Full course must be completed before credit is allowed.

1. PERSONAL HYGIENE. Two hours per week; first six weeks of fall quarter. Examination at close of course. COOKE.
- 2-3-4. GYMNASIUM AND SWIMMING. Two hours a week. Required qualifications in swimming, life-saving, bar-vaulting, jumping, sprinting, running, and on heavy apparatus. FOSTER, ROEMER.
- 5-6-7. ADVANCED LEADERS. Three hours a week. FOSTER, ROEMER.

- 8-9-10. CORRECTIVE GYMNASISTICS. Three hours a week. Special individual courses for students physically defective. BROWN.
- 11-12. WRESTLING. Three times per week. Students admitted by special assignment.
- 13-14-15. INTERMEDIATE SWIMMING. Life-saving, efficiency swimming, and fancy diving. Instruction is given in rescuing and restoring the apparently drowned and other useful swimming accomplishments. GLIDDEN, BUSWELL.
- 16-17-18. ADVANCED SWIMMING. Life-saving, efficiency swimming, and fancy diving. Instruction is given in rescuing and restoring the apparently drowned and other useful swimming accomplishments. GLIDDEN, BUSWELL.
- 19-20. BOXING. By special arrangement a few students may be accommodated in this class which meets twice per week. GOLDFE.
- 21-22-23. INTRAMURAL ATHLETICS. Competitive games in the various athletic leagues in football, basket-ball, hockey, track and field events, baseball, tennis, swimming, handball, bowling, etc. FOSTER.

PHYSICS

Professors HENRY A. ERIKSON, Chairman; W. FRANCIS G. SWANN, JOHN T. TATE, ANTHONY ZELENY; Professorial Lecturer LOUALLEN F. MULLER.

REQUIREMENTS OF THE DEPARTMENT

For *B.A. with Honors*, the general requirements; work chosen from courses above 90; and any course in Mathematics open only to juniors and seniors if approved by the Department. Mathematics 106, 107, 108 have already been thus approved. Thesis in connection with any course in Physics above and including 142.

Courses 21, 22, 41, 42, 51, 52, 61, 62 comprise a general course in Physics extending through four quarters. Those who intend to teach Physics in secondary schools are advised to take Courses 181-3-5 and 182-4-6 in addition to the above general course. Those who intend to enter the field of industrial research are advised to take all of the intermediate courses in addition to the general course.

COURSES

No.	Credits	Title	Offered to	Prerequisites
<i>Introductory Courses</i>				
21	4	Elements of Mechanics.....	All	Trigonometry
22	1	Elements of Mechanics Lab..	All	21 or Reg. in 21
31	3	Acoustics.....	All	None
41	4	Sound and Heat.....	All	21
42	1	Sound and Heat Lab.....	All	22, 41, or Reg. in 41
51	4	Light.....	All	21

No	Credits	Title	Offered to	Prereq. courses
52	1	Light Lab.....	All	22, 51, or Reg. in 51
61	4	Magnetism and Electricity...	All	21
62	1	Magnetism and Electricity Lab.....	All	22, 61, or Reg. in 61

Intermediate Courses

*142	3	Pyrometry and Heat.....	Jr., sr., grad.	42, 62
*162	3	Electrical Meas.....	Jr., sr., grad.	62
*171-3-4	9	Radioactivity.....	Jr., sr., grad.	42, 52, 62, Math. 52
*181-3-5	9	Theoretical Phys.....	Jr., sr., grad.	41, 51, 61, Math. 52
*182-4-6	9	Experimental Phys.....	Jr., sr., grad.	42, 52, 62
*191-3-5	9	Elements of Math. Phys.....	Sr., grad.	42, 51, 61, Math. 52
*192-4-6	12	Elementary Physical Investi- gation.....	Sr., grad.	182-4-6

INTRODUCTORY COURSES

21. ELEMENTS OF MECHANICS. Mechanics of solids, fluids, and wave motion. A study of the simpler fundamental principles. First part of a general Course 21, 41, 51, 61. Course 22 should be taken in conjunction with this course. One lecture, three recitations a week. ZELENY, TATE, MILLER.
22. ELEMENTS OF MECHANICS LABORATORY. Measurements in the mechanics of solids, fluids, and wave motion; the laboratory part supplementing Course 21. One two-hour session in the laboratory a week. MILLER.
31. ACOUSTICS. A study of the fundamental principles of sound. A course designed primarily for the students in the Department of Music. Open also to other students. Three lectures a week. ERIKSON.
41. SOUND AND HEAT. A study of the principles underlying sound and heat phenomena. Course 42 should be taken in conjunction with this course. One lecture, three recitations a week. ZELENY, MILLER.
42. SOUND AND HEAT LABORATORY. The laboratory part supplementing Course 41. One two-hour session in the laboratory a week. MILLER.
51. LIGHT. A study of the principles underlying light phenomena. Course 52 should be taken in conjunction with this course. One lecture, three recitations a week. ZELENY, MILLER.
52. LIGHT LABORATORY. The laboratory part supplementing Course 51. One two-hour session in the laboratory a week. MILLER.
61. MAGNETISM AND ELECTRICITY. A study of the principles underlying magnetic and electric phenomena. Course 62 should be taken in conjunction with this course. One lecture, three recitations a week. ZELENY, MILLER.
62. ELECTRICAL LABORATORY. The laboratory part supplementing Course 61. One two-hour session in the laboratory a week. ZELENY.

INTERMEDIATE COURSES

- *142. PYROMETRY AND HEAT. An experimental study of pyrometry, heat quantity, heat transfer, hygrometry, and gas liquefaction. One lecture, two three-hour sessions in the laboratory a week. MILLER.
- *151-2. GEOMETRICAL AND PHYSICAL OPTICS. (Not offered in 1919-20.)
- *162. ELECTRICAL MEASUREMENTS. Devoted mainly to the study of potentiometer methods, capacity, inductance, magnetic flux, and temperature measurement by electrical methods. Three two-hour laboratory periods a week. ZELENY.
- *171-3-4. RADIOACTIVITY. An analytical study of the theories, and methods of investigation supplemented by laboratory technique.
- *181-3-5. THEORETICAL PHYSICS. An intensive analytical survey of the fundamental principles of mechanics, sound, heat, light, electricity, and magnetism, designed to supplement the general course and to prepare students for more specialized graduate courses. Three lectures a week. TATE.
- *182-4-6. EXPERIMENTAL PHYSICS. A comprehensive course extending through the year, designed to familiarize students with fundamental and standard methods of precise measurements as exemplified by representative experiments in mechanics, sound, heat, light, and electricity. May be begun any quarter. ERIKSON, MILLER, TATE, ZELENY.
- *191-3-5. ELEMENTS OF MATHEMATICAL PHYSICS. A study of the fundamental principles and standard methods involved in the mathematical analysis of physical problems. Three lectures a week. TATE.
- *192-4-6. ELEMENTARY PHYSICAL INVESTIGATION. The experimental or theoretical study of physical phenomena the nature or laws of which are not as yet understood. ERIKSON, SWANN, TATE, ZELENY.

POLITICAL SCIENCE

Professors CEPHAS D. ALLIN, Chairman, JEREMIAH S. YOUNG; Associate Professors ROBERT E. CUSHMAN, RAYMOND MOLEY;¹ Assistant Professors WILLIAM ANDERSON, QUINCY WRIGHT; Instructor ALBERT J. LOBB.

REQUIREMENTS OF THE DEPARTMENT

For B.A. with Honors, see general requirements.

Professional Courses. The attention of those who are preparing themselves for the public service is called to the special training courses outlined on pages 30, 31, 32 of the Bulletin. Further information may be had from the chairman of the department.

Bureau of Research in Government. This bureau is organized to conduct and direct special investigations into practical political and adminis-

¹ Absent on leave, 1919-20.

trative problems, national, state, and local. Dr. Raymond Moley will act as Director, but all members of the staff will take part in the work of the bureau. Advanced and graduate students are strongly urged to take advantage of its facilities.

COURSES

Beginning Courses

No.	Credits	Title	Offered to	Prereq. courses
1	5	American Government.....	Soph., jr., sr. ¹	None
3	5	Comparative European Government.....	Soph., jr., sr. ¹	None

Intermediate Courses

7	5	State and Local Government.	Soph., jr., sr.	1
11	5	Municipal Government.....	Soph., jr., sr.	1
15	5	Introduction to Political Science.....	Soph., jr., sr.	1 or 3
21	5	Colonial Government.....	Soph., jr., sr.	1 or 3
31	5	Political Parties.....	Soph., jr., sr.	1 or 3

Advanced Courses

*51-2-3	9	Business Law.....	Jr., sr.	10 cr. in Pol. Sci. or 10 cr. in Econ. or 5 cr. in each.
*58	5	Elementary Law.....	Jr., sr.	10 cr. in Pol. Sci., or 5 in Pol. Sci. and 5 in Sociology
*111	3	Government of Minnesota...	Jr., sr., grad.	1 and ⁷ or 11 or 31
*115	3	Municipal Problems.....	Jr., sr., grad.	11
*118	3	Government and the Immigrant.....	Jr., sr., grad.	10 cr. or Americanization 5
*121-2	8	International Law.....	Jr., sr., grad.	10 cr. in Pol. Sci. or History 107-108.
*125	5	Amer. Diplomatic History...	Jr., sr., grad.	10 cr. in Pol. Sci. or History 5-6
*127	5	Amer. Foreign Relations.....	Jr., sr., grad.	121-2 or 125
*131-2	6	World Politics.....	Jr., sr., grad.	10 cr. in Pol. Sci. including Course 3 or History 107-108 or History 81-82-83
*135	3	Contemporary Political Problems.....	Jr., sr., grad.	10 cr.
*151-2	8	Constitutional Law.....	Jr., sr., grad.	13 cr.
*155-6	5	Comparative Administrative Law.....	Jr., sr., grad.	13 cr.
*157	5	Police Power.....	Jr., sr., grad.	13 cr. in Pol. Sci. or Econ. or Soc.
*165-6	6	British Empire.....	Jr., sr., grad.	13 cr. in Pol. Sci. or Hist. 7-8, or Hist. 81-82-83
*167	3	British Constitutional Law..	Jr., sr., grad.	165-6
*171	3	Municipal Corporations.....	Jr., sr., grad.	15 cr. in Pol. Sci. including one starred course
*175	4	Law of Labor.....	Jr., sr., grad.	151-2 or 157, or Econ. 161 or 13 cr. in Econ.
*181	3	Modern Political Thought...	Jr., sr., grad.	13 cr. including Course 15 or Philosophy 127

¹ Also open to freshmen who have had 10 credits in History.

No.	Credits	Title	Offered to	Prereq. courses
*191-2-3	9	Development of International Law and Organization.....	Sr., grad.	121-2-3, or History 107-8, or History 159-60
*Econ. 155	3	Business and Government...	Sr., grad.	See Economics
*Econ. 191-2	6	Public Finance.....	Jr., sr., grad.	See Economics or 13 cr. in Pol. Sci.
*Econ. 193	3	State and Local Taxation...	Jr., sr., grad.	See Econ.
Hist. 7-8	10	English History, 1815-1918..	Soph., jr., sr.	See History
*Hist. 177	5	Anglo-German Relations, 1900-1914.....	Sr., grad.	See History
Civ. Eng. 53, 3	3	Municipal Engineering.....	Jr., sr.	11
*201-2-3	9	Seminar in Public Law.....	Grad. and srs. with suitable preparation	Consent of instructor
*211-2-3	9	Seminar in Modern Government and Political Theory..	Grad., and srs. with suitable preparation	Consent of instructor
*221-2-3	9	Seminar in Local Government and Administration..	Grad. and srs. with suitable preparation	Consent of instructor

ALLIED COURSES IN OTHER DEPARTMENTS

Economics 11-12, 76, 105, 154, 161, 162, 167; Education 124-5-6; History 5-6, 9-10, 61, 104, 107-8, 120-1, 157-8; Philosophy 127, 135; Sociology 6, 55, 101, 104.

BEGINNING COURSES

1. AMERICAN GOVERNMENT. Origin and nature of the American governmental system; organization and actual workings of the national government to-day.
3. COMPARATIVE EUROPEAN GOVERNMENT. The governments and politics of the great European powers of to-day.

INTERMEDIATE COURSES

7. STATE AND LOCAL GOVERNMENT. A comparative study of American state governments. The adoption and amendment of constitutions; organization, powers, and methods of the three departments; problems of administrative reorganization. CUSHMAN, LOBB.
11. MUNICIPAL GOVERNMENT. The growth of cities in the United States. The evolution of the council, mayor, commission, and city-manager forms of government; their relative merits. Popular control. Municipal functions. Departmental organization and civil service. ANDERSON.
15. INTRODUCTION TO POLITICAL SCIENCE. Introductory presentation of the problem of government. The nature of the state, the forms and functions of government, the principles of politics. ANDERSON.

21. COLONIAL GOVERNMENT. Ancient and modern colonization; principles of government and methods of administration in the chief French, Dutch, English, and American colonies and dependencies. ALLIN.
31. POLITICAL PARTIES. The nature and functions of political parties in modern democratic states. Organization and methods of parties; legal control of parties and elections; public opinion as a factor in popular government. (Not offered in 1919-20.)

ADVANCED COURSES

- *51-2-3. BUSINESS LAW. Principles governing ordinary business transactions. Contracts—formation, operation, interpretation, breach, and discharge. Agency and service. Negotiable instruments. Business associations—partnerships and private corporations. Property—personal and real. YOUNG.
- *58. ELEMENTARY LAW. Legal principles governing the family and personal relations; judicial decisions regarding social and economic problems; the administration of justice from the standpoint of the citizen. LOBB.
- *111. GOVERNMENT OF MINNESOTA. The development and present organization of the state government; its relation to the local governments; the growth of the state constitution; present problems and proposed changes. LOBB.
- *115. MUNICIPAL PROBLEMS. A specialized course in modern, legal, administrative, and functional problems of cities. The content of the course will change from year to year, keeping abreast of municipal progress. ANDERSON.
- *118. GOVERNMENT AND THE IMMIGRANT. The legal and administrative aspects of Americanization. Federal and state laws affecting immigration, citizenship, and naturalization; the practical administration of these laws through governmental agencies; the political experiences of the foreign-born. (Not offered in 1919-20.)
- *121-2. INTERNATIONAL LAW. Nature, sources and sanction of international law; status of nations, rules of peace, neutrality and war. Emphasis upon application of principles to concrete cases. Special attention in the first quarter to diplomatic and consular practice. WRIGHT.
- *125. AMERICAN DIPLOMATIC HISTORY. Attention to the principles and policies guiding American diplomacy in its stages of development as well as to the methods pursued and the personalities of American diplomats. WRIGHT.
- *127. AMERICAN FOREIGN RELATIONS. Such topics as the Monroe Doctrine, Freedom of the Seas, the Open Door, Arbitration, Disarmament, will

- be considered with particular reference to the future policy of the United States. WRIGHT.
- *131-2. WORLD POLITICS. A study of the foreign policies and international relations of the leading European powers to-day. ALLIN.
- *135. CONTEMPORARY POLITICAL PROBLEMS. The League of Nations; parliamentary government; reorganization of our state governments; administrative centralization; government by commission; electoral ballot, budgetary, and civil service reforms; proportional representation; initiative, referendum, and recall; responsibilities of citizenship. YOUNG.
- *145. LEGISLATIVE POWER AND METHODS. Source and scope of the legislative power; methods used by legislative bodies; current political questions; formulation and defense of legislative bills. (Not offered in 1919-20.) YOUNG.
- *151-2. CONSTITUTIONAL LAW. Judicial interpretation of the constitution; power of judicial review; separation of governmental powers; relation of state and national governments; construction of national powers; protection of civil and political rights; jurisdiction of the courts. CUSHMAN.
- *153. NATIONAL AND STATE ADMINISTRATION. The principles of American administrative organization and the operation of administrative departments, and of important administrative boards and commissions. (Not offered in 1919-20.)
- *155-6. COMPARATIVE ADMINISTRATIVE LAW. Administration as a science; origin and development; and analysis of the administrative systems of the United States, England, France, and Germany, with special reference to the law of officers, the merit system, and special administrative tribunals. YOUNG.
- *157. POLICE POWER. Nature of the police power; constitutional aspects of social and economic legislation, including safety, order, morals, and protection against business fraud and oppression; the fundamental rights under the police power. YOUNG.
- *161. COMPARATIVE FEDERAL GOVERNMENT. Ancient and modern federal unions, especially the constitutions of the United States, Switzerland, Canada, and Australia, the South African Union, and the proposals for imperial federation. (Not offered in 1919-20.) ALLIN.
- *165-6. GOVERNMENT AND POLITICS OF THE BRITISH EMPIRE. Analysis of the organization and workings of the present British constitution; the political parties, leaders, and platforms; influences of parties on imperial politics and government. ALLIN.

- *167. BRITISH CONSTITUTIONAL LAW. A study of the principles of the Common Law in relation to the English constitution together with an analysis of the judicial interpretation of some of the most important acts of parliament. ALLIN.
- *171. MUNICIPAL CORPORATIONS. The legal basis of municipal government; the relation of the city to the state; home rule. The city as a legal entity; its powers, duties, and liability for torts. ANDERSON.
- *173. LAW OF MUNICIPAL IMPROVEMENTS. Legal problems involved in programs for municipal improvement and city planning; taxation, special assessments, eminent domain, and the police power. (Not offered in 1919-20.) CUSHMAN.
- *175. LAW OF LABOR. Constitutional aspects of laws for the protection of labor; regulation of hours and wages; legal restraints on labor; legality of strikes, boycotts, picketing, etc. Legal aspects of settlement of labor disputes. CUSHMAN.
- *181. MODERN POLITICAL THOUGHT. The state in the modern age. Sovereignty and liberty. Individualism and socialism. Democracy. Recent literature on the forms and functions of government. ANDERSON.
- *191-2-3. DEVELOPMENT OF INTERNATIONAL LAW AND ORGANIZATION. The classics in international law, systems of international relations, international administrative organizations and leagues of nations. WRIGHT.
- *201-2-3. SEMINAR IN PUBLIC LAW. YOUNG, et al.
- *211-2-3. SEMINAR IN MODERN GOVERNMENT AND POLITICAL THEORY. ALLIN, et al.
- *221-2-3. SEMINAR IN LOCAL GOVERNMENT AND ADMINISTRATION.

NOTE.—A student registered in a seminar course will be expected to complete a satisfactory piece of research before receiving credit for the course.

The Bureau of Government Research is designed to give all possible assistance in the conducting of such research, but is not intended to relieve the student of his personal responsibility.

PSYCHOLOGY

Associate Professors RICHARD M. ELLIOTT, Chairman; WILLIAM S. FOSTER, HERBERT WOODROW; Assistant Professors MABEL R. FERNALD, KARL S. LASHLEY,¹ JOHN J. B. MORGAN; Instructor FRANCES E. LOWELL.

REQUIREMENTS OF THE DEPARTMENT

For B.A. with Honors. besides the general requirements, twenty-four credits in starred courses. Starred courses in Educational Psychology

¹ Absent on leave. 1919-20.

and, to the extent of six credits, in Philosophy, may be counted in partial fulfillment of this requirement.

Students who desire to do research work should consult with the chairman of the Department.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2-3	9	General Psychology.....	Soph., jr., sr.	None
*101-102	6	Experimental Psychology....	Jr., sr., grad.	1-2-3
*103	3	Quantitative Psychology....	Jr., sr., grad.	1-2-3
*108-109	6	Advanced General Psychology	Jr., sr., grad.	1-2-3
*114-115	6	Human Behavior.....	Jr., sr., grad.	1-2-3
*119-120	6	Animal Behavior.....	Jr., sr., grad.	1-2-3
*121	3	Neuro-Psychology.....	Jr., sr., grad.	1-2-3
*125-126	6	Differential Psychology.....	Jr., sr., grad.	1-2-3
*127	3	Social Psychology.....	Jr., sr., grad.	1-2-3
*131-132-133	9	Child Mind.....	Jr., sr., grad.	1-2-3
*137-138	6	Applied Psychology.....	Jr., sr., grad.	1-2-3
*144-145	6	Abnormal Psychology.....	Jr., sr., grad.	1-2-3
*200-1-2	6-9	Seminar.....	Sr., grad.	By permission

1-2-3. GENERAL PSYCHOLOGY. An introductory survey of psychology; its material, fundamental laws, applications, and relations to other sciences. Laboratory experiments provide illustrative material and training in methods. One lecture, one recitation, two laboratory hours per week. All instructors.

*101-102. EXPERIMENTAL PSYCHOLOGY. A laboratory course of standard experiments in the analysis and measurement of mental phenomena. One lecture, four laboratory hours per week. WOODROW.

*103. QUANTITATIVE PSYCHOLOGY. Psychophysics and the theory of mental measurement. One lecture, four laboratory hours per week. WOODROW.

*108-109. ADVANCED GENERAL PSYCHOLOGY. A systematic presentation of the laws of mental activity. FOSTER.

*114-115. HUMAN BEHAVIOR. An analysis from the point of view of the objective school of psychologists. ELLIOTT.

*119-120. ANIMAL BEHAVIOR. The development of reaction-systems in animals, with emphasis upon the application of studies of animals to the solution of general problems in physiological psychology. Animal Biology, 1-2-3 is advised as a prerequisite. One lecture four laboratory hours per week.

*121. NEURO-PSYCHOLOGY. Specialization of functions in the nervous system in relation to behavior. Discussion from the standpoint of psychology of current theories of integration and localization. Two lectures, two laboratory hours per week.

- *125-126. **DIFFERENTIAL PSYCHOLOGY.** Important distinguishing characteristics (psychological) of individuals and of groups. Emphasis on experimental and statistical methods of discovering differences and of making comparisons. Each student participates in investigation of definite problems and in analysis of results. FERNALD.
- *127. **SOCIAL PSYCHOLOGY.** Study of the dependence of familiar forms of social organization and behavior upon the fundamental laws of mental activity. The adjustment of the innate mental equipment of the individual to the norms of social groups. FERNALD.
- *131-2-3. **CHILD MIND.** General intelligence and special mental abilities; their development and their relation to heredity, physiological factors, education, speech defects, and delinquency. LOWELL.
- *137-138. **APPLIED PSYCHOLOGY.** A survey of the applications of psychology, with especial reference to business. MORGAN.
- *144-145. **ABNORMAL PSYCHOLOGY.** A systematic review of psychopathology in relation to normal behavior. MORGAN.
- 200-1-2. **SEMINAR.** Selected topics from the history of psychology. Open to advanced students with permission of the instructor. Six to nine credits in proportion to work done. FOSTER.

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

Professor MELVIN E. HAGGERTY; Assistant Professors HERMIONE L. DEALEY, MARVIN J. VAN WAGENEN.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
55	3	Elem. Educ. Psychology.....	Soph., jr., sr.	6 credits in Psychol. of which 3 may be in Educ. Psychology
106-107-108	9	Adv. Educ. Psychology.....	Sr., grad.	55 or equivalent
110	3	Psychology of Secondary School Subjects.....	Sr., grad.	55 or equivalent
111	3	Educational Diagnosis.....	Sr., grad.	55 or equivalent
111T-112T	4	Educational Diagnosis..... (for teachers)	Sr., grad.	55 or equivalent
116	2	Psychology of Elementary School Subjects.....	Sr., grad.	
126-127	4	Methods of Educ. Research...	Sr., grad.	
128	2	Review of Statistical Studies..	Sr., grad.	126-127
134-135-136	6	Mental Tests and Mental Diagnosis.....	Sr., grad.	55 or equivalent
137-138-139	3 to 9	Experimental Education.....	Sr., grad.	Advanced courses necessary to pursue problems. Consult instructor
140	2	Psychology and Vocational Advisement.....	Sr., grad.	
149-150-151	3 to 9	Psycho-Educational Clinic...	Sr., grad.	Ed. 134-135-136, or equivalent

No.	Credits	Title	Offered to	Prereq. courses
156	3	Psychological Problems of Voc. Educ.....	Sr., grad.	
201-202-203	6	Seminar in Educational Psychology.....	Sr., grad.	106-107-108

55. **ELEMENTARY EDUCATIONAL PSYCHOLOGY.** A survey of fundamental facts of human behavior involved in educational activities. Open to seniors, juniors, and qualified students in third quarter of sophomore year upon advice of Professor HAGGERTY.
- 106-107-108. **ADVANCED EDUCATIONAL PSYCHOLOGY.** Advanced work in genetic psychology, origin and nature of human organism, development and control of instincts; their relation to group activities. Methods of measuring rate of learning; study of typical learning experiments and an examination of the conditions of the most economic learning. Study of group and individual differences and their relations to educational practice.
110. **PSYCHOLOGY OF SECONDARY SCHOOL SUBJECTS.** Review of experimental results dealing with content of high-school curriculum, with a discussion of the bearing of these results upon selection of the content of high-school subjects and the methods of presenting it effectively.
111. **EDUCATIONAL DIAGNOSIS.** The typical educational problems involving educational scales and standard tests. Nature of tests, methods of use, analysis of results obtained, and programs of remedial educational procedure based on the results of the test.
- 111T-112T. **EDUCATIONAL DIAGNOSIS (for teachers).**
116. **PSYCHOLOGY OF ELEMENTARY SCHOOL SUBJECTS.** Review of experimental results dealing with elementary school subject-matter; a discussion of the direct bearing of these findings upon selection and method of presentation of the content of various subjects of the elementary school curriculum.
- 126-127. **METHODS OF EDUCATIONAL RESEARCH.** A study of statistical and other methods as applied to educational investigation. This course is ordinarily required of all candidates for advanced degrees.
128. **REVIEW OF STATISTICAL STUDIES.** A survey of statistical studies in education with special reference to the methods employed and the reliability of the results obtained.
- 134-135-136. **MENTAL TESTS AND MENTAL DIAGNOSIS.** Study of mental variation in children, its nature, degree, causes, and effects. Methods of treating superior and subnormal children in the schools. A laboratory course in the study of individual differences by means of mental tests.

- 137-138-139. **EXPERIMENTAL EDUCATION.** The application of experimental methods to educational research. Problems in mental measurement, educational and mental diagnosis, and the psychology of learning, will be set as individual problems for properly prepared students.
140. **PSYCHOLOGY AND VOCATIONAL ADVISEMENT.** A study of different forms of measurement used in the analysis of individual behavior from the standpoint of special interests and vocational aptitudes and their relationship to various occupations.
- 149-150-151. **PSYCHO-EDUCATIONAL CLINIC.** Conducted in coöperation with the Department of Sociology and the Medical School clinics in pediatrics and nervous and mental diseases. Students will receive systematic instruction in giving psychological examinations and in scientific interpretation of data.
156. **PSYCHOLOGICAL PROBLEMS OF VOCATIONAL EDUCATION.** A practical course covering the psychological facts and principles involved in vocational education, and in industrial and commercial administration. Attention given to matters of personnel, acquisition of skill, motivation of workers, and efficiency of administration.
- 201-202-203. **SEMINAR IN EDUCATIONAL PSYCHOLOGY.** A research course for graduate students. Required of all students writing theses in educational psychology.

ROMANCE LANGUAGES

Professors EVERETT WARD OLMSTED, Head; COLBERT SEARLES, IRVILLE C. LECOMPTE; Associate Professors RALPH E. HOUSE, RUTH S. PHELPS; Assistant Professors FRANCIS B. BARTON, JULES FRELIN, EDWARD H. SIRICH; Instructors THOMAS W. BUSSON, HERBERT E. CLEFTON, NELSON COBURN, JOSEPHINE DE BOER, SOLOMON M. DELSON, MARGUERITE GUINOTTE, GUSTAAF VAN ROOSBROECK, SAMUEL VASCONCELOS; Teaching Fellows ETHEL ELLIOTT, CAMILA HENRIQUEZ URENA, PAUL KRAMER, OLIVE NOTT.

REQUIREMENTS OF THE DEPARTMENT

For B.A. with Honors, general requirements: a reading knowledge of Latin or German with two years' work in Spanish or Italian, if French is the major subject, or two years' work in French or Italian, if Spanish is the major subject.

In the junior year, Courses 84-85-86, 87-88-89, 97-98-99, and 100-101-102, if French is the major subject; and Courses 37-38-39, 46-47-48, 49-50-51, and 151-152-153, if Spanish is the major subject. In the senior year, Courses 103-104-105, 131-132-133, 134-135-136, and 112-113-114, or any other two-hour advanced course, if French is the major subject; or Courses 154-155-156, 157-158-159, 163-164-165, and 169-170-171, or any other two-hour advanced course, if Spanish is the major subject. Substitutions

may be made for these courses with the approval of the Department. Alternation of courses required in the junior and senior years is allowable.

Certificate of Aptitude.—The Department grants a certificate of aptitude to those students who have completed in a satisfactory manner certain prescribed courses destined to fit them for teaching French or Spanish in the secondary schools. For details, consult bulletin at Room 200 F.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
<i>French</i>				
1-2-3	9†	Beginning French.....	Architects	None
4-5	10†	Beginning French.....	All	None
7-8	10†	Intermediate French.....	All	4-5 or 2 years of high-school French
10-11	10†	Survey of French Lit.....	All	7-8 or 3 years of high-school French
13-14-15 ¹	9†	Survey of French Lit.....	All	7-8 or 3 years of high-school French
16-17-18 ¹	3†	Elem. French Conversation	All	7-8 or 3 years of high-school French
19-20-21 ¹	3†	Elem. French Composition.	All	7-8 or 3 years of high-school French
22-23-24	9	French Scientific Reading ²	Pre-Medics	4-5, or 2 years of high-school French
*81	5	French Phonetics.....	Jr., sr.	13-14-15
*84-85-86	3†	Advanced French Conversation.....	Jr., sr.	16-17-18
*87-88-89	3†	Advanced French Composition.....	Jr., sr.	19-20-21
*90	3	Teachers' Course.....	Jr., sr.	See below
*97-98-99	9†	French Lit. Nineteenth Century.....	Jr., sr.	13-14-15
*100-101-102	9†	French Lit. Seventeenth Century.....	Jr., sr., grad.	13-14-15
*103-104-105	9†	French Lit. Eighteenth Century.....	Jr., sr., grad.	13-14-15
*106-107-108	9†	French Lit. Sixteenth Century.....	Sr., grad.	100-101-102 or 103-104-105
*109-110-111	6†	French Dramatic Literature	Jr., sr., grad.	100-101-102- or 103-104-105
*112-113-114	6†	French Lyric Poetry.....	Jr., sr., grad.	97-98-99
*118-119-120	6†	French Realistic Novel: Nineteenth Century....	Jr., sr., grad.	97-98-99 or with permission of instructor
*121-122-123	6†	Lectures in French.....	Jr., sr., grad.	13-14-15 and 84-85-86
*131-132-133	6†	French Oral Diction.....	Jr., sr., grad.	84-85-86
*134-135-136	3†	French Syntax and Composition.....	Jr., sr., grad.	87-88-89

† All quarters must be completed before credit is given for any one quarter.

¹ Courses 13-14-15, 16-17-18 and 19-20-21 may be combined to form a five-hour unit course for Junior College students. The unit course thus formed may be dropped at the end of the second quarter, but the third quarter's work must be completed before more advanced courses in French may be elected. Courses 37-38-39, 40-41-42, and 43-44-45 may be combined in like manner to form a unit course in Spanish. Courses 84-85-86, 87-88-89, and 97-98-99 may also be combined under the same conditions.

² Pre-medical students entering without any preparation in French, will take Courses 4-5, 7, 23, and 24. Course 8 may be taken if desired, but is not required.

<i>Spanish</i>				
No.	Credits	Title	Offered to	Prereq. courses
31-32	10†	Beginning Spanish.....	All	None
33-34	10†	Intermediate Spanish.....	All	31-32 or 2 years high-school Span.
35-36	10	Survey of Spanish Lit.....	All	34-35 or 3 years
37-38-39 ¹	9†	Survey of Spanish Lit.....	All	High-school Span.
40-41-42 ¹	3†	Elem. Spanish Conversation.....	All	34-35 or 3 years high-school Span.
43-44-45 ¹	3†	Elem. Spanish Composition	All	34-35 or 3 years high-school Span.
*46-47-48	3†	Advanced Spanish Conversation.....	Jr., sr.	40-41-42
*49-50-51	3†	Advanced Spanish Composition.....	Jr., sr.	43-44-45
*52	3	Teachers' Course.....	Jr., sr.	See below.
151-152-153	6†	Cervantes.....	Jr., sr., grad.	37-38-39
154-155-156	6†	Spanish Dramatic Literature.....	Jr., sr., grad.	37-38-39
*157-158-159	6†	Spanish Novel.....	Jr., sr., grad.	37-38-39
*160-161-162	6†	Critical Study of Selected Spanish Classics.....	Jr., sr., grad.	37-38-39
*163-164-165	6†	Lectures in Spanish.....	Jr., sr., grad.	40-41-42 and 46-47-48 or 37-38-39
*169-170-171	3†	Spanish Syntax and Composition.....	Jr., sr., grad.	49-50-51 or by permission of instructor
<i>Portuguese</i>				
*53-54-55	9†	Beginning Portuguese.....	Jr., sr.	15 credits in dep't preferably Spanish
<i>Italian</i>				
61-62	10†	Beginning Italian.....	All	None
*64-65-66	9†	Survey of Italian Lit.....	Jr., sr.	61-62
*181-182-183	6†	Dante, Petrarch, Boccaccio	Jr., sr., grad.	61-62; 64-65-66 or 13-14-15 or Eng. 1-2-3
*184-185-186	3†	Dante (in English).....	Jr., sr., grad.	Hist. 1-2-3 and Eng. 1-2-3 or Fr. 13-14-15. (Required of students taking 181-182-183.)

† All quarters must be completed before credit is given for any one quarter.

¹ Courses 13-14-15, 16-17-18 and 19-20-21 may be combined to form a five-hour unit course for Junior College students. The unit course thus formed may be dropped at the end of the second quarter, but the third quarter's work must be completed before more advanced courses in French may be elected. Courses 38-38-39, 40-41-42 and 43-44-45 may be combined in like manner to form a unit course in Spanish. Courses 84-85-86, 87-88-89, and 97-98-99 may be also combined under the same conditions.

For sequences of junior college courses, see the departmental bulletin at room 200 F.

Courses in French or Spanish conversation may be taken only when accompanied by the corresponding courses in composition. No credit will be given for work done in a course in conversation unless the course in composition is passed also. Courses in composition may be taken separately.

Students in the Engineering and Medical Schools may receive credit for one quarter of Course 7-8 when attached to Course 4-5.

The Teachers' Course in French (90) will be offered the first and third quarters. The Teachers' Course in Spanish (52) will be offered the second quarter.

Prerequisites for Teachers' Course, in addition to Course 13-14-15 (or Spanish equivalent, Course 37-38-39) one conversation-composition course and one literary.

No student will be allowed to elect courses more advanced than Intermediate French or Spanish, who has not received a grade of C or better in the intermediate courses.

INTRODUCTORY COURSES

French

- 4-5. BEGINNING FRENCH. Pronunciation, grammar, oral exercises, translation. FRELIN, DELSON, CLEFTON, GUINOTTE, ELLIOTT, NOTT.
- 7-8. INTERMEDIATE FRENCH. Review of grammar, connected prose composition, conversation and reading of representative authors. FRELIN, CLEFTON, DELSON, GUINOTTE.
- 10-11. SURVEY OF FRENCH LITERATURE. This course will outline the history of French literature from 1600 to present day, and is prerequisite for the courses devoted to special periods. Representative texts will be read. SIRICH, CLEFTON, GUINOTTE.
- 13-14-15. SURVEY OF FRENCH LITERATURE. Same as 10-11, except that it is a three-hour course extending through three quarters. LECOMPTE, PHELPS, VAN ROOSBROECK.
- 16-17-18. ELEMENTARY FRENCH CONVERSATION. A small amount of outside preparation will be required. OLMSTED, BARTON, FRELIN, GUINOTTE.
- 19-20-21. ELEMENTARY FRENCH COMPOSITION. OLMSTED, BARTON, FRELIN, GUINOTTE.
- *81. FRENCH PHONETICS. Practical study of the pronunciation of French: the sounds, the stress group, the connected phrase. Oral and phonograph practice in enunciation based upon reading of texts representing various literary types. DELSON.
- *84-85-86. ADVANCED FRENCH CONVERSATION. FRELIN.
- *87-88-89. ADVANCED FRENCH COMPOSITION. FRELIN.
- *90. TEACHERS' COURSE. Methods of teaching French in high schools. Courses of study, textbooks, etc. Lectures, observations, and reports. Open to juniors and seniors qualifying for a certificate to teach French as a major or minor subject. Credit in Education only. DE EOER.

Spanish

- 31-32. BEGINNING SPANISH. Pronunciation, grammar, oral exercises and translation. HOUSE, VASCONCELOS.
- 33-34. INTERMEDIATE SPANISH. Review of grammar, conversation, connected prose composition, and reading of representative authors. HOUSE, VASCONCELOS.
- 35-36. SURVEY OF SPANISH LITERATURE. Same as 37-38-39, except that it is a five-hour two-quarter course.
- 37-38-39. SURVEY OF SPANISH LITERATURE. An outline of the history of Spanish literature from 1500 to the present day, based upon texts and

collateral reading. Prerequisite for courses devoted to special periods.
HOUSE.

40-41-42. ELEMENTARY SPANISH CONVERSATION. A small amount of outside preparation will be required. COBURN.

43-44-45. ELEMENTARY SPANISH COMPOSITION. COBURN.

*46-47-48. ADVANCED SPANISH CONVERSATION.

*49-50-51. ADVANCED SPANISH COMPOSITION. Special attention given to social and commercial correspondence.

*52. TEACHERS' COURSE. Methods of teaching Spanish in the high schools. Courses of study, textbooks, etc. Lectures, observations, and reports. Open to juniors and seniors qualifying for a certificate to teach Spanish as a major or minor subject. Credit in Education only. DE BOER.

Italian

61-62. BEGINNING ITALIAN. Pronunciation, grammar, oral exercises, translation. PHELPS.

*64-65-66. SURVEY OF ITALIAN LITERATURE. An outline of the history of Italian literature from 1400 to the present day with especial emphasis on poetry. Representative texts will be read. PHELPS.

Portuguese

*53-54-55. BEGINNING PORTUGUESE. Pronunciation, grammar, oral exercises, and reading of representative texts. OLMSTED.

ADVANCED COURSES

French

*97-98-99. FRENCH LITERATURE: NINETEENTH CENTURY. A study of the romantic and realistic movements as manifested in the novel, drama, and poetry. Assigned texts and collateral reading. The course is conducted entirely in French. BARTON, DELSON.

*100-101-102. FRENCH LITERATURE: SEVENTEENTH CENTURY. Influence of the literary salons. Development of French prose. Perfection of French dramatic art by Corneille, Racine, and Molière. Assigned texts, collateral reading. OLMSTED.

*103-104-105. FRENCH LITERATURE: EIGHTEENTH CENTURY. Philosophic movement: Bayle, Fontenelle, Montesquieu, Voltaire, l'Encyclopédie, Rousseau. Literature: poetry, tragedy, comedy, novel. Reading, discussions, reports based on collateral reading. SEARLES.

*106-107-108. FRENCH LITERATURE: SIXTEENTH CENTURY. Forerunners of the Renaissance: Marot and l'Ecole Lyonnaise. The Renaissance movement and the Reformation, Rabelais, Calvin and the Pléiade and

its successors; Montaigne; the situation at the close of the century. SIRICH.

- *109-110-111. FRENCH DRAMATIC LITERATURE. A study of the development of dramatic literature in France from the classical period to the present time. OLMSTED.
- *112-113-114. FRENCH LYRIC POETRY. Principles of French prosody. A study of the evolution of French lyric poetry. Alternates with 115-116-117. SEARLES.
- *115-116-117. FRENCH CLASSICISM. The development of French classic ideals and doctrines. The humanistic element, the reform of Malherbe, the adoption of the Aristotelian doctrines. French classic writers. Alternates with 112-113-114. (Not offered in 1919-20.) SEARLES.
- *118-119-120. FRENCH REALISTIC NOVEL: NINETEENTH CENTURY. A study of realism with especial reference to the novel. Flaubert, Maupassant, Zola, etc. LECOMPTE.
- *121-122-123. LECTURES IN FRENCH. Announcement later.
- *131-132-133. FRENCH ORAL DICTION. Dissertations orales sur des sujets variés.
- *134-135-136. FRENCH SYNTAX AND COMPOSITION. Special studies in characteristic problems of French syntax. BARTON.

Spanish

- *151-152-153. CERVANTES. A study of his life and works. Attention will be centered upon *Don Quixote* and the *Novelas Exemplares*. Alternates with 157-158-159. (Not offered in 1919-20.)
- *154-155-156. SPANISH DRAMATIC LITERATURE. A general survey of Spanish dramatic literature, with special attention to the Golden Age. Alternates with 160-161-162. (Not offered in 1919-20.) HOUSE.
- *157-158-159. SPANISH NOVEL. A study of the development of Spanish fiction from the picaresque novel to that of the present day. Alternates with 151-152-153.
- *160-161-162. CRITICAL STUDY OF SELECTED SPANISH CLASSICS. Intensive reading of texts and study of literary influences. The Spanish ballad and the picaresque novel will be treated in 1919-20. Alternates with 154-155-156. HOUSE.
- *163-164-165. LECTURES IN SPANISH. Subject for 1919-20: Spanish Literature of the nineteenth and twentieth centuries.
- *169-170-171. SPANISH SYNTAX AND COMPOSITION. Special studies in characteristic problems of Spanish syntax. HOUSE.

Italian

*181-182-183. DANTE, PETRARCH, AND BOCCACCIO. An introduction to their works. The three cantiche of the *Divina Commedia* are read, one each year in rotation, together with a number of the canzoni, and sonnets of Petrarch, and portions of the *Decameron*. PHELPS.

*184-185-186. DANTE IN ENGLISH. Lectures; reading and discussion of the *New Life*, and the two cantiche of the *Divine Comedy* not read in 181-182-183. Private reading of one other work. PHELPS.

SCANDINAVIAN

Professors GISLE C. J. BØTHNE, Chairman, ANDREW A. STOMBERG.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2	10	Beginning Norwegian	All	None
3	5	Intermediate Norwegian	All	None
4-5	10	Advanced Norwegian (Survey)	Soph., jr., sr.	1-2-3
7-8	10	Beginning Swedish	All	None
9	5	Intermed. Swedish	All	None
10-11	10	Advanced Swedish	Soph., jr., sr.	7-8-9
12	5	Ancient and Medieval Scand. Hist.	Soph., jr., sr.	10-11, or 4-5 or Hist. 1-2-3
*101-2-3	9	Modern Norwegian Literature	Jr., sr., grad.	4-5
*104-5-6	9	Modern Scand. History	Jr., sr., grad.	10-11-12 or 4-5 or His- tory 1-2-3 or 4-5-6
*107-8-9	9	Modern Swedish Literature . .	Jr., sr., grad.	10-11-12
*110	3	Ibsen	Sr., grad.	101-2-3
*111-2-3	6	Old Norse (Icelandic)	Sr., grad.	See statement
*114	3	Strindberg	Sr., grad.	107-8-9
*115	3	Teachers' Course in Swedish.	Sr., grad.	10-11-12 or 4-5
*116	3	Teachers' Course in Nor- wegian	Sr., grad.	4-5 or 10-11-12
*117-8	6	Earlier Norwegian Literature	Sr., grad.	101-2-3

1-2. BEGINNING NORWEGIAN. Grammar, composition, select readings in easy prose and poetry.

3. INTERMEDIATE NORWEGIAN. Grammar, composition, conversation, elementary history of literature, and select works of modern authors.

4-5. ADVANCED NORWEGIAN (SURVEY). Prose and poetry. BØTHNE.

7-8. BEGINNING SWEDISH. Grammar, composition, conversation, reading of selected prose texts. STOMBERG.

9. INTERMEDIATE SWEDISH. Reading selected works in prose and verse. STOMBERG.

10-11. ADVANCED SWEDISH (SURVEY). Brief survey of the history of Swedish literature and reading of Tegner's *Fritiofs Saga* and Runeberg's *Fänrik Staks Sägner*. STOMBERG.

12. ANCIENT AND MEDIEVAL SCANDINAVIAN HISTORY. The antiquities of Scandinavian formation of states, the Viking expeditions, medieval culture. Knowledge of Scandinavian not required. STOMBERG.
- 101-102-103. MODERN NORWEGIAN LITERATURE. Norwegian literature from 1814 to the present day. BOTHNE.
- *104-105-106. MODERN SCANDINAVIAN HISTORY. Religious, political, and economic changes in the North, military enterprises, growth of liberalism, material progress. Knowledge of Scandinavian not required. STOMBERG.
- *107-108-109. MODERN SWEDISH LITERATURE. The Swedish novel. Study of a selected list of Swedish classics. STOMBERG.
- *110. IBSEN. Lectures, reading, and interpretation. BOTHNE.
- *111-112-113. OLD NORSE (ICELANDIC). Grammar, and reading. Gunnlaug's *Saga Ormstungu*. BOTHNE.
- *114. STRINDBERG. Lectures, reading, and interpretation. STOMBERG.
- *115. TEACHERS' COURSE IN SWEDISH. For students who expect to teach Swedish in the high schools. STOMBERG.
- *116. TEACHERS' COURSE IN NORWEGIAN. For students who expect to teach Norwegian in the high schools. BOTHNE.
- *117-118. EARLY NORWEGIAN LITERATURE. History of literature. Saga period. Norwegian and Danish folk-songs. Holberg, *Oplysningstiden*. Six credits. BOTHNE.

SOCIOLOGY AND SOCIAL WORK

Professors ARTHUR J. TODD¹, Chairman, ALBERT E. JENKS; Associate Professors LUTHER L. BERNARD, MANUEL C. ELMER; Assistant Professors ROSS L. FINNEY, GUSTAV A. LUNQUIST; Lecturers FRANK J. BRUNO, OTTO W. DAVIS, ARTHUR H. TAYLOR, EDWARD C. WAITE; Superintendents of State Board of Control institutions; Teaching Fellow ALMENA DAWLEY; Supervisor of Field Work CAROLINE BEDFORD.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
1	5	Introduction to Sociology and Anthropology.....	Soph., jr., sr. ²	None
6	3	Modern Social Reform Movements.....	Soph., jr., sr.	1

² For freshmen, this course is open only during their third quarter.

¹ On leave of absence.

DEPARTMENTAL STATEMENTS

No.	Credits	Title	Offered to	Prereq. courses
14	3	Rural Sociology.....	Jr., sr.	1 for Arts students. None for seniors in professional schools
*51	3	Background of Dependency and Defectiveness.....	Jr., sr.	1
*52	3	Treatment of Dependents and Defectives.....	Jr., sr.	51
*53	3	Treatment of Delinquents...	Jr., sr., grad.	1, and Psychology 1-2-3 recommended
*54	3	Child Welfare.....	Jr., sr.	51 or 52
*55	3	Housing Problems.....	Jr., sr.	1
*99	3	Supervised Field Practice Work.....	Jr., sr., grad.	Consent of director
*101	3	Social Organization.....	Jr., sr., grad.	Three courses one of which may be in psych., philos., econ. or pol. sci.
*102	3	Social Control.....	Jr., sr., grad.	Same as for 101
*108	3	Social Psychology (primarily for sociology students)....	Jr., sr., grad.	1 and Psy. 1-2-3
*110	2	Community Organization and Social Work in Small Towns	Jr., sr., grad.	Two courses
*114	3	Rural Social Institutions....	Jr., sr., grad.	14
*119	3	The Family.....	Jr., sr., grad.	Three courses one of which may be in home econ., econ., pol. sci., anthropol. or law
*120	3	Social Progress.....	Jr., sr., grad.	Three courses, one of which may be in econ., pol. sci., educ. or philos.
*121	3	Methods of Social Investigation.....	Jr., sr., grad.	Three courses
*128	2	Charitable Admin., Finance, and Publicity.....	Jr., sr., grad.	Three courses
*130	2	Technique of Family Treatment.....	Jr., sr., grad.	51, 52 and one other
*132	2	Juvenile Courts and Probation	Jr., sr., grad.	51, 52, 53
*133-134-135	3	Hospital Social Service.....	Jr., sr., grad.	Consent of Director
*137-138-139	6	Mental Case Work.....	Jr., sr., grad.	Consent of Director
*140	3	History of Social Theory....	Jr., sr., grad.	Same as for 101
*180	2	Seminar in Educational Sociology.....	Jr., sr., grad.	1, 6 and 120 or educ.

1. INTRODUCTION TO SOCIOLOGY AND ANTHROPOLOGY. A study of the origin and development of human societies; various agencies which have determined the type of social life; social organization, institutions, and progress; bearing of sociology upon other social sciences and arts. TODD, JENKS, BERNARD, ELMER, FINNEY, LUNDQUIST.

6. MODERN SOCIAL REFORM MOVEMENTS. A survey of attempts to overcome certain social maladjustments: child labor, the city, bad housing, poverty, degeneracy; movements for public health, industrial democracy, social insurance, protection of infancy and youth, public recreation, etc. TODD, ELMER, FINNEY.

14. RURAL SOCIOLOGY. The background and evolution of country life; rural conveniences, communication, coöperation; rural social institutions, especially the family, school, church and social center; rural leadership, surveys, organization, social agencies. BERNARD, LUNDQUIST.
- 45-46. ELEMENTS OF SOCIAL HYGIENE AND COMMUNITY PROTECTIVE WORK. (Not offered in 1919-20.)
- *51. THE BACKGROUND OF DEPENDENCY AND DEFECTIVENESS. This course considers the conditions in contemporary industrial societies out of which the social problems of the dependent and defective arise. BRUNO.
- *52. TREATMENT OF DEPENDENTS AND DEFECTIVES. This course reviews the methods used or advocated for the prevention and alleviation of poverty and defectiveness. BRUNO.
- *53. TREATMENT OF DELINQUENTS. The causes of crime; nature of the criminal; criminal procedure; methods of treatment (prisons, reformatories, parole, probation); the juvenile offender; juvenile courts; preventive methods. ELMER.
- *54. CHILD WELFARE. Study of social obligations to the child; development of the child-saving movement in the United States; infant and child mortality, recreation, education; courts, institutions, societies, and other public efforts for the child. TAYLOR.
- *55. HOUSING PROBLEMS. An examination of housing evils and their causes; the various movements for the prevention or improvement of bad housing; town planning; garden cities. Lectures, readings, field work, and essay. DAVIS.
- *99. SUPERVISED FIELD PRACTICE WORK. This is a course in technique open only to selected students who have taken, or are taking, Courses 51, 52, 53, 54, 55, 110, 130, or 132. BEDFORD.
- *101. SOCIAL ORGANIZATION. The organization and structure of social groups; the selection of group types and values; the disorganization and reorganization of institutions; purposive social organization. BERNARD.
- *102. SOCIAL CONTROL. Nature, purpose, and methods of social control; institutional and non-institutional controls; the evolution of sanctions in social control; the revision of the social controls under the influence of modern science. BERNARD.
- *103. SOCIOLOGY OF CONFLICT. (Not offered in 1919-20.)
- *104. STATE CARE OF DEPENDENTS, DEFECTIVES, AND DELINQUENTS IN MINNESOTA. (Not offered in 1919-20.)

- *108. SOCIAL PSYCHOLOGY (primarily for sociology students). The social attitudes; their development and modification under social pressures; the interactions of individuals and groups. BERNARD.
- *110. METHODS OF COMMUNITY ORGANIZATION AND SOCIAL WORK IN SMALL TOWNS AND COUNTRY. Concrete problems and methods are emphasized. BERNARD.
- *114. RURAL SOCIAL INSTITUTIONS. A detailed study of the problems of organization and efficiency of selected rural institutions, especially religious, educational, civic, and recreational. For advanced students. Lectures, discussion, reports. LUNDQUIST.
- *119. THE FAMILY. The evolution of the family; its various forms and their relation to other social institutions; the service of the family in social evolution; contemporary problems of the family (standards of living, birth rate, feminism, etc.) ELMER.
- *120. SOCIAL PROGRESS. A study of the basis for social progress in human nature; analysis of fundamental social institutions with regard to their contributions to human advance; necessary social readjustments to convert drift into progress. BERNARD.
- *122. METHODS OF SOCIAL INVESTIGATION. Methods of gathering and presenting community facts; social statistics; social surveys. Lectures, problems, and field work. ELMER, DAWLEY.
- *125-126-127. SETTLEMENT AND COMMUNITY CENTER WORK. (Not offered in 1919-20.)
- *128. CHARITABLE ADMINISTRATION, FINANCE, AND PUBLICITY. A technical study of methods of organizing charitable agencies, of financing them, and of making the public aware of their work. Lectures and practice work. DAVIS.
- *130. TECHNIQUE OF FAMILY TREATMENT. An intensive study of social case work as the basis of practical dealing with problems of dependency and delinquency. Lectures and conferences. BRUNO.
- *132. JUVENILE COURTS AND PROBATION. Primarily a course in probation practice work, but prefaced by lectures on the social and legal aspects of the juvenile court and probation. TODD, WAITE.
- *133-134-135. HOSPITAL SOCIAL SERVICE. A course open only to students who are properly grounded in case work and who wish to specialize in this field. ———, TEBBETS.
- *137-138-139. MENTAL CASE WORK. Specialized social case work with mentally abnormal and subnormal persons. Clinical material from the psycho-educational clinic, psychiatric clinics, and University dispensary. (Registration only with consent of the Director.) DAWLEY.

- *140. HISTORY OF SOCIAL THEORY. A rapid survey of the leading social theories from the time of the Greeks, with special reference to the development of sociology in the nineteenth century. The theories are related to their social backgrounds. BERNARD.
- *150. SEMINAR. Subject for fall quarter: The Literature of Social Protest. Open to qualified students in either English or Sociology. (Not offered in 1919-20.) TODD.
- *151. SEMINAR. Subject for winter quarter: Social Aspects of the Labor Problem. (Not offered in 1919-20.) TODD.
- *152. SEMINAR. Subject for spring quarter: Problems of Institutional Administration and Reconstruction. (Not offered in 1919-20.) TODD.
- *180. SEMINAR IN EDUCATIONAL SOCIOLOGY. FINNEY.

ALLIED COURSES IN OTHER DEPARTMENTS

Home Economics 70, 71, 72, 39; Political Science, 48, 5, *108; Anthropology 5, *113, *125; Economics *161, *167; Philosophy *124-125; Education *3; Agricultural Education *173.

SAVE FOR SECOND QUARTER

The University of Minnesota

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

PROGRAM, FALL AND WINTER QUARTERS, 1919-1920

ABBREVIATIONS AND EXPLANATIONS

The following abbreviations are used: A, Armory; AB, Animal Biology; Ar indicates that days, hours, room are to be arranged later; C, Chemistry Building; D, Dental Building; Ed, College of Education; En, Engineering Building, University Farm; F, Folwell Hall; HE, Home Economics Building, University Farm; IA, Institute of Anatomy; L, Law Building; Lib, Library; M, Mines; MA, Mechanic Arts; ME, Main Engineering Building; MechE, Mechanical Engineering Building; MH, Millard Hall; Mu, Music Building; O, Observatory; P, Pillsbury Hall; PIPath, Plant Pathology Building, University Farm; Ph, Physics Building; Psy, Psychology Building; WGm, Women's Gymnasium.

The symbol ¶ indicates that the instructor is to be assigned.

The Roman numeral indicates the hour of meeting of a class; e.g., I, 8:30-9:20 a.m.

The numbers of the first column are those of the courses described in the Bulletin which should be consulted for further information regarding nature of the course, to whom it is open, prerequisites, etc.

AGRICULTURE, FORESTRY, AND HOME ECONOMICS

The following divisions of this College offer courses to students in the College of Science, Literature, and the Arts who can meet the prerequisites:

Agricultural Biochemistry	Farm Engineering
Agricultural Education	Forestry
Agronomy and Farm Management	Home Economics
Animal Husbandry	Horticulture
Bee Culture	Plant Pathology and Botany
Dairy Husbandry	Soils
Entomology and Economic Zoology	Veterinary Medicine

Descriptions of the courses offered will be found in the bulletins of the College of Agriculture, Forestry, and Home Economics. The hour schedule will be found in the program issued each quarter.

Students who desire to take more than a single course in Agriculture are advised to consult with some member of the division in which they are interested in order to arrange the sequence of courses which will be of greatest value.

AMERICANIZATION TRAINING AND ANTHROPOLOGY

No.	Title	Hour	Day	Building	Instructor
1f	Introduction to Anthropology.....	I	MTWThF	25F	Mathie
1f	Introduction to Anthropology.....	II	MTWThF	25F	Jenks
1w	Introduction to Anthropology.....	II	MWF	15F	Mathie
2f	General Anthropology	II	MWF	2F	Mathie
2w	General Anthropology	II	MWF	2F	Jenks
5w	General Immigration	III	TThS	15F	Mathie
40f	Slavic Culture	IV	TS	9F	Junek
41w	Slavic Languages	IV	TS	9F	Junek
*113f	Older Immigrants	III	MWF	9F	Jenks
*114w	Newer Immigrants	III	MWF	9F	Jenks
*125f	Methods of Americanization.....	I	MWF	15F	Jenks, Clark, Junek
*126w	Organization of Americanization..	I	MWF	15F	Jenks, Clark, Junek

No.	Title	Hour	Day	Building	Instructor
*131f	Supervised Americanization Work.	II	TTh & Ar	2F	Clark, Junek
*132w	Supervised Americanization Work.	II	TTh & Ar	2F	Clark, Junek
*137f	Race Leaders and Programs.....	I	TThS	2F	Clark

ANIMAL BIOLOGY

No.	Title	Hour	Day	Building	Instructor
1f-2w	General Zoology				
	Sec. I	Lab. I, II	TThS	101AB	†
		Lect. II	MW		
			I, II		
	Sec. II	Lab. III, IV	MWF	101AB	†
		Lect. III, IV	T		
			III		
	Sec. III	Lab. V, VI, VII	TTh	101AB	†
		Lect. V	MW		
			V, VI		
	Sec. IV	Lab. V, VI	MWF	101AB	†
		Lect. V, VI	TTh	313AB	†
1w-2s	General Zoology				
		Lab. I, II	MWF	101AB	†
		Lect. II	TTh		
			I, II		
				313AB	†
1s-2su or 2w	General Zoology				
		Lab. I, II	TThS	101AB	†
		Lect. II	MW		
			I, II		
				313AB	†
5f-6w-7s	General Zoology				
	(Pre-medical)	Lab. III, IV	TS	101AB	†
		Lect. IV	MWF	313AB	†
9f-10w	Histology-Embryology ...		III, IV	201, 211AB	Downey
9s	Histology-Embryology ...		III, IV	201, 211AB	Downey
17f-18w	General Physiology		V, VI, VII		
			V, VI, VII, VIII	10AB	Lund
			F		
23s	Morphogenesis and Behavior of Organisms...		V, VI, VII		
			V, VI, VII, VIII	10AB	Lund
			F		
27s	Comparative Anatomy ...		V, VI	107-9AB	†
35s	General Embryology ...		III, IV	102AB	Nachtrieb
37f-38w-39s	General Entomology ...		I, II	208-10AB	Oestlund
43s	Introd. Entomology ...		I, II	208-10AB	Oestlund
43su	Introd. Entomology ...		I, II	208-10AB	Oestlund
44f	Animal Parasites		V, VI	208-10AB	Riley
44s	Animal Parasites		V, VI	208-10AB	Riley
45w	Insects and Disease.....		III, IV	208-10AB	Riley
45su	Insects and Disease.....		III, IV	208-10AB	Riley
59s	General Ecology		V, VI, VII	208-10AB	Chapman
*103w	Morphology of Invertebrates		I, II	211, 213AB	Sigerfoos
			TThS		
*107s	Protozoology		I, II	211, 213AB	Sigerfoos
*109f-110w	General Physiology		V, VI, VII	10AB	Lund
			V, VI, VII, VIII		
			F		
114w-115s	Ornithology		V, VI, VII	211, 314AB	Roberts
*117f-118w-119s	Ecology of Insects.....		V, VI, VII	208-10AB	Chapman
*124su	Advanced Ecology		V, VI	208-10AB	Chapman
*125f-6w-7s	Advanced Entomology....		III, IV	208-10AB	Oestlund
*130w	Biology Aphididae		III, IV	208-10AB	Oestlund
*139s	Hist'l. Development Insects		III, IV	208-10AB	Riley
139su	See 139s				
*149f-150w-151s	Blood of Vertebrates....		VI, VII	201, 211AB	Downey
*153f-154w-155s	Hematology		V, VI, VII	201, 211AB	Downey
175s	Nature Study		V, VI, VII	213AB	Sigerfoos
*182w	Genetics and Eugenics...		III	211AB	Nachtrieb
*197f-198w-199s	Problems		Ar	Ar	†

ARCHITECTURE

No.	Title	Hour	Day	Building	Instructor
21.1f					
21.2w	Freehand Drawing	V, VI	MWF	401ME	Burton
21.3s					
72.1f					
72.2w	Elements of Architecture.....	II	MTWThF	309ME	Mann
72.3s		V, VI	MTWTh		Burton Hamilton

ASTRONOMY

No.	Title	Hour	Day	Building	Instructor
7f	Navigation	V	MWF	124F	Leavenworth
11f	Descriptive Astronomy...	IV	MTWFS	124F	Beal
11w	Descriptive Astronomy...	III	MTWThF	124F	Leavenworth
25f	Stellar Astronomy.....	III	MTWThF	124F	Leavenworth
25w	Stellar Astronomy.....	IV	MTWFS	124F	Beal
*51f-52w-53s	General Astronomy.....	II	MWF	124F	Leavenworth
		II	TThS	124F	Beal
*62f	Elements of Pract. Ast...	Ar	Ar	O	Beal
*62w	Elements of Pract. Ast...	Ar	Ar	O	Beal
*101f-102w-103s	Practical Astronomy.....	Ar	Ar	O	Leavenworth
*140w	Least Squares	Ar	Ar	O	Leavenworth

BACTERIOLOGY AND IMMUNOLOGY

No.	Title	Hour	Day	Building	Instructor
6f	Elementary Bacteriology	V, VI	MWF	MH	Benton
6w	Elementary Bacteriology	V, VI	MWF	MH	Henrici
105f	Special Bacteriology	I, II	MWF	MH	Larson
115f	Course in Immunity.....	Ar	Ar	MH	Larson
117f	Higher Bacteria	V, VI	TTh	MH	Henrici

BOTANY

No.	Title	Hour	Day	Building	Instructor
1f-2w	General Botany				
	Sect. I	Lab. I, II	MWF	212, 214, 220P	Durand, et al
		Quiz. I	T	212, 214, 220P	Durand, et al
		Lect. II	TThS	210P	Durand, et al
	Sect. II	Lab. III, IV	MWF	212, 214, 220P	Durand, et al
		Quiz. III	Th	212, 214, 220P	Durand, et al
		Lect. IV	TThS	210P	Durand, et al
	Sect. III	Lab. V, VI	MWF	212, 214, 220P	Durand, et al
		Quiz. V	Th	212, 214, 220P	Durand, et al
		Lect. V, VI	T	210P	Durand, et al
		VI	Th	210P	Durand, et al
3f	General Botany				
		Lab. V, VI	TTh	214P	Durand, et al
		Lect. VII	TTh	200aP	Durand, et al
11f	Algae and Fungi.....	I, II	TWThFS	AB	Tilden, Durand
12w	Bryophytes and Pteridophytes	I, II	TWThFS	AB	Huff
17w	Anatomy of Vascular Plants	III, IV	MTWFS	AB	Butters
*51f	Histological Methods	I, II	MWF	AB	Durand
*52f	Plant Physiology	III, IV	MTWFS	AB	Knight
*53w	Botany of Econ. Plants..	III, IV	MTWFS	AB	Knight
*61f-w-s	Teachers' Course	VII	MTWThF	AB	Johnson
*113f-114w-115s	Advanced Taxonomy	V, VI	MWF	AB	Rosendahl
*118w-119s	Cytology	I, II	MWF	AB	Rosendahl
*126f	Algae; Tax. and Morph. of Rhodophyceae.....	V, VI, VII	TTh	AB	Tilden

No.	Title	Hour	Day	Building	Instructor
*131f	Field Ecology	V, VI, VII	TTh	AB	Cooper
		I, II, III	S	AB	
*132w	Ecological Anatomy	III, IV	MTWThF	AB	Cooper
*141f	Adv. Plant Physiology...	I, II	MTWThF or Ar.	AB	Knight
*142w	Adv. Plant Physiology...	I, II	MTWThF or Ar.	AB	Knight

CHEMISTRY

DIVISION OF GENERAL AND INORGANIC CHEMISTRY

No.	Title	Hour	Day	Building	Instructor
1f-2w	General Inorganic Chemistry.				
	Lec.	V	MWF	100C	Whitmore
	Lab.	V-VII	TTh	210C	Whitmore
4f-5w	General Inorganic Chemistry.				
	Lec.	V	MWF	225C	Cohen
	Lab.	V-VII	TTh	210C	†
6f-7w	General Inorganic Chemistry.				
	Lec.	II	MWF	225C	Cohen
	Lab.	III-IV	MWF	210C	Cohen
9f-10w	General Inorganic Chemistry.				
	Lec.	II	MWF	100C	Sneed
	Lab.	V-VII	TTh	210C	Sneed
11f	Qual. Chem. Analysis.....				
	Lec.	II	TThS	325C	Sneed
	Lab.	V-VI	MW	110C	Sneed
12f-13w	Qual. Chem. Analysis.....				
	Lec.	III	MWF	111C	Whitmore
	Lab.	V-VII	TTh	110C	Whitmore
101f	History of Chemistry.....	Ar	Ar	Ar	Cohen
102w	Adv. Inorganic Preparations..	Ar	Ar	Ar	Whitmore
103w	Adv. Inorganic Chemistry....	IV	TS	345C	Sneed

DIVISION OF ANALYTICAL CHEMISTRY

20f	Quantitative Analysis				
	Lec.	VI	M	325C	Sidener
	Lab.	V-VIII	TTh	310C	Sidener, Geiger
20w	Quantitative Analysis				
	Lec.	IV	T	325C	Geiger
	Rec.	V	F	315C	Geiger
	Lab.	V-VIII	MW	310C	Sidener, Geiger
		VI-VIII	F	310C	Sidener, Geiger
123f	Iron and Steel Analysis.....				
	Lec.	IV	T	315C	Sidener
	Lab.	V-VIII	MF	310C	Sidener, Geiger
124w	Mineral and Ore Analysis...				
	Lec.	IV	T	315C	Sidener
	Lab.	V-VIII	MF	310C	Sidener, Geiger

DIVISION OF ORGANIC CHEMISTRY

31w	Elementary Organic Chemistry				
	Lec.	IV	MWF	325C	Hunter
	Lab.	V-VII	TTh	10C	Hunter, Woollett
35f-36w	Organic Chemistry.....				
	Lec.	III	MWF	100C	Hunter
	Rec.	III	T	111C	
	Lab.	V-VII	WF	10C	Hunter, Woollett
132f	Adv. Organic Chemistry.....	II	MWF	315C	Jones
138f	Adv. Organic Chemistry Lab.†	Ar	Ar	Ar	Jones
139w	Adv. Organic Chemistry Lab.†	Ar	Ar	Ar	†

† Open only to those students who are taking or have taken the lecture course in Advanced Organic Chemistry.

DIVISION OF PHYSICAL CHEMISTRY

141f-142w	Physical Chemistry	Lec. IV	MWF	115C	MacDougall
		Lab. V-VII	F†	117C	MacDougall
		Rec. III	S	115C	†
146w	Lab. Course in Radiochem...	Ar	Ar	Ar	Henderson
147f-148w	Adv. Physical Chemistry.....	I	TThS	115C	MacDougall
151f-152w	Adv. Physical Chemistry.....	Lab. Ar	Ar	117C	MacDougall

† 6 cr. course, no laboratory; 8 cr. course, laboratory on F.; 10 cr. course, laboratory arranged.

COMPARATIVE PHILOLOGY

No.	Title	Hour	Day	Building	Instructor
*101f-102w	Science of Language....	VI	TTh	205F	Klaeber
*103w	Universal Language.....	IV	TS	205F	Klaeber
*141f-142w-143s	Hist. Grammar of English Language	VI	WF	205F	Klaeber

DRAWING AND DESCRIPTIVE GEOMETRY

No.	Title	Hour	Day	Building	Instructor
31f-w	Drafting and Tracing.....	V, VI, VII	TTh	13ME	†
33f-34w	Technical Drawing	I, II	TThS	1ME	†
		V, VI	MWF	1ME	†

ECONOMICS

NOTE: Economics 3f-4w (1919-20) equals 3f-4w-5s (1918-19).

No.	Title	Hour	Day	Building	Instructor
1f-2w	Introd. to Econ. Hist... Sections to be ar.	III	MTThFS	Law Aud.	Gras, Dickin- son, et al.
3f-4w	Principles of Economics.. Lecture	IV	T	Lit. Th.	Hansen, et al.
	Sec. 1	II	MWThF	Ar	†
	2	II	MWThF	Ar	†
	3	III	MWThF	321F	†
	4	III	MWThF	25F	†
	5	IV	MWFS	209MA	†
	6	IV	MWFS	2F	†
	7	V	MWThF	109MA	†
	8	V	MWThF	102MA	†
	9	VI	MWThF	107F	†
	10	I	TThFS	109MA	†
	11	I	TThFS	113F	†
	12	III	TThFS	Ar	†
	13	III	TThFS	Ar	†
3s-4f	Principles of Economics.. (see 3f-4w)				Hansen, et al.
5f, s	General Economics	I	MWThFS	Farm	Holmes
6f, w	Agricultural Economics...	III	MWF	Farm	Holmes
7w, s	Principles of Economics...	III	MTWThF	Farm	Chambers
8f-9w-10s	Principles of Economics.. Sec. 1	I	MWF	Engineers	Ar
	2	IV	MWF	Engineers	Ar
11f-12w	Statistics	IV	MWF	102MA	Mudgett
14s	Statistics	IV	MWF		
	Lec. Sec. 1	IV	MWF	Ar	Mudgett
	2	I	MWF	Ar	†
	Lab. Sec. 1	VI, VII	M	Ar	†
	2	VI, VII	Th	Ar	†
15f-16w-17s	Economic Problems	IV	MWF	Eng. Ar	Blakey
18s	Prob. in Agri. Economics	III	MTWThF	Farm	Black
19f	Prin. of Agri. Marketing	III	MTWFS	Farm	†
20w	Prob. in Rural Economics	IV	MTWThF	Ar	Cumberland

	Principles of Organization and Management	II	MTWThF	Ar	Pelz
25f-26w	Prin. of Accounting.....				
	Lea. Sec. 1	II	MWF	301MA	Sanders, et al.
	2	III	MWF	301MA	¶
	3	III	MWF	301MA	¶
	4	IV	MWF	301MA	¶
	5	IV	MWF	301MA	¶
	6	I	TThS	301MA	¶
	7	III	TThS	301MA	¶
	Lab. Sec. 1	V, VI	M	301MA	¶
	2	III, IV	T	301MA	¶
	3	V, VI	T	301MA	¶
	4	VI, VII	T	301MA	¶
	5	VI, VII	T	301MA	¶
	6	VI, VII	W	301MA	¶
	7	VI, VII	W	301MA	¶
	8	II, III	Th	301MA	¶
	9	VI, VII	Th	301MA	¶
	10	VI, VII	Th	301MA	¶
	11	V, VI	F	301MA	¶
	12	VII, VIII	F	301MA	¶
41s	Financial Hist. of U. S. . . .	I	MWF	Ar	Blakey
*51f-52w-53s	Business Law	II	MWF	See Political Science	
*54f	Corporation Finance				
	Sec. 1	II	TS	202MA	Stehman
	2	I	TS	Ar	¶
	3	III	TS	Ar	¶
	Lecture	II	Th	202MA	¶
*55w	Adv. Corporation Finance	II	TThS	109MA	Stehman
*59f	Life Insurance	III	MWF	102MA	James
*60w	Fire Insurance	III	MWF	102MA	James
*61s	General Insurance	III	MWF	Ar	James
*76f	Commercial Policies	I	MWF	209MA	Blakey
*77w	Foreign Trade	I	MWF	209MA	Blakey
*85f	Prin. of Marketing.....	I	TWThFS	102MA	Sherman
*86f, w	Advertising and Selling..	VI	MWF	202MA	Pelz, Sherman
*88w	Retail Marketing	I	TThS	102MA	Sherman
*95f-96w	Office Management	V, VI	TTh	202MA	Sykes
*97s	Seminar in Secretarial Administration	Ar	Ar	Ar	Sykes
*100f-101w-102s	Economic History of Europe 1300-1750.....	II	TThS	218b Lib	Gras
*103f-104w	Value and Distribution....	VII	MWF	102MA	Garver
*105s	Hist. of Econ. Ideas.....	VII	MWF	Ar	Garver
*107f	Land Tenure	VI	MTWThF	Farm	Black
*108w	Agricultural Statistics ...	V	MTWThF	Farm	Black
		VI	MWF		
*109s	Econ. of Consumption....	Ar	Ar	Ar	¶
*110w	Farm Marketing Prob....	I	MTWThF	Farm	¶
*116f-117w-118s	Advanced Agri. Econ....	II	TThS	Farm	Black, Cumberland, Holmes
				Farm	Black, Cumberland, Holmes
*119f-120w-121s	Sem. in Agri. Econ.....			Farm	Black, Cumberland, Holmes
	To be ar.				
*126f-127w-128s	Special Research Prob. in Agri. Economics			Farm	Black, Cumberland, Holmes
	To be ar.				
*131f	Cost Accounting	II	TThS	Ar	Noble
*132w-133s	Industrial Accounting....	II	TThS	Ar	Noble
*134f-135w-136s	Auditing			Ar	Rotzel
	To be ar.				
*137f-138w-139s	Accounting Practice and Procedure	II	MWF	102MA	Sanders

*143f-144w	Money and Banking.....					Dowrie, Eber-sole, Stehman
	Lecture	IV	T	202MA		
	Quiz. Sec. 1	II	MWThF	209MA		
	2	IV	MWFS	202MA		
	3	V	MWThF	209MA		
*145s	International Exchange...	Ar	Ar	Ar		Dowrie
*146w	Investments	VI	MWF	209MA		Ebersole
*146s	Investments	Ar	Ar	Ar		Ebersole
*147f	Bank Administration	VI	MWF	209MA		Ebersole
*149s	Business Cycles	VI	MWF	Ar		Ebersole
*150s	Farm Finance	Ar	Ar	Ar		Dowrie
*153w	Modern Bus. Corporation	II	TThS	202MA		Gray
*154s	Public Utilities	II	TThS	Ar		Gray
*160s	Economic Motives	Ar	Ar	Ar		Dickinson
*161f	Labor Problems	IV	MWF	Ar		Hansen
*162w	Trade Unionism	IV	MWF	Ar		Hansen
*164w	Police Power	See	Political Science.			
*165s	Law of Labor.....	See	Political Science.			
169s	Labor and Reform Move-ments	Ar	Ar	Ar		Hansen
*173s	Railway Problems.....	III	TThS	Ar		Gray
*191f-192w	Public Finance	III	MWF	213MA		Blakey
*193s	State & Local Taxation..	Ar	Ar	Ar		Blakey
*195f-196w-197s	Sem. in Bus. Finance... To be ar.					Dowrie, Eber-sole, Stehman

EDUCATION

DEPARTMENT OF EDUCATIONAL ADMINISTRATION AND SUPERVISION

No.	Title	Hour	Day	Building	Instructor
3f, w, s	Social Aspects of Educ..	I	MWF	205Ed	Finney
		III	TThS	202Ed	Finney
5s	American School (offered at Univ. Farm).....	VI	MWF	Farm	Swift
		VII	MWF		
20f	High-School Curriculum..	IV	TThS	205Ed	Koos
113s	Secondary Education				
	Movements	II	TThS	202Ed	Miller
119f-120w	School Curricula	VIII	MWF	205Ed	Rankin
121f, w, s	School Organization and Administration	VII	MWF	202Ed	Rankin
124f-125w-126s	Educational Adminis....	VIII	MWF	202Ed	Sies
141f	School Sanitation	I	MWF	202Ed	Rankin
142s	Industrial Education	VIII	MWF	205Ed	Rankin
160f-161w-162s	Theory of Supervision....	I, II	S	111Ed	Sies
164f	Problems of H.-S. Admin.	VIII	MWF	111Ed	Koos
167f	Junior High School.....	II	TThS	202Ed	Koos

DEPARTMENT OF HISTORY AND PHILOSOPHY OF EDUCATION

if	Brief Course in History of Education	Sec. 1	II	MTWThF	205Ed	Alexander
		Sec. 2	III	MTWThF	205Ed	Alexander
		Sec. 3	VI	MTWThF	205Ed	Alexander
		Sec. 4	VII	MTWThF	205Ed	Swift
1w	Brief Course in History of Education		II	MTWThF	205Ed	Alexander
1s	Brief Course in History of Education		II	MTWThF	205Ed	Alexander
101f	Found. of Modern Educ.	VIII, IX		TTh	202Ed	Swift

102w	Hist. of Mod. Sec. and Higher Educ.	VIII, IX	TTh	202Ed	Swift
103s	Hist. of Mod. Elem. Educ.	VIII, IX	TTh	202Ed	Swift
†129w-130s	Educational Classics	III	MWF	205Ed	Alexander
†131w-132s	Compar. School Systems...	III	TThS	205Ed	Alexander
146w	Hist. and Prin. of Relig. Education	VI, VII	TTh	112Ed	Swift
148s	Hist. of Educ. in U. S.	VI	MWF	202Ed	Alexander

† Students may take either quarter.

DEPARTMENT OF THEORY AND PRACTICE OF TEACHING

11f, w, s	Technique of Teaching...	I	TThS	205Ed	Miller
		IV	MWF	205Ed	Morehouse
15f, w, s	Practice Teaching.....	Ar	Ar	Ar	Miller

ENGLISH, RHETORIC, AND PUBLIC SPEAKING

COURSES IN ENGLISH

No.	Title	Hour	Day	Building	Instructor
Af-Bw-Cs	Freshman English	Lec. II	M	Little Theater	
		Rec. I or	TWThS	Assigned on registration	
		Rec. II	TWThS	Assigned on registration	
		Lec. IV	T	Little Theater	
		Rec. III or	MWThF	Assigned on registration	
		Rec. IV	MWFS	Assigned on registration	
		Lec. VI	T	Little Theater	
As	Freshman English	Rec. V or	MWThF	Assigned on registration	
		Rec. VI	MWThF	Assigned on registration	
1f-2w-3s	English Survey	Lec. III	M	Little Theater	
		Rec. III	TWThF	Assigned on registration	
4f	Old English	IV	MWF	301F	¶
		IV	MWF	110F	¶
		IV	MWF	113F	¶
		IV	MWF	205F	¶
		VII	MWF	301F	¶
		VII	MWF	110F	¶
		VII	MWF	206F	¶
		VII	MWF	212F	¶
		VIII	MTThF	205F	¶
		VIII	MTThF	205F	¶
4s	Old English	III	TThFS	205F	Klaeber
6f	Chaucer	VII	MTThF	204F	Beach
6w	Chaucer	III	TWFS	205F	Griffin
8f	Shakespeare	II	TWFS	204F	Stoll
8w	Shakespeare	II	TWFS	204F	Northrop
27w	Hist. of Eng. Language..	IV	TS	204F	Klaeber
40f	Bible as Literature.....	III	MWF	204F	Burton
*51w	Spenser	V	MTThF	205F	Stoll
*53s	17th Century Lyrist.....	II	TWFS	204F	Northrop
*54s	American Literature	II	TWFS	301F	Moore
*58w-59s	19th Century Prose.....	VI	MWF	204F	Beach
*64s	Bacon	VI	MWThS	301F	Northrop
*66f	English Novel	II	MTThF	301F	Burton
*103w	Beowulf	VII	TWThF	205F	Klaeber
*105f-106w	18th Century Poetry.....	III	TThS	110F	Moore
*110w	Romantic Movement	I	TWFS	205F	Beach
*111f-112w	17th Century Prose.....	III	MWF	110F	Northrop
*129f	Modern Drama	IV	MTWF	204F	Burton
*136s	Advanced Shakespeare...	III	TWFS	302F	Stoll
*140s	Advanced Chaucer	III	TWFS	204F	Griffin
*141f-142w-143s	Historical Grammar	VI	WF	205F	Klaeber
*146w-147s	Metrical Romances.....	II	TThS	302F	Griffin

COURSES IN RHETORIC

2f-3w	Comp. and Rhet.....	I	MWF	Assigned on registration
	See note 1	II	TThS	Assigned on registration
3f	Comp. and Rhet.	III	MWF	Assigned on registration
	See note 2	I	TThS	Assigned on registration
		III	TThS	Assigned on registration
Af-Bw-Cs	Freshman English	Lec. II	M	Little Theater
		Rec. I or	TWThS	Assigned on registration
		Rec. II	TWThS	Assigned on registration
		Lec. IV	T	Little Theater
		Rec. III or	MWThF	Assigned on registration
		Rec. IV	MWFS	Assigned on registration
		Lec. VI	T	Little Theater
		Rec. V or	MWThF	Assigned on registration
		Rec. VI	MWThF	Assigned on registration
As	Freshman English	Lec. III	M	Little Theater
		Rec. III	TWThF	Assigned on registration
4f-5w-6s	Composition for Technical Students	I	MWF	Assigned on registration
		III	MWF	Assigned on registration
11f-12w-13s	Exp., Descr., Narr.....	Sec. 1	I	MWF 311F Hillhouse
		Sec. 2	II	MWF 311½F -Whitney
		Sec. 3	V	MWF 305F Ruud
		Sec. 4	II	TThS 306F Buck
		Sec. 5	III	TThS 306F Phelan
17f	Argument	I	TThS 306F	Jackson
15f-16w-17s	Exp. and Arg.....	II	MWF 303F	Ford
		III	TThS 311½F	Jackson
*103f-104w-105s	Stud. in Struc. & Style..	VI	MWF 303F	Ford
*107f	Imit. Writing	IV	MWF 304F	Thomas
*109w-110s	Short-story Writing	IV	MWF 304F	Thomas
*111f-112w-113s	Essay Writing	III	TThS 304F	†
*119f-120w-121s	Seminar in Writing.....	V, VI	T 302F	Thomas

NOTE 1.—This course is a continuation of Rhet. 1s or 1su given in 1918-19.

NOTE 2.—This course is a continuation of Rhet. 1w-2s or 1s-2su given in 1918-19.

COURSES IN PUBLIC SPEAKING

41f-42w-43s	Public Speaking				
	Sec. 1	II	MWF 308F	†	
	2	I	TThS 308F	†	
	3	II	TThS 308F	Rarig	
	4	III	MTWThF 308F	Lindsley	
	5	VII	MTWThF 308F	†	
41w-42s	Public Speaking				
	Sec. 1	I	MTWThF 308F	†	
41s	Public Speaking	VI	MTWThF Ar	†	
43f	Public Speaking	VI	MWF 308F	†	
*55f-56w-57s	Arg. and Debate.....	Ar	Ar	Lindsley	
*81f-82w-83s	Int. Reading.....	IV	MWF 308F	Rarig	
*85f-86w-87s	Advanced Pub. Speak....	VI	MWF Ar	Rarig	
*91f-92w-93s	Play Prod.....	VII	MWF Ar	†	
*97f	Adv. Debate	Ar	Ar 308F	Rarig, Lindsley	

ENTOMOLOGY AND ECONOMIC ZOOLOGY

No.	Title	Hour	Day	Building	Instructor
4f	Econ. Vertebrate Zoology	Ar	Ar	Ar	Washburn
*140f,su	Insecticides and Their Action	Ar	Ar	Ar	Moore
*197f,w,s,su	Introduction to Research and other work prescribed by the Division.	Ar	Ar	Ar	Entire Staff

GEOLOGY AND MINERALOGY

No.	Title	Hour	Day	Building	Instructor
1f-2w†	General Geology	I	MTWThF	210P	Johnston
1f-2w†	General Geology	III	MTWThF	110P	Emmons
1f-2w†	General Geology	IV	MTWFS	110P	Johnston
1f-2w†	General Geology	VII	MTWThF	200aP	Dunbar
*5f-6w†	Economic Geology	II	MWF	210P	Quirke
7f-8w	Gen. Geol. Laboratory...	Ar	Ar	112P	Johnston
*11f-12w-13s	Index Fossils				
	Lec.	II	M	105P	Stauffer
	Lab.	VI-VII	WF	105P	Stauffer
15w	Minerals and Rocks.....	Ar	Ar	100P	Grout
21w-22s†	Essentials of Mineralogy.				
	Lec.	IV	MWF	210P	Broderick
	Lab.	V-VIII	F	100P	Broderick
	Lab.	III	MWF	100P	Broderick
23f-24w-25s†	Elements of Mineralogy..				
	Lec.	II	MWF	Ar	Broderick
	Lab.	V-VIII	F	100P	Broderick
27w	Outlines of Mineralogy...	Ar	Ar	Ar	Grout
29f	General Physiography....	III	MTWThF	210P	Posey
30w	Principles of Geography..	III	MTWThF	210P	Posey
34w	Meteorology	II	MWF	200aP	Posey
*55f	Teachers' Course in Geog.	I	MWF	200aP	Posey
*57f-58w-59s	Paleontology	II-III	TThS	105P	Stauffer
*61f	Physical Mineralogy	Ar	Ar	Ar	Broderick
*65f	Crystallography	Ar	Ar	Ar	Broderick
*101f	Sedimentation	III	TThS	Ar	Dunbar
*105f	Rock Study	V-VI	TTh	110P	Grout
*106w	Petrography	V-VI	TTh	200P	Grout
*107f-108w-109s	Paleontologic Practice....	VI-VII	MWF	105P	Stauffer
*111f	Ore Deposits	I	TThS	110P	Emmons
*112w	Adv. Economic Geology...	I	TThS	110P	Emmons
*113s	Problems in Ore Deposits	V-VIII	W	104P	Emmons
*116f	Geog. of South America.	I	TThS	200aP	Posey
*118w	Geog. of Europe.....	II	TThS	200aP	Posey
*124w-125s	Struct. & Met. Geology..	III	TThS	112P	Johnston
*131f-132w-133s	Advanced Petrology.....	Ar	Ar	200P	Grout
*137w	Testing Econ. Minerals..				
	Lec.	IV	F	200P	Grout
	Lab.	V-VIII	F	200P	Grout
*140w-141s	Applied Petrography.....	Ar	Ar	200P	Grout
*144w-145s	Const. & Int. of Geol.				
	Maps	V-VII	TTh	112P	Quirke
*151f-152w-153s	Adv. General Geology....	IV	MWF	105P	Stauffer
*166w-167s	Mineralography	Ar	Ar	Ar	Broderick

† All quarters must be completed before credit is given for any one quarter.

GERMAN

No.	Title	Hour	Day	Building	Instructor
1f	Beginning	II	MTWThF	209F	†
2f	Beginning, Intermediate..	I	MTWThF	209F	†
2w	Beginning, Intermediate...	II	MTWThF	209F	†
3f	Beginning, Advanced....	II	MTWThF	207F	†
3w	Beginning, Advanced....	I	MTWThF	209F	†
4f-5w-6s	Beginning Chemists.....	III	MWF	209F	†
4w-5s-6f	Beginning Chemists.....	III	TThS	209F	†
7f	Chemists Intermediate....	III	MWF	207F	†
7w	Chemists Intermediate....	III	TThS	209½F	†
9f	Prose and Poetry.....	I	TThS	209½F	†
10f	Rapid Reading	IV	MTWFS	207F	Kroesch
10w	Rapid Reading	II	MTWThF	207F	Schlenker
11w	Adv. Rapid Reading.....	IV	MTWFS	207F	Kroesch

12f	Narrative Prose	III	MTWThF	212F	¶
13f	Adv. Narrative Prose....	II	MTWThF	212F	¶
13w	Adv. Narrative Prose....	III	MTWThF	212F	¶
14w	Prose and Poetry.....	II	MTWThF	209½F	¶
15f	Narrative Prose, Chem...	III	MTWF	212F	¶
15f	Narrative Prose, Pre-Med.	I	MTWThF	207F	¶
25w-26s	Elementary Scientific....	III	MWF	207F	¶
28f-29w	Adv. Chemical German..	III	TThS	207F	¶
28w-29s	Adv. Chemical German..	III	MWF	204F	¶
31f-32w	Medical German	II	MWF	109F	¶
31w-32f	Medical German	I	TThS	209½F	¶
40w-41s	Commercial German	III	MWF	102F	¶
*50f-51w-52s	Composition	III	M	209½F	Myers
*53f-54w-55s	Conversation	III	WF	209½F	Myers
*56f-57w-58s	Essay Writing	IV	TS	209½F	Burkhard
*59f-60w-61s	Oral Dictation	VII	TTh	207F	Koenig
*62f	German Comedies	IV	MWF	209½F	Davies
*63w	Modern Drama	IV	MWF	209½F	Davies
*66f	Survey 18th Century....	III	TThS	209½F	Burkhard
*67w	Survey 19th Century....	III	TThS	204F	Burkhard
*71w	Teachers' Course	VI	MWF	209F	Schlenker
*72w-72s	Drama since 1880.....	IV	MWF	209F	Schlenker
*77f	Faust I.....	IV	MWF	209F	Schlenker
*100f-101w-102s	Middle High	VII	MWF	207F	Kroesch
*103w	Phonetics	Ar	Ar	Ar	Kroesch
*126f-127w-128s	Grillparzer	V, VI, VII	Th	209½F	Myers
*150f-151w-152s	Novelle	V, VI, VII	T	209½F	Burkhard
*160f-161w-162s	Lyric	V, VI, VII	M	209½F	Davies
*225f-226w-227s	Literary Problems	V	MWF	209F	Schlenker

GREEK

No.	Title	Hour	Day	Building	Instructor
1f-2w-3s	First year Greek.....	IV	MTWFS	114F	Savage
4f-5w-6s	History & Epic Poetry...	III	TWThFS	114F	Savage
*51f	Philosophy	VI	MWF	114F	Savage
*52w	Oratory	VI	MWF	114F	Savage
*101f	Lyric Poetry	Ar	Ar	114F	Savage
*102w	Advanced Drama	Ar	Ar	114F	Savage
<i>Courses in which no knowledge of Greek is required</i>					
61f	Greek Drama	VI	TTh	114F	Savage
62w	Greek Lit. and Life.....	VI	TTh	114F	Savage
63f	Greek Mythology	I	WF	114F	Savage
63w	Greek Mythology	I	WF	114F	Savage

HISTORY

No.	Title	Hour	Day	Building	Instructor
1f-2w	Modern World, 1648-1918	II	TWThFS	Lit. Th.	Ford, Tyler
1w-2s	Modern World, 1648-1918	III	MTWThF	Ar	Tyler
3f-4w	England, 1066 to Present	II	MTWThF	Law Aud.	White, Note-stein
5f-6w	American History	III	MTThFS	301F	Shippee
7w-8s	England, 1815-1919	IV	MWFS	112Lib	Notestein
9f-10w	Intr. to Econ. History...	III	MTThFS	Law Aud.	Gras, Dickin-son
11f-12w-13s	Medieval History (Music students only).....	III	MWF	112Lib	Krey
14f	Europe, 1100-1648.....	I	MTWThF	111Lib	Krey
*56f	Teachers' Course	VIII	MWF	Ar	¶
*56w	Teachers' Course	VIII	MWF	Ar	¶
*101f	French Revolution	IV	MWF	111Lib	Ford
*103f	Near East, Ancient.....	III	MTWThF	111Lib	Davis

*104W	Near East, Modern.....	III	MTWThF	111Lib	Davis
*107f-108W	Europe, 1848-1914	VI	MTThF	111Lib	Tyler
*111W	European Background of Amer. Immigration....	V	MTWThF	113F,	Stephenson
*115f-116W-117S	Econ. Hist. of Europe, - 1300-1750	II	TThS	218b Lib	Gras
*121W-122S	English Backgrounds and American Colonies	VII	MWF	112Lib	White
*133f-134W-135S	Ancient Civilization.....	VII	MWF	111Lib	Davis
*141f	West in American History to 1815	VI	MWF	218b Lib	Buck
*142W	West in Amer. History, 1815-1865	VI	MWF	218b Lib	Shippee
*155f	United States, 1850-1865.	V, VI	TTh	218b Lib	Shippee
*157W	Selected Topics, 19th Cen- tury Europe	VII, VIII	TTh	218b Lib	Ford
*162f-163W-164S	Selected Topics, Medi- eval History	VII	TTh	218a Lib	White, Krey
*177f	Anglo-German Relations..	VII, VIII	MW	218b Lib	Notestein
*183W	Stuart Period	VII, VIII	MW	218b Lib	Notestein
Pol. Science					
*125W	Amer. Diplomatic History	III	MTThF	218b Lib	Wright

HOME ECONOMICS

No.	Title	Hour	Day	Building	Instructor
3f,w,s	Textiles	I, II	TWThFS	307HE 211HE	Phelps Weller
4f,w,s	Textiles	V, VI	MWF	307HE 211HE	Phelps Weller
11f,w,s	Garment Making				
	Section 1	V, VI, VII	TTh	364HE	McDowell
	Section 2	V, VI	MWF	304HE	Phelps
13f,w,s	Dressmaking	III, IV	MTWFS	305HE	Patchin, McDowell
17f,w,s	Adv. Clothing Construct. Section 1	V, VI, VII	TTh	305HE	Weller
	Section 2	V, VI	MWF	305HE	Carlotta Brown
22f,w,s	Food Economics	I, II	TWThFS	203,205,207HE	Stinson
23f,w	Nutrition I	V,VI,VII,VIII	MWF	211, 213HE	Mumford
34f,w,s,su	Home Management: Oper- ation and Maintenance, Lectures	VII	MWF	213HE	Mumford Vermilye
51f,w,s	Drawing and Design.... Section 1	V, VI, VII	TTh	400HE	V. Goldstein
52f,w	Art History and Appre- ciation				
	Section 1	II	MWF	401HE	H. Goldstein
	Section 2	VII	MWF	400HE	V. Goldstein
53f,w,s	Advanced Design				
	Section 1	I, II	MWThF	400HE	H. Goldstein
	Section 2	III, IV	MTWF	401HE	V. Goldstein
123f,w,s	Clothing Economics	III	MWF	309HE	Weller

HUMAN ANATOMY

Students in this College may elect courses in Human Anatomy (see Medical School program) only by arrangement with the Head of the Department of Anatomy.

HUMAN PHYSIOLOGY

No.	Title	Hour	Day	Building	Instructor
1f-2w-3s	Human Physiology	I	MTWThF	MH	Lyon, Beard, Greisheimer
4f-5w-6s	Human Physiology	I, II, III	S	MH	Lyon, Beard, Greisheimer
*100f-101w-102s	Physiologic Chemistry....	I, II, III	TTh	310MH	Pettibone, Kingsbury
*103f	Physiol. Muscle, Nerve, Blood, Circulation.....	IV V, VI, VII V, VI	MWF MW F	301MH	Scott, Lyon, McClendon
*104w	Physiol. & Nerv. System, Senses, Respiration, etc.	IV V, VI, VII V, VI	MWF MW F	301MH	Scott, Lyon, McClendon
*110f	Physical Chemistry of Vital Phenomena.....	V, VI, VII	TTh	303MH	McClendon
*111w	Electro Physiology.....	V, VI, VII	TTh	303MH	McClendon

JOURNALISM

No.	Title	Hour	Day	Building	Instructor
13f-14w	Reporting	I	MWF	3F	Radder
*16f-17w	Copy Reading	II	MWF	3F	Radder
*18s	News Editing	II	MWF	3F	Radder

LATIN

No.	Title	Hour	Day	Building	Instructor
1f-2w	Beginning Latin	IV	MTWFS	109F	¶
1w-2s	Beginning Latin	I	MTWThF	109F	¶
2w	Intermediate Latin†.....	IV	MTWFS	109F	¶
11f	Selections	III	MTWThF	109F	¶
12w	Selections‡	III	MTWThF	109F	¶
21f	Livy	III	MTWThF	107F	Pike
22w	Plautus and Terence§....	III	MTWThF	107F	Pike
*51f	Pliny's Letters	I	MWF	107F	Pike
*52w	Apuleius	I	MWF	107F	Pike
81f	Teachers' Course	I	MWF	109F	Deneen
81w	Teachers' Course	I	MWF	25F	Deneen
*131f	Ovid	II	MWF	107F	Pike
*132w	Seneca's Epistles	II	MWF	107F	Pike
*201f-202w-203s	Annals of Tacitus.....	VII-VIII		107F	Pike

† Students entering second quarter with one year of Latin may select this course.

‡ Students entering second quarter with two or three years of Latin may select this course.

§ Students entering second quarter with four years of Latin may select this course.

MATHEMATICS

The Junior College courses in Mathematics may be combined into sequence of consecutive courses as follows:

1f-2w. To make a three-quarter sequence add 6s.

1f-6w. To make a three-quarter sequence add 2s.

2f-6w. To make a three-quarter sequence add 30s, 20s, or 16s.

6f-2w. To make a three-quarter sequence add 30s, 20s, or 16s.

No.	Title	Hour	Day	Building	Instructor
1f	Higher Algebra	II	TWThFS	104, 105F	¶
		IV	MTWFS	104, 105F	¶
		VII	MTWThF	104F	¶
1w	Higher Algebra	IV	MTWFS	102F	¶
2f	College Algebra	I	TWThFS	101, 125F	¶
		III	TWThFS	104, 105F	¶

2w	College Algebra	I	TWThFS	105F	†
		II	TWThFS	102F	†
		IV	MTWFS	104, 105F	†
		VI	MTWThF	104F	†
6f	Trigonometry	VII	MTWThF	104F	†
		I	TWThFS	105F	†
		II	TWThFS	102, 125F	†
6w	Trigonometry	VI	MTWThF	104F	†
		II	TWThFS	104, 105F	†
		I	TWThFS	101, 125F	†
20f	Math. of Investment.....	III	TWThFS	105F	†
		VII	MTWThF	125F	Barton
30f	Analytic Geometry	III	TWThFS	125F	Bussey
		VI	MTWThF	125F	Hart
30w	Analytic Geometry	III	TWThFS	104F	Bussey
		III	TWThFS	101F	Underhill
*50f	Calculus I.....	VI	MTWThF	101F	Yeaton
		III	TWThFS	125F	Bauer
*50w	Calculus I.....	VI	MTWThF	125F	Hart
		III	TWThFS	101F	Underhill
*51w	Calculus II.....	VI	MTWThF	101F	Yeaton
		III	TWThFS	101F	Underhill
*54f	Teachers' Course	III	MTWThF	111Ed	Reeve
*62w-63s	Theory of Equations.....	VI	MWF	102F	Bussey
*70f	History of Mathematics..	VI	MWF	102F	Bussey
*102f-103w-104s	Advanced Geometry	II	MWF	101F	Yeaton
*106f-107w-108s	Adv. Calculus and Differential Equations	I	MWF	102F	Jackson
*130f-131w-132s	Functions of a Real Variable	III	TThS	102F	Jackson

METALLURGY

No.	Title	Hour	Day	Building	Instructor
1w	Assaying	III	TWThF	108M	Appleby
2w	Assaying Laboratory	I-VIII	M	7M	Christianson, Pease, Smith
3f	General Metallurgy	I	TThS	108M	Christianson
4w	Metallurgy of Pig Iron...	I	TThS	108M	Christianson
*105f	Metallurgy of Base Metals	II	WThFS	108M	Pease
*106w	Mety. of Precious Metals	II	WThFS	108M	Pease
*153f	Metallography	Ar	Ar	305M	†
*154w	Metallography	Ar	Ar	305M	†

MILITARY SCIENCE AND TACTICS

No.	Title	Hour	Day	Building	Instructor	
1f-2w-3s	Military Drill	Sec. I	I, II	M	A	Colonel Burton
			I	W	A	Colonel Burton
			II	W	A	Colonel Burton
			I, II	S	A	Colonel Burton
			III	III, IV	M	A	Colonel Burton
4f-5w-6s	Military Drill	Sec. I	VII	W	A	Colonel Burton
			III, IV	S	A	Colonel Burton
			V, VI	Th	A	Colonel Burton
			V	T	A	Colonel Burton
			Ar	Ar	A	Colonel Burton
7f-8w-9s	Military Drill and Science..	Ar	Ar	A	Colonel Burton	
10f-11w-12s	Adv. Military Drill & Science.	Ar	Ar	A	Colonel Burton	

† This section 2 to be limited to not more than 80 men.

MUSIC

No.	Title	Hour	Day	Building	Instructor
1f-2w-3s	Harmony	II	MWF	Mu	¶
4f-5w-6s	Counterpoint	III	TTh	Mu	¶
7f-8w-9s	Ear Training	V	T	Mu	¶
10f-11w-12s	Composition	Ar	Ar	Mu	¶
*11f-12w-13s	Analysis	IV	W	Mu	¶
14f-15w-16s	History of Music.....	II	MWF	Mu	¶
17f-18w-19s	Appreciation of Music.....	V	M	Mu	¶
*20f-21w-22s	Bach and Beethoven.....	V, VI	T	Mu	¶
25f-26w-27s	Ensemble	Ar	Ar	Mu	¶
28f-29w-30s	First-Year Organ	Ar	Ar	Mu	¶
31f-32w-33s	Second-Year Organ	Ar	Ar	Mu	¶
34f-35w-36s	Third-Year Organ	Ar	Ar	Mu	¶
37f-38w-39s	Fourth-Year Organ	Ar	Ar	Mu	¶
39f-40w-41s	First-Year Piano	Ar	Ar	Mu	¶
42f-43w-44s	Second-Year Piano	Ar	Ar	Mu	¶
45f-46w-47s	Third-Year Piano	Ar	Ar	Mu	¶
48f-49w-50s	Fourth-Year Piano	Ar	Ar	Mu	¶
51f-52w-53s	First-Year Violin	Ar	Ar	Mu	¶
54f-55w-56s	Second-Year Violin	Ar	Ar	Mu	¶
57f-58w-59s	Third-Year Violin	Ar	Ar	Mu	¶
60f-61w-62s	Fourth-Year Violin	Ar	Ar	Mu	¶
63f-64w-65s	First-Year Vocal Training...	Ar	Ar	Mu	¶
66f-67w-68s	Second-Year Vocal Training.	Ar	Ar	Mu	¶
69f-70w-71s	Third-Year Vocal Training..	Ar	Ar	Mu	¶
72f-73w-74s	Fourth-Year Vocal Training.	Ar	Ar	Mu	¶
75f-76w-77s	Public School Music.....	VII, VIII	WF	Ed	¶
*78f-79w-80s	Adv. Public School Music..	Ar	Ar	Ed	¶
81f-82w-83s	Normal Piano	VI	MWF	Mu	¶
*84f-85w-86s	Adv. Normal Piano.....	VII	MWF	Mu	¶
*88f-89w-90s	Ear Training	V	Th	Mu	¶
91f-92w-93s	Orchestra	Ar	Ar	Mu	¶
94f-95w-96s	Other Orchestral Inst.....	Ar	Ar	Mu	¶
97f-98w-99s	University Choir	VIII	M	Mu	¶

PHILOSOPHY

No.	Title	Hour	Day	Building	Instructor
1f	Problems of Phil.....	IV	MTWFS	321F	Lodge
1w	Problems of Phil.....	III	TWThFS	322F	Swenson
2f	Logic	III	TWThFS	322F	Swenson
2w	Logic	IV	MTWFS	321F	Lodge
3f	Ethics	I	TWThFS	322F	Wilde
20w-21s	Present Day Phil.....	I	MWF	322F	Wilde
63f	Develop. of Religion.....	II	TThS	322F	Swenson
100w-101s	Phil. of Religion.....	II	TThS	322F	Swenson
108w-109s	History of Ethics.....	II	MWF	322F	Lodge
113f-114w-115s	History of Phil.....	IV	MWF	322F	Wilde
120w	Scandinavian Phil.....	VI	MWF	322F	Swenson
135f	Plato	3:30-5	MW	322F	Lodge
124w-125s	Political and Social Ethics	I	TThS	322F	Wilde
147f	Advanced Logic	VI	MWF	322F	Swenson
151f-152w-153s	Kant	VI	T	316F	Lodge
161f-162w-163s	Seminar	Ar	Ar	316F	Wilde

PHYSICAL EDUCATION

FOR MEN

No.	Title	Hour	Day	Building	Instructor
1f	Personal Hygiene	VI	TTh	A	Cooke
		VI	MW		
		IV	MW		
1w	Personal Hygiene	VI	TTh	A	Cooke

18	Personal Hygiene	VI	TTh	A	Cooke
2f-3w-4s	Gymnasium & Swimming.	VI	TTh	A	Foster, Roemer
		VI	MW		
		IV	MW		
5f-6w-7s	Advanced Leaders	Ar	Ar	A	¶
8f-9w-10s	Corrective Gymnastics ...	Ar	Ar	A	Cooke, Roemer
11w-12s	Wrestling	Ar	Ar	A	¶
13f-14w-15s	Intermediate Swimming...	Ar	Ar	A	¶
16f-17w-18s	Advanced Swimming	Ar	Ar	A	¶
19w-20s	Boxing	Ar	Ar	A	Goldie
21f-22w-23s	Intramural Athletics	Ar	Ar	A	Foster, Roemer

PHYSICAL EDUCATION

FOR WOMEN

No.	Title	Hour	Day	Building	Instructor
*1f-2w-3s	Elem. Phys. Training.....	IV	MWF	3, 151, 153WGm	¶
		VI	MWF	3, 151, 153WGm	¶
		VII	MWF	3, 151, 153WGm	¶
		III	TThS	3, 151, 153WGm	¶
*4f-5w-6s	Intermed. Phys. Training..	VI	TTh	153WGm	Kissock
	One other hr. to be ar.				
*7f-8w-9s	Adv. Phys. Training.....	VII	TTh	153WGm	Schill
	One other hr. to be ar.				
11f	Preliminary Hygiene	I	M	201WGm	¶
		IV	M	201WGm	¶
		VI	T	201WGm	¶
		VII	T	201WGm	¶
22f-23w-24s	Soph. Rhythmic Expr.....	IV	TS	151WGm	Ladd
		VII	TTh	151WGm	Ladd
		VIII	TTh	151WGm	Ladd
37f, s	Soph. Organized Games....	II	TTh	151WGm	Barr
38w	Soph. Folk Dancing.....	II	TTh	151WGm	Barr
40f, w, s	Soph. Major Sports.....	VIII	MW	151WGm	Kissock
43f, w, s	Soph. Elem. Swimming....	IV	MW	51WGm	Baker
		IV	TS	51WGm	Baker
		VI	MW	51WGm	Baker
		VI	TTh	51WGm	Baker
44f, w, s	Soph. Adv. Swimming.....	VIII	MW	51WGm	Baker
		VIII	TTh	51WGm	Baker
45f, w, s	General Swimming	VII	MW	51WGm	Baker
		VII	TTh	51WGm	Baker
	General Swimming without				
	Instruction	VIII	F	51WGm	
52f-53w	Soph. Phys. Train. (includ-	III	WF	3, 153WGm	Schill, Barr
	ing orthopedic section)...	IV	TS	3, 153WGm	Schill, Barr
		V	TTh	3, 153WGm	Schill, Barr
13f	Personal Hygiene	II	MWF	201WGm	Norris
14w	Hygiene of the Family....	II	MWF	201WGm	Norris
	Not offered in 1919-20.				
16f	Anatomy and Kinesiology...				
	Lec.	III	MWF	201WGm	Tolg
	Lab.	V	MWF	304IA	
17w	Prin. of Gymnastic Exer...				
	Lec.	III	MWF	201WGm	Schill
	Lab.	V	MWF	151WGm	
18s	Teachers' Course in Play..				
	Lec.	III	MWF	201WGm	Kissock
	Lab.	V	MWF	151WGm	
19f-20w-21s	Rhythmic Expression	VIII	MW	153WGm	Ladd

31f-32w-33s	Folk Danc. & Organ. Games	V	TTh	151WGM	Kissock
34f-35w-36s	Hockey, Basketball and Baseball	VIII	TTh	151WGM	Kissock

*3s, open to students who have not taken 1f-2w.

6s, open to students who have not taken 4f-5w.

9s, open to students who have not taken 7f-8w.

Any course in exercise may be entered any quarter by obtaining permission of Department.

PHYSICS

Introductory Courses

No.	Title	Hour	Day	Building	Instructor	
31f	Elements of Mechanics...	Lec.	VII	M	30Ph	Zeleny
		Rec.	†II, III	TThS	17Ph	Zeleny
		Rec.	I, II	TThS	16Ph	Miller
		Rec.	†III	MWF	17Ph	Zeleny
		Lab.	V, VI	Th	23Ph	Miller
22f	Elements of Mechanics...	Lab.	VII, VIII	Th	23Ph	Miller
		Lab.	I, II	F	23Ph	Miller
		Lab.	V, VI	F	23Ph	Miller
		Lab.	VII, VIII	F	23Ph	Miller
		Lab.	I, II	S	23Ph	Miller
21w	Elements of Mechanics...	Lec.	VII	W	30Ph	Tate
		Rec.	III	MWF	23Ph	Tate
22w	Elements of Mechanics...	Lab.	Ar	Ar	23Ph	Miller
21s	Elements of Mechanics...	Lec.	VII	W	30Ph	Tate
		Rec.	III	MWF	23Ph	Tate
22s	Elements of Mechanics...	Lab.	Ar	Ar	23Ph	Miller
		Lec.	II	TThS	30Ph	Erikson
31f	Acoustics	II	TThS	30Ph	Erikson	
41w	Sound and Heat.....	Lec.	VII	M	30Ph	Zeleny
		Rec.	†II, III	TThS	17Ph	Zeleny
		Rec.	I, II	TThS	16Ph	Miller
		Rec.	†III	MWF	17Ph	Zeleny
42w	Heat Laboratory	Ar	Ar	23Ph	Miller	
51f	Light	Lec.	VII	W	30Ph	Tate
		Rec.	I, II	TThS	16Ph	Tate
		Lab.	Ar	Ar	16Ph	Tate
61s	Magnetism & Electricity.	Lec.	VII	M	30Ph	Zeleny
		Rec.	†II, III	TThS	17Ph	Zeleny
		Rec.	I, II	TThS	17Ph	Miller
		Rec.	†III	MWF	16Ph	Zeleny
62s	Electrical Laboratory	Ar	Ar	32Ph	Zeleny	
<i>Intermediate Courses</i>						
*142f	Pyrometry & Heat.....	Lec.	IV	T	30Ph	Miller
		Lab.	V, VI, VII	TTh	9Ph	Miller
*162f	Electrical Measurements..	V, VI	WF	32Ph	Zeleny	
		{ III, IV	WF }	32Ph	Zeleny	
		{ VII, VIII	Th }			
		I	ThTS	15Ph	†	
*171f-173w-174s	Radioactivity	I	ThTS	15Ph	†	
*181f-183w-185s	Theoretical Physics	II	TThS	18Ph	Tate	
*182f-184w-186s	Experimental Physics ...	Ar	Ar	2Ph	Erikson	
*191f-193w-195s	Elem. of Math. Physics..	Ar	Ar	18Ph	Tate	
*192f-194w-196s	Elemty. Phys. Investigatn.	Ar	Ar	20Ph	†	

† Pre-Medical section.

POLITICAL SCIENCE

No.	Title	Hour	Day	Building	Instructor
1f	American Government....	I	MTWThF	202MA	¶
		IV	MTWFS	109MA	¶
		VI	MTWThF	102MA	¶
2w	American Government....	II	MTWThF	5F	¶
		VI	MTWThF	109MA	¶
3f	Compar. European Govt..	III	MTWThF	5F	¶
7f	State and Local Govt....	II	MTWThF	109MA	Cushman
		VI	MTWThF	109MA	Lobb
7w	State and Local Govt....	VI	MTWThF	102MA	Cushman
11f	Municipal Govt.....	III	MTWThF	3F	Anderson
15w	Introd. to Pol. Sci.....	III	MTWThF	109MA	Anderson
21w	Colonial Govt.....	IV	MTWFS	109MA	Allin
31f	Political Parties	II	MTWThF	321F	Moley
*51f-52w-53s	Business Law†	II	MWF	202MA	Young
*58w	Elementary Law	IV	MWFS	107F	Lobb
*111f	Govt. of Minnesota.....	III	TThS	109MA	Lobb
*118w	Govt. and the Immigrant.	VI	MWF	112Lib	Moley
*121f-122w	International Law†	IV	MWFS	213MA	Wright
*125w	Amer. Diplomatic History	III	MTThF	218b Lib	Wright
*131f-132w	World Politics†	II	TThS	102MA	Allin
*135f	Contemp. Pol. Problems.	III	TThS	102MA	Young
*151f-152w	Constitutional Law†	II	MWFS	213MA	Cushman
*155w-156s	Compar. Admin. Law†...	IV	TThS†	102MA	Young
*157f	Police Power	III	MTWThS	202MA	Young
*165f-166w	Govt. of British Empire†	II	MWF	114F	Allin
*191f-192w-193s	Development of Interna- tional Law and Org'n..	VI	MWF	213MA	Wright

† All quarters must be completed before credit will be given for any one quarter.

‡ The IV hour Thursday will be used only when there is no convocation.

PSYCHOLOGY

No.	Title	Hour	Day	Building	Instructor		
1f-2w-3s	General Psychology		I or VII	M	Little Th.	¶	
		Lecture	II	W	Psy	¶	
		Sec. 1	Rec. Lab.	I, II	F	Psy	¶
		Sec. 2	Rec. Lab.	III, IV	F	Psy	¶
			Rec. Lab.	V, VI	F	Psy	¶
		Sec. 3	Rec. Lab.	VI	W	Psy	¶
			Rec. Lab.	V, VI	F	Psy	¶
		Sec. 4	Rec. Lab.	II	F	Psy	¶
			Rec. Lab.	I, II	W	Psy	¶
		Sec. 5	Rec. Lab.	III	F	Psy	¶
			Rec. Lab.	III, IV	W	Psy	¶
		Sec. 6	Rec. Lab.	VI	F	Psy	¶
Rec. Lab.	V, VI		W	Psy	¶		
Sec. 7	Rec. Lab.	III	T	Psy	¶		
	Rec. Lab.	III, IV	S	Psy	¶		
Sec. 8	Rec. Lab.	VI	T	Psy	¶		
	Rec. Lab.	V, VI	Th	Psy	¶		
Sec. 9	Rec. Lab.	II	Th	Psy	¶		
	Rec. Lab.	I, II	T	Psy	¶		
Sec. 10	Rec. Lab.	III	Th	Psy	¶		
	Rec. Lab.	III, IV	T	Psy	¶		
Sec. 11	Rec. Lab.	II	T	Psy	¶		
	Rec. Lab.	I, II	Th	Psy	¶		
Sec. 12	Rec. Lab.	VIII	Th	Psy	¶		
	Rec. Lab.	I, II	S	Psy	¶		
*101f-102w	Experimental Psychology.	V	T	Psy	Woodrow		
		VI, VII	TTh	Psy	Woodrow		
*103s	Quantitative Psychology..	V	T	Psy	Woodrow		
		VI, VII	TTh	Psy	Woodrow		

*108w-109s	Adv. General Psychology.	II	MWF	Psy	Foster
*114w-115s	Human Behavior	II	TThS	Psy	Elliott
*119f-120w	Animal Behavior	VI	M	Psy	Lashley
		VI, VII	WF	Psy	Lashley
*121s	Neuro-Psychology	VI	MF	Psy	Lashley
		VI, VII	W	Psy	Lashley
*125f-126w	Differential Psychology...	III	MWF	Psy	Fernald
*127s	Social Psychology	III	MWF	Psy	Fernald
*131f-132w-133s	Child Mind	4:30 to 5:45	Th	Psy	Lowell
		10:30 to 11:45	S	Psy	Lowell
*137f-138w	Applied Psychology	III	TThS	Psy	Morgan
*144w-145s	Abnormal Psychology ...	IV	MWF	Psy	Morgan
*200f-201w-202s	Seminar	Ar	Ar	Psy	Foster

EDUCATIONAL PSYCHOLOGY

No.	Title	Hour	Day	Building	Instructor
*55f, w, s	Elem. Educ. Psychology..	I	MWF	Psy	Haggerty, Dealey
*106f-107w-108s	Adv. Educ. Psychology...	IV	MWF	Psy	Haggerty
*110w	Psychol. of Secondary School Subjects	II	MWF	Psy	Van Wageningen
*111s	Educational Diagnosis...	II	MWF	Psy	Van Wageningen
*111Tf-112Tw	Educ. Diag. (for teachers)	I, II	S	Psy	Van Wageningen
*116s	Psychol. of Elementary School Subjects	I, II	S	Psy	Van Wageningen
*126f-127w	Methods of Edu. Research	VIII, IX	T	Psy	Van Wageningen
*128s	Review of Statistical Studies	VIII, IX	T	Psy	Van Wageningen
*134f-135w-136f	Mental Diagnosis, Mental Tests	VI, VII	TTh	Psy	Haggerty, Dealey
*137f-138w-139s	Experimental Education..	VIII, IX†	Th	Psy	Haggerty, Van Wageningen
*140s	Psychology and Vocational Advisement	I, II	S	Psy	Dealey
*149f-150w-151s	Psycho-Educ. Clinic.....	Ar	MWF	Psy	Haggerty, Dealey
*156s	Psychological Problems of Vocational Education...	Ar	Ar	Psy	Haggerty

† Other hours by arrangement. Consult instructor.

ROMANCE LANGUAGES

FRENCH

No.	Title	Hour	Day	Building	Instructor
1f-2w-3s†	Beginning French	V	MWF	201F	¶
4s-5ff	Beginning French	II	MTWThF	205F	¶
		IV	MTWFS	101F	¶
4f-5w†	Beginning French	I	MTWThF	201F	¶
		II	MTWThF	213F	¶
		III	MTWThF	226F	¶
		IV	MTWFS	201F	¶
		V	MTWThF	202F	¶
4w-5s†	Beginning French	I	MTWThF	321F	¶
		III	MTWThF	3F	¶
7f-8w†	Intermediate French	I	MTWThF	202F	¶
		II	MTWThF	226F	¶
		III	MTWThF	213F	¶
7w-8s†	Intermediate French	II	MTWThF	125F	¶
		IV	MTWThF	101F	¶
13f-14w-15s†	French Survey	I	MWF	226F	Sirich
		II	TThS	101F	Van Roosbroeck
		III	TThS	201F	Phelps
		VI	MWF	227F	LeCompte

16f-17w-18s†	Elem. Fr. Conversation...	I	TTh	226F	Barton
		II	MW	202F	Olmsted
		III	MW	201F	Frelin
		VII	MW	202F	Guinotte
19f-20w-21s†	Elem. Fr. Composition...	I	S	226F	Barton
		II	F	202F	Olmsted
		III	F	201F	Frelin
		VII	F	202F	Guinotte
22f-23w-24s	Scientific Fr. Reading...	I	MWF	209½F	†
*84f-85w-86s†	Adv. Fr. Conversation...	V	MW	226F	Frelin
*87f-88w-89s†	Adv. Fr. Composition...	V	F	226F	Frelin
*90f	Teachers' Course	VI	MWF	226F	de Boer
*97f-98w-99s†	19th Century Fr. Lit....	IV	MWF	213F	Barton, Delson
*100f-101w-102s†	17th Century Fr. Lit....	III	MWF	202F	Olmsted
*103f-104w-105s†	18th Century Fr. Lit....	III	TThS	113F	Searles
*106f-107w-108s†	16th Century Fr. Lit....	VI	MWF	203F	Sirich
*109f-110w-111s†	Fr. Dramatic Lit.....	V-VI	Th	203F	Olmsted
*112f-113w-114s†	Fr. Lyric Poetry.....	IV	TTh	203F	Searles
*118f-119w-120s†	Realistic Novel	IV	TTh	202F	LeCompte
*121f-122w-123s†	Fr. Lectures	VII	TTh	201F	†
*131f-132w-133s†	Fr. Oral Diction.....	V	MW	213F	Delson
*134f-135w-136s†	Fr. Syntax	V	F	213F	Barton

† Architects only.

‡ Pre-Medical students only.

SPANISH

No.	Title	Hour	Day	Building	Instructor
31f-32w†	Beginning Spanish	I	MTWThF	227F	†
		II	MTWThF	227F	†
		III	MTWThF	227F	†
		IV	MTWFS	226F	†
		V	MTWThF	227F	†
31w-32s†	Beginning Spanish	I	MTWThF	204F	†
34f-35w†	Intermediate Spanish.....	II	MTWThF	113F	Coburn
		III	MTWThF	2F	Vasconcelos
34w-35s†	Intermediate Spanish	II	MTWThF	205F	Coburn
37f-38w-39s†	Spanish Survey	II	TThS	201F	House
40f-41w-42s†	Elem. Span. Conversation	II	MW	201F	Henriquez
43f-44w-45s†	Elem. Span. Composition.	II	F	201F	Henriquez
*46f-47w-48s†	Adv. Span. Conversation.	III	TTh	202F	Coburn
*49f-50w-51s†	Adv. Span. Composition..	III	S	202F	Coburn
*52w	Teachers' Course	VI	MWF	226F	de Boer
*157f-158w-159s†	Spanish Novel	IV	MF	227F	Henriquez
*160f-161w-162s†	Selected Classics	IV	TS	227F	House
*163f-164w-165s†	Spanish Lectures	VIII	TTh	202F	Henriquez
*169f-170w-171s†	Spanish Syntax	IV	M	203F	House

ITALIAN

No.	Title	Hour	Day	Building	Instructor
61f-62w†	Beginning Italian	I	MTWThF	213F	Phelps
64f-65w-66s†	Italian Survey	II	MWF	110F	Phelps
*181f-182w-183s†	Dante, Petrarch, Boccaccio	IV	MW	212F	Phelps
*184f-185w-186s†	Dante (in English).....	IV	F	212F	Phelps

PORTUGUESE

No.	Title	Hour	Day	Building	Instructor
*53f-54w-55s†	Beginning Portuguese....	II	MWF	202F	Olmsted

SCANDINAVIAN

No.	Title	Hour	Day	Building	Instructor
1f-2w	Beginning Norwegian	I	TWThFS	206F	Bothne
3s	Intermediate Norwegian..	I	TWThFS	206F	Bothne
4f-5w	Adv. Norwegian (Survey)	III	TWThFS	206F	Bothne
7f-8w	Beginning Swedish	II	MTWThF	206F	Stomberg
9s	Intermediate Swedish ...	II	MTWThF	206F	Stomberg
10f-11w	Advanced Swedish	I	MTWThF	110F	Stomberg
12s	Ancient and Medieval Scandinavian History...	I	MTWThF	110F	Stomberg
*101f-102w-103s	Modern Norwegian Lit...	II	TThS	110F	Bothne
*104f-105w-106s	Modern Scand. Hist....	IV	MWF	206F	Stomberg
*107f-108w-109s	Modern Swedish Lit....	V	MWF	206F	Stomberg
*110w	Ibsen	Ar	Ar	206F	Bothne
*111f-112w-113s	Old Norse (Icelandic)...	Ar	Ar	206F	Bothne
*114f	Strindberg	Ar	Ar	Ar	Stomberg
*115w	Teachers' Course in Swed.	Ar	Ar	206F	Stomberg
*116s	Teachers' Course in Nor..	Ar	Ar	206F	Bothne
*117w-118s	Earlier Norwegian Lit...	Ar	Ar	206F	Bothne

SOCIOLOGY AND SOCIAL WORK

No.	Title	Hour	Day	Building	Instructor
1f	General Introduction	I	MTWThF	5F	Bernard
		II	MTWThF	5F	Jenks
		IV	MTWThF	5F	Finney
		VI	MTWThF	9F	Elmer
		I	MWF	Farm	Lundquist
1w	General Introduction	I	MTWThF	5F	Bernard
		VI	MTWThF	5F	Elmer
3f	Social Aspects of Educ..	Ar	Ar	Ar	Finney
6f	Modern Social Reform Movements	II	TThS	9F	Elmer
6w	Modern Social Reform Movements	II	TThS	9F	Elmer
		III	TThS	5F	Elmer
14f	Rural Sociology	II	MWF	15F	Bernard
14w	Rural Sociology	I	MWF	Farm	Lundquist
*51f	Background of Depen- dency & Defectiveness.	I	TThS	9F	Bruno
*52w	Treatment of Dependents and Defectives.....	I	TThS	9F	Bruno
*53f	Treatment of Delinquents	II	MWF	9F	Elmer
*55f	Housing Problems	I	MWF	124F	Davis
*99	Supervised Field Practice Work	Ar	Ar	Ar	Bedford
*101w	Social Organization	II	TThS	12F	Bernard
*102w	Social Control	II	MWF	12F	Bernard
*108f	Social Psychology	II	TThS	15F	Bernard
*110w	Rural Community Organi- zation, etc.	VII-VIII	Th	15F	Bernard
*119w	The Family	III	TThS	9F	Elmer
*121w	Methods of Social In- vestigation	VII	MWF	12F	Elmer
*133f-134w-135s	Hospital Social Service...	Ar	Ar	Ar	Tebbets
*137f-138w-139s	Mental Case Work.....	Ar	Ar	Ar	Dawley

The University of Minnesota

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

PROGRAM WINTER QUARTER, 1919-1920

ABBREVIATIONS AND EXPLANATIONS

The following abbreviations are used: A, Armory; AB, Animal Biology; Ar indicates that days, hours, room are to be arranged later; C, Chemistry Building; D, Dental Building; Ed, College of Education; En, Engineering Building, University Farm; F, Folwell Hall; HE, Home Economics Building, University Farm; IA, Institute of Anatomy; L, Law Building; Lib, Library; M, Mines; MA, Mechanic Arts; ME, Main Engineering Building; MechE, Mechanical Engineering Building; MH, Millard Hall; Mu, Music Building; O, Observatory; P, Pillsbury Hall; PIPath, Plant Pathology Building, University Farm; Ph, Physics Building; Psy, Psychology Building; WGM, Women's Gymnasium; CB, Christian Bible College.

The symbol ¶ indicates that the instructor is to be assigned.

The Roman numeral indicates the hour of meeting of a class; e.g., I, 8:30-9:20 a.m.

The numbers of the first column are those of the courses described in the Bulletin which should be consulted for further information regarding nature of the course, to whom it is open, prerequisites, etc.

AGRICULTURE, FORESTRY, AND HOME ECONOMICS

The following divisions of this College offer courses to students in the College of Science, Literature, and the Arts who can meet the prerequisites:

Agricultural Biochemistry	Farm Engineering
Agricultural Education	Forestry
Agronomy and Farm Management	Home Economics
Animal Husbandry	Horticulture
Bee Culture	Plant Pathology and Botany
Dairy Husbandry	Soils
Entomology and Economic Zoology	Veterinary Medicine

Descriptions of the courses offered will be found in the bulletins of the College of Agriculture, Forestry, and Home Economics. The hour schedule will be found in the program issued each quarter.

Students who desire to take more than a single course in Agriculture are advised to consult with some member of the division in which they are interested in order to arrange the sequence of courses which will be of greatest value.

AMERICANIZATION TRAINING AND ANTHROPOLOGY

No.	Title	Hour	Day	Building	Instructor
1w	Introduction to Anthropology.....	I	MTWThF	25F	Mathie
2w	General Anthropology	II	MWF	2F	Jenks
5w	General Immigration	III	TThS	15F	Mathie
41w	Slavic Languages	IV	TS	9F	Junek
70w	Food Preparation.....	V, VI	MWF	213HE	Lindquist
*114w	Newer Immigrants	III	MWF	9F	Jenks
*126w	Organization of Americanization..	I	MWF	15F	Jenks, Clark, Junek
*204w	Seminar in Anthropology.....	V, VI	M	12F	Jenks
*132w	Supervised Americanization Work.	II	TTh & Ar	2F	Clark, Junek

ANIMAL BIOLOGY

No.	Title	Hour	Day	Building	Instructor	
1f-2w	General Zoology					
	Sec. I	Lab. I, II	TThS	101AB	¶	
		Lect. II	MW			
	Sec. II	Lab. I, II	F	313AB	¶	
		Lect. III, IV	MWF	101AB	¶	
			T			
	Sec. III	Lab. III	ThS	313AB	¶	
		Lect. V, VI, VII	TTh	101AB	¶	
			V			
	Sec. IV	Lab. V, VI	F	313AB	¶	
		Lect. V, VI	MWF	101AB	¶	
			TTh	313AB	¶	
1w-2s	General Zoology					
		Lab. I, II	MWF	101AB	¶	
		Lect. I, II	T			
			II	ThS	313AB	¶
5f-6w-7s	General Zoology					
	(Pre-medical)	Lab. III, IV	TS	101AB	¶	
		Lect. IV	MWF	313AB	¶	
9f-10w	Histology-Embryology ...	III, IV	MTWThF			
17f-18w	General Physiology	V, VI, VII	MW	201, 211AB	Downey	
		V, VI, VII, VIII	F	101AB	Lund	
37f-38w-39s	General Entomology	I, II	MWF	208-10AB	Oestlund	
45w	Insects and Disease.....	V-VIII	WF	311Adm(F)	¶	
		V-VIII	TTh			
*103w	Morphology of Invertebrates	I, II	TThS	211, 213AB	Sigerfoos	
*109f-110w	General Physiology	V, VI, VII	MW	101AB	Lund	
		V, VI, VII, VIII	F			
114w-115s	Ornithology	V, VI, VII	TTh	314AB	Roberts	
*117f-118w-119s	Ecology of Insects.....	V, VI, VII	MW	208-10AB	Chapman	
*125f-6w-7s	Advanced Entomology....	III, IV	TThS	208-10AB	Oestlund	
*130w	Biology Aphididae	III, IV	MWF	208-10AB	Oestlund	
*149f-150w-151s	Blood of Vertebrates....	Ar	Ar	201, 211AB	Downey	
*153f-154w-155s	Hematology	V, VI, VII	TTh	201, 211AB	Downey	
175s	Nature Study	V, VI, VII	TTh	213AB	Sigerfoos	
*182w	Genetics and Eugenics...	III	MWF	211AB	Nachtrieb	
*197f-198w-199s	Problems	Ar	Ar		¶	

ARCHITECTURE

No.	Title	Hour	Day	Building	Instructor
10w	Freehand Drawing	V, VI	MWF	401ME	Burton, Johnson
4w	Elements of Architecture.....	II	W	317ME	Forsythe
		V, VI	MWF		Burton
		V, VI, VII	TTh		Prudden
		III, IV	S		

ASTRONOMY

No.	Title	Hour	Day	Building	Instructor
11w	Descriptive Astronomy...	III	MTWThF	124F	Leavenworth
		VI	MTWThF	124F	Beal
25w	Stellar Astronomy.....	IV	MTWFS	124F	Beal
*51f-52w-53s	General Astronomy.....	II	MWF	124F	Leavenworth
		II	TThS	124F	Beal
*62w	Elements of Pract. Ast...	Ar	Ar	O	Beal
*101f-102w-103s	Practical Astronomy.....	Ar	Ar	O	Leavenworth
*140w	Leas' Squares	Ar	Ar	O	Leavenworth

BACTERIOLOGY AND IMMUNOLOGY

No.	Title	Hour	Day	Building	Instructor
6w	Elementary Bacteriology	V, VI, VII	MW	201MH	Benton
		V, VI	F	201MH	Benton
115w	Court in Immunity.....	V, VI	TTh	201MH	Larson

BOTANY

No.	Title	Hour	Day	Building	Instructor
1f-2w	General Botany				
	Sect. I	Lab. I, II	MWF	212, 214, 220P	Durand, et al
		Quiz. I	T	212, 214, 220P	Durand, et al
		Lect. II	TThS	210P	Durand, et al
	Sect. II	Lab. III, IV	MWF	212, 214, 220P	Durand, et al
		Quiz. IV	T	212, 214, 220P	Durand, et al
		Lect. III	TThS	210P	Durand, et al
	Sect. III	Lab. V, VI	MWF	212, 214, 220P	Durand, et al
		Quiz. V	Th	212, 214, 220P	Durand, et al
		Lect. V, VI	T	210P	Durand, et al
		VI	Th	210P	Durand, et al
12w	Bryophytes and Pteridophytes	I, II	TWThFS	AB	Huff
17w	Anatomy of Vascular Plants	III, IV	MTWFS	AB	Butters
*53w	Botany of Econ. Plants..	III, IV	MTWFS	AB	Knight
*61f-w-s	Teachers' Course	VII	MTWThF	AB	Johnson
*113f-114w-115s	Advanced Taxonomy	V, VI	MWF	AB	Rosendahl
*118w-119s	Cytology	I, II	MWF	AB	Rosendahl
*132w	Ecological Anatomy	III, IV	MTWThF	AB	Cooper
*142w	Adv. Plant Physiology...	I, II	MTWThF	AB	Knight

or Ar.

CHEMISTRY

DIVISION OF GENERAL AND INORGANIC CHEMISTRY

No.	Title	Hour	Day	Building	Instructor
1f-2w	General Inorganic Chemistry.				
	Lec.	V	MWF	100C	Whitmore
	Lab.	V, VI	TTh	210C	Whitmore
		VII, VIII	TTh		
4f-5w	General Inorganic Chemistry.				
	Lec.	III	MWF	225C	Heisig
	Lab.	V, VI	TTh	210C	Heisig
		VII, VIII	TTh		
6f-7w	General Inorganic Chemistry.				
	Lec.	II	MWF	225C	Cohen
	Lab.	III-IV	MWF	210C	Cohen
9f-10w	General Inorganic Chemistry.				
	Lec.	II	MWF	100C	Sneed
	Lab.	V-VII	TTh	210C	Sneed
		VI-VIII	TTh		
102w	Adv. Inorganic Preparations..	Ar	Ar	Ar	Whitmore
103w	Adv. Inorganic Chemistry....	IV	TS	345C	Sneed

DIVISION OF ANALYTICAL CHEMISTRY

20w	Quantitative Analysis				
	Lec.	V	M	115C	Geiger
	Rec.	V	W	115C	Geiger
	Lab.	VI-VIII	MW	310C	Sidener, Geiger
		V-VIII	F	310C	Sidener, Geiger
124w	Mineral and Ore Analysis...				
	Lec.	V	M	315C	Sidener
	Lab.	VI-VIII	M	310C	Sidener, Geiger
		V-VIII	W		

DIVISION OF ORGANIC CHEMISTRY

No.	Title	Hour	Day	Building	Instructor	
31W	Elementary Organic Chemistry	Lec.	IV	MWF	325C	Hunter
		Lab.	V-VII	TTh	10C	Hunter, Woollett
35f-36w	Organic Chemistry.....	Lec.	III	MWF	325C	Hunter
		Rec.	III	T	111C	
		Lab.	V-VII	WF	10C	Hunter, Woollett
		Adv. Organic Chemistry Lab.†	Ar	Ar	Ar	¶

† Open only to those students who are taking or have taken a lecture course in Advanced Organic Chemistry.

DIVISION OF PHYSICAL CHEMISTRY

No.	Title	Hour	Day	Building	Instructor	
141f-142w	Physical Chemistry	Lec.	IV	MWF	225C	MacDougall
		Lab.	V-VII	F‡	117C	MacDougall
		Rec.	III	S	115C	¶
146w	Lab. Course in Radiochem...	Ar	Ar	Ar	Henderson	
147f-148w	Adv. Physical Chemistry.....	I	TThS	115C	MacDougall	
151f-152w	Adv. Physical Chemistry.....	Lec.	Ar	Ar	117C	MacDougall
		Lab.	Ar	Ar	Ar	Royeson

‡ 6 cr. course, no laboratory; 8 cr. course, laboratory on F.; 10 cr. course, laboratory arranged.

COMPARATIVE PHILOLOGY

No.	Title	Hour	Day	Building	Instructor
*101f-102w	Science of Language....	V, VI	T	205F	Klaeber
*141f-142w-143s	Hist. Grammar of English Language	V, VI	Th	205F	Klaeber

DRAWING AND DESCRIPTIVE GEOMETRY

No.	Title	Hour	Day	Building	Instructor
31f-w	Drafting and Tracing.....	V, VI, VII	TTh	13ME	Kirchner
33f-34w	Technical Drawing	I, II	TThS	101ME	Potter
		V, VI	MWF	13ME	Cederberg

ECONOMICS

NOTE: Economics 3f-4w (1919-20) equals 3f-4w-5s (1918-19).

No.	Title	Hour	Day	Building	Instructor
1f-2w	(Introduc. to Econ. Hist.) Lectures	III	MTTh	306Dent	Gras, Dickin- son, et al.
	Sec.				
	1	I	WTh	5CB	¶
	2	V	WTh	5CB	¶
	3	VI	WTh	5CB	¶
	4	I	FS	F 202MA S	5F ¶
	5	I	FS	F 3F S	227F ¶
	6	II	FS	F 9F S	225F ¶
	7	II	FS	F 3F S	226F ¶
	8	III	FS	F 15F S	107F ¶
	9	III	FS	F 212F S	109F ¶
	10	III	FS	F 207F S	124F ¶
	11	III	FS	F 308Dent. S	3F ¶
	12	III	FS	5CB	¶
	13	III	FS	F 209MA S	226F ¶
	14	IV	FS	38CB	¶
	15	IV	FS	42CB	¶
	16	IV	FS	43CB	¶

No.	Title	Hour	Day	Building	Instructor
3f-4w	Principles of Economics..			CB Aud	Hansen, et al.
	Lecture	IV	T		
	Sec. 1	II	MWThF	5CB	¶
	2	II	MWThF	44CB	¶
	3	III	MWThF	321F	¶
	4	III	MWThF	25F	¶
	5	IV	MWFS	209MA	¶
	6	IV	MWFS	2F	¶
	7	V	MWThF	109MA	¶
	8	V	MWThF	102MA	¶
	9	VI	MWThF	107F	¶
	10	I	TThFS	109MA	¶
	11	I	TThFS	113F	¶
	12	III	TThS	102MA	¶
		III	F	42CB	¶
3w-4s	Principles of Economics..	VI	MTWThF	207F	James
6f, w	Agricultural Economics...	I	MWF	Farm	Holmes
7w, s	Principles of Economics..	III	MTWFS	Farm	Chambers
8f-9w-10s	Principles of Economics..				
	Sec. 1	I	MWF	205ME	Dickinson
	2	IV	MWF	136ME	Pelz
11f-12w	Statistics				
	Lecture	IV	W	202MA	Mudgett
	Sec. 1	IV	MF	202MA	¶
	2	VII	MF	303MA	¶
15f-16w-17s	Economic Problems	IV	MWF	111M	Blakey
20w	Prin. in Rural Economics	IV	MTWFS	5F	Cumberland
25f-26w	Prin. of Accounting.....				
	Lec. Sec. 1	II	MWF	301MA	Sanders, et al.
	2	III	MWF	301MA	¶
	3	III	MWF	303MA	¶
	4	IV	MWF	303MA	¶
	5	IV	MWF	301MA	¶
	6	I	TThS	301MA	¶
	7	III	TThS	303MA	¶
	Lab. Sec. 1	V, VI	M	301MA	¶
	2	III, IV	T	301MA	¶
	3	V, VI	T	301MA	¶
	4	VII, VIII	T	301MA	¶
	5	VI, VII	T	303MA	¶
	6	VI, VII	W	301MA	¶
	7	II, III	Th	303MA	¶
	8	V, VI	M	303MA	¶
	9	VI, VII	Th	301MA	¶
	10	V, VI	F	301MA	¶
	11	VII, VIII	F	301MA	¶
25w-26s	Principles of Accounting†				
	Lecture	I	TThS	303MA	Sanders, et al.
	Laboratory	VII, VIII	W	303MA	¶
*51f-52w-53s	Business Law	II	MWF	See Political Science	
*60w	Fire Insurance	III	MWF	102MA	James
*77w	Foreign Trade	I	MWF	209MA	Blakey
*86f, w	Advertising and Selling..	VI	MWF	202MA	Sherman
*88w	Retail Marketing	I	TThS	102MA	Sherman
*95f-96w	Office Management				
	Rec.	V, VI	T	102MA	Sykes
	Lab. Sec. 1	V, VI	W	104, 113MA	¶
	2	V, VI	Th	104, 113MA	¶
*100f-101w-102s	Economic History of Europe 1300-1750.....	II	TThS	218b Lib	Gras
*103f-104w	Value and Distribution...	VII	MWF	102MA	Garver
*108w	Agricultural Statistics ...	V	MWF	Farm	Black
*109s	Econ. of Consumption....	Ar	Ar	Ar	¶
*110w	Farm Marketing Prob....	I	MTWThF	Farm	¶
*116f-117w-118s	Advanced Agri. Econ....	II	TThS	Farm	Black, Cumberland, Holmes

No.	Title	Hour	Day	Building	Instructor
*119f-120w-121s	Sem. in Agri. Econ..... To be ar.	Ar	Ar	Farm	Black, Cumberland, Holmes
*126f-127w-128s	Special Research Prob. in Agri. Economics	Ar	Ar	Farm	Black, Cumberland, Holmes
*132w-133s	Industrial Accounting....	II	TThS	301MA	Noble
*134f-135w-136s	Auditing	8:20-10p.m.	M	Ar	Rotzel
*137f-138w-139s	Accounting Practice and Procedure	II	MWF	102MA	Sanders
*143f-144w	Money and Banking.....				Dowrie, Ebersole, Stehman
	Lecture	IV	T	202MA	
	Quiz. Sec. 1	II	MWThF	209MA	
	2	IV	MWF	102MA	
		IV	S	202MA	
	3	V	MWThF	209MA	
*146w	Investments	VI	MWF	209MA	Ebersole
*153w	Modern Bus. Corporation	II	TThS	202MA	Gray
*162w	Trade Unionism	IV	MWF	D308	Hansen
*164w	Police Power	See Political Science.			
*191f-192w	Public Finance	III	MWF	213MA	Blakey
*195f-196w-197s	Sem. in Bus. Finance... To be ar.	4-6p.m.	W		Dowrie, Ebersole, Stehman

† Limited to entering sophomores.

EDUCATION

DEPARTMENT OF EDUCATIONAL ADMINISTRATION AND SUPERVISION

No.	Title	Hour	Day	Building	Instructor
3f, w, s	Social Aspects of Educ..	I	MWF	205Ed	Finney
		III	TThS	205Ed	Finney
20w,s	High-School Curriculum..	I	TThS	102Ed	Koos
119f-120w	School Curricula	VIII	MWF	205Ed	Rankin
119TW-120Ts	School Curricula (for Teachers	I, II	S	111Ed	Rankin
121f, w, s	School Organization and Administration	VII	MWF	102Ed	Rankin
124f-125w-126s	Educational Adminis.....	VIII	MWF	102Ed	Sies
160f-161w-162s	Theory of Supervision....	I, II	S	112Ed	Sies
164w,s	Problems of H.-S. Admin.	II	TThS	102Ed	Koos
167w	Junior High School.....	VIII, IX	Th	102Ed	Koos

DEPARTMENT OF HISTORY AND PHILOSOPHY OF EDUCATION

1w	Brief Course in History of Education	II	MTWThF	205Ed	Alexander
102w	Hist. of Mod. Sec. and Higher Educ.....	VIII, IX	TTh	205Ed	Swift
†129w-130s	Educational Classics	III	MWF	205Ed	Alexander
†131w-132s	Compar. School Systems..	III	TThS	102Ed	Alexander
146w	Hist. and Prin. of Relig. Education	VI, VII	TTh	205Ed	Swift

† Students may take either quarter.

DEPARTMENT OF THEORY AND PRACTICE OF TEACHING

11f, x, s	Technique of Teaching...	I	TThS	205Ed	Miller
		IV	MWF	205Ed	Morehouse
15f, w, s	Practice Teaching.....	Ar	Ar	Ar	Miller

ENGLISH, RHETORIC, AND PUBLIC SPEAKING

COURSES IN ENGLISH

No.	Title	Hour	Day	Building	Instructor
Af-Bw-Cs	Freshman English	Lec. II	M		Little Theater
		Rec. I or	TWThS		Assigned on registration
		Rec. II	TWThS		Assigned on registration
		Lec. IV	T		Little Theater
		Rec. III or	MWThF		Assigned on registration
		Rec. IV	MWFS		Assigned on registration
		Lec. VI	T		Little Theater
		Rec. V or	MWThF		Assigned on registration
Aw	Freshman English	Rec. VI	MWThF		Assigned on registration
		Lec. V	M		Little Theater
1f-2w-3s	English Survey	Rec. Ar	Ar		Assigned on registration
		IV	MWF	123F	¶
		IV	MWF	110F	¶
		IV	MWF	113F	¶
		IV	MWF	205F	¶
		VII	MWF	301F	¶
		VII	MWF	110F	¶
		VII	MWF	206F	¶
6w	Chaucer	VII	MWF	209F	¶
8w	Shakespeare	III	TWFS	205F	Griffin
27w	Hist. of Eng. Language..	II	TWFS	204F	Northrop
*51w	Spenser	IV	TS	204F	Klaeber
*58w-59s	19th Century Prose.....	V	MTThF	204F	Stoll
*103w	Beowulf	VI	MWF	204F	Beach
*105f-106w	18th Century Poetry.....	VII	TWThF	205F	Klaeber
*110w	Romantic Movement	III	TThS	110F	Moore
*111f-112w	17th Century Prose.....	I	TWFS	205F	Beach
*141f-142w-143s	Historical Grammar	III	MWF	110F	Northrop
*146w-147s	Metrical Romances.....	VI	WF	205F	Klaeber
		II	TThS	302F	Griffin

COURSES IN RHETORIC

2w-3s	Comp. and Rhet.....	I	TThS	Ar	¶	
3w	Comp. and Rhet.....	I	MWF	Ar	¶	
		III	MWF	Ar	¶	
		II	TThS	Ar	¶	
		III	TThS	Ar	¶	
Af-Bw-Cs	Freshman English	Lec. II	M		Little Theater	
		Rec. I or	TWThS		Assigned on registration	
		Rec. II	TWThS		Assigned on registration	
		Lec. IV	T		Little Theater	
		Rec. III or	MWThF		Assigned on registration	
		Rec. IV	MWFS		Assigned on registration	
		Lec. VI	T		Little Theater	
		Rec. V or	MWThF		Assigned on registration	
As	Freshman English	Rec. VI	MWThF		Assigned on registration	
		Lec. III	M		Little Theater	
Aw	Freshman English	Rec. III	TWThF		Assigned on registration	
		Sec. V	M			
4f-5w-6s	Composition for Technical Students	Rec. Ar.	TWThF	Ar	¶	
		I	MWF		Assigned on registration	
11f-12w-13s	Exp., Descr., Narr.....	Sec. 1	I	MWF	311F	Hillhouse
		Sec. 2	II	MWF	311½F	Whitney
		Sec. 3	V	MWF	305F	Ruud
		Sec. 4	II	TThS	303F	Buck
		Sec. 5	III	TThS	306F	Phelan
		Sec. 6	III	TThS	311½F	Jackson
17f	Argument	I	TThS	306F	Jackson	
15f-16w-17s	Exp. and Arg.....	II	MWF	303F	Ford	

No.	Title	Hour	Day	Building	Instructor
*103f-104w-105s	Stud. in Struc. & Style..	VI	MWF	303F	Ford
*109w-110s	Short-story Writing	IV	MWF	304F	Thomas
*119f-120w-121s	Seminar in Writing.....	V, VI	T	302F	Thomas

COURSES IN PUBLIC SPEAKING

41f-42w-43s	Public Speaking				
	Sec.				
	1	II	MWF	308F	Anthony
	2	III	MWF	311½F	Anthony
	3	VI	MWF	308F	MacNaughton
	4	I	TThS	308F	Anthony
	5	II	TThS	308F	Lindsley
	3	III	TThS	304F	Anthony
41f-42w	Public Speaking	III	MTWThF	308F	Rarig
41s	Public Speaking	VI	MTWThF	Ar	†
*55f-56w-57s	Arg. and Debate.....	VI	MWF	308F	Lindsley
*81f-82w-83s	Int. Reading.....	IV	MWF	308F	Rarig
*85f-86w-87s	Advanced Pub. Speak....	VI	MWF	6F	Rarig
*91f-92w-93s	Play Prod.....	VII	MWF	306F	MacNaughton
*97w,s	Adv. Debate	Ar	Ar	308F	Rarig, Lindsley

ENTOMOLOGY AND ECONOMIC ZOOLOGY

No.	Title	Hour	Day	Building	Instructor
2w	Economic Entomology....	Ar	MWF	Adm(F)	Ruggles
12w	Forest Zoology	Ar	Ar	Adm(F)	Washburn
*197f,w,s,su	Introduction to Research and other work pre- scribed by the Division.	Ar	Ar	Ar	Entire Staff

For other courses offered by this department, see Animal Biology 38w, 45w, 18w, 130w.

GEOLOGY AND MINERALOGY

No.	Title	Hour	Day	Building	Instructor
1f-2w†	General Geology	I	MTWThF	210P	Johnston
		III	MTWThF	110P	Emmons
		IV	MTWFS	110P	Johnston
		VII	MTWThF	200aP	Dunbar
1w-2s	General Geology	II	MTWThF	210P	Dunbar
*5f-6w†	Economic Geology	II	MWF	210P	Schwartz
7f-8w	Gen. Geol. Laboratory...	Ar	Ar	112P	Johnston
*11f-12w-13s	Index Fossils				
	Lec.	II	M	105P	Stauffer
	Lab.	VI-VII	WF	105P	Stauffer
15w	Minerals and Rocks.....	Ar	Ar	100P	Grout
21w-22s†	Essentials of Mineralogy.				
	Lec.	IV	MWF	210P	Broderick
	Lab.	V-VIII	F	100P	Broderick
	Lab.	III	MWF	100P	Broderick
23f-24w-25s†	Elements of Mineralogy..				
	Lec.	II	MWF	110P	Broderick
	Lab.	V-VIII	F	110P	Broderick
17w	Outlines of Mineralogy...	Ar	Ar	Ar	Grout
30w	Principles of Geography...	III	MTWThF	210P	Posey
34w	Meteorology	II	MWF	200aP	Posey
*57f-58w-59s	Paleontology	II-III	TThS	105P	Stauffer
*106w	Petrography	V-VI	TTh	200P	Grout
*107f-108w-109s	Paleontologic Practice....	VI-VII	MWF	112P	Stauffer
*112w	Adv. Economic Geology..	I	TThS	110P	Emmons
*113s	Problems in Ore Deposits..	V-VIII	W	104P	Emmons
*118w	Geog. of Europe.....	I	TThS	200aP	Posey
*124w-125s	Struct. & Met. Geology..	III	TThS	112P	Johnston
*131f-132w-133s	Advanced Petrology.....	Ar	Ar	200P	Grout
*137w	Testing Econ. Minerals..				
	Lec.	IV	F	200P	Grout
	Lab.	V-VIII	F	200P	Grout

No.	Title	Hour	Day	Building	Instructor
*140w-141s	Applied Petrography.....	Ar	Ar	200P	GROUT
*144w-145s	Const. & Int. of Geol. Maps	V-VII	TTh	112P	Schwartz
*151f-152w-153s	Adv. General Geology....	IV	MWF	105P	Stauffer
*166w-167s	Mineralography	Ar	Ar	Ar	Broderick

† All quarters must be completed before credit is given for any one quarter.

GERMAN

No.	Title	Hour	Day	Building	Instructor
1w	Beginning	I	MTWThF	45cB	¶
2w	Beginning, Intermediate..	II	MTWThF	209F	Myers
		IV	MTWFS	15F	Downs
		VI	MTWThF	202F	Strand
3w	Beginning, Advanced....	I	MTWThF	209F	Kuhlman
4f-5w-6s	Beginning Chemists.....	III	MWF	209F	Downs
		III	TThs	212F	Schlenker
4w-5s-6f	Beginning Chemists.....	III	TThS	209F	Davis
7w	Chemists Intermediate....	III	TThS	209½F	Hendrickson
10w	Rapid Reading	II	MTWThF	207F	¶
11w	Adv. Rapid Reading.....	IV	MTWFS	207F	Kuhlman
13w	Adv. Narrative Prose....	III	MTWThF	40cB	Frary
14w	Prose and Poetry.....	II	MTWThF	209½F	Davies
25w-26s	Elementary Scientific....	III	TThS	5F	Downs
28f-29w	Adv. Chemical German..	III	TThS	207F	Myers
28w-29s	Adv. Chemical German..	III	MWF	204F	Schlenker
31f-32w	Medical German	II	MWF	109F	Burkhard
31w-32s	Medical German	I	TThS	209½F	Kroesch
		I	MWF	9F	Downs
40w-41s	Commercial German	III	MWF	102F	¶
*50f-51w-52s	Composition	III	M	209½F	Davis
*53f-54w-55s	Conversation	III	WF	209½F	Myers
*56f-57w-58s	Essay Writing	IV	TS	209½F	Kroesch
*59f-60w-61s	Oral Diction	VII	TTh	207F	Koenig
*63w	Modern Drama	IV	MWF	209½F	Davies
*67w	Survey 19th Century....	III	TThS	204F	Burkhard
*71w	Teachers' Course	VI	MWF	209F	Hubman
*72w-73s	Drama since 1880.....	IV	MWF	209F	Schlenker
*100f-101w-102s	Middle High	VII	MWF	207F	Kroesch
*126f-127w-128s	Grillparzer	V, VI, VII	Th	209½F	Myers
*150f-151w-152s	Novelle	V, VI, VII	T	209½F	Burkhard
*160f-161w-162s	Lytic	V, VI, VII	M	209½F	Davies
*225f-226w-227s	Literary Problems	V	MWF	209F	Schlenker

GREEK

No.	Title	Hour	Day	Building	Instructor
1f-2w-3s	First Year Greek.....	IV	MTWFS	114F	Savage
4f-5w-6s	History & Epic Poetry...	III	TWThFS	114F	Savage
*52w	Oratory	V	MWF	114F	Savage
*102w	Advanced Drama	Ar	Ar	114F	Savage

Courses in which no knowledge of Greek is required

62w	Greek Lit. and Life.....	VI	TTh	114F	Savage
63w	Greek Mythology	I	WF	114F	Savage

HISTORY

No.	Title	Hour	Day	Building	Instructor
1f-2w	Modern World, 1648-1918	II	TWThFS	CB Aud	Ford, Tyler
1w-2s	Modern World, 1648-1918	III	MTWThF	CB Chap	Tyler
3f-4w	England, 1066 to Present	II	MTWThF	Lit Th	White, Note-
				Law Aud	stein
5f-6w	American History	III	MWThFS	301F	Shippee
7w-8s	England, 1815-1919	IV	MTWFS	112Lib	Notestein

No.	Title	Hour	Day	Building	Instructor
9f-10w	Intr. to Econ. History...	III	MTThFS	CB Aud	Gras, Dickinson
11f-12w-13s	Medieval History (Music students only).....	III	MWF	112Lib	Krey
*56w	Teachers' Course	VIII	MWF	111Lib	¶
*104w	Near East, Modern.....	III	MTWThF	111Lib	Davis
*107f-108w	Europe, 1848-1914	VI	MTThF	111Lib	Tyler
*111w	European Background of Amer. Immigration....	V	MTWThF	113F	Stephenson
*115f-116w-117s	Econ. Hist. of Europe, 1300-1750	II	TThS	218b Lib	Gras
*121w-122s	English Backgrounds and American Colonies	VII	MWF	112Lib	White
*133f-134w-135s	Ancient Civilization.....	VII	MWF	111Lib	Davis
*142w	West in Amer. History, 1815-1865	VI	MWF	218b Lib	Buck
*157w-158s	Selected Topics, 19th Century Europe	VII, VIII	TTh	218b Lib	Ford, Tyler
*162f-163w-164s	Selected Topics, Medieval History	VII	TTh	218a Lib	White, Krey
*183w	Stuart Period	VII, VIII	MW	218b Lib	Notestein
Pol. Science					
*125w	Amer. Diplomatic History	III	MWFS	218b Lib	Wright

HOME ECONOMICS

No.	Title	Hour	Day	Building	Instructor
3f,w,s	Textiles	I, II	TWThFS	307HE 211HE	Phelps Weller
4f,w,s	Textiles	V, VI	MWF	307HE 211HE	Phelps Weller
11f,w,s	Garment Making				
	Section 1	V, VI, VII	TTh	112,304HE	McDowell
	Section 2	V, VI	MWF	304HE	McDowell
13f,w,s	Dressmaking	III, IV	MTWFS	305HE	Patchin, McDowell
15w-16s	Adv. Clothing Construction	I-IV	S	304HE	Weller, Brown
17f,w,s	Adv. Clothing Construct.	V, VI, VII	TTh	305HE	Weller, Brown
20f,w,s	Foods and Cookery.....	V, VI	MWF	203,209HE	Stinson
21f,w,s	Foods and Cookery.....	V, VI	MTWThF	207,309HE	Stinson, Child
		III, IV	MTWFS	106,207HE	Stinson, Child
22f,w,s	Food Economics	I, II	TWThFS	203,205,207HE	Stinson
23f,w	Nutrition I	V,VI,VII,VIII	MWF	211, 213HE	Mumford
34f,w,s,su	Home Management: Operation and Maintenance, Lectures	VII	MWF	213HE	Lindquist
51f,w,s	Drawing and Design....				
	Section 1	V, VI, VII	TTh	307,400HE	V. Goldstein
52f,w	Art History and Appreciation	II	MWF	401HE	H. Goldstein
53f,w,s	Advanced Design				
	Section 1	I, II	MWThF	400HE	H. Goldstein
	Section 2	V, VI, VII	MWF	400HE	V. Goldstein
63f,w,su	Institutional Experience..				
	Lecture	I		309HE	Treat, Richards
	Laboratory	Ar	Ar	Ar	Ar
70w	Food Preparation in Relation to Social Work....	V, VI, VII	TTh	103,213HE	Lindquist
103f,w,s	Dietetics	I, II	MTWThF	209,213HE	Biester
123f,w,s	Clothing Economics.....	III	MWF	309HE	Weller
131f,w,s	Home Management, House Planning and Equipment	V, VI	MTWThF	401HE	Morse

HUMAN ANATOMY

Students in this College may elect courses in Human Anatomy (see Medical School program) only by arrangement with the Head of the Department of Anatomy.

HUMAN PHYSIOLOGY

No.	Title	Hour	Day	Building	Instructor
4w	Human Physiology	I	MTWThF	315MH	Lyon, Beard
		I, II, III	S	301HM	Greisheimer
*100f-101W-102S	Physiologic Chemistry....	I, II, III	TTh	310MH	Pettibone, Kingsbury
*104w	Physiol. & Nerv. System, Senses, Respiration, etc.	IV	MWF	301MH	Scott, Lyon, McClendon
		V, VI, VII	MW		
		V, VI	F		
*111W	Electro Physiology.....	V, VI, VII	TTh	303MH	McClendon

JOURNALISM

No.	Title	Hour	Day	Building	Instructor
13f-14W-15S	Reporting	I	MWF	3F	Radder
*16f-17W	Copy Reading	II	MWF	12F	Radder

LATIN

No.	Title	Hour	Day	Building	Instructor
1f-2w	Beginning Latin	IV	MTWThF	109F	¶
1W-2S	Beginning Latin	VI	MTWThF	109F	¶
2w	Intermediate Latin†.....	IV	MTWFS	109F	¶
12w	Selections‡	III	MTWThF	109F	¶
22w	Plautus and Terence§....	III	MTWThF	109F	Pike
*52w	Apuleius	I	MWF	107F	Pike
81w	Teachers' Course	I	MWF	101Ed	Deneen
*132w	Seneca's Epistles	II	MWF	107F	Pike
*201f-202W-203S	Annals of Tacitus.....	VII-VIII	Th	107F	Pike

† Students entering second quarter with one year of Latin may select this course.

‡ Students entering second quarter with two or three years of Latin may select this course.

§ Students entering second quarter with four years of Latin may select this course.

MATHEMATICS

The Junior College courses in Mathematics may be combined into sequence of consecutive courses as follows:

- 1-2. To make a three-quarter sequence add 6.
- 1-6. To make a three-quarter sequence add 2.
- 2-6. To make a three-quarter sequence add 30, 20, or 16.
- 6-2. To make a three-quarter sequence add 30, 20, or 16.

No.	Title	Hour	Day	Building	Instructor
1w	Higher Algebra	VI	MTWThF	104,105F	¶
		VII	MTWThF	101,102F	¶
2w	College Algebra	II	TWThFS	102F	¶
6w	Trigonometry	II	TWThFS	104,105F	¶
		I	TWThFS	101,105F	¶
		III	TWThFS	104,105F	¶
		IV	MTWFS	102,104,105F	¶
		VII	MTWThF	104,105,125F	¶
30w	Analytic Geometry	I	TWThFS	104F	¶
*50w	Calculus I.....	III	TWThFS	125F	Underhill
		VI	MTWThF	125F	Hart
*51W	Calculus II.....	III	TWThFS	101F	Mathews
		VI	MTWThF	101F	Underhill
*62w-63s	Theory of Equations.....	VI	MWF	102F	Bussey

No.	Title	Hour	Day	Building	Instructor
*71w	Solid Analytic Geometry..	II	TWThFS	123F	Shumway
*106f-107w-108s	Adv. Calculus and Differential Equations	I	MWF	102F	Jackson
*130f-131w-132s	Functions of a Real Variable	III	TThS	102F	Jackson
*197f-198w	Exterior Ballistics	V	MWF	125F	Hart

METALLURGY

No.	Title	Hour	Day	Building	Instructor
1w	Assaying	III	TWThF	108M	Appleby
2w	Assaying Laboratory	I-VIII	M	7M	Christianson, Pease, Smith
4w	Metallurgy of Pig Iron...	I	TThS	108M	Christianson
*106w	Mcty. of Precious Metals	II	WThFS	108M	Pease
*154w	Metallography	Ar	Ar	305M	Harder

MILITARY SCIENCE AND TACTICS

No.	Title	Hour	Day	Building	Instructor
1f-2w-3s	Military Drill				
	Sec. I	I, II	M	A	Colonel Burton
		I	W	A	Colonel Burton
	II	I	W	A	Colonel Burton
		I, II	S	A	Colonel Burton
	III	III, IV	M	A	Colonel Burton
		VII	W	A	Colonel Burton
	IV	VII, VIII	M	A	Colonel Burton
		VII	W	A	Colonel Burton
	V	V	T	A	Colonel Burton
		VII	Th	A	Colonel Burton
4f-5w-6s	Military Drill				
	Sec. I	VII	W	A	Colonel Burton
		III, IV	S	A	Colonel Burton
	†II	V, VI	Th	A	Colonel Burton
		V	T	A	Colonel Burton
7f-8w-9s	Military Drill and Science...	Ar	Ar	A	Colonel Burton
10f-11w-12s	Adv. Military Drill & Science.	Ar	Ar	A	Colonel Burton

† This section 2 to be limited to not more than 80 men.

MUSIC

No.	Title	Hour	Day	Building	Instructor
1f-2w-3s	Harmony	II	MWF	Mu	†
		II	TThS	Mu	†
4f-5w-6s	Counterpoint	III	TTh	Mu	†
7f-8w-9s	Ear Training	V	T	Mu	†
10f-11w-12s	Composition	Ar	Ar	Mu	†
*11f-12w-13s	Analysis	IV	W	Mu	†
14f-15w-16s	History of Music.....	II	MWF	Mu	†
17f-18w-19s	Appreciation of Music.....	V	M	Mu	†
*20f-21w-22s	Bach and Beethoven.....	V, VI	T	Mu	†
23f-26w-27s	Ensemble	Ar	Ar	Mu	†
28f-29w-30s	First-Year Organ	Ar	Ar	Mu	†
31f-32w-33s	Second-Year Organ	Ar	Ar	Mu	†
34f-35w-36s	Third-Year Organ	Ar	Ar	Mu	†
37f-38w-39s	Fourth-Year Organ	Ar	Ar	Mu	†
39f-40w-41s	First-Year Piano	Ar	Ar	Mu	†
42f-43w-44s	Second-Year Piano	Ar	Ar	Mu	†
45f-46w-47s	Third-Year Piano	Ar	Ar	Mu	†
48f-49w-50s	Fourth-Year Piano	Ar	Ar	Mu	†
51f-52w-53s	First-Year Violin	Ar	Ar	Mu	†
54f-55w-56s	Second-Year Violin	Ar	Ar	Mu	†
57f-58w-59s	Third-Year Violin	Ar	Ar	Mu	†
60f-61w-62s	Fourth-Year Violin	Ar	Ar	Mu	†
63f-64w-65s	First-Year Vocal Training...	Ar	Ar	Mu	†

No.	Title	Hour	Day	Building	Instructor
66f-67w-68s	Second-Year Vocal Training.	Ar	Ar	Mu	¶
69f-70w-71s	Third-Year Vocal Training..	Ar	Ar	Mu	¶
72f-73w-74s	Fourth-Year Vocal Training.	Ar	Ar	Mu	¶
75f-76w-77s	Public School Music.....	VII, VIII	WF	Ed	¶
*78f-79w-80s	Adv. Public School Music..	Ar	Ar	Ed	¶
81f-82w-83s	Normal Piano	VI	MWF	Mu	¶
*84f-85w-86s	Adv. Normal Piano.....	VII	MWF	Mu	¶
*88f-89w-90s	Ear Training	V	Th	Mu	¶
91f-92w-93s	Orchestra	7:30	W	Armory	¶
94f-95w-96s	Other Orchestral Inst.....	Ar	Ar	Mu	¶
97f-98w-99s	University Choir	VIII	M	Mu	¶

PHILOSOPHY

No.	Title	Hour	Day	Building	Instructor
1w	Problems of Phil.....	III	TWThFS	322F	Swenson
2w	Logic	IV	MTWFS	321F	Lodge
20w-21s	Present Day Phil.....	I	MWF	322F	Wilde
100w-101s	Phil. of Religion.....	II	TThS	322F	Swenson
108w-109s	History of Ethics.....	II	MWF	322F	Lodge
113f-114w-115s	History of Phil.....	IV	MWF	322F	Wilde
120w	Scandinavian Phil.....	VI	MWF	322F	Swenson
124w-125s	Political and Social Ethics	I	TThS	322F	Wilde
151f-152w-153s	Kant	V	W	316F	Lodge
129w-130s	Ancient Phil. Theories of the State	VI, VII	T	316F	Wilde

PHYSICAL EDUCATION

FOR MEN

No.	Title	Hour	Day	Building	Instructor
1w	Personal Hygiene	II	WF	A	Cooke
		III	WF		
		IV	WF		
		IV	TS		
		VI	TTh		

PHYSICAL EDUCATION

FOR WOMEN

No.	Title	Hour	Day	Building	Instructor
*1f-2w-3s	Elem. Phys. Training.....	IV	MWF	3, 151, 153WGm	¶
		VI	MWF	3, 151, 153WGm	¶
		VII	MWF	3, 151, 153WGm	¶
		III	TThS	3, 151, 153WGm	¶
*4f-5w-6s	Intermed. Phys. Training..	VI	TTh	153WGm	Kissock
	One other hr. to be ar.				
*7f-8w-9s	Adv. Phys. Training.....	VII	TTh	153WGm	Schill
	One other hr. to be ar.				
22f-23w-24s	Soph. Rhythmic Expr.....	IV	TS	151WGm	Ladd
		VII	TTh	151WGm	Ladd
		VIII	TTh	151WGm	Ladd
38w	Soph. Folk Dancing.....	II	TTh	151WGm	Barr
40f, w, s	Soph. Major Sports.....	VIII	MW	151WGm	Kissock
43f, w, s	Soph. Elem. Swimming....	IV	MW	51WGm	Baker
		IV	TS	51WGm	Baker
		VI	MW	51WGm	Baker
		VI	TTh	51WGm	Baker
44f, w, s	Soph. Adv. Swimming.....	VIII	MW	51WGm	Baker
		VIII	TTh	51WGm	Baker
45f, w, s	General Swimming	VII	MW	51WGm	Baker
		VII	TTh	51WGm	Baker
	General Swimming without Instruction	VIII	F	51WGm	

No.	Title	Hour	Day	Building	Instructor
52f-53w	Soph. Phys. Train. (including orthopedic section)...	III	WF	3, 153WGm	Schill, Barr
		IV	TS	3, 153WGm	Schill, Barr
		V	TTh	3, 153WGm	Schill, Barr
14w	Hygiene of the Family....	II	MWF	201WGm	Norris
	Not offered in 1919-20.				
17w	Prin. of Gymnastic Exer....				
	Lec.	III	MWF	201WGm	Schill
	Lab.	V	MWF	151WGm	
19f-20w-21s	Rhythmic Expression	VIII	MW	153WGm	Ladd
31f-32w-33s	Folk Danc. & Organ. Games	V	TTh	151WGm	Kissock
34f-35w-36s	Hockey, Basketball and Baseball	VIII	TTh	151WGm	Kissock

*3s, open to students who have not taken 1f-2w.

6s, open to students who have not taken 4f-5w.

9s, open to students who have not taken 7f-8w.

Any course in exercise may be entered any quarter by obtaining permission of Department.

PHYSICS

Introductory Courses

No.	Title	Hour	Day	Building	Instructor			
21w	Elements of Mechanics & Sound	Lec.	V	W	30Ph	Erikson		
		Rec.	I	MWF	2F	Erikson		
22w	Elements of Mechanics & Sound	Lec.	V, VI	M	16Ph	Erikson		
		Lab.						
41w	Heat	Lec.	VII	M	30Ph	Miller		
		Sec. 1	Rec.	I	TThS	17Ph	Miller	
			2	Rec.	†II	TThS	17Ph	Miller
			3	Rec.	III	TThS	17Ph	Downey
			4	Rec.	†III	MWF	215ME	Welo
42w	Heat Laboratory	Sec. 1	Lab.	V, VI	Th	23Ph	Miller & Assts.	
			2	Lab.	VII, VIII	Th	23Ph	Miller & Assts.
			3	Lab.	I, II	F	23Ph	Miller & Assts.
			4	Lab.	V, VI	F	23Ph	Miller & Assts.
			5	Lab.	VII, VIII	F	23Ph	Miller & Assts.
			6	Lab.	I, II	S	23Ph	Miller & Assts.
45w	†Heat	Lec.	VII	M	30Ph	Miller		
		Sec. 1	Rec.	I	TThS	2F	Downey	
			2	Rec.	I	TThS	114F	Johnson
			3	Rec.	I	TThS	3F	Mackell

Intermediate Courses

*166w	Elect. Meas. of Precision	Ar	Ar	12Ph	Zeleny
*171f-173w-174s	Radioactivity	I	TThS	15Ph	†
*181f-183w-185s	Theoretical Physics	II	TThS	16Ph	Tate
*182f-184w-186s	Experimental Physics ...	Ar	Ar	2Ph	Tate
*191f-193w-195s	Elem. of Math. Physics..	Ar	Ar	18Ph	Tate
*192f-194w-196s	Elemty. Phys. Investigatn.	Ar	Ar	20Ph	†

† Pre-Medical section.

‡ For Pre-Dental only.

POLITICAL SCIENCE

No.	Title	Hour	Day	Building	Instructor
1w	American Government....	II	MTWThF	5F	†
		VI	MTWThF	109MA	†
7w	State and Local Govt....	III	MTWThF	109MA	Cushman
15w	Introd. to Pol. Sci.....	IV	MTWFS	Ar	Anderson
*51f-52w-53s	Business Law†	II	MWF	202MA	Young

No.	Title	Hour	Day	Building	Instructor
*58w	Elementary Law	IV	MWFS	107F	Lobb
*121f-122w	International Law†	IV	MWFS	213MA	Wright
*125w	Amer. Diplomatic History	III	MWFS	218b Lib	Wright
*151f-152w	Constitutional Law†	II	MWFS	213MA	Cushman
*155w-156s	Compar. Adm. Law†...	IV	TThS‡	102MA	Young
*157w	Police Power	III	MTWThF	202MA	Young
*165f-166w	Govt. of British Empire†	II	MWF	114F	Allin
*179w-180s	Ancient Phil. Theories of the State	VI, VII	T	316F	Wilde

† All quarters must be completed before credit will be given for any one quarter.

‡ The IV hour Thursday will be used only when there is no convocation.

PSYCHOLOGY

No.	Title	Hour	Day	Building	Instructor
1f-2w-3s	General Psychology				
	Lecture	I or VII	M	Little Th.	†
	Sec. 1	Rec. II	W	Psy115	†
		Lab. I, II	F	Psy211	†
	Sec. 2	Rec. III	W	Psy115	†
		Lab. III, IV	F	Psy211	†
	Sec. 3	Rec. VI	W	Psy115	†
		Lab. V, VI	F	Psy211	†
	Sec. 4	Rec. II	F	Psy115	†
		Lab. I, II	W	Psy211	†
	Sec. 5	Rec. III	F	Psy115	†
		Lab. III IV	W	Psy211	†
	Sec. 6	Rec. VI	F	Psy115	†
		Lab. V, VI	W	Psy211	†
	Sec. 7	Rec. III	T	Psy115	†
		Lab. III, IV	S	Psy211	†
	Sec. 8	Rec. VI	T	Psy115	†
		Lab. V, VI	Th	Psy211	†
	Sec. 9	Rec. II	Th	Psy115	†
		Lab. I, II	T	Psy211	†
	Sec. 10	Rec. III	Th	Psy211	†
		Lab. III, IV	T	Psy211	†
	Sec. 11	Rec. II	T	Psy115	†
		Lab. I, II	Th	Psy211	†
	Sec. 12	Rec. VIII	Th	Psy211	†
		Lab. I, II	S	Psy211	†
	Sec. 13	Rec. V	F	Psy115	†
		Lab. V, VI	T	Psy211	†
	Sec. 14	Rec. VII	F	Psy211	†
		Lab. VII, VIII	T	Psy211	†
	Sec. 15	Rec. IV	W	Psy115	†
		Lab. III, IV	M	Psy211	†
	Sec. 16	Rec. V	W	Psy115	†
		Lab. V, VI	M	Psy211	†
*101f-102w	Experimental Psychology.	V	T	Psy116	Woodrow
		VI, VII	TTh	Psy116	Woodrow
*203s	Quantitative Psychology..	V	T	Psy	Woodrow
		VI, VII	TTh	Psy	Woodrow
*108w-109s	Adv. General Psychology.	II	MWF	Psy109	Foster
*114w-115s	Human Behavior	II	TThS	Psy109	Elliott
*125f-126w	Differential Psychology...	III	MWF	Psy109	Fernald
*127s	Social Psychology	III	MWF	Psy109	Fernald
*131f-132w-133s	Child Mind	4:30 to 5:45	Th	Psy115	Lowell
		10:30 to 11:45	S	Psy109	Lowell
*137f-138w	Applied Psychology	III	TThS	Psy115†	Morgan
*144w-145s	Abnormal Psychology ...	IV	MWF	Psy	Morgan
*200f-201w-202s	Seminar	7:30 to 9:30pm	Th	Psy302	Foster

EDUCATIONAL PSYCHOLOGY

No.	Title	Hour	Day	Building	Instructor
*55f, w, s	Elem. Educ. Psychology..	I	MWF	Psy	Haggerty, Dealey
*106f-107w-108s	Adv. Educ. Psychology...	IV	MWF	Psy	Haggerty
*110w	Psychol. of Secondary School Subjects	II	MWF	Psy	Van Wagenen
*111Tf-112Tw	Educ. Diag. (for teachers)	I, II	S	Psy	Van Wagenen
*126f-127w	Methods of Edu. Research	VIII, IX	T	Psy	Van Wagenen
*134f-135w-136f	Mental Diagnosis, Mental Tests	VI, VII	TTh	Psy	Haggerty, Dealey
*137f-138w-139s	Experimental Education..	VIII, IX†	Th	Psy	Haggerty,
*149f-150w-151s	Psycho-Educ. Clinic.....	Ar	MWF	Psy	Haggerty, Dealey

† Other hours by arrangement. Consult instructor.

ROMANCE LANGUAGES

FRENCH

No.	Title	Hour	Day	Building	Instructor
1f-2w-3s†	Beginning French	V	MWF	301F	†
4f-5w†	Beginning French	I	MTWThF	201F	†
		II	MTWThF	213F	†
		III	MTWThF	226F	†
		IV	MTWFS	201F	†
		V	MTWThF	202F	†
4w-5s†	Beginning French	I	MTWThF	321F	†
		IV	MTWFS	44CB	†
7f-8w†	Intermediate French	I	MTWThF	202F	†
		II	MTWThF	226F	†
		III	MTWThF	213F	†
7w-8s†	Intermediate French	II	MTWThF	202F	†
		IV	MTWFS	101F	†
13f-14w-15s†	French Survey	I	MWF	43CB	Sirich
		II	TThS	40CB	Van Roosbroeck
		III	TThS	201F	Phelps
		VI	MWF	227F	LeCompte
16f-17w-18s†	Elem. Fr. Conversation...	I	TTh	43CB	Barton
		II	MW	40CB	Delson
		III	MW	201F	Guinotte
		VII	MW	202F	Guinotte
19f-20w-21s†	Elem. Fr. Composition...	I	S	43CB	Barton
		II	F	40CB	Delson
		III	F	201F	Frelin
		VII	F	202F	Guinotte
22f-23w-24s	Scientific Fr. Reading†..	I	MWF	209½F	†
*84f-85w-86s†	Adv. Fr. Conversation...	V	MW	109F	Frelin
*87f-88w-89s†	Adv. Fr. Composition...	V	F	109F	Frelin
*97f-98w-99s†	19th Century Fr. Lit....	IV	MWF	213F	Barton, Delson
*100f-101w-102s†	17th Century Fr. Lit....	III	MWF	202F	Olmsted
*103f-104w-105s†	18th Century Fr. Lit....	III	TThS	43CB	Searles
*106f-107w-108s†	16th Century Fr. Lit....	VI	MWF	203F	Sirich
*109f-110w-111s†	Fr. Dramatic Lit.....	III	TTh	203F	Olmsted
*118f-119w-120s†	Realistic Novel	{ IV	T	202F	LeCompte
		{ 12:30	F		
*121f-122w-123s†	Fr. Lectures	{ VII	Th	201F	†
		{ VIII	M		
*131f-132w-133s†	Fr. Oral Diction.....	V	MW	213F	Delson
*134f-135w-136s†	Fr. Syntax	V	F	203F	Barton

† Architects only.

‡ Pre-Medical students only.

SPANISH

No.	Title	Hour	Day	Building	Instructor
31f-32w†	Beginning Spanish	I	MTWThF	227F	¶
		II	MTWThF	227F	¶
		III	MTWThF	227F	¶
		IV	MTWFS	226F	¶
		V	MTWThF	227F	¶
31w-32s†	Beginning Spanish	I	MTWThF	204F	¶
33f-34w	Intermediate Spanish.....	II	MTWThF	113F	Coburn
		III	MTWThF	2F	Vasconcelos
		IV	MTWThF	205F	Coburn
33w-34s	Intermediate Spanish.....	II	MTWThF	205F	Coburn
37f-38w-39s†	Spanish Survey	II	TThS	38CB	House
40f-41w-42s†	Elem. Span. Conversation	II	MW	38CB	Heras
43f-44w-45s†	Elem. Span. Composition.	II	F	38CB	Heras
*46f-47w-48s†	Adv. Span. Conversation.	III	TTh	202F	Vasconcelos
*49f-50w-51s†	Adv. Span. Composition..	III	S	202F	Vasconcelos
*52w	Teachers' Course	VI	MWF	226F	de Boer
*157f-158w-159s†	Spanish Novel	IV	MF	227F	Heras
*160f-161w-162s†	Selected Classics	IV	TS	227F	House
*163f-164w-165s†	Spanish Lectures	VIII	TTh	202F	Heras
*169f-170w-171s†	Spanish Syntax	IV	W	203F	House

ITALIAN

No.	Title	Hour	Day	Building	Instructor
61f-62w†	Beginning Italian	I	MTWThF	38CB	Phelps
*181f-182w-183s†	Dante, Petrarch, Boccaccio	IV	MW	212F	Phelps
*184f-185w-186s†	Dante (in English).....	IV	F	212F	Phelps

SCANDINAVIAN

No.	Title	Hour	Day	Building	Instructor
1f-2w	Beginning Norwegian	I	TWThFS	206F	Bothne
4f-5w	Adv. Norwegian (Survey)	III	TWThFS	206F	Bothne
7f-8w	Beginning Swedish	II	MTWThF	206F	Stomberg
10f-11w	Advanced Swedish	I	MTWThF	110F	Stomberg
*101f-102w-103s	Modern Norwegian Lit..	II	TThS	110F	Bothne
*107f-108w-109s	Modern Swedish Lit....	V	MWF	206F	Stomberg
*110w	Ibsen	Ar	Ar	206F	Bothne
*111f-112w-113s	Old Norse (Icelandic)...	Ar	Ar	206F	Bothne
*115w	Teachers' Course in Swed.	Ar	Ar	206F	Stomberg
*117w-118s	Earlier Norwegian Lit...	Ar	Ar	206F	Bothne

SOCIOLOGY AND SOCIAL WORK

No.	Title	Hour	Day	Building	Instructor
1w	General Introduction	I	MTWThF	5F	Bernard
		VI	MTWThF	5F	Lively
6w	Modern Social Reform Movements	II	TThS	9F	Elmer
		III	MWF	5F	Finney
		I	MWF	Farm	Lundquist
14w	Rural Sociology	I	MWF	Farm	Lundquist
*52w	Treatment of Dependents and Defectives.....	I	TThS	9F	Bruno
*55w	Housing Problems.....	I	MWF	124F	Davis
*99	Supervised Field Practice Work	Ar	Ar	Ar	Bedford
*101w	Social Organization	II	TThS	12F	Bernard
*110w	Rural Community Organi- zation, etc.	VII-VIII	Th	15F	Bernard
*119w	The Family	III	TThS	9F	Elmer
122w	Methods of Social In- vestigation	VII	MWF	12F	Elmer
*133f-134w-135s	Hospital Social Service...	Ar	Ar	Ar	Tebbets

The University of Minnesota

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

PROGRAM SPRING QUARTER, 1919-1920

ABBREVIATIONS AND EXPLANATIONS

The following abbreviations are used: A, Armory; AB, Animal Biology; Ar indicates that days, hours, room are to be arranged later; C, Chemistry Building; D, Dental Building; Ed, College of Education; En, Engineering Building, University Farm; F, Folwell Hall; HE, Home Economics Building, University Farm; IA, Institute of Anatomy; L, Law Building; Lib, Library; M, Mines; MA, Mechanic Arts; ME, Main Engineering Building; MechE, Mechanical Engineering Building; MH, Millard Hall; Mu, Music Building; O, Observatory; P, Pillsbury Hall; PIPath, Plant Pathology Building, University Farm; Ph, Physics Building; Psy, Psychology Building; WGm, Women's Gymnasium; CB, Christian Bible College.

The symbol † indicates that the course must be completed before credit is received for any quarter.

The Roman numeral indicates the hour of meeting of a class; e.g., I, 8:30-9:20 a.m.

The numbers of the first column are those of the courses described in the Bulletin which should be consulted for further information regarding nature of the course, to whom it is open, prerequisites, etc.

The letters f, w, s, and su stand respectively for fall, winter, spring, and summer, and indicate the quarter in which a course is offered.

Each course beginning in the spring quarter has in parenthesis an abbreviated statement of credits, classes to whom offered, and prerequisites. Thus: (3; jr., sr.; pre. 7-8) means that the course carries three credits, is offered to juniors and seniors, and demands course 7-8 in the same department as a prerequisite. In each case, this statement is either the same as or more accurate than the corresponding statement in the Bulletin.

AGRICULTURE, FORESTRY, AND HOME ECONOMICS

The following divisions of this College offer courses to students in the College of Science, Literature, and the Arts who can meet the prerequisites:

Agricultural Biochemistry	Farm Engineering
Agricultural Education	Forestry
Agronomy and Farm Management	Home Economics
Animal Husbandry	Horticulture
Bee Culture	Plant Pathology and Botany
Dairy Husbandry	Soils
Entomology and Economic Zoology	Veterinary Medicine

Descriptions of the courses offered will be found in the bulletins of the College of Agriculture, Forestry, and Home Economics. The hour schedule will be found in the program issued each quarter.

Students who desire to take more than a single course in Agriculture are advised to consult with some member of the division in which they are interested in order to arrange the sequence of courses which will be of greatest value.

AMERICANIZATION TRAINING AND ANTHROPOLOGY

No.	Title	Hour	Day	Building	Instructor
1s	Introduction to Anthropology.. (5; 3rd qu. fr., soph., jr., sr.; no pre.)	I	MTWThF	25F	Mathie
5s	General Immigration	III	TThS	15F	Mathie
	(3; soph., jr., sr.; pre. 1)				
41w-42s	Slavic Languages	IV	TS	9F	Junek
*112s	Amer. Negro	II	MWF	3F	Jenks
	(3; jr., sr., gr.; pre. 2 courses)				
*115s	Americanisms and Assim.....	III	MWF	9F	Jenks
	(3; jr., sr., gr.; pre. 3 courses)				
*125s	Methods of Americanization....	IV	MWF	2F	Jenks, Junek, Clark
	(3; jr., sr., gr.; pre. 3 courses)				
*127s	Tech. of Teaching Adults.....	I	MWF	15F	Clark, Junek
	(3; jr., sr., gr.; pre. 125)				
*133s	Supervised Americanization Wk.	V	TTh & Ar	2F	Clark, Junek
	(3; jr., sr., gr.; pre. 3 courses, including 125)				
*139s	Race Leaders and Programs....	I	TThS	15F	Clark
	(3; jr., sr., gr.; pre. 3 courses)				

ANIMAL BIOLOGY

(See also Entomology and Economic Zoology)

No.	Title	Hour	Day	Building	Instructor
1w-2s†	General Zoology				
	Lab.	I, II	MWF	101AB	Ar
	Lect.	I, II	T		
		II	ThS	313AB	Ar
1s-2su or 2w†	General Zoology				
	(10; all; no pre.)				
	Lab.	I, II	TThS	101AB	Ar
	Lect.	II	MW	313AB	Ar
		I, II	F	313AB	Ar
5f-6w-7s†	General Zoology				
	(Pre-medical) Lab.	III, IV	TS	101AB	Sigerfoos
	Lect.	IV	MWF	313AB	Ar
9s§	General Histology	III, IV	MTWThF	201AB	Nachtrieb
	(5; fr., soph., jr., sr.; pre. 1-2)				
23s§	Morphogenesis & Behavior of Organisms	V-VII V-VIII	MW F	208-10AB	Lund
	(5; fr., soph., jr., sr.; pre. 1-2)				
35s§	General Embryology	V, VI	MTWThF	201AB	Nachtrieb
	(5; fr., soph., jr., sr.; pre. 1-2)				
37f-38w-39s	General Entomology	I, II	MWF	208-10AB	Oestlund
43s	Intro. to Entomology	V, VI	MTWThF	208AB	Oestlund
	(5; fr., soph., jr., sr.; pre. 1-2)				
44s	Animal parasites	V-VIII	WF	206AB	Riley
	(3; soph., jr., sr.; pre. 1-2)				
59s	General Ecology	V-VII	TTh	211, 213AB	Chapman
	(3; jr., soph., jr., sr.; pre. 1-2)				
*107s	Protozoology	I, II	TThS	213AB	Sigerfoos
	(3; jr., sr.; pre. 1-2, and 5 other cr. in An. B.)				
*114w-115s†	Ornithology	V, VI, VII	TTh	314, 21AB	Roberts
*117f-118w-119s	Ecology of Insects	V, VI, VII	MW	208-10AB	Chapman
*125f-6w-7s	Advanced Entomology ..	III, IV	TThS	208-10AB	Oestlund
*139s	Histol. Devel. of Insects.	Ar	Ar	Ar	Riley
	(5; soph., jr., sr.; pre. 1-2, and 37, 38, or 43)				
*149f-150w-151s	Blood of Vertebrates.....	Ar	Ar	201, 211AB	Downey
*153f-154w-155s	Hematology	V, VI, VII	TTh	201, 211AB	Downey
175s	Nature Study	V, VI, VII	TTh	213AB	Sigerfoos
	(3; jr., sr.; pre. 1-2)				
*197f-198w-199s	Problems	Ar	Ar	Ar	Ar

§ Open only to students having a grade of C or better in General Zoology. Registration limited to 15.

ARCHITECTURE

No.	Title	Hour	Day	Building	Instructor
10f-11w-12s	Frechand Drawing	V, VI	MWF	401ME	Burton Johnson
4f-5w-6s	Elements of Architecture ..	II V, VI V, VI, VII III, IV	W MWF TTh S	317ME	Forsythe Burton Prudden

ASTRONOMY

No.	Title	Hour	Day	Building	Instructor
7s	Navigation	VI	MWF	124F	Leavenworth
	(3; soph., jr., sr.; pre.; consult dept)				
11s	Descriptive Astronomy	I IV	MTWThF MTWFS	124F 124F	Beal Beal
	(5; 3rd qu. fr., soph., jr., sr.; no pre.)				
25s	Stellar Astronomy	III	MTWThF	124F	Leavenworth
	(5; soph., jr., sr.; pre. 11)				
*51f-52w-53s	General Astronomy	II	MWF	124F	Leavenworth
*62s	Elements of Pract. Astron..	II	TThS	124F	Beal
	(3; jr., sr.; pre. 11 or 51, and 10 cr. in Math. including trig.)				
*140s	Least Squares	IV	MWF	123F	Leavenworth
	(3; sr., gr.; pre. Math*51)				

BACTERIOLOGY AND IMMUNOLOGY

No.	Title	Hour	Day	Building	Instructor
6s	Elementary Bacteriology	V, VI, VII V, VI	MW F	201MH 201MH	Benton Benton
	(4; all; no pre.)				

BOTANY

No.	Title	Hour	Day	Building	Instructor
1s	General Botany	Lab. III, IV Quiz. III Lect. IV III, IV	MWF T T S	212-214P 212-214P 210P	Durand in charge
	(5; all; no pre.)				
7s	Taxonomy of Flowering Plants	Lab. V, VI Quiz. V Lect. VI	MWF Th TTh	212-214P 210P 210P	Rosendahl in charge
	(5; 3rd qu. fr., soph., jr., sr.; pre. 2)				
13s	Gymnosperms and Angio- sperms	III, IV	MTWThF	202AB	Butters
	(5; soph., jr., sr.; pre. 2)				
*54s	Elementary Ecology	III, IV	MTWFS	G	Cooper
	(5; jr., sr.; pre. 52)				
*61f-w-s	Teachers Course	Ar	Ar	111AB	Johnson
	(5; jr., sr.; pre. 20 cr. including 7)				
*105s	Algae	I, II	TWThFS	10AB	Tilden
	(5; jr., sr., gr.; pre. 11)				
*110s	Gymnosperms	Ar	Ar	5AB	Butters
	(5 cr.; jr., sr., gr.; 7 and 13)				
*113f-114w-115s	Advanced Taxonomy	V-VII	MWF	202AB	Rosendahl
*118w-119s	Cytology	I, II	MWF	202AB	Rosendahl
*124s	Algae: Green	V, VI, VII	TTh	104AB	Tilden
	(3; jr., sr., gr.; pre. 105)				
*125s	Algae: Brown	V, VI, VII	WF	104AB	Tilden
	(3; jr., sr., gr.; pre. 105)				

No.	Title	Hour	Day	Building	Instructor
*133 ^e	Forest. Geog. of North America	V, VI	MWF	G	Cooper
	(5; sr., gr.; pre. 54)				
*143 ^s	Advanced Plant Physiol. . .	I, II	MTWThF or Ar	G	Knight
	(5; sr., gr.; pre. 52 and Gen. Org. Chem.)				

CHEMISTRY

DIVISION OF GENERAL AND INORGANIC CHEMISTRY

No.	Title	Hour	Day	Building	Instructor
1f-2w-3st	Gen. Inorgan. Chem.				
	Lect. V		MWF	100C	Henderson
	Lab. V, VI		TTh	210C	Henderson
		VII, VIII	TTh		
6f-7w-8st	Gen. Inorgan. Chem.				
	Lect. II		MWF	225C	Cohen
	Lab. III-IV		MWF	210C	Cohen
		VII, VIII	TTh		
115	Qual. Chem. Anal.				
	Lect. III or V		MWF	225C	Heisig
	Lab. V, VI		TTh	210C	Heisig
		or VII, VIII	TTh		
	(4; fr., soph. pre-med.; pre. 1-2-3 or 4-5)				
125	Qual. Chem. Anal.				
	Lect. II		MWF	100C	Sneed
	Lab. V, VI, VII		TTh	210C	Sneed
		or VI, VII, VIII	TTh		
	(5; soph.; pre. 6-7-8 or 9-10)				
195	Teachers' Course	III	MWF	315C	Geiger
	(3; jr., sr.; pre. Gen. Chem. and Qual. Anal.)				
1045	Adv. Inorgan. Chem.	Ar	Ar	Ar	Sneed
	(2; jr., sr., gr.; pre. 35-36, 20-21)				

DIVISION OF ANALYTICAL CHEMISTRY

No.	Title	Hour	Day	Building	Instructor
215	Quant. Anal.				
	Lect. V		M	325C	Geiger
	Rec. V		F	315C	Geiger
	Lab. VI, VII, VIII		MF	310C	Sidener, Geiger
		V-VIII	W		
	(5; soph., jr., sr.; pre. 20)				
1255	Spec. Prob. in Quant. Anal.	V, VI, VII	TThF	310C	Sidener, Geiger
	(2 or 3; sr., gr.; pre. 21)				
1265	Sanitary Water Anal.	V, VI, VII, VIII	T or Th	310C	Sidener
	(1 or 2; sr., gr.; pre. 21)		or TTh		

DIVISION OF ORGANIC CHEMISTRY

No.	Title	Hour	Day	Building	Instructor
31w-325	Element. Org. Chem.				
	Lec. IV		MWF	325C	Hunter
	Lab. V-VII		TTh	10C	Hunter, Woollett
1315	Adv. Org. Chem.	III	MWF	325C	Hunter
	(3; jr., sr., gr.; pre. 31-32)				
1395	Adv. Org. Chem.	Ar	Ar	331C	Jones, Hunter
	(Cr. ar.; jr., sr., gr.; pre. 137-138)				

§ Open only to those students who are taking or have taken a lecture course in Advanced Organic Chemistry.

DIVISION OF PHYSICAL CHEMISTRY

No.	Title	Hour	Day	Building	Instructor
141f-142w-143s	Physical Chemistry				
	Lec.	IV	MWF	225C	MacDougall
	Lab.	V-VII	F†	117C	MacDougall
	Rec.	III	S	115C	Ar
147f-148w-149s	Adv. Physical Chemistry..		TThS	115C	MacDougall
151f-152w-153s	Adv. Physical Chemistry.				
	Lab.	Ar	Ar	117C	MacDougall

† 3 cr. course, no lab.; 4 cr. course, lab. on F; 5 cr. course, lab. ar.

COMPARATIVE PHILOLOGY

No.	Title	Hour	Day	Building	Instructor
*105	Life of words	VI	TTh	205F	Klaeber
	(2; jr., sr., gr.; see bulletin)				
*141f-142w-143s	Hist. Grammar of English Language	VI	WF	205F	Klaeber
*163	Phonetics	Ar	Ar	Ar	Kroesch
	(3; jr., sr., gr.; see bulletin)				

DRAWING AND DESCRIPTIVE GEOMETRY

No.	Title	Hour	Day	Building	Instructor
31w-32s	Drafting and Tracing	V, VI, VII	TTh	13ME	Kirchner
33f-34w-35s	Technical Drawing	I, II	TThS	101ME	Potter
		V, VI	MWF	13ME	Cederberg
33s	Technical Drawing	I, II	TThS	101ME	Potter
		V, VI	MWF	13ME	Cederberg

(2; all; no pre.)

ECONOMICS

No.	Title	Hour	Day	Building	Instructor
38-4f	Principles of Economics..				
	Lect.	IV	T	CB Aud	Hansen, et al
	Sec. 1	I	MWThF	102MA	Ar
	2	I	TThFS	202MA	Ar
	3	I	MWThF	45CB	Ar
	4	II	MWThF	40CB	Ar
	5	II	MWThF	43CB	Ar
	6	II	TThFS	44CB	Ar
	7	III	MWThF	109MA	Ar
	8	III	MWThF	209MA	Ar
	9	IV	MWFS	102MA	Ar
	10	IV	MWFS	209MA	Ar
	11	V	MWThF	109MA	Ar
	12	V	MWThF	202MA	Ar
	13	V	MWThF	209MA	Ar
	14	V	TWThF	5F	Ar
	15	VI	MWThF	5F	Ar
	16	VI	TWThF	2F	Ar
	(5; fr. [3d qu. pre-bus. only]; soph., jr., sr.; no pre.)				
3w-4s†	Principles of Economics..	VI	MTWThF	322F	James
5s‡	General Economics	I	MTWThF	Farm	Holmes
	(5; fr., soph., jr.; no pre.)				
8f-9w-10s	Principles of Economics (Engineers)				
	Sec. 1	I	MWF	205ME	Dickinson
	2	IV	MWF	136ME	Dickinson
14s	Statistics				
	Lect.	III	MWF	CB Aud.	Mudgett et al
	Lab. Sec. 1	VII-VIII	TTh	301MA	Ar
	2	VII-VIII	WF	301MA	Ar

No.	Title	Hour	Day	Building	Instructor	
		3	III-IV	TS	301MA	Ar
		4	I-II	MW	301MA	Ar
		5	I-II	TTh	301MA	Ar
		6	V-VI	MW	301MA	Ar
		7	V-VI	TTh	301MA	Ar
	(5; soph., jr., sr.; pre. 3-4 or 5-6)					
15f-16w-17s	Economic Problems (Engineers)	IV	MWF	111M	Blakey	
23s	Principles of Organization and Management					
	Lect.	IV	MWF	CB Aud.	Peiz	
	Sec. 1	V	MW	3F	Ar	
	2	III	MW	25F	Ar	
	3	II	MW	45CB	Ar	
	4	VII	TTh	202MA	Ar	
	5	VI	TTh	202MA	Ar	
	6	V	TTh	3F	Ar	
	7	III	TTh	25F	Ar	
	8	II	TTh	45CB	Ar	
	9	I	TTh	5F	Ar	
	(5; soph., jr., sr.; pre. 3-4 or 5, 6)					
25w-26s	Principles of Accounting..					
	Lect. 1	I	TThS	209MA	Sanders et al	
	2	I	TThS	303MA	Ar	
	3	I	MWF	303MA	Ar	
	Lab. 1	III-IV	S	303MA	Ar	
	2	V-VI	T	303MA	Ar	
	3	VII-VIII	Th	303MA	Ar	
28s ¹	Principles of Accounting.					
	Lect.	IV	MTWS	Farm	Sanders and Noble	
	Lab.	V, VI	T	Farm	Ar	
	(5; soph., jr., sr.; no pre.)					
41s	Financial History of U. S.	I	MWF	209MA	Blakey	
	(3; jr., sr.; pre. 3-4 or 5, 6)					
*51f-52w-53s	Business Law	II	MWF	202MA	See Pol. Sci.	
*61s	Property Insurance	III	MWF	102MA	James	
	(3; jr., sr.; pre. 3-4)					
*89s	Sales Management	I	TThS	213MA	Sherman	
	(3; jr., sr.; pre. *85 and *86 or *88)					
*100f-101w-102s	Econ. Hist. of Europe, 1300-1750	II	TThS	218b Lib.	Gras	
*105s	Hist. of Econ. Ideas....	VII	MWF	102MA	Garver	
	(3; jr., sr., gr.; pre. *103-4)					
*109s	Econ. of Consumption...	IV	MWF	317Adm	Black	
	(3; jr., sr.; pre. 3-4 or 5, 6)			(Farm)		
*119f-120w-121s	Sem. in Agri. Econ.....			Farm	Black, Holmes	
*126f-127w-128s	Spec. Research Prob. in Agri. Econ.....			Farm	Black, Holmes	
*132w-133s	Industrial Accounting....	II	TThS	303MA	Noble	
*134f-135w-136s	Auditing	Ar	Ar	Ar	Ar	
*137f-138w-139s	Practice and Procedure...	II	MWF	102MA	Sanders	
*145s	International Exchange...	II	TThS	102MA	Dowrie	
	(3; jr., sr., gr.; pre. 143-144)					
*149s	Business Cycles	VIII	MWF	209MA	Ebersole	
	(3; jr., sr., gr.; pre. *143-4, *146)					
*150s	Farm Finance	II	MWF	4PP(F)	Dowrie	
	(3; jr., sr., gr.; pre. 3-4 or 5, 6)					
*154s	Public Utilities	II	TThS	202MA	Gray	
	(3; jr., sr., gr.; pre. *54)					
*160s	Economic Motives	VI	MWF	209MA	Dickinson	
	(3; jr., sr., gr.; pre. 3-4, Psychol. 1-2-3)					
*165s	Law of Labor.....				See Pol. Sci.	

No.	Title	Hour	Day	Building	Instructor
*169s	Labor and Socialist Movement in Europe..... (3; jr., sr., gr.; pre. *161)	IV	MWF	202MA	Hansen
*173s	Econ. of Transport. (3; jr., sr., gr.; pre. *54)	III	TThS	102MA	Gray
*193s	State and Local Taxation. (3; jr., sr., gr.; pre. *191-2)	III	MWF	213MA	Blakey
*195f-196w-197s	Sem. in Bus. Fin.	VII, VIII	T	Ar	Dowrie and Stehman
*210f-211w-212s	Sem. in Econ. Hist.	Ar	Ar	Ar	Gras

‡ No new registration except by petition.
§ Limited to one section of 35 students.
¶ Not open to pre-business students.
Note to pre-business students: All students who intend to take advanced work in Business Psychology should elect Psych. 8s.

EDUCATION

DEPARTMENT OF EDUCATIONAL ADMINISTRATION AND SUPERVISION

No.	Title	Hour	Day	Building	Instructor
3s	Social Aspects of Education	I III	MWF TThS	205Ed 205Ed	Rankin Finney
(3; jr., sr.; pre. 9 cr. in Psych. of which three may be in Educ. Psych.)	American School	VI VII	MWF MWF	Farm Farm	Swift Swift
(3; jr., sr.; pre. 9 cr. in Psych. of which three may be in Educ. Psych.)	High-School Curriculum ...	I	TThS	102Ed	Koos
(3; jr., sr.; pre. Psych. 1-2-3)	School Curricula for Teachers	I, II	S	113Ed	Rankin
119Tw-120Ts 121s	School Organ. & Admin.	VII	MWF	102Ed	Rankin
(3; sr., gr.; pre. 1 or 101-102 and 3)	Educational Adminis.	VIII	MWF	102Ed	Sies
125w-126s 142s	Industrial Education	VIII	MWF	205Ed	Rankin
(3; sr., gr.; pre. 1 or 101-2-3 and 3)	Theory of Supervision.....	III, IV	S	102Ed	Sies
161w-162s 164s	Problems of High-School Administration	II	TThS	102Ed	Koos
(3; sr., gr.; pre. 1 or 101-2-3 and 3)					

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

No.	Title	Hour	Day	Building	Instructor
55s	Elementary Educ. Psychol. .	I IV	MWF MWF	Psy Psy	Dealey Haggerty
(3; jr., sr.; pre. 6 cr. in Psych.)	Individual Differences	IV	MWF	Psy	Van Wagenen
(3; jr., sr., gr.; pre. 55 or equiv.)	Educational Diagnosis	II	MWF	Psy	Van Wagenen
(3; jr., sr., gr.; pre. 9 cr. in Psych. of which 3 may be in Educ. Psych.)	Review of Statistical Studies	VIII, IX	T	Psy	Van Wagenen
(2; jr., sr., gr.; pre. 126, 127)	Mental Tests and Mental Diagnosis	VI, VII	TTh	Psy	Haggerty, Dealey
(4; jr., sr., gr.; pre. 9 cr. in Psych. of which 3 may be in Educ. Psych.)	Experimental Education ..	Ar with instructor			Haggerty, Van Wagenen
138w-139s	Psycho-Educational Clinic...	Ar	MWF	Psy	Haggerty, Dealey
150w-151s 156s	Psychol. Prob. of Vocational Education	III, IV	S	Psy	Haggerty Dealey
(2; jr., sr., gr.; pre. 55 or equiv.)					

DEPARTMENT OF HISTORY AND PHILOSOPHY OF EDUCATION

No.	Title	Hour	Day	Building	Instructor
1s	Brief Course in the History of Education	II	MTWThF	205Ed	Alexander
(3; jr., sr.; pre. 9 cr. in Psych. of which 3 may be in Educ. Psych.)					

No.	Title	Hour	Day	Building	Instructor
103s	History of Modern Elem. Education	VIII, IX	TTh	205Ed	Swift
	(3; jr., sr., gr.; pre. 9 cr. in Psych. of which 3 may be in Educ. Psych. and 6 cr. in Hist.)				
129w-130s	Educational Classics	III	MWF	205Ed	Alexander
131w-132s	Comp. School Systems.....	III	TThS	Ar Ed	Alexander
148s	Hist. of Education in the United States	VI	MWF	205Ed	Alexander
	(3; jr., sr., gr.; pre. 9 cr. in Psych. of which 3 may be in Educ. Psych.)				

DEPARTMENT OF THEORY AND PRACTICE OF TEACHING

No.	Title	Hour	Day	Building	Instructor
11s	Technique of Teaching.....	IV	MWF	205Ed	Morehouse
	(3; jr., sr.; pre. 9 qu. cr. in Psych. of which 3 may be in Educ. Psych.)	I	TThS	205Ed	Miller
15s	Practice Teaching	Ar	Ar	Ar	Miller
	(5; sr., gr.; pre. See statement in Bulletin)				

NOTE: Courses in Education are starred for seniors who receive their degrees in June, 1920; not starred for other students in Science, Literature, and the Arts.

ENGLISH, RHETORIC, AND PUBLIC SPEAKING COURSES IN ENGLISH

No.	Title	Hour	Day	Building	Instructor
Af-Bw-Cs	Freshman English.....	Lec. II	M	Little Theater	
		Rec. I or	TWThS	Assigned on registration	
		Rec. II	TWThS	Assigned on registration	
		Rec. IV	T	Little Theater	
		Rec. III or	MWThF	Assigned on registration	
		Rec. IV	MWFS	Assigned on registration	
		Rec. VI	T	Little Theater	
		Rec. V or	MWThF	Assigned on registration	
		Rec. VI	MWThF	Assigned on registration	
Aw-Bs	Freshman English	Lect. V	W	Little Theater	
		Rec. Ar	MTThF		
1f-2w-3s	English Survey.....	IV	MWF	110F, 113F 204F, 205F	
		VII	MWF	204F, 205F 206F, 209F	
4s	Old English	V	TWThF	204F	Klaeber
	(4; jr., sr.; pre. 1-2-3)				
*53s	17th Cent. Lyrists.....	III	TWFS	204F	Northrop
	(4; jr., sr.; pre. 1-2-3)				
*54s	Amer. Lit.	II	TWFS	301F	Moore
	(4; jr., sr.; pre. 1-2-3)				
*58w-59s	19th Cent. Prose.....	VI	MWF	204F	Beach
*64s	Bacon	VI	MWThF	227F	Northrop
	(4; jr., sr.; pre. 1-2-3)				
*136s	Advanced Shakespeare... ..	II	TWFS	205F	Stoll
	(4; jr., sr., gr.; pre. 1-2-3, 8, and either a B in 8 or 4 add. cr. in courses below 10)				
*140s	Advanced Chaucer	III	TWFS	302F	Griffin
	(4; jr., sr., gr.; pre. 1-2-3, 6, and either a B in 6 or 4 add. cr. in courses below 10)				
*146w-147s	Metrical Romances	II	TThS	302F	Griffin

COURSES IN RHETORIC

No.	Title	Hour	Day	Building	Instructor
Af-Bw-Cs	Freshman English.....	Lec. II	M	Little Theater	
		Rec. I or	TWThS	Assigned on registration	
		Rec. II	TWThS	Assigned on registration	

No.	Title	Hour	Day	Building	Instructor
		Lec. IV	T	Little Theater	
		Rec. III or	MWThF	Assigned on registration	
		Rec. IV	MWFS	Assigned on registration	
		Lec. VI	T	Little Theater	
		Rec. V or	MWThF	Assigned on registration	
		Rec. VI	MWThF	Assigned on registration	
Aw-Bs	Freshman English	Lect. V	W	Little Theater	
		Rec. Ar	MTThF		
As	Freshman English	I	Ar	Ar	Ar
		II	Ar	Ar	Ar
	(5; all; no pre.)				
2s	Comp. and Rhet.	I	MWF	303F	Ar
2w-3s	Comp. and Rhet.	I	TThS	303F	Ar
3s†	Comp. and Rhet.	II	TThS	311½F	Ar
		III	TThS	301F	Ar
4s	Comp. for Tech. Students	III	MWF	306F	Ar
	(3; all; no pre.)				
4f-5w-6s	Comp. for Tech. Students	I	MWF	Assigned on registration	
11f-12w-13s	Exp., Descr., Narr.....	Sec. 1 I	MWF	311F	Hillhouse
		2 II	MWF	311½F	Whitney
		3 V	MWF	305F	Ruud
		4 II	TThS	303F	Buck
		5 III	TThS	306F	Phelan
		6 III	TThS	311½F	Jackson
15f-16w-17s	Exp. and Arg.	II	MWF	303F	Ford
*103f-104w-105s	Stud. in Struc. & Style..	VI	MWF	303F	Ford
*109w-110s	Short-story Writing	IV	MWF	304F	Thomas
*119f-120w-121s	Seminar in Writing.....	V, VI	T	302F	Thomas

† Same as 6s; the continuation of 1-2 taken during any two previous quarters.

COURSES IN PUBLIC SPEAKING

No.	Title	Hour	Day	Building	Instructor
41f-42w-43s	Public Speaking	Sec. 1 II	MWF	308F	Anthony
		2 III	MWF	311½F	Anthony
		3 VI	MWF	308F	MacNaughton
		4 I	TThS	308F	Anthony
		5 II	TThS	308F	Lindsay
		6 III	TThS	304F	Anthony
41s	Public Speaking	III	MTWThF	308F	Rarig
	(5; soph., jr., sr.; pre. Rhet. 1-2-3)				
*55f-56w-57s	Arg. and Debate.....	VI	MWF	207F	Lindsay
*81f-82w-83s	Int. Reading	IV	MWF	308F	Rarig
*85f-86w-87s	Advanced Pub. Speak....	VI	MWF	6F	Rarig
*91f-92w-93	Play Prod.	VII	MWF	306F	MacNaughton
*97w,s	Adv. Debate	Ar	Ar	308F	Rarig, Lindsay

ENTOMOLOGY AND ECONOMIC ZOOLOGY

No.	Title	Hour	Day	Building	Instructor
	(See also Animal Biology for other courses offered by this department)				
1s	Introductory Entomology	V, VI	MTWThF	208-210AB	Oestlund
	(5; fr., soph., jr., sr.; pre. An. Bi. 1-2)				
16s	Plant Pest Control	V, VI, VII	TTh	306Adm(F)	Ruggles
	(2; jr., sr.; pre. 1-2 or 3, Pl. Path.)				
*197s	Introduction to Research and other work prescribed by the Division	Ar	Ar	Ar	Entomology Staff

GEOLOGY AND MINERALOGY

No.	Title	Hour	Day	Building	Instructor
1s-2w†	General Geology	III	MTWThF	110P	Emmons
	(10; 3rd qu. fr., soph., jr., sr.; no pre.)				
1w-2s	General Geology	II	MTWThF	210P	Dunbar
7s	General Geol. Lab.....	Ar	Ar	Ar	Ar
	(2; 3rd qu. fr., soph., jr., sr.; sup. 1-2)				
*11f-12w-13s	Index fossils				
	Lect.	II	M	105P	Stauffer
	Lab.	VI, VII	WF	105P	Stauffer
15s	Minerals and Rocks.....	Ar	S	200P	Grout
	(1 or more; jr., sr.; pre. 1 or 29)				
23f-24w-25s	Elem. of Mineralogy.....				
	Lect.	II	MWF	110P	Broderick
	Lab. 1	VI, VII	F	100P	Broderick
			S		
		2	MW	100P	Broderick
27s	Outlines of Mineralogy..	Ar	S	100P	Broderick
	(1; jr., sr.; no pre.)				
*36s	Geog. of North America.	I	MWF	200aP	Posey
	(3; jr., sr., gr.; 9 cr. from 1 or 29, 30, 34, 37, 5.)				
37s	Econ. and Com. Geog....	III	MTWThF	210P	Posey
	(5; 3rd qu. fr., soph., jr.; no pre.)				
*57f-58w-59s	Paleontology	II, III	TThS	105P	Stauffer
*107f-108w-109s	Paleontologic Practice....	VI, VII	MWF	104P	Stauffer
*113s	Prob. in Ore Deposits....	V-VIII	M	104P	Emmons
	(3; sr., gr.; pre. 112)				
*119s	Geography of Asia.....	I	TThS	200aP	Posey
	(3; jr., sr., gr.; same as *36)				
*124w-125s	Struct. and Met. Geol....	III	TThS	200aP	Schwartz
*131f-132w-133s	Adv. Petrology	Ar	Ar	200P	Grout
*140w-141s	Applied Petrography.....	Ar	Ar	200P	Grout
*144w-145s	Const. and Inter. of Geol.				
	Maps	V-VII	TTh	104P	Schwartz
*150s	Field Geol. (Black Hills)				
	(10; jr., sr., gr.; see Dept.)				
*151f-152w-153s	Adv. General Geol.....	IV	MWF	104P	Stauffer
*166w-167s	Minerallography	V-VII	TTh	103P	Broderick

GERMAN

No.	Title	Hour	Day	Building	Instructor
1s	Beginning	II	MTWThF	207F	Myers
		IV	MTWFS	209F	Kroesch
		V	MTWThF	209F	Ar
	(5; all; no pre.)				
2s	Beginning, Intermediate..	I	MTWThF	209½F	Jente
		V	MTWThF	207F	Schwarz
	(5; all; pre. 1 or 1 yr. prep. Ger.)				
3s	Beginning Advanced	II	MTWThF	212F	Kuhlman
		IV	MTWFS	207F	Downs
		VI	MTWThF	209F	Strand
	(5; all; pre. 2)				
4f-5w-6s†	Beginning Chemists	III	MWF	212F	Ar
		III	TThS	209F	Schlenker
10s	Rapid Reading	I	MTWThF	209F	Kuhlman
	(5; all; Pre. 3)				
11s	Adv. Rapid Reading	II	MTWThF	209F	Jente
	(5; all; pre., 10)				
12s	Narrative Prose	II	MTWThF	209½F	Davies
	(5; all; pre., 2 yrs prep. Ger.)				
14s	Prose and Poetry	III	MTWThF	213F	Hendrickson
	(5; all; pre., 13 or 4 yrs prep. Ger.)				

No.	Title	Hour	Day	Building	Instructor
25s-26f†	Elementary Scientific ... (3; Chem.; pre. 7)	III	TThS	212F	Davies
25w-26s†	Elementary Scientific ...	III	TThS	207F	Downs
28w-29s†	Adv. Chemical German...	III	MWF	209F	Schlenker
31s-32f†	Medical German (3; premed.; pre., 10, 12, or 15)	II	MWF	114F	Burkhard
31w-32s†	Medical German I	I	MWF	207F	Downs
41s	Commercial German (3; all; pre., 40, 11, or 14)	III	TThS	207F	Downs
			MWF	102F	Jente
*50f-51w-52s†	Composition	III	M	207F	Davies
*53f-54w-55s†	Conversation	III	WF	207F	Myers
*56f-57w-58s†	Essay Writing	IV	TS	209½F	Myers
*64s	Classic Drama	IV	MWF	209½F	Davies
*65s	Survey	III	TThS	209½F	Burkhard
	(3; jr., sr.; pre. 6 starred cr.)				
*73s	Drama since 1880	IV	MWF	107F	Schlenker
	(3; jr., sr.; pre. 72 or 9 starred cr.)				
*100w-101w-102s†	Middle High German ..	Ar	Ar	Ar	Kroesch
103s	Phonetics	Ar	Ar	Ar	Kroesch
	(3; sr., gr.; pre. 9 starred cr. in mod. lang.)				
*126f-127w-128s†	Grillparzer	Ar	Ar	Ar	Myers
*150f-151w-152s†	Novelle	VI-VIII	T	208F	Burkhard
*225f-226w-227s†	Literary Problems	VI-VIII	W	208F	Schlenker

GREEK

No.	Title	Hour	Day	Building	Instructor
1f-2w-3s†	First Year Greek.....	IV	MTWFS	114F	Savage
4f-5w-6s	Epic Poetry	III	MTThFS	114F	Savage
*53s	Dramatic Poetry	Ar	Ar	112F	Savage
	(3; jr., sr.; prereq.; 51 or 52)				
*103s	Advanced Epic	Ar	Ar	112F	Savage
	(3; sr., grad.; pre. 101 or 102)				
	<i>Courses open to all. No knowledge of Greek required</i>				
60s	Sculpture	VI	TTh	114F	Savage
	(2; jr., sr.; no pre.)				
62s	Literature, Life	I	WF	114F	Savage
	(2, jr., sr.; no pre.)				

HISTORY

No.	Title	Hour	Day	Building	Instructor
1w-2s	Modern World, 1648-1918	III	MTWThF	Lit. Th.	Tyler
3s-4f	Eng., 1066 to Present.... (5; all; no pre.)	II	MTWThF	Law Aud.	White, Notestein
5s-6f	American History..... (5; 3rd qu. fr., soph., jr., sr.; pre. 10 cr.)	III	MWThFS	301F	Shippee
7w-8s	England, 1815-1919	IV	MTWFS	112 Lib	Notestein
11f-12w-13s	Medieval History (Music Students only)	III	MWF	112 Lib	Mrs. Tyler
61s	Recent American History (5; jr., sr.; pre. 15 cr., incl. 5-6)	I	MWThFS	111 Lib	Shippee
*105s	Roman History	III	MTWThF	111 Lib	Davis
	(5; jr., sr.; pre. 15 cr.)				
*112s	Hist. of Am. Immigration (5; jr., sr., gr.; pre. 15 cr.)	V	MTWThF	113 Fol	Stephenson
*115f-6w-7s	Economic History of Eu- rope, 1300-1750	II	TThS	218b Lib	Gras
*121w-122s	English Backgrounds and American Colonies	VII	MWF	112 Lib	White
*133f-4w-5s	Ancient Civilization	VII	MWF	111 Lib	Davis

No.	Title	Hour	Day	Building	Instructor
*153s	West in American Politics since 1865	VI, VII	MW	218a Lib	Buck
	(5; sr., gr.; 20 cr., incl. 5-6)				
*157w-158s	Selected Topics, 19th Century Europe	VII, VIII	TTh	218b Lib	Tyler
*162f-3w-4s	Selected Topics Medieval History	VII	TTh	218a Lib	White
*183s	Stuart Period	VII, VIII	MW	218b Lib	Notestein
	(5; sr., gr.; 20 cr. incl. 3-4)				

HOME ECONOMICS

(For credits, prerequisites, etc., see the bulletin of the College of Agriculture, Forestry, and Home Economics, Announcement of Courses in Home Economics.)

No.	Title	Hour	Day	Building	Instructor
4f,w,s	Textiles	V, VI	MWF	307HE 211HE	Phelps Weller
11f,w,s	Garment Making				
	Sec. 1	V, VI, VII	TTh	112,203HE	McDowell
	Sec. 2	V, VI	MWF	304HE	McDowell
13f,w,s	Dressmaking	III, IV	MTWFS	305HE	Patchin McDowell
17f,w,s	Adv. Clothing Construct.....	V, VI, VII	TTh	305HE	Weller, Brown
20f,w,s	Foods and Cookery.....	V, VI	MWF	203,209HE	Stinson
21f,w,s	Foods and Cookery.....	V, VI	MTWThF	207,309HE	Stinson, Child
		III, IV	MTWFS	203HE	Stinson, Child
22f,w,s	Food Economics	I, II	TWThFS	203-205,207HE	Stinson
23f,w,s	Nutrition I	I, II	MTWThF	211,313HE	Mumford
34f,w,s,su	Home Management: Operation and Maintenance, Lectures.	VII	MWF	213HE	Lindquist
51f,w,s	Drawing and Design.....				
	Sec. 1	V, VI, VII	TTh	400HE	V. Goldstein Bacon
52f,w,s	Art History and Appreciation.	II	MWF	400HE	H. Goldstein
53f,w,s	Advanced Design	III, IV	MTWF	400HE	H. Goldstein
71s	Elem. Dietetics for Social Workers	V-VII	MWF	103,106HE	Lindquist
103f,w,s	Dietetics	I, II	MTWThF	209,213HE	Biester
122s	Advanced Textiles	V-VII	TTh	211,307HE	Weller
123f,w,s	Clothing Economics	III	MWF	309HE	Weller
131f,w,s	Home Management: House Planning and Equipment...	401HE	Morse	V, VI	MTWThF

HUMAN ANATOMY

Students in this College may elect courses in Human Anatomy (see Medical School program) only by arrangement with the Head of the Department of Anatomy.

HUMAN PHYSIOLOGY

No.	Title	Hour	Day	Building	Instructor
4s	Human Physiology	V	MTF	214M	Scott, et al.
		V, VI	Th	201M	
		VI-VIII	T or F		
	(3; all; elem. An. Bi. and Chem.)				
6s	Physiological Chemistry	VI, VII	M	214M	Pettibone, et al.
		V-VII	W		
	(3; all; Organ. Chem.)				

JOURNALISM

No.	Title	Hour	Day	Building	Instructor
13f-14w-15s	Reporting	I	MWF	321F	Radder
18s	Magazine and Special Feature Writing	II	MWF	12F	Radder
	(3; jr., sr., gr.; pre. 13-14-15)				

LATIN

No.	Title	Hour	Day	Building	Instructor
1s-25u	Beginning Latin	II	MTWThF	109F	Ar
	(5; all; no pre.)				
1w-2s†‡	Intermediate Latin	VI	MTWThF	109F	Cram
3s	Caesar	IV	MTWFS	109F	Cram
	(5; all; pre. 1 and 2)				
13s§	Selections	III	MTWThF	109F	Cram
	(5; all; pre. 11 or 12)				
23s¶	Horace	III	MWF	107F	Pike
	(3; all; pre. 4 yrs. Lat., or any two of 11, 12, and 13)				
*53s	Suetonius	I	MWF	107F	Pike
	(3; soph., jr., sr.; pre. any one of 21, 22, 23, or an equiv.)				
*133s	Vulgar Latin	II	MWF	107F	Pike
	(3; jr., sr., gr.; any two of 51, 52, 53, or an equiv.)				
*201f-202w-203s	Annals of Tacitus.....	VI, VII	Th	108F	Pike

† Students entering third quarter with one year of Latin may select this course.

‡ Students entering third quarter with two or three years of Latin may select this course.

¶ Students entering third quarter with four years of Latin may select this course.

MATHEMATICS

The Junior College courses in Mathematics may be combined into sequences of consecutive courses as follows:

1-2. To make a three-quarter sequence add 6.

1-6. To make a three-quarter sequence add 2.

2-6. To make a three-quarter sequence add 30, 20, or 16.

6-2. To make a three-quarter sequence add 30, 20, or 16.

No.	Title	Hour	Day	Building	Instructor
1s	Higher Algebra	IV	MTWFS	104F	
	(5; all; pre. 1 yr. elem. alg.)	VI	MTWThF	104F	
2s	College Algebra	II	MTWThF	102F	
	(5; all; pre. 1 or prep. high. alg.)	IV	MTWFS	105F	
6s	Trigonometry	II	MTWThF	104F	
	(5; all; pre. 1 or prep. high. alg.)	III	MTWThF	104F	
		VI	MTWThF	105F	
		VII	MTWThF	105F	
16s	Solid Geometry	VII	MTWThF	125F	Mathews
	(5; all; pre. 2 and 6)				
20s	Mathematics of Investment	I	MTWThF	105F	Hart
	(5; all; pre. 2 and 6)				
30s	Analytic Geometry	II	TWThFS	101F	Underhill
	(5; all; pre. 2 and 6)				
*50s	Calculus I	I	MTWThF	101F	Barton
	(5; jr., sr.; pre. 30)				
*51s	Calculus II	III	TWThFS	101F	Underhill
	(5; jr., sr.; pre. 50)				
*52s	Calculus III	III	MTWThF	105F	Hart
	(5; jr., sr.; pre. 51)				
*54s	Teachers' Course	VIII	MTWThF	113Ed	Reeve
	(5; jr., sr.; pre. 50)				
*62w-63s	Theory of Equations.....	VI	MWF	102F	Bussey
*700s	Adv. Analytic Geometry.	II	MTWThF	125F	Mathews
	(5; jr., sr.; pre. 50)				

No.	Title	Hour	Day	Building	Instructor
*106f-107w-108s	Adv. Calculus and Differential Equations	I	MWF	102F	Jackson
*130f-131w-132s	Functions of a Real Variable	III	TThS	102F	Jackson
*197f-198w-199s	Exterior Ballistics	V	MWF	125F	Hart

METALLURGY

No.	Title	Hour	Day	Building	Instructor
4w-5s	Metallurgy of Pig Iron..	I	TThS	108M	Christianson
*106w-107s	Mety. of Precious Metals	II	WThFS	108M	Pease
*154w-155s	Metallography	Ar	Ar	305M	Harder

MILITARY SCIENCE AND TACTICS

No.	Title	Hour	Day	Building	Instructor
1f-2w-3s and 4f-5w-6s	Military Drill				
	Sec. 1	II	MW		
		VIII	F		
	Sec. 2	IV	MW		
		VIII	Th		
	Sec. 3	V	TTh		
		VIII	F		
	Sec. 4	VI	MW		
		VIII	Th		
	Sec. 5	VII	MW		
		VIII	F		
7f-8w-9s	Military Drill and Science	Ar	Ar	A	Colonel Goodwin
10f-11w-12s	Adv. Mil. Drill & Science	Ar	Ar	A	Colonel Goodwin

MUSIC

No.	Title	Hour	Day	Building	Instructor
1f-2w-3s	Harmony	II	MWF	Mu	Ar
1w-2s-3su	Harmony	V	MWF	Mu	Ar
4f-5w-6s	Counterpoint	III	TTh	Mu	Ar
7f-8w-9s	Ear Training	V	T	Mu	Ar
10f-11w-12s	Composition	Ar	Ar	Mu	Ar
*11f-12w-13s	Analysis	IV	W	Mu	Ar
14f-15w-16s	History of Music.....	II	MWF	Mu	Ar
17f-18w-19s	Appreciation of Music.....	V	M	Mu	Ar
*20f-21w-22s	Bach and Beethoven.....	V, VI	T	Mu	Ar
25f-26w-27s	Ensemble	Ar	Ar	Mu	Ar
28f-29w-30s	First-Year Organ	Ar	Ar	Mu	Ar
31f-32w-33s	Second-Year Organ	Ar	Ar	Mu	Ar
34f-35w-36s	Third-Year Organ	Ar	Ar	Mu	Ar
37f-38w-39s	Fourth-Year Organ	Ar	Ar	Mu	Ar
39f-40w-41s	First-Year Piano	Ar	Ar	Mu	Ar
42f-43w-44s	Second-Year Piano	Ar	Ar	Mu	Ar
45f-46w-47s	Third-Year Piano	Ar	Ar	Mu	Ar
48f-49w-50s	Fourth-Year Piano	Ar	Ar	Mu	Ar
51f-52w-53s	First-Year Violin	Ar	Ar	Mu	Ar
54f-55w-56s	Second-Year Violin	Ar	Ar	Mu	Ar
57f-58w-59s	Third-Year Violin	Ar	Ar	Mu	Ar
60f-61w-62s	Fourth-Year Violin	Ar	Ar	Mu	Ar
63f-64w-65s	First-Year Vocal Training...	Ar	Ar	Mu	Ar
66f-67w-68s	Second-Year Vocal Training...	Ar	Ar	Mu	Ar
69f-70w-71s	Third-Year Vocal Training...	Ar	Ar	Mu	Ar
72f-73w-74s	Fourth-Year Vocal Training...	Ar	Ar	Mu	Ar
75f-76w-77s	Public School Music.....	VII, VIII	WF	Ed	Ar
*78f-79w-80s	Adv. Public School Music...	Ar	Ar	Ed	Ar

No.	Title	Hour	Day	Building	Instructor
81f-82w-83s	Normal Piano	VI	MWF	Mu	Ar
*84f-85w-86s	Adv. Normal Piano.....	VII	MWF	Mu	Ar
91f-92w-93s	Orchestra	7:30	W	Armory	Ar
94f-95w-96s	Other Orchestral Inst.....	Ar	Ar	Mu	Ar
97f-98w-99s	University Choir	VIII	M	Mu	Ar

PHILOSOPHY

No.	Title	Hour	Day	Building	Instructor
2s	Logic	III	M-F	322F	Lodge
	(5; 3rd qu. fr., soph., jr., sr.; no pre.)				
10s	Science and Religion.....	IV	TS	301F	Swenson
	(2; soph., jr., sr.; pre. 10 cr. in Phil., Psy., or An. Biol.)				
*20w-21s	Present Day Philosophy..	I	MWF	322F	Wilde
*55s	Esthetics	IV	MWF	321F	Swenson
	(3; jr., sr.; pre. 10 cr.)				
*100w-101s	Phil. of Religion.....	II	TThS	322F	Swenson
*108w-109s	History of Ethics.....	II	MWF	316F	Lodge
*113f-114w-115s	History of Phil.	IV	MWF	322F	Wilde
*124w-125s	Political and Social Ethics	I	TThS	322F	Wilde

PHYSICAL EDUCATION

FOR MEN

No.	Title	Hour	Day	Building	Instructor
1s	Personal Hygiene	Ar	Ar	A	Cooke-Brown
2s	Gymnastics and Games.....	II	W-F	A	Roemer-Glidden
	Swimming	III	W-F	A	Roemer-Glidden
	Elementary	III	T-Th	A	Roemer-Glidden
		IV	W-F	A	Roemer-Glidden
		V	M-W	A	Roemer-Glidden
		VI	M-F	A	Roemer-Glidden
3s	Boxing	VII	M-F	A	Goldie
		VIII	M-F	A	Goldie
4s	Wrestling	VII	T-Th	A	Gilman
		VIII	T-Th	A	Gilman
5s	Advanced Gym.	VII	T-Th	A	Foster-Roemer
6s	Corrective Gym.	Ar	Ar	A	Brown
7s	Intramural Athletics	Ar	Ar	A	Foster
8s	Swimming, Intermediate	M-T-S	Ar	A	Buswell
9s	Swimming, Advanced	Ar	Ar	A	Buswell

NOTE: 3s-4s-5s-8s and 9s, open to students having finished prerequisites, or by permission of department.

PHYSICAL EDUCATION

FOR WOMEN

No.	Title	Hour	Day	Building	Instructor
*1f-2w-3s	Elem. Phys. Training.....	IV	MWF	3, 151, 153WGM	Ar
		VI	MWF	3, 151, 153WGM	Ar
		VII	MWF	3, 151, 153WGM	Ar
		III	TThS	3, 151, 153WGM	Ar
*4f-5w-6s†	Intermed. Phys. Training..	VI	TTh	153WGM	Kissock
	One other hr. to be ar.				
*7f-8w-9s†	Adv. Phys. Training.....	VII	Th	153WGM	Schill
	One other hr. to be ar.				
22f-23w-24s	Soph. Rhythmic Expr.....	IV	TS	151WGM	Ladd
		VII	TTh	151WGM	Ladd
		VIII	TTh	151WGM	Ladd
39s	Soph. Organized Games....	II	TTh	151WGM	Barr
40f,w,s	Soph. Major Sports.....	VIII	MW	151WGM	Kissock

No.	Title	Hour	Day	Building	Instructor	
43f,w,s	Soph. Elem. Swimming....	IV	MW	51WGM	Baker	
		IV	TS	51WGM	Baker	
		VI	MW	51WGM	Baker	
		VI	TTh	51WGM	Baker	
44f,w,s	Soph. Adv. Swimming.....	VIII	MW	51WGM	Baker	
		VIII	TTh	51WGM	Baker	
45f,w,s	General Swimming	VII	MW	51WGM	Baker	
		VII	TTh	51WGM	Baker	
52f-53w	General Swimming without Instruction	VIII	F	51WGM		
		Soph. Phys. Train. (including orthopedic section)...	III	WF	3, 153WGM	Schill, Barr
			IV	TS	3, 153WGM	Schill, Barr
			V	TTh	3, 153WGM	Schill, Barr
18s	Teacher's Course in Play.. (3; sr.; pre. 4-5-6, 31-32-33, 34-35-36)	Lect.	III	MWF	201WGM	Kissock
		Lab.	V	MWF	151WGM	
19f-20w-21s	Rhythmic Expression	VIII	MW	153WGM	Ladd	
31f-32w-33s	Folk Danc. & Organ. Games	V	TTh	151WGM		
34f-35w-36s	Hockey, Basketball and Baseball	VIII	TTh	151WGM	Kissock	

*3s, open to students who have not taken 1f-2w.

6s, open to students who have not taken 4f-5w.

9s, open to students who have not taken 7f-8w.

Any course in exercise may be entered any quarter by obtaining permission of Department.

PHYSICS

Introductory Courses

No.	Title	Hour	Day	Building	Instructor	
218§	Elements of Mechanics & Sound (3; all; pre. trig.)	Lect.	VII	W	30Ph	Erikson
		Rec.	I	TThS	30Ph	Erikson
225§	Elements of Mechanics & Sound (1; all; pre. 21 or reg. in 21)	Lab.	V, VI	Th	23Ph	Erikson & Assts.
		Lab.	VI, VII	Th	23Ph	Erikson & Assts.
		Lab.	VII, VIII	F	23Ph	Erikson & Assts.
		Lab.	III, IV	S	23Ph	Erikson & Assts.
41§	Heat					
		(3; all; pre. 21)				
		Lect.	V or VII	Th	30Ph	Miller
42§	Heat Laboratory	Rec.	III	MWF	17Ph	Miller
61§	Magnetism and Electricity..... (3; all; pre. 21)	Sec. 1	Ar	Th	23Ph	Miller & Assists
		Lect.	VII	M	30Ph	Zeleny
		Sec. 1 Rec.	I	TThS	17Ph	Zeleny
		Sec. 2 Rec.	II	TThS	17Ph	Zeleny
		Sec. 3 Rec.	III	TThS	17Ph	Downey
62§	Electrical Laboratory					
		(1; all; pre. 61 or reg. in 61)				
		Sec. 1	V, VI	Th	31Ph	Zeleny & Assists
		Sec. 2	VII, VIII	Th	31Ph	Zeleny & Assists
		Sec. 3	I, II	F	31Ph	Zeleny & Assists
		Sec. 4	V, VI	F	31Ph	Zeleny & Assists
		Sec. 5	VII, VIII	F	31Ph	Zeleny & Assists
Sec. 6	I, II	S	31Ph	Zeleny & Assists		

No.	Title	Hour	Day	Building	Instructor
69st	Magnetism and Electricity..... (3; all; pre. 25)				
	Lect.	V	M	30Ph	Zeleny
	Rec.	I	TThS	3F	Mackell
	Rec.	I	TThS	114F	Johnson
	Rec.	VI	MWF	17Ph	Downey

Intermediate Courses

*171f-173w-174s	Radioactivity	I	TThS	15Ph	
*181f-183w-185s	Theoretical Physics	II	TThS	16Ph	Tate
*182f-184w-186s	Experimental Physics...	Ar	Ar	2Ph	Tate
*191f-193w-195s	Elem. of Math. Physics.	Ar	Ar	18Ph	Tate
*192f-194w-196s	Elemty. Phys. Investgtn.	Ar	Ar	2Ph	

¶ Pre-Medical section.

‡ For Pre-Dental only.

§ Offered also in Summer Session.

POLITICAL SCIENCE

No.	Title	Hour	Day	Building	Instructor
18‡	American Government.....	I	MTWThF	109MA	
		II	MTWThF	CBChap	
		III	MTWThF	202MA	
		IV	MTWFS	109MA	
		VI	MTWThF	301F	
	(5; soph., jr., sr.; no pre.)				
38‡	Comparative European Govt.	II	MTWThF	209MA	Wright
	(5; soph., jr., sr.; no pre.)				
78	State and Local Government	II	MTWThF	109MA	Cushman
	(5; soph., jr., sr.; pre. 1)	VI	MTWThF	109MA	Lobb
*51f-52w-53s	Business Law	II	MWF	202MA	Young
*127s	American Foreign Relations	III	MTWF	218b Lib	Wright
	(4; jr., sr., gr.; pre. 121-2 or 125)				
*135s	Contemp. Political Problems	VI	MWF	102MA	Young
	(3; jr., sr., gr.; pre. 10 cr.)				
*155w-156s	Comparative Adm. Law....	IV	TS	213MA	Young
*175s	Law of Labor.....	V	MWThF	102MA	Cushman
	(4; jr., sr., gr.; pre. 151-2, or 157, or Ec. 161, or 13 cr. in Ec.)				

† Open also to freshmen with ten credits in history.

PSYCHOLOGY

No.	Title	Hour	Day	Building	Instructor
1f-2w-3s‡	General Psychology				
	Lect.	I or VII	M	Lit. Th.	Elliott, Foster
	Sec. 1 Rec.	II	W	115Psy	
	Lab.	I, II	F	211Psy	
	2 Rec.	III	W	115Psy	
	Lab.	III, IV	F	211Psy	
	3 Rec.	VI	W	115Psy	
	Lab.	V, VI	F	211Psy	
	4 Rec.	III	T	115Psy	
	Lab.	III, IV	S	211Psy	
	5 Rec.	VI	T	115Psy	
	Lab.	V, VI	Th	211Psy	
	6 Rec.	II	Th	115Psy	
	Lab.	I, II	T	211Psy	
	7 Rec.	III	T	115Psy	
	Lab.	III, IV	Th	211Psy	
	8 Rec.	II	T	115Psy	
	Lab.	I, II	Th	211Psy	
	9 Rec.	I	Th	115Psy	
	Lab.	I, II	S	211Psy	

No.	Title	Hour	Day	Building	Instructor
6s	General Psychology for Music Students.....	Ar	Ar	115Psy	Woodrow
	(5; mus. stud.; no pre.)				
8s§	Application of Psych. to Business	V	MWF	Psy. Amph.	Morgan
	(3; pre-bus. or bus. only; pre. 1-2)				
*103s	Quantitative Psychology..	V	T	116Psy	Woodrow
	(3; jr., sr., gr.; pre. 101-2)	VI, VII	Th		
*108w-109s†	Adv. General Psych.....	II	MWF	109Psy	Foster
*114w-115s†	Human Behavior	II	TThS	109Psy	Elliott
*127s	Social Psychology	III	MWF	109Psy	Fernald
	(3; jr., sr., gr.; pre. 1-2-3)				
*131f-132w-133s	Child Mind	4:30 to 5:45	Th	115Psy	Lowell
		10:30 to 11:45	S	109Psy	
*144w-145s	Abnormal Psych.	IV	MWF	115Psy	Morgan
*200f-201w-202s	Seminar	4:00 to 6:00	W	302Psy	Foster

† 3s required for all intending to continue Psychology next year, except Business students, who should substitute 8s.

§ 8s prerequisite for advanced work in Business Psychology.

ROMANCE LANGUAGES

FRENCH

No.	Title	Hour	Day	Building	Instructor
1f-2w-3s††	Beginning French	V	MWF	213F	
4w-5s†	Beginning French	I	MTWThF	212F	
		IV	MTWFS	213F	
		V	MTWThF	101F	
4s-5f†	Beginning French	I	MTWThF	213F	
	(10; all; no pre.)	V	MTWThF	212F	
7w-8s	Intermediate French.....	II	MTWThF	202F	
		IV	MTWFS	101F	
7s-8f	Intermediate French	I	MTWThF	301F	
		II	MTWThF	213F	
		III	MTWThF	226F	
		IV	MTWFS	201F	
		V	MTWThF	202F	
	(5; all; pre. 4-5, or 2 yrs. h. s. Fr.)				
10s-11f†	French Survey	I	MTWThF	202F	
		II	MTWThF	226F	
		III	MTWThF	110F	
	(10; all; pre. 7-8, or 3 yrs. h. s. Fr.)				
13f-14w-15s†	French Survey	I	MWF	43CB	Sirich
		II	TThS	107F	Van Roosbroeck
		III	TThS	201F	Phelps
		VI	MWF	226F	Searles
16f-17w-18s†	Elem. Fr. Conversation..	I	TTh	107F	
		II	MW	25F	Guinotte
		III	MW	201F	Guinotte
19f-20w-21s†	Elem. Fr. Composition...	I	S	102F	
		II	F	25F	Guinotte
		III	F	201F	Frelin
22f-23w-24s§	Scientific Fr. Reading...	I	MWF	40CB	
*84f-85w-86s†	Adv. Fr. Conversation...	V	MW	109F	Frelin
*87f-88w-89s†	Adv. Fr. Composition....	V	F	109F	Frelin
90s	Teachers' Course	VI	MWF	213F	de Boer
	(3; jr., sr.; see bulletin)				
*97f-98w-99s†	19th Century Fr. Lit....	IV	MWF	202F	Barton, Delson
*100f-101w-102s†	17th Century Fr. Lit....	III	MWF	202F	Olmsted
*103f-104w-105s†	18th Century Fr. Lit....	III	TThS	107F	Searles
*106f-107w-108s†	16th Century Fr. Lit....	VI	MWF	203F	Sirich
*109f-110w-111s†	Fr. Dramatic Lit.....	III	TTh	203F	Olmsted
*118f-119w-120s†	Realistic Novel	IV	T	203F	LeCompte
			F		
			12:30		

No.	Title	Hour	Day	Building	Instructor
*121-122w-123s†	Fr. Lectures	} VII VIII	Th	201F	Ar
			M		
*131f-132w-133s†	Fr. Oral Diction.....	V	MW	203F	Delson
*134f-135w-136s†	Fr. Syntax	V	F	203F	Barton

† Architects only.

§ Pre-medical students only.

SPANISH

No.	Title	Hour	Day	Building	Instructor
31w-32s†	Beginning Spanish	I	MTWThF	201F	
31s-32f†	Beginning Spanish	I	MTWThF	204F	
	(10; all; no pre.)	III	MTWThF	205F	
33s-34f	Intermediate Spanish....	I	MTWThF	227F	
		II	MTWThF	201F	
		III	MTWThF	227F	
		IV	MTWFS	226F	
	(5; all; 31-32, or 2 yrs. h. s. Spanish)	V	MTWThF	227F	
35s-36f†	Spanish Survey	II	MTWThF	113F	Drake
	(10; all; 33-34, or 3 yrs. h. s. Spanish)				
37f-38w-39s†	Spanish Survey	II	TThS	38CB	House
40f-41w-42s†	Elem. Span. Conversation	II	MW	38CB	Heras
43f-44w-45s†	Elem. Span. Composition.	II	F	38CB	Heras
*46f-47w-48s†	Adv. Span. Composition.	III	TTh	202F	Vasconcelos
*49f-50w-51s†	Adv. Span. Composition.	III	S	202F	Vasconcelos
*152f-158w-159s†	Spanish Novel	IV	MF	227F	Heras
*160f-161w-162s†	Selected Classics	IV	TS	227F	House
*163f-164w-165s†	Spanish Lectures	VIII	TTh	202F	Heras
*169f-170w-171s†	Spanish Syntax	IV	W	203F	House

ITALIAN

No.	Title	Hour	Day	Building	Instructor
64s-65f	Italian Survey	I	MTWThF	38CB	Phelps
*181f-182w-183s†	Dante, Petrarch, Boccaccio	IV	MW	212F	Phelps
*184f-185w-186s†	Dante (in English).....	IV	F	212F	Phelps

SCANDINAVIAN

No.	Title	Hour	Day	Building	Instructor
3s	Intermediate Norwegian.	I	TWThFS	206F	Bothne
	(5; all; no pre.)				
9s	Intermediate Swedish ...	II	MTWThF	206F	Stomberg
	(5; all; no pre.)				
12s	Ancient and Medieval Scand. Lit.	I	MWThFS	110F	Stomberg
	(5; soph., jr., sr.; no pre.)				
*101f-102w-103s	Modern Norwegian Lit....	II	TThS	114F	Bothne
*107f-108w-109s	Modern Swedish Lit....	V	MWF	206F	Stomberg
*111f-112w-113s	Old Norse (Icelandic)...	Ar	Ar	217F	Bothne
*116s	Teachers' Course in Nor.	Ar	Ar	217F	Bothne
	(3; sr., gr.; pre. 4-5 or 10-11-12)				
*117w-118s	Early Norwegian Lit....	Ar	Ar	217F	Bothne

SHOP PRACTICE

No.	Title	Hour	Day	Building	Instructor
Shop Practice		VI-VIII	M	MechE	Shipley
		V-VIII	T		
		III-IV	Th		

(cr. ar.; pre-dent. only; no pre.)

SOCIOLOGY AND SOCIAL WORK

No.	Title	Hour	Day	Building	Instructor
15	Introduction to Sociology	I	MTWThF	9F	Bernard
		II	MTWThF	15F	Lundquist
		IV	MTWFS	5F	Finney
		VI	MTWThF	9F	Lively
		IV‡	MWF	105Eng(Farm)	Lundquist
(5; 3rd qu. fr.; soph., jr., sr.; no pre.)					
35	Social Aspects of Educ..	III	TThS	205Ed	Finney
	(3; jr., sr.; pre. 1)				
65	Modern Social Reform				
	Movements	I	MWF	5F	Elmer
	(3; soph., jr., sr.; pre. 1)	III	MWF	5F	Finney
*53s	Treatment of Delinquents	II	MWF	9F	Elmer
	(3; jr., sr., gr.; pre. 1; Psy. 1-2-3 recommended)				
*54s	Child Welfare	IV	TS&Ar	15F	Taylor
	(3; jr., sr.; pre. 51 or 52)				
*99s	Supervised Field Practice				
	Work	Ar	Ar	Ar	Bedford
	(3; jr., sr., gr.; pre., consent of director.)				
*114s	Rural Social Institutions.	I	TThS	Fa1m	Lundquist
	(3; jr., sr., gr.; pre. 2 courses)				
*120s	Social Progress	II	MWF	5F	Bernard
	(3; jr., sr., gr.; pre. 3 courses, one of which may be in anthrop., econ., pol. sci., educ., philos., or psych.)				
*123s	Social Statistics	VII	MWF	9F	Elmer
	(3; jr., sr., gr.; pre. 122)				
*128s	Charitable Adm., Finance, and Publicity	VII, VIII	Th	12F	Davis
	(2; jr., sr., gr.; pre. 3 courses)				
*130s	Tech. of Family Treat..	VII, VIII	T	12F	Bruno
	(2; jr., sr., gr.; pre. 51, 52)				
*132s	Juvenile Courts & Proba.	I	TTh&Ar	12F	Waite, Bruno
	(2; jr., sr., gr.; pre. 51, 52, 53)				
*133f-134w-135s	Hospital Social Service..	Ar	Ar	Ar	Tebbets
*140s	History of Social Thought	II	TThS	12F	Bernard
	(3; jr., sr., gr.; pre. same as for 120)				

‡ Three credits.

The Bulletin
of the University of
Minnesota

The College of Engineering and
Architecture
Announcement for the Year
1919-1920



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1919							1920													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	1	2	3	4	5	..	..	..	..	1	2	3	..	..	..	..	1	2	3
6	7	8	9	10	11	12	4	5	6	7	8	9	10	4	5	6	7	8	9	10
13	14	15	16	17	18	19	11	12	13	14	15	16	17	11	12	13	14	15	16	17
20	21	22	23	24	25	26	18	19	20	21	22	23	24	18	19	20	21	22	23	24
27	28	29	30	31	..	..	25	26	27	28	29	30	31	25	26	27	28	29	30	31
..
AUGUST							FEBRUARY							AUGUST						
..	..	..	..	..	1	2	1	2	3	4	5	6	7	1	2	3	4	5	6	7
3	4	5	6	7	8	9	8	9	10	11	12	13	14	8	9	10	11	12	13	14
10	11	12	13	14	15	16	15	16	17	18	19	20	21	15	16	17	18	19	20	21
17	18	19	20	21	22	23	22	23	24	25	26	27	28	22	23	24	25	26	27	28
24	25	26	27	28	29	30	29	..	..	..	..	..	..	29	30	31	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
SEPTEMBER							MARCH							SEPTEMBER						
..	1	2	3	4	5	6	..	1	2	3	4	5	6	..	..	..	1	2	3	4
7	8	9	10	11	12	13	7	8	9	10	11	12	13	5	6	7	8	9	10	11
14	15	16	17	18	19	20	14	15	16	17	18	19	20	12	13	14	15	16	17	18
21	22	23	24	25	26	27	21	22	23	24	25	26	27	19	20	21	22	23	24	25
28	29	30	..	..	..	..	28	29	30	31	..	..	..	26	27	28	29	30	..	..
..
OCTOBER							APRIL							OCTOBER						
..	..	..	1	2	3	4	..	..	..	..	1	2	3	..	..	..	..	..	1	2
5	6	7	8	9	10	11	4	5	6	7	8	9	10	3	4	5	6	7	8	9
12	13	14	15	16	17	18	11	12	13	14	15	16	17	10	11	12	13	14	15	16
19	20	21	22	23	24	25	18	19	20	21	22	23	24	17	18	19	20	21	22	23
26	27	28	29	30	31	..	25	26	27	28	29	30	..	24	25	26	27	28	29	30
..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	..	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER						
..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	1	2	3	4	5	6
2	3	4	5	6	7	8	2	3	4	5	6	7	8	7	8	9	10	11	12	13
9	10	11	12	13	14	15	9	10	11	12	13	14	15	14	15	16	17	18	19	20
16	17	18	19	20	21	22	16	17	18	19	20	21	22	21	22	23	24	25	26	27
23	24	25	26	27	28	29	23	24	25	26	27	28	29	28	29	30	..	..	..	..
30	..	..	..	..	..	..	30	31	..	..	..	..	..	..	..	..	..	..	..	..
DECEMBER							JUNE							DECEMBER						
..	1	2	3	4	5	6	..	..	1	2	3	4	5	..	..	..	1	2	3	4
7	8	9	10	11	12	13	6	7	8	9	10	11	12	5	6	7	8	9	10	11
14	15	16	17	18	19	20	13	14	15	16	17	18	19	12	13	14	15	16	17	18
21	22	23	24	25	26	27	20	21	22	23	24	25	26	19	20	21	22	23	24	25
28	29	30	31	..	..	..	27	28	29	30	..	..	..	26	27	28	29	30	31	..
..

UNIVERSITY CALENDAR

1919-1920

1919

September	20	Saturday	Payment of fees closes, except for new students
September	24-30	Week	Examinations for removal of conditions, and entrance examinations
September	30	Tuesday	Payment of fees for new students closes
September	29-30		Registration days
October	1	Wednesday	Classes begin at 8:30 a.m.
October	16	Thursday	Senate meeting, 4:30 p.m.
November	27	Thursday	Thanksgiving Day; a holiday
December	18	Thursday	Senate meeting, 4:00 p.m.
December	23	Tuesday	Christmas vacation begins 9:00 p.m.

1920

January	2	Friday	Christmas vacation ends 8:30 a.m.
January	2	Friday	Registration day
January	3	Saturday	Classes begin at 8:30 a.m.
February	12	Thursday	Lincoln's Birthday; a holiday
February	19	Thursday	Senate meeting, 4:00 p.m.
March	25	Thursday	Winter quarter ends
March	31	Wednesday	Registration day
April	1	Thursday	Classes begin at 8:30 a.m.
April	2	Friday	Good Friday; a holiday
May	20	Thursday	Senate meeting, 4:00 p.m.
June	13	Sunday	Baccalaureate service
June	16	Wednesday	Spring quarter closes
June	17	Thursday	Forty-eighth Annual Commencement
June	18-19		Registration days for summer quarter
June	21	Monday	Summer quarter begins
September	3	Friday	Summer quarter closes

Schedule of Condition Examinations

Friday,	September 26,	9:00 a.m.	Physics
		2:00 p.m.	Chemistry, Experimental Engineering
Saturday,	September 27,	9:00 a.m.	Mathematics and Mechanics
		2:00 p.m.	Language, Drawing and Descriptive Geometry
Monday,	September 29,	9:00 a.m.	Rhetoric
		2:00 p.m.	Civil, Electrical, Mechanical Engineering, and Architectural subjects

Condition examinations are ordinarily held in the classrooms of the respective departments. The fee is one dollar. Students purposing to take such examinations are to notify the department concerned in advance, and make all arrangements with the particular instructor. Where conflicts occur in examination periods, arrangements should be made with the instructors concerned for a new schedule of time.

Condition examinations at times other than those scheduled require Faculty authorization as Special Examinations, and involve a fee of five dollars.

THE COLLEGE OF ENGINEERING AND ARCHITECTURE

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WILLIAM R. APPLEBY, M.A., Professor of Metallurgy
LEON ARNAL, A.D.G.F., Professor of Architecture
FRANCIS B. BARTON, Docteur de l'Université de Paris, Assistant Professor
of Romance Languages
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RICHARD O. BEARD, M.D., Associate Professor of Physiology
HENRY C. BERTLESEN, Lieutenant, U. S. A., Assistant Professor of Mili-
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ROY G. BLAKEY, Ph.D., Associate Professor of Economics
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ROBERT W. FRENCH, B.S. in C.E., Assistant Professor of Drawing and
Descriptive Geometry
ISAAC W. GEIGER, Ph.D., Assistant Professor of Chemistry
JOHN H. GRAY, Ph.D., Professor of Economics
CARL A. HERRICK, M.E., Assistant Professor of Mathematics and Me-
chanics

* On leave of absence.

6 COLLEGE OF ENGINEERING AND ARCHITECTURE

- WILLIAM F. HOLMAN, Ph.D., Associate Professor of Mathematics and Mechanics
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- J. HUGH JACKSON, B.A., Assistant Professor of Economics
- ROY C. JONES, M.S. in Arch., Assistant Professor of Architectural Design
- WILLIAM H. KIRCHNER, B.S., Professor of Drawing and Descriptive Geometry
- IRVILLE C. LE COMPTE, Ph.D., Professor of Romance Languages
- LOUIS W. MCKEEHAN, Ph.D., Associate Professor of Physics
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- LOUALLEN F. MILLER, M.A., Professorial Lecturer in Physics
- BURT L. NEWKIRK Ph.D., Assistant Professor of Mathematics and Mechanics
- CHARLES W. NICHOLS, Ph.D., Assistant Professor of Rhetoric
- EVERETT W. OLMSTED, Ph. D., Professor of Romance Languages
- JOHN I. PARCEL, B.A., B.S. in C.E., Professor of Structural Engineering
- RUTH S. PHELPS, M.A., Assistant Professor of Romance Languages
- CHARLES L. PILLSBURY, Professorial Lecturer
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- OTTO S. ZELNER, B.S., Assistant Professor of Surveying

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 ARTHUR R. CADE, M.S., Instructor in Chemistry
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 RALPH L. DOWDELL, Met.E., Instructor in Metallography
 RALPH R. GRIFFITH, Instructor in Shop
 HELEN HARRISON, B.A., Instructor in Secretarial Work
 CLARK W. HIRLEMAN, M.E., Instructor in Mechanical Engineering
 JOSEPH HAVLICEK, Sergeant, U. S. Army, retired, Instructor in Military
 Science and Tactics
 FREDERICK W. HOORN, E.E., Instructor in Mathematics and Mechanics
 SIGURD B. HUSTVEDT, Ph.D., Instructor in Rhetoric
 ALBERT C. HODGE, Ph.B., Instructor in Economics
 ALBERT C. JAMES, M.B.A., Instructor in Economics
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 EDWARD P. QUIGLEY, Instructor in Forge Work
 WILLIAM H. RICHARDS, Instructor in Carpentry and Pattern Work
 RODERICK W. SILER, Instructor in Mathematics and Mechanics
 J. WARREN STEHMAN, M.A., Instructor in Economics
 GEORGE W. SWENSON, Instructor in Electrical Engineering
 HARRY W. DIXON, Engineer, Assistant in Power Plant Operation

SPECIAL LECTURERS IN ELECTRICAL ENGINEERING

FRED DUSTIN, Former Electrical Inspector, City of Minneapolis
 "Practical Operation of the Rules for Safe Electrical Construction."
 P. G. DOWNTON, Electric Storage Battery Company
 "Electric Vehicles and Batteries."

* On leave of absence, 1919-20.

GENERAL INFORMATION

The College of Engineering and Mechanic Arts was authorized under the legislative act of 1868, and courses in Civil and Mechanical Engineering were first offered in 1871. A course in Electrical Engineering was first offered in 1887. In 1912 the name of the College was changed to the College of Engineering and Architecture, and an Architectural course was established.

DEGREES

The College of Engineering and Architecture offers a four-year course of study in General Engineering, and in Civil, Mechanical, and Electrical Engineering, also in Architecture. These courses lead to the degree of Bachelor of Science in Engineering or Architecture.

There is also offered a fifth year upon completion of which the student receives the degree of Civil, Mechanical, or Electrical Engineer, or Architect. This College also offers work in the Graduate School leading to the degree of Master of Science in Engineering.

For students entering in the fall of 1919 and thereafter the College of Engineering and Architecture offers a four-year course of study in General Engineering, and in Civil, Mechanical, and Electrical Engineering, also in Architecture. These courses lead to the degree of Bachelor of Science in Engineering, Bachelor of Science in Civil, Mechanical, or Electrical Engineering or Architecture.

This College also offers work in the Graduate School leading to the degree of Master of Science in Engineering.

The degree of Civil, Mechanical, or Electrical Engineer will be conferred upon those who have received the degree of Bachelor of Science in Civil, Mechanical, or Electrical Engineering after four years of engineering experience in positions of responsibility, and who complete the equivalent of one year's work in college either in residence or in absentia, and present a satisfactory thesis.

The candidate for the Engineer's degree who holds a Master's degree in Engineering must have had three years of engineering experience in positions of responsibility and must also present a satisfactory thesis.

THE PURPOSES OF THE COLLEGE

The purpose of this College is to give the student a broad foundation in the fundamental principles of engineering together with sufficient knowledge of professional practice to enable him to apply these principles. It is not possible in college to educate a fully trained engineer, as the application of engineering principles to the practice of engineering can be learned only through experience. There are certain subjects, such as surveying, drafting, and shop work in which a certain proficiency is acquired. These subjects enable a student upon graduation to fill satisfactorily a subordinate position until he has obtained experience.

The course in General Engineering is for those students desiring to take broad training without specializing in any particular branch of engineering.

The character of engineering work has been undergoing many changes, and the engineer is now filling many commercial and executive positions in manufacturing establishments. With these changing demands upon the engineer, the College is emphasizing more and more the commercial training and the commercial application of engineering principles.

The College endeavors to have its technical courses taught by experts in each particular branch who have had considerable practical experience in addition to their technical training.

EXTENSION WORK

Extension courses are offered in Architecture and Engineering. For definite information regarding extension work attention is directed to the Bulletin of the General Extension Division of the University.

ENTRANCE REQUIREMENTS

The entrance requirements of the College of Engineering are given in detail beginning page 10 of this Bulletin.

REGISTRATION

For detailed information concerning registration see printed program of the College. These programs are issued prior to the opening of each quarter. Registration in the fall quarter will occur on September 29 and 30; for the winter quarter on January 2; and for the spring quarter on March 31. Students must register in person (not by mail) on the date set; fees must be paid in advance of this date as no student will be permitted to register until he presents a receipt for fees.

See General Information Bulletin regarding fines for late registration and late payment of fees.

SPECIAL STUDENTS

In exceptional cases applicants are admitted to the College to pursue, under the direction of the Faculty, special lines of study. Such students must be of mature years, and shall give satisfactory evidence of ability to do with credit the work applied for. Admission to the College of students of this class requires in each specific case a vote of the Faculty.

ADVANCED STANDING

Students who have pursued courses of study in other colleges of recognized standing may receive advanced credit under the rules of the University and of the College.

CREDIT HOUR

A *credit hour* refers to a unit of time as part of a week's work. One credit hour means three actual hours of work each week. If one credit hour subject is presented in a recitation period, it is assumed that the student will give two hours to the preparation of this hour of classroom work. Where the subject is given in laboratory, shop, or drafting room, the time spent by the student in class is three actual hours for each credit hour.

A *quarter credit hour* is one credit hour a week extending through a quarter.

FEEES AND EXPENSES

The annual fee for students in this college is sixty dollars. See Bulletin of General Information for details, and for statements of the cost of living.

SCHOLARSHIPS AND PRIZES

For scholarships and prizes in this college, see the Bulletin of General Information. Special attention is called to the Free and Service Scholarships mentioned in the Bulletin of General Information.

THESES

Every candidate for a graduate degree such as the degree of Engineer or Architect is required to prepare a thesis on some subject particularly relating to his course. The thesis must embody the result of some research made by him, a special design, or an original report upon some engineering or architectural problem. It must be creditable from a literary, as well as from a technical, point of view.

CHANGES IN BULLETIN

The Faculty of the College of Engineering and Architecture reserves the right to cancel or change without notice any course printed in this Bulletin. The Bulletin is a statement of present conditions, and is subject to modification in any particular by Faculty action.

ENTRANCE REQUIREMENTS

- 1. English..... 4 units
 or
 { English..... 3 units
 and
 { Foreign language..... 2 units
- 2. Elementary Algebra..... 1 unit
 Plane Geometry..... 1 unit
- 3. Enough additional work to make in all 15 units, of which not more than 4 may be in Group F.

High-school students desiring to enter this College are urged to take advanced algebra, solid geometry, and chemistry in high school. Students entering with deficiencies in these subjects will be required to take courses in the University covering these deficiencies before they can proceed with other work for which these are prerequisites. Such courses, however, carry no credit toward graduation.

Students looking forward to the study of Architecture will find it to their advantage to take freehand drawing in high school, to elect French as a language, and to cover the field of general history as far as possible.

LIST OF ENTRANCE SUBJECTS

Only those subjects included in the following groups may be counted toward admission.

The term *unit* means not less than five recitations of forty minutes each per week for a period of thirty-six weeks. In manual subjects and kindred courses, it means the equivalent of ten recitation periods per week for thirty-six weeks.

GROUP A. ENGLISH: three or four units.

GROUP B. LANGUAGES: Latin, Greek, German, French, Italian, Spanish, Scandinavian, one to four units each.

GROUP C. HISTORY AND SOCIAL SCIENCES: Ancient and modern history, one unit each; English and senior American history, one-half unit each; American government, economics, economic history of England, and economic history of the United States, one-half unit each; commercial geography and history of commerce, one-half or one unit each.

GROUP D. MATHEMATICS: Elementary algebra and plane geometry, one unit each; higher algebra, solid geometry, and trigonometry, one-half unit each.

GROUP E. NATURAL SCIENCES: Physics and chemistry, one unit each; botany and zoology, one-half or one unit each; physiology, astronomy, geology, and physiography, one-half unit each.

GROUP F. VOCATIONAL SUBJECTS: Business law and business arithmetic, one-half unit each; elementary and advanced bookkeeping, one unit each; stenography and typewriting, one or two units. Freehand drawing, mechanical drawing, and shopwork, one or two units each. Agriculture, one to four units. Normal training subjects, one to three units, provided the applicant has had one year of subsequent teaching experience.

ASSEMBLIES AND MENTOR SYSTEM

A mentor system has been introduced in this College in order to bring about a closer relation between the student and the Faculty. Each member of the freshman class is assigned to some member of the Faculty as his adviser. The relation of the adviser to the student is to be that of elder brother to whom the student can go at all times for advice and counsel. All the student's reports are sent to the adviser so that the student and adviser can keep in intimate contact. The adviser is also expected to keep in touch with the parents of the student whenever it may seem necessary.

The assembly system is closely connected with the mentor system. Each week the freshman class is called together and transacts its class business and also listens to talks by various members of the University Faculty, visiting engineers, and others. This is done in order that the class may be more closely organized and that the student may have a better idea of the University as a whole.

COURSES OF STUDY

CIVIL, MECHANICAL, ELECTRICAL, AND GENERAL ENGINEERING

The freshman year is the same for all Engineering and General or Business courses. The freshman year for Architecture is given on page 22.

FRESHMAN YEAR*

(Civil, Electrical, Mechanical, General)

First Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
M. & M. 11.1	Applied Mathematics and Mechanics . . .	5	4	..	3	8
Rhet. 4f	Rhetoric and Composition	3	3	..	..	6
Chem. 1	General Inorganic Chemistry	3½	..	3	5	2
M.E. 11.1	Shop	2½	..	..	8	..
Draw. 11.1	Engineering Drawing	2½	..	..	8	..
	General Lecture . . . . .	..	..	1	..	..
	Military Drill	1	..	..	3	..

Second Quarter

M. & M. 11.2	Applied Mathematics and Mechanics . . .	5	4	..	3	8
Rhet. 5w	Rhetoric and Composition	3	3	..	..	6
Chem. 2	General Inorganic Chemistry	3½	..	3	5	2
M.E. 11.2	Shop	2½	..	..	8	..
Draw. 11.2	Engineering Drawing	2½	..	..	8	..
	General Lecture . . . . .	..	..	1	..	..
	Hygiene and First Aid	1	..	1	2	..
	Military Drill	1	..	..	3	..

Third Quarter

M. & M. 11.3*	Applied Mathematics and Mechanics . . .	5	4	..	3	8
Rhet. 6s	Rhetoric and Composition	3	3	..	..	6
Chem. 3	Qualitative Chemical Analysis	3½	..	3	5	2
M.E. 11.3 and 11.4	Shop	2½	..	..	8	..
Draw. 21.3	Descriptive Geometry	2½	..	1	7	..
	General Lecture . . . . .	..	..	1	..	..
	Military Drill	1	..	..	3	..

* Students who expect to take the General Course in Engineering and specialize in architectural work, should register for Drawing 31.1, 31.2, and 31.3 instead of Drawing 11.1, 11.2, and 21.3.

CIVIL ENGINEERING

SOPHOMORE YEAR

First Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
M. & M. 12.1	Applied Mathematics and Mechanics . . .	5	4	..	3	8
Phys. 23	Elements of Mechanics and Sound	3	3	1	..	5
Phys. 24	Mechanics Laboratory	1	..	..	2	1
C.E. 12.1	Surveying	3	1	..	8	..
Draw. 42.1	Drafting	2	..	..	6	..
	Elective	3	..	..	..	..
	Military Drill	1	..	..	3	..

COURSES OF STUDY

Second Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
M. & M. 12.2	Applied Mathematics and Mechanics	5	4	..	3	8
Phys. 47	Heat and Light	3	3	1	..	5
Phys. 48	Heat and Light Laboratory	1	..	..	2	1
C.E. 12.2	Surveying	3	1	..	8	..
Draw. 42.2	Drafting	2	..	..	6	..
	Elective	3	..	..	..	..
	Military Drill	1	..	..	3	..

Third Quarter

M. & M. 12.3	Applied Mathematics and Mechanics	5	4	..	3	8
Phys. 63	Electricity and Magnetism	3	3	1	..	5
Phys. 64	Electricity and Magnetism Laboratory	1	..	..	2	1
C.E. 12.3	Surveying	3	1	..	8	..
Draw. 42.3	Drafting	2	..	..	6	..
	Elective	3	..	..	..	..
	Military Drill	1	..	..	3	..

JUNIOR YEAR

First Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
M. & M. 23.1	Technical Mechanics	3	3	..	..	6
M. & M. 33.1	Strength of Materials	4	4	..	..	8
M. & M. 43.1	Materials Testing Laboratory	1	..	..	3	..
C.E. 13.4	Surveying	3	1	..	8	..
C.E. 33.1	Stresses in Structures	3	1	..	4	4
C.E. 53.1	Highways and Pavements	3	2	..	3	4
	or Elective	3	..	..	..	..

Second Quarter

M. & M. 23.2	Technical Mechanics	3	3	..	..	6
M. & M. 53.2	Hydraulics	3	3	..	..	6
M. & M. 63.2	Hydraulic Laboratory	1	..	..	3	..
C.E. 23.1	Railway Engineering	3	1	..	6	2
C.E. 33.2	Stresses in Structures	3	1	..	6	2
C.E. 53.2	Highways and Pavements	3	2	..	3	4
	or Elective	3	..	..	..	..

Third Quarter

M. & M. 23.3	Technical Mechanics	3	3	..	..	6
C.E. 23.2	Railway Engineering	3	1	..	6	2
C.E. 33.3	Structural Design	4	1	..	6	2
C.E. 53.3	Municipal Engineering	3	1	2	..	6
	Elective	3	..	..	..	..

SUMMER CAMP

C.E. 23.3 Summer Camp is held in the vacation preceding the senior year for 6 weeks from August 15 to October 1. Credit: 9 hours to be applied to electives in senior year. Required of all students taking the Civil Engineering Course.

SENIOR YEAR

First Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
C.E. 164.1	Hydrology	3	2	..	3	4
C.E. 134.1	Bridge Analysis	3	1	..	4	4

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Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
C.E. 144.1	Masonry and Foundations.....	3	2	..	3	4
M.E. 144.6	Heat Engines.....	2½	3	..	..	5
M.E. 184.7	Heat Engine Laboratory.....	1½	..	..	4	..
C.E. 124.1	Railway Engineering or Elective.....	3	..	..	..	..
<i>Second Quarter</i>						
C.E. 164.2	Water Supply.....	3	2	..	3	4
C.E. 134.2	Bridge Design.....	3	1	..	4	4
C.E. 144.2	Reinforced Concrete.....	3	1	1	3	4
E.E. 144.23	Electric Power.....	4	3	..	3	6
C.E. 124.2	Railway Engineering or Elective.....	3	..	..	..	..
<i>Third Quarter</i>						
C.E. 164.3	Sanitary Engineering.....	3	1	..	6	2
C.E. 134.3	Bridge Design.....	3	1	..	4	4
C.E. 144.3	Reinforced Concrete.....	3	1	..	6	2
C.E. 124.3	Railway Engineering or Elective.....	3	..	..	..	..
	Electives.....	6	..	..	..	..

MECHANICAL ENGINEERING

For freshmen year, see page 12.

SOPHOMORE YEAR

First Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
M. & M. 12.1	Applied Mathematics and Mechanics.....	5	4	..	3	8
Phys. 23	Elements of Mechanics and Sound.....	3	3	1	..	5
Phys. 24	Mechanics Laboratory.....	1	..	..	2	1
Draw. 52.1	Drafting.....	2	..	..	6	..
M.E. 12.5	Shop.....	2½	..	..	8	..
M.E. 22.1	Mechanical Technology.....	1½	..	2	..	2
Chem. 20	Quantitative Chemical Analysis.....	3	..	1	8	..
	Military Drill.....	1	..	..	3	..

Second Quarter

M. & M. 12.2	Applied Mathematics and Mechanics....	5	4	..	3	8
Phys. 47	Heat and Light.....	3	3	1	..	5
Phys. 48	Heat and Light Laboratory.....	1	..	..	2	1
Draw. 52.2	Drafting.....	2	..	..	6	..
M.E. 12.6	Shop.....	2½	..	..	8	..
M.E. 22.2	Mechanical Technology.....	1	..	2	..	1
	Option.....	3-2	..	..	..	..
	Military Drill.....	1	..	..	3	..

Third Quarter

M. & M. 12.3	Applied Mathematics and Mechanics....	5	4	..	3	8
Phys. 63	Electricity and Magnetism.....	3	3	1	..	5
Phys. 64	Electricity and Magnetism.....	1	..	..	2	1
M.E. 32.1	Elementary Machine Design.....	2	..	..	6	..
M.E. 42.1	Automotives.....	3	2	..	4	3
	Option.....	3-2	..	..	..	..
	Military Drill.....	1	..	..	3	..
M.E. 12.7su	Summer Shop*.....	5	..	..	44	..

* The summer course in shop is given during the vacation period following the sophomore year and is in session for four weeks. Machine shop practice covering a period of not less than ten weeks, eight hours per day, in commercial shops will be accepted in lieu of this work if approved by the Department. The five credits earned in this course may be applied on required electives in the senior or post-senior years.

COURSES OF STUDY

JUNIOR YEAR

First Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
M. & M. 23.1	Technical Mechanics.....	3	3	..	..	6
M. & M. 33.1	Strength of Materials.....	4	4	..	..	8
M. & M. 43.1	Materials Testing Laboratory.....	1	..	..	3	..
Phys. 144	Advanced Heat Measurement.....	3	1	..	6	2
M.E. 33.2	Mechanism and Kinematics.....	3	4	..	..	5
	Economics or Language.....	3	..	..	..	..
M.E. 93.2	Seminar (optional).....	$\frac{3}{2}$	..	1	1	..

Second Quarter

M. & M. 23.2	Technical Mechanics.....	3	3	..	..	6
M. & M. 53.2	Hydraulics.....	3	3	..	..	6
M. & M. 63.2	Hydraulic Laboratory.....	1	..	..	3	..
M.E. 43.2	Steam Engines.....	$2\frac{3}{4}$	3	..	..	5
M.E. 83.1	Elementary M. E. Lab.....	$1\frac{3}{4}$	..	..	4	..
M.E. 33.3	Mechanism and Kinematics.....	3	2	..	4	3
	Economics or Language.....	3	3	..	..	6
M.E. 93.3	Seminar (optional).....	$\frac{3}{2}$	..	1	1	..

Third Quarter

M. & M. 23.3	Technical Mechanics.....	3	3	..	..	6
M.E. 33.5	Machine Design.....	3	1	1	6	1
M.E. 43.3	Steam Engines and Boilers.....	$2\frac{3}{4}$	3	..	..	5
M.E. 83.2	Steam Laboratory.....	$1\frac{3}{4}$	..	..	4	..
M.E. 63.1	Measurement of Power.....	2	2	..	2	2
	Economics or Language.....	3	..	..	..	..
M.E. 93.4	Seminar (optional).....	$\frac{3}{2}$	..	1	1	..
M.E. 83.3	Power Laboratory.....	$1\frac{3}{4}$	..	..	4	..

SENIOR YEAR

First Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
M.E. 154.1	Thermodynamics.....	3	3	..	..	6
E.E. 144.25	Electric Power.....	3	2	..	3	4
M.E. 134.6	Machine Design.....	3	1	1	6	1
M.E. 144.8	Gas Engines and Producers.....	$2\frac{3}{4}$	3	..	..	5
M.E. 184.4	Power and Gas Engine Laboratory.....	$1\frac{3}{4}$	..	..	4	..
P.S. 25f	American Government.....	2	3	..	..	3
M.E. 194.5	Seminar.....	$\frac{3}{2}$	..	1	1	..
	Elective.....	2-3	..	..	..	..

Second Quarter

M.E. 154.2	Turbines.....	$2\frac{3}{4}$	3	..	..	5
M.E. 184.5	Power and Steam Laboratory.....	$1\frac{3}{4}$	..	..	4	..
E.E. 144.27	Electric Power.....	3	2	..	3	4
C.E. 33.5	Structural Engineering.....	3	2	..	3	4
Met. 156w	Metallography.....	3	..	2	4	3
P.S. 26	American Government.....	2	3	..	..	3
M.E. 194.6	Seminar.....	$\frac{3}{2}$	..	1	1	..
	Elective.....	2-3	..	..	..	..

Third Quarter

Course no	Title	Credits	Rec.	Lect.	Lab.	Prep.
M.E. 154.3	Heating and Ventilating.....	3	2	1	3	3
E.E. 144.29	Electric Power.....	3	2	..	3	4
C.E. 33.6	Structural Design.....	2	..	..	6	..
Met. 157s	Metallography.....	3	..	2	4	3
P.S. 27	Business Law.....	2	3	..	..	3
M.E. 184.6	Engineering Laboratory.....	2	..	..	6	..
M.E. 194.7	Seminar.....	$\frac{1}{2}$	..	1	1	..
	Elective.....	2-3	..	..	..	..

POST-SENIOR YEAR

First Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.*
M.E. 225.3	Industrial Management.....	3	1	2	4	2
M.E. 265.2	Power Engineering.....	3	1	1	6	1
M.E. 285.9	Engineering Research.....	3-9	..	..	8	1
	Electives.....	9-10	..	..	..	..

Second Quarter

M.E. 295.1	Contracts and Specifications.....	2	..	2	..	1
	Engineering Design as approved.....	3	..	..	..	..
M.E. 285.10	Engineering Laboratory.....	3	..	..	8	1
	Electives including Thesis.....	9-11	..	..	..	..

Third Quarter

Econ.	Business Organization.....	3	..	..	..	..
	Engineering Design as approved.....	3	..	..	..	..
M.E. 285.11	Engineering Laboratory.....	3	..	..	8	1
	Electives including Thesis.....	9-10	..	..	..	..

FOR CLASSES ENTERING PRIOR TO 1919

SUGGESTED POST-SENIOR OPTIONS IN RAILWAY MECHANICAL
ENGINEERING*First Quarter*

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
M.E. 275.1	Railway Technology.....	3	..	..	6	3
M.E. 275.2	Railway Design.....	3	..	1	8	..
M.E. 275.5	Locomotive Construction.....	1	1	..	..	2
E.E.	Electric Railways.....	3	..	..	..	..
C.E.	Railway Engineering.....	3	..	..	..	..
Econ.	Railway Problems.....	3	3	..	..	6
Met.	Advanced Metallography.....	3	1	1	4	3

Second Quarter

M.E. 275.3	Railway Design.....	3	..	1	8	..
M.E. 275.6	Locomotive Construction.....	1	1	..	..	2
E.E.	Steam Railway Electrification.....	3	..	..	..	..
Econ.	Railway Problems.....	3	..	..	..	..
Met.	Advanced Metallography.....	3	1	1	4	3

COURSES OF STUDY

Third Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
M.E. 275.4	Railway Design	3	..	1	8	..
M.E. 275.7	Locomotive Construction.....	1	1	..	..	2
M.E. 275.8	Locomotive Testing.....	3	..	..	9	..
E.E.	Steam Railway Electrification.....	3	..	..	..	..
Econ.	Railway Problems.....	3	..	..	..	..
Econ. 161 or Econ. 165	Labor Problems.....	3	..	..	..	..
Met.	Advanced Metallography.....	3	1	1	4	3

SUGGESTED POST-SENIOR OPTIONS IN INDUSTRIAL ENGINEERING

First Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
M.E. 225.3	Industrial Management	3	1	2	..	6
M.E. 215.9	Tool Design	3	..	1	6	2
C.E.	Industrial Sanitation.....	2	..	..	..	..
Econ.	Business Management.....	3	1	2	..	6
Econ.	Accounting.....	3	..	..	..	..

Second Quarter

M.E. 225.4	Industrial Management (laboratory).....	3	..	1	6	2
M.E. 215.10	Tool Construction.....	3	..	..	..	..
E.E.	Valuation of Public Utilities.....	1	..	1	..	..
Econ.	Business Management.....	3	..	..	..	..
Econ.	Accounting.....	3	..	..	..	..

Third Quarter

M.E. 225.5	Industrial Management (problems).....	3	1	1	4	3
M.E. 225.6	Safety Engineering	2	..	2	..	4
Econ.	Business Management.....	3	1	2	..	6
Econ.	Accounting.....	3	1	2	..	6

SUGGESTED POST-SENIOR OPTIONS IN POWER ENGINEERING

First Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
M.E. 235.8	Steam Engine Design	3	..	1	8	..
M.E. 235.9	Gas Engine Design	3	..	1	8	..
M.E. 265.3	Power Plant Management.....	2	..	1	4	1
C.E.	Hydrology.....	3	..	..	..	..
Chem.	Power Plant Chemistry.....	2	..	1	4	1

Second Quarter

M.E. 235.13	Gas Tractor Design.....	3	..	1	8	..
M.E. 265.6	Power Plant Design.....	3	..	1	8	..
M.E. 265.4	Power Plant Management.....	2	..	1	4	1
M.E. 255.4	Advanced Heating and Ventilating.....	3	2	1	..	6
C.E.	Water Power.....	3	..	..	..	..

Third Quarter

M.E. 265.7	Power Plant Design.....	3	..	1	8	..
M.E. 265.5	Power Plant Management.....	2	..	1	4	1
M.E. 255.5	Compressed Air and Refrigeration.....	3	3	..	..	6
M.E. 255.6	Mechanical Equipment of Buildings.....	3	1	1	6	1
C.E.	Water Power.....	3	..	..	..	..

ELECTRICAL ENGINEERING

For freshman year, see page 12.

SOPHOMORE YEAR

First Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
M. & M. 12.1	Applied Mathematics and Mechanics . . .	5	4	..	3	8
Phys. 23	Elements of Mechanics and Sound	3	3	1	..	5
Phys. 24	Mechanics Laboratory	1	..	..	2	1
E.E. 12.1	Elements of Electrical Engineering	3	2	1	2	4
Draw. 52.1	Drafting	2	..	..	6	..
	Language or Approved Elective	3	3	..	..	6
	Military Drill	1	..	..	3	..

Second Quarter

M. & M. 12.2	Applied Mathematics and Mechanics . . .	5	4	..	3	8
Phys. 47	Heat and Light	3	3	1	..	5
Phys. 48	Heat and Light Laboratory	1	..	..	2	1
E.E. 12.3	Elements of Electrical Engineering	3	2	1	2	4
Draw. 52.2	Drafting	2	..	..	6	..
	Language or Approved Elective	3	3	..	..	6
	Military Drill	1	..	..	3	..

Third Quarter

M. & M. 12.3	Applied Mathematics and Mechanics . . .	5	4	..	3	8
Phys. 63	Electricity and Magnetism	3	3	1	..	5
Phys. 64	Electricity and Magnetism Laboratory . .	1	..	..	2	1
E.E. 12.5	Elements of Electrical Engineering	3	2	1	2	4
Draw. 52.3	Drafting	2	..	..	6	..
	Language or Approved Elective	3	3	..	..	6
	Military Drill	1	..	..	3	..

JUNIOR YEAR

First Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
M. & M. 23.1	Technical Mechanics	3	3	..	..	6
M. & M. 33.1	Strength of Materials	4	4	..	..	8
M. & M. 43.1	Materials Testing Laboratory	1	..	..	3	..
E.E. 23.1	Direct Current Machinery	3	3	..	..	6
E.E. 23.2	Direct Current Machinery Laboratory . .	2	..	..	4	2
Phys. 164f	Electrical Measurements	3	1	..	6	2
C.E. 13.6	Surveying	2	..	..	6	..

Second Quarter

M. & M. 23.2	Technical Mechanics	3	3	..	..	6
M. & M. 53.2	Hydraulics	3	3	..	..	6
M. & M. 63.2	Hydraulic Laboratory	1	..	..	3	..
E.E. 23.3	Direct Current Machinery	3	3	..	..	6
E.E. 23.4	Direct Current Machinery Laboratory . .	2	..	..	4	2
M.E. 33.4	Mechanism and Kinematics	3	2	..	3	4
	Elective	3	..	..	..	..

Third Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
M. & M. 23.3	Technical Mechanics.....	3	3	..	..	6
E.E. 23.5	Direct Current Machinery.....	3	3	..	..	6
E.E. 23.6	Direct Current Machinery Laboratory...	2	..	..	4	2
M.E. 33.7	Machine Design.....	4	1	1	8	2
C.E. 33.7	Elements of Structures.....	3	2	..	3	4
	Elective.....	3	..	..	..	..

SENIOR YEAR

First Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
E.E. 124.51	Alternating Currents.....	3	3	..	..	6
E.E. 124.52	Alternating Current Laboratory.....	2	..	..	4	2
Econ. 15f	Economic Problems for Engineers.....	3	3	..	..	6
M.E. 144.4	*Heat Engines.....	4	3	..	3	6
	Electives.....	6	..	..	..	..

Second Quarter

E.E. 124.53	Alternating Currents.....	3	3	..	..	6
E.E. 124.54	Alternating Current Laboratory.....	2	..	..	4	2
Econ. 16w	Economic Problems for Engineers.....	3	3	..	..	6
M.E. 144.5	*Heat Engines.....	2½	3	..	..	5
M.E. 184.8	Steam and Gas Engine Laboratory.....	1½	..	..	4	..
	Electives.....	6	..	..	..	..

Third Quarter

E.E. 124.55	Alternating Currents.....	3	3	..	..	6
E.E. 124.56	Alternating Current Laboratory.....	2	..	..	4	2
Econ. 17w	Economic Problems for Engineers.....	3	3	..	..	6
E.E. 134.58	Electrical Design.....	4	..	..	12	..
	Electives.....	6	..	..	..	..

POST-SENIOR YEAR

Thesis.....	3 to 6 credits per quarter
Advanced Electrical Engineering Electives.....	4 to 9 credits per quarter
General Electives.....	3 to 9 credits per quarter
Total.....	16 to 19 credits per quarter

The choice of electives should be made in conference with the Department. Electrical Engineering electives will be chosen from E.E. Course 144.67 to 295.69. The thesis should be closely connected with one or more of the latter.

Students desiring to specialize in Electro-Chemistry may be allowed substitutions in the senior year.

ELECTIVES

Suggested for sophomores and juniors:

- American Government
- Economics
- English
- Foreign Language

* In 1919-20, seniors who took Heat Engines during their junior year, will substitute an equal weight of electives.

Logic
 Psychology
 Public Speaking
 Technical Writing

Students who did not have two years of German or French in high school are urged to begin a foreign language before the junior year.

Suggested for seniors: Business Law
 Electric Lighting
 Journal Reading
 Mathematics
 Power Plant Operation
 Psychology
 Public Speaking
 Railway Electrical Engineering

Suggested for post-seniors: Accounting
 Batteries and Electric Vehicles
 Business Organization
 Illuminating Engineering
 Labor Problems
 Precise Measurements
 Radio-Signaling
 Railway Problems
 Steam Railroad Electrification
 Telegraphy and Telephony
 Valuation

Electives for juniors and seniors.

GENERAL COURSE IN ENGINEERING

For freshman year, see page 12.

SOPHOMORE YEAR

First Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
M. & M. 12.1	Applied Mathematics and Mechanics	5	4	..	3	8
Phys. 23	Elements of Mechanics and Sound	3	3	1	..	5
Phys. 24	Mechanics Laboratory	1	..	..	2	1
	Drafting	2	..	..	6	..
C.E. 12.1	Surveying	3	..	..	..	..
	Electives	3	..	..	..	..
	Military Drill	1	..	..	3	..

Second Quarter

M. & M. 12.2	Applied Mathematics and Mechanics	5	4	..	3	8
Phys. 47	Heat and Light	3	3	1	..	5
Phys. 48	Heat and Light Laboratory	1	2	1
	Drafting	2	6	..
	Electives	6
	Military Drill	1	3	..

COURSES OF STUDY

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Third Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
M. & M. 12.3	Applied Mathematics and Mechanics	5	4	..	3	8
Phys. 63	Electricity and Magnetism	3	3	1	..	5
Phys. 64	Electricity and Magnetism Laboratory	1	..	..	2	1
	Drafting	2	..	..	6	..
	Electives	6	..	..	..	..
	Military Drill	1	..	..	3	..

JUNIOR YEAR

First Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
M. & M. 23.1	Technical Mechanics	3	3	..	..	6
M. & M. 33.1	Strength of Materials	4	4	..	..	8
M. & M. 43.1	Materials Testing Laboratory	1	..	..	3	..
	Economics	3	..	..	..	..
	Electives	6	..	..	..	..

Second Quarter

M. & M. 23.2	Technical Mechanics	3	3	..	..	6
M. & M. 53.2	Hydraulics	3	3	..	..	..
M. & M. 63.2	Hydraulic Laboratory	1	..	..	3	..
	Economics	3	..	..	..	..
	Electives	7	..	..	..	..

Third Quarter

M. & M. 23.3	Technical Mechanics	3	3	..	..	6
M.E. 144.7	Heat Engines	2½	3	..	..	5
M.E. 184.7	Heat Engine Laboratory	1½	..	..	4	..
	Economics	3	..	..	..	..
	Electives	7	..	..	..	..

SENIOR YEAR

First Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
	American Government	2	..	..	..	..
	Principles of Accounting	3	..	..	..	..
	Approved Electives	12	..	..	..	..

Second Quarter

C.E. 33.1	Stresses in Structures	3	..	..	..	..
	American Government	2	..	..	..	..
	Principles of Accounting	3	..	..	..	..
	Approved Electives	9	..	..	..	..

Third Quarter

E.E. 144.23	Electric Power	4	..	..	..	..
	Business Law	2	..	..	..	..
	Approved Electives	11	..	..	..	..

ARCHITECTURE

FRESHMAN YEAR

First Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
M. & M. 11.1	Applied Mathematics and Mechanics	5	4	..	3	8
Draw. 31.1	Graphics	2	..	2	..	4
Rhet. 4f	Rhetoric and Composition	3	3	..	..	6
French 1f	French	3	3	..	..	6
Arch. 31.1	Elements of Architecture	3	..	1	8	..
	General Lecture . . . . .	..	..	1	..	..
	Military Drill	1	..	..	3	..

Second Quarter

M. & M. 11.2	Applied Mathematics and Mechanics	5	4	..	3	8
Draw. 31.2	Graphics	2	..	2	..	4
Rhet. 5w	Rhetoric and Composition	3	3	..	..	6
French 2w	French	3	3	..	..	6
Arch. 31.2	Elements of Architecture	3	..	1	8	..
	General Lecture . . . . .	..	..	1	..	..
	Hygiene and First Aid	1	..	1	2	..
	Military Drill	1	..	..	3	..

Third Quarter

M. & M. 11.3	Applied Mathematics and Mechanics	5	4	..	3	8
Draw. 31.3	Graphics	2	..	2	..	4
Rhet. 6s	Rhetoric and Composition	3	3	..	..	6
French 3s	French	3	3	..	..	6
Arch. 31.3	Elements of Architecture	3	..	1	8	..
	General Lecture . . . . .	..	..	1	..	..
	Military Drill	1	..	..	3	..

SOPHOMORE YEAR

First Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
M. & M. 92.1	Calculus for Architects	4	4	..	..	8
Phys. 23	Elements of Mechanics and Sound	3	3	1	..	5
Phys. 24	Mechanics Laboratory	1	..	..	2	1
Arch. 22.1	Freehand Drawing	2	..	..	6	..
Arch. 32.1	Design	4	..	..	12	..
Arch. 42.1	Spec. and Working Drawings	3	..	1	8	..
	Military Drill	1	..	..	3	..

Second Quarter

M. & M. 92.2	Mechanics for Architects	4	4	..	..	8
Phys. 47	Heat and Light	3	3	1	..	5
Phys. 48	Heat and Light Laboratory	1	..	..	2	1
Arch. 22.2	Freehand Drawing	2	..	..	6	..
Arch. 32.2	Design	4	..	..	12	..
Arch. 42.2	Spec. and Working Drawings	3	..	1	8	..
	Military Drill	1	..	..	3	..

COURSES OF STUDY

Third Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
M. & M. 92.3	Strength of Materials for Architects	4	4	..	..	8
Phys. 63	Electricity and Magnetism	3	3	1	..	5
Phys. 64	Electricity and Magnetism Laboratory	1	..	..	2	1
Arch. 22.3	Freehand Drawing	2	..	..	6	..
Arch. 32.3	Design	4	..	..	12	..
Arch. 42.3	Spec. and Working Drawings	3	..	1	8	..
	Military Drill	1	..	..	3	..

JUNIOR YEAR

First Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
Arch. 13.1	Architectural History	2	..	2	..	4
Arch. 23.1	Freehand Drawing	3	..	..	9	..
Arch. 33.1	Design	6	..	..	18	..
C.E. 33.8	Stresses	3	..	..	5	4
	Elective	3	..	..	..	..

Second Quarter

Arch. 13.2	Architectural History	2	..	2	..	4
Arch. 23.2	Freehand Drawing	3	..	..	9	..
Arch. 33.2	Design	6	..	..	18	..
C.E. 33.9	Structural Design	3	..	..	5	4
	Elective	3	..	..	..	..

Third Quarter

Arch. 13.3	Architectural History	2	..	2	..	4
Arch. 23.3	Freehand Drawing	3	..	..	9	..
Arch. 33.3	Design	6	..	..	18	..
C.E. 43.1	Reinforced Concrete	3	..	..	5	4
	Elective	3	..	..	..	..

SENIOR YEAR

First Quarter

Course no.	Title	Credits	Rec.	Lect.	Lab.	Prep.
Arch. 114.1	Architectural History	2	..	2	..	4
Arch. 124.1	Freehand Drawing	3	..	..	9	..
Arch. 134.1	Design	6	..	..	18	..
Arch. 144.1	Materials of Construction	2	2	..	..	4
Arch. 164.1	History of Sculpture and Painting	2	..	2	..	4
E.E. 144.11	Electric Wiring and Equipment	2	..	2	..	4

Second Quarter

Arch. 114.2	Architectural History	2	..	2	..	4
Arch. 124.2	Freehand Drawing	3	..	..	9	..
Arch. 134.2	Design	6	..	..	18	..
Arch. 144.2	Materials of Construction	2	2	..	..	4
Arch. 164.2	Landscape Design	2	..	..	6	..
C.E. 174.1	Building Sanitation	2	2	..	..	4

Third Quarter

Arch. 114.3	Architectural History	2	..	2	..	4
Arch. 124.3	Freehand Drawing	3	..	..	9	..
Arch. 134.3	Design	6	..	..	18	..
Arch. 154.3	Business Practice	2	2	..	..	4
Arch. 164.3	Decoration and Allied Arts	2	..	1	3	2
M.E. 154.3	Heating and Ventilating	3	2	1	3	3

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POST-SENIOR YEAR

Work divided into major and minor groups all elective.

Required number of credits, sixteen.

All students required to take one major and not less than two nor more than three minor groups.

Value of major group 10, and of minor group 3 or 2.

Major groups: (a) Architectural Design

(b) Architectural Construction

Minor groups: (a) Painting, Modeling, Figure Composition, Decorative Design

(b) Liberal Studies

(c) Engineering or Technical Studies

Structures

Materials Laboratory

Heating and Ventilation

Building Sanitation

Mechanical Equipment of Buildings

Electrical Equipment of Buildings

(d) Architectural History Research

DEPARTMENTAL STATEMENTS

ARCHITECTURE

Professors FREDERICK M. MANN, LEON ARNAL; Assistant Professors
SAMUEL C. BURTON, JAMES H. FORSYTHE, ROY C. JONES.

COURSES

No.	Title	Credits	Required of	Prereq. courses
13.1	Architectural History	2	Jr. Arch.	31.1, 31.2, 31.3
13.2	Architectural History	2	Jr. Arch.	13.1
13.3	Architectural History	2	Jr. Arch.	13.2
114.1	Architectural History	2	Sr. Arch.	13.3
114.2	Architectural History	2	Sr. Arch.	114.1
114.3	Architectural History	2	Sr. Arch.	114.2
22.1	} Freehand Drawing.....	6	Soph. Arch.	22.1
22.2				22.2
22.3				
23.1	} Freehand Drawing.....	9	Jr. Arch.	22.1, 22.2, 22.3
23.2				
23.3				
124.1	} Freehand Drawing.....	9	Sr. Arch.	23.1, 23.2, 23.3
124.2				
124.3				
31.1	Elements of Architecture.....	3	Fr. Arch.	.....
31.2	Elements of Architecture.....	3	Fr. Arch.	31.1
31.3	Elements of Architecture.....	3	Fr. Arch.	31.2
32.1	} Architectural Design, Elementary...	12	Soph. Arch.	32.1
32.2				32.2
32.3				32.3
33.1	} Architectural Design, Intermediate..	18	Jr. Arch.	33.1
33.2				33.2
33.3				33.3
134.1	} Architectural Design, Advanced... ..	18	Sr. Arch.	134.1
134.2				134.2
134.3				134.2
42.1	} Specifications and Working Draw..	9	Soph. Arch.	31.3
42.2				42.1
42.3				42.2
144.1	} Materials of Construction.....	4	Sr. Arch.	42.3
144.2				
154.3	Business Practice.....	2	Sr. Arch.	Sr. standing
164.1	History of Sculpture and Painting... ..	2	Sr. Arch.	13.3
164.2	Landscape Design.....	2	Sr. Arch.	33.3
164.3	Decoration and Allied Arts.....	2	Sr. Arch.	23.3
72.1	} Elements of Architecture.....	15	Soph., S.L. & A.	Soph. standing
72.2				
72.3				

General.—The course in Architecture aims to meet the exacting requirements of the professional practice of architecture. The scientific and liberal studies of the course form a necessary foundation for the special studies in architecture.

The General Course in Engineering forms an outline of fundamental studies, to which special studies in architecture and the related fields may be added to meet the special requirements of preparation for the practice of Architectural Engineering, certain types of Business Administration, Building Contracting, and similar activities. Some variations from the fixed schedule of studies of the General Engineering Course may be allowed to students in the field of Architectural Engineering.

Students who wish to extend and broaden their course in Architecture can arrange a six-year schedule leading to the degree of B.S. in the College of Science, Literature, and the Arts; and B.S. in Architecture, in the College of Engineering and Architecture.

- 13.1. **ARCHITECTURAL HISTORY.** Technical study of the architecture of Ancient Egypt, Assyria, Persia, and Greece, with emphasis on the latter. Study of political, social, and economic conditions affecting the architecture of this period. Illustrated lectures and library research. FORSYTHE.
- 13.2. **ARCHITECTURAL HISTORY.** Technical study of the architecture of Ancient Rome and of the Renaissance in Italy to the end of the fifteenth century. Study of political, social, and economic conditions. Illustrated lectures and library sketches and research. FORSYTHE.
- 13.3. **ARCHITECTURAL HISTORY.** Technical study of the architecture of the Renaissance of the sixteenth and seventeenth centuries in Italy. Architecture of the Renaissance in Spain. Illustrated lectures and library research. FORSYTHE.
- 114.1. **ARCHITECTURAL HISTORY.** Technical study of the architecture of the Middle Ages; in Italy, France, and England; sources and influences in the development of the Romanesque and Gothic styles, particularly in France. Lectures and library research. MANN.
- 114.2. **ARCHITECTURAL HISTORY.** Technical study of developed Gothic architecture in France and England. Early Renaissance architecture in France and England, its sources and affecting influences. Lectures and library research. MANN.
- 114.3. **ARCHITECTURAL HISTORY.** Technical study of the development of architecture from the seventeenth century to and including the present time, particularly in France, England, and America. Lectures and library research. MANN.
- 22.1, 22.2, 22.3. **ELEMENTARY FREEHAND DRAWING.** Drawing with charcoal, pencil, pen and ink, and color from architectural ornament and details of the figure; drawing from memory. The course is arranged to give an appreciation of balance in light and shade. BURTON.
- 22.1, 22.2, 22.3. **ELEMENTARY FREEHAND DRAWING** for Science, Literature, and the Arts students. Same as above. BURTON.

- 23.1, 23.2, 23.3. **FREEHAND DRAWING.** Drawing from the antique in charcoal, pen and ink, pastel, and pencil. Painting from still life in oils and water-color. Study of the elementary principles of composition and of color arrangement. BURTON.
- 124.1, 124.2, 124.3. **FREEHAND DRAWING.** Drawing and painting from the antique and from life; figure composition. Study of draperies in preparation for work in decoration, figure composition and the application of the figure to mural decoration. Modeling in clay. BURTON.
- 31.1. **ELEMENTS OF ARCHITECTURE.** Exercises in instrumental drawing and architectural lettering. Theory and practice of wash rendering. Lectures and library research. JONES.
- 31.2. **ELEMENTS OF ARCHITECTURE.** Original problems in the architectural treatment of walls, floors, windows, and mouldings. Lectures and library research. JONES.
- 31.3. **ELEMENTS OF ARCHITECTURE.** Study of the elements, forms, and principles of architecture. Original problems in their use in elementary architectural design. Lectures and library research. MANN, JONES.
- 32.1, 32.2, 32.3.* **ARCHITECTURAL DESIGN.** Original problems dealing in general with elements of elevation and their composition into simple architectural units. Sketch problems dealing with elementary plan compositions. Individual criticism and library research. JONES.
- 33.1, 33.2, 33.3.† **ARCHITECTURAL DESIGN.** Original problems dealing in general with the elements of plan. Composition of simple complete buildings. Sketch problems dealing with plan composition. Individual and general criticism and library research. ARNAL.
- 134.1, 134.2, 134.3. **ARCHITECTURAL DESIGN.** Original problems dealing with composition of single buildings or groups of buildings and those of special character. Subjects of decorative or imaginative interest. Sketch problems. ARNAL.

* Work in all the design courses is carried on simultaneously and students pass from one to the next in sequence in varying lengths of time, according to their accomplishment, and irrespective of University time units. The normal time required to complete the design courses is three years. To students completing them in less, special advance work is open.

† By special arrangement in coöperation with the Minnesota Chapter of the American Institute of Architects, each junior architect, who has had less than one year of practical office experience, may be assigned to practical work in an architect's office either in Minneapolis or St. Paul. This work extends over not less than eighteen hours of each week during one quarter, and takes the place of one of the junior design courses, either Architecture 33.1, 33.2, or 33.3, and carries six credits.

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- 42.1, 42.2, 42.3. SPECIFICATIONS AND WORKING DRAWINGS. Preparation of plans and detailed working drawings of frame and masonry buildings. Specifications, measured drawings of important details of construction. Written reports from buildings under construction. FORSYTHE.
- 144.1, 144.2. MATERIALS OF CONSTRUCTION. The properties and processes of manufacture of building materials, and their uses in construction. MANN.
- 154.3. BUSINESS PRACTICE. Relations of the architect, owner, and builder; forms of contracts, professional ethics, and office administration. MANN.
- 164.1. HISTORY OF SCULPTURE AND PAINTING. Historical study of ancient, Renaissance, and modern sculpture and of the Renaissance and modern schools of painting. BURTON.
- 164.2. LANDSCAPE DESIGN. Theory and practice of landscape design. Lectures and design problems. (Lecturer to be appointed.)
- 164.3. DECORATION AND THE ALLIED ARTS. Color theory. History of decoration and ornament, furniture, weaving, glass making, etc. MANN.
- 72.1, 72.2, 72.3. ELEMENTS OF ARCHITECTURE. Beginning course for students in the Science, Literature, and Arts course in Architecture and Decoration. Parallel to Courses 31.1, 31.2, 31.3, with addition of instrumental and freehand drawing. JONES.

CHEMISTRY

Professors LAUDER W. JONES, CHARLES F. SIDENER; Associate Professor M. CANNON SNEED; Assistant Professors FRANK W. BLISS, ISAAC W. GEIGER; Instructor ARTHUR R. CADE.

COURSES

No.	Title	Credits	Required of	Prereq. courses
1	General Inorganic Chemistry	3½	Fr.	None
2	General Inorganic Chemistry	3½	Fr.	1
3	General Inorganic Chemistry	3½	Fr.	1, 2
11	Qualitative Chemical Analysis	3½	Elective	1, 2, 3 or 4, 5
20	Quantitative Analysis	3	Soph. M.E.	1, 2, 3

1. GENERAL INORGANIC CHEMISTRY. Designed for those who have had no high-school chemistry. A study of the general laws of chemistry, and of the non-metals and their compounds. Three lectures, four hours laboratory per week. BLISS, CADE, and Assistants.
2. GENERAL INORGANIC CHEMISTRY. A continuation of Course 1. BLISS, CADE, and Assistants.
3. GENERAL INORGANIC CHEMISTRY. A study of the metals and their compounds. A continuation of Course 2. BLISS, CADE, and Assistants.

11. **QUALITATIVE CHEMICAL ANALYSIS.** Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. Three lectures, four hours laboratory per week. BLISS, CADE, and Assistants.
20. **QUANTITATIVE ANALYSIS.** Introductory course covering general principles and methods, both gravimetric and volumetric. Work on various quantitative processes from the viewpoint of modern theories, proper methods of procedure and laboratory practice. One lecture, nine hours laboratory per week. SIDENER, GEIGER, and Assistants.

CIVIL ENGINEERING

Professor FREDERIC BASS; Associate Professors JOHN I. PARCEL, ALVIN S. CUTLER; Assistant Professors GEORGE A. MANEY, OTTO S. ZELNER; Instructor MAURICE B. LAGAARD; Professorial Lecturer ADOLPH F. MEYER.

COURSES

No.	Title	Credits	Required of	Prereq. courses
12.1f	Surveying	3	Soph. C.E.	Math. 11.3, Draw.
12.2w	Surveying	3	Soph. C.E.	C.E. 12.1
12.3s	Surveying	3	Soph. C.E.	C.E. 12.2
13.4	Surveying	3	Jr. C.E.	C.E. 12.3
13.6	Surveying	3	Jr. E.E., Elective	
			Sr. M.E.	
23.1w	Railway Engineering	3	Jr. C.E.	C.E. 13.1
23.2s	Railway Engineering	3	Jr. C.E.	C.E. 23.1
23.3su	Summer Camp	9	Jr. C.E.	C.E. 23.2
124.1f	Railway Engineering	3	Elective, sr. C.E.	C.E. 23.3
124.2w	Railway Engineering	3	Elective, sr. C.E.	C.E. 124.1
124.3s	Railway Engineering	3	Elective, sr. C.E.	C.E. 124.2
33.1f	Stresses in Structures	3	Jr. C.E.	Math. 12.3 Draw. 42.3
33.2w	Stresses in Structures	3	Jr. C.E.	C.E. 33.1
33.3s	Elementary Structural Design	3	Jr. C.E.	C.E. 33.2
134.1f	Bridge Analysis	3	Sr. C.E.	C.E. 33.3
134.2w	Bridge Design	3	Sr. C.E.	C.E. 134.1
134.3s	Bridge Design	3	Sr. C.E.	C.E. 134.2
33.5w	Structural Engineering	3	Jr. M.E.	Math. 12.3
33.6s	Structural Engineering	2	Jr. M.E.	C.E. 33.5
33.7f	Structural Engineering	3	Elective, jr. E.E.	Math. 12.3
33.8f	Stresses	3	Jr. Arch.	Math. 92.3
33.9w	Structural Design	3	Jr. Arch.	C.E. 33.8
43.1s	Reinforced Concrete	3	Jr. Arch.	Math. 92.3
144.1f	Masonry and Foundations	3	Sr. C.E.	Math. 53.2
144.2w	Reinforced Concrete	3	Sr. C.E.	C.E. 144.1
144.3s	Reinforced Concrete	3	Sr. C.E.	C.E. 144.2
144.4	Reinforced Concrete	2	Elective (sr. M.E., sr. E.E.)	Math. 33.1 and 23.3
53.1f	Highways and Pavements		Elective, jr., C.E.	C.E. 12.2
53.2w	Highways and Pavements		Elective, jr. C.E.	C.E. 12.2
53.3s	Municipal Engineering		Jr. C.E.	

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No.	Title	Credits	Required of	Prereq. courses
164.1f	Hydrology.....	4	Sr. C.E.	
164.2w	Water Supply.....	4	Sr. C.E.	Math. 53.2
164.3s	Sanitary Engineering.....	3	Sr. C.E.	Math. 53.2
164.4	Water Power.....	3	Elective, sr. C.E.	Math. 53.2
174.1	Building Sanitation.....	2	Sr. Arch.	
225.1	Railway Administration.....			C.E. 24.2
225.2	Railway Terminals and Yards....			C.E. 24.2
265.1	Water and Sewage Purification...			C.E. 164.2
265.2	Water and Sewage Laboratory...			C.E. 164.2
265.3	Hydraulic Laboratory.....			C.E. 164.4
255.1	Highway Laboratory.....			C.E. 53.1, 53.2
275.1	Building Sanitation.....			
275.2	City Planning.....			C.E. 53.1
275.3	Industrial Sanitation.....			
265.4	Water Power.....			C.E. 164.4
265.5	Drainage and Flood Control....			C.E. 164.1
265.6	River Improvement.....			C.E. 164.1
235.1	Indeterminate Structures.....			C.E. 134.3, 144.2
235.2	Advanced Structural Design.....			C.E. 134.3, 144.2
255.2	Highway Administration.....			C.E. 53.1, 53.2
245.3	Cement and Concrete Laboratory.			C.E. 144.3
235.3	Structural Laboratory.....			C.E. 134.3
245.4	Reinforced Concrete Analysis....			C.E. 144.3

- 12.1f. SURVEYING. Field problems; use of chain, compass, transit and level. Computation and platting of surveys made in the field. Determination of area by D. M. D. method and planimeter. CUTLER,
- 12.2w. SURVEYING. Lectures and drawing room. Platting of maps, profiles and cross-sections. Computation of earthwork quantities. U. S. Public Land Surveys. Conventional signs. ZELNER,
- 12.3s. SURVEYING. Adjustments of instruments, profile and differential leveling, transit surveys, stadia method. CUTLER,
- 13.4. SURVEYING. A complete topographical survey, stadia method, is made and platting. ZELNER.
- 13.6. SURVEYING. A short course in the use, care, and adjustment of surveying instruments. Methods of leveling and transit surveys. Offered to students other than Civil Engineers.
- 23.1w. RAILWAY ENGINEERING. A study of U.S.G.S. and railroad topographic maps with special reference to the location of a railway. A general survey of the problem of railway location, including grades, curvature, rise and fall, etc. CUTLER.
- 23.2s. RAILWAY ENGINEERING. Field and drafting room. Simple, compound, and spiral curves. Observations for determination of meridian. Elements of hydrographic and precise surveying. All preparatory to more extended work in Summer Camp. CUTLER, ZELNER.
- 23.3su. SUMMER CAMP. Six weeks immediately preceding the beginning of the senior year. Continuation of Course 23.2s, including extended

- railroad, topographic, hydrographic, and triangulation surveys. CUTLER, ZELNER.
- 124.1f. RAILWAY ENGINEERING. Design and construction of railroad buildings and structures; culverts, wooden trestles, switches, cross-overs, crossing frogs, etc. Method of computing earthwork, and estimates and reports. Distribution of material by means of mass diagram. CUTLER.
- 124.2w. RAILWAY ENGINEERING. Train resistance, ruling and momentum grades, curvature, distance, rise and fall, as factors in location and operation of railroads. Train loading, acceleration, retardation; locomotives and equipment. Operating costs governing grade revision. CUTLER.
- 124.3s. RAILWAY ENGINEERING. Lectures, office work, and field inspection. Design and operations of various types of yards and terminals, and terminal facilities, including the hump, engine house, coal and water station. Signalling and interlocking. CUTLER.
- 33.1f. STRESSES IN STRUCTURES. Algebraic and graphic analysis of various types of roof and bridge trusses for fixed loading. PARCEL.
- 33.2w. STRESSES IN STRUCTURES. Moving loads and influence lines. Standard engine loadings and equivalent uniform loads. PARCEL.
- 33.3s. ELEMENTARY STRUCTURAL DESIGN. Designing principles and methods. Complete design and detail drawing of framed mill building bent. PARCEL.
- 134.1f. BRIDGE ANALYSIS. Stresses in simple span railway bridge trusses of the larger type. Baltimore, Petit, Whipple, and "K" trusses. MANEY.
- 134.2w. BRIDGE DESIGN. Design and detail drawing of railway plate girder viaduct. MANEY.
- 134.3s. BRIDGE DESIGN. Complete design and detail drawing of railway pin truss span. MANEY.
- 144.1f. MASONRY AND FOUNDATIONS. Brief study of masonry structures in general. Theory of earth pressure; walls, footings, dams, ordinary and deep foundations. MANEY.
- 144.2w. REINFORCED CONCRETE. Principles of reinforced concrete. Theory of beams, slabs, and columns and the application to ordinary structures. MANEY.
- 144.3s. REINFORCED CONCRETE DESIGN. Continuation of 144.2 with especial emphasis on the practical features of the design of buildings, bridges, retaining walls, etc. MANEY.

- 33.5w. STRUCTURAL ENGINEERING (for Mechanical Engineers). Analysis of stresses in simple structural frames. Roof trusses, crane trusses, mill building bent. MANEY.
- 33.6s. STRUCTURAL ENGINEERING (for Mechanical Engineers). Brief treatment of main features in design of beams, columns, plate girder and roof truss. MANEY.
- 33.7w. STRUCTURAL ENGINEERING (for Electrical Engineers). Short course covering similar ground to Courses 33.5 and 33.6. MANEY.
- 33.8f. STRESSES IN STRUCTURES. Application of laws of equilibrium to simple structures. Special emphasis is placed on graphic methods. MANEY.
- 33.9w. STRUCTURAL DESIGN. General principles of structural design. Girders, columns, and roof trusses. MANEY.
- 43.1s. REINFORCED CONCRETE. Brief course in theory and designing methods with special reference to buildings. MANEY.
- 144.4 REINFORCED CONCRETE. A short course for mechanical and electrical engineers embracing the principal features of 144.2. LAGAARD.
- 53.1f. HIGHWAYS AND PAVEMENTS. Elementary course with field inspection, relating to the economics, location, construction, and maintenance of highways and pavements. BASS,
- 53.2w. HIGHWAYS AND PAVEMENTS. Continuation of Course 53.1, with laboratory practice.
- 53.3s. MUNICIPAL ENGINEERING. Development of municipal public works. City planning, transportation, and housing. The principles of public health and sanitation. Public water supplies, sewerage and sewage disposal, refuse collection and disposal, the sanitation of buildings. BASS.
- 164.1f. HYDROLOGY. Rainfall, evaporation, transpiration, percolation, runoff. Flood and low water flows of streams. Storage for use in water supply, water power, irrigation, and navigation. Mass curves and frequency curves. BASS,
- 164.2w. WATER SUPPLY ENGINEERING. Sources of water supply; quality of water. Laboratory methods of testing water; wells, surface water intakes, conduits and pipe lines, distribution systems, and purification plants. Selection of pumping machinery and motive power. BASS.
- 164.3s. SANITARY ENGINEERING. Quantities of sewage and storm water; precipitation and run-off. Sanitary sewer system for a small community; storm water system for a city district. Stream pollution and sewage disposal. BASS.

- 164.4. WATER POWER. Types of low, medium, and high head developments. Details of developments; spillway dams; hollow reinforced concrete dams, arch dams, high masonry dams, movable dams. Turbine settings and characteristics.
- 174.1. BUILDING SANITATION. The location and orientation of buildings; lighting, ventilation, water supply, plumbing, sewage, and refuse disposal. BASS.
- 225.1. RAILWAY ADMINISTRATION. An analysis of railway organization and methods of management and operation. Principles of valuation and rate making. CUTLER.
- 225.2. RAILWAY TERMINALS AND YARDS. A continuation of Course 124.3. CUTLER.
- 265.1. WATER AND SEWAGE PURIFICATION. Continuation of Course 164.3. Design of water purification, sewage disposal, and refuse disposal plants. BASS.
- 265.2. WATER AND SEWAGE LABORATORY. Principles and practice of operation of typical water purification and sewage disposal works. BASS.
- 265.3. HYDRAULIC LABORATORY. Study of special hydraulic problems in laboratory, drafting room, and field.
- 255.1. HIGHWAY LABORATORY. Investigations in cooperation with State Highway Department. BASS,
- 275.1. BUILDING SANITATION. A design course in the sanitation of buildings. Heating and ventilating, plumbing, lighting. Housing problems. BASS, ROWLEY.
- 275.2. CITY PLANNING. The physical elements of the city; topography, drainage, geology. Public works and structures. Street arrangements; rapid transit; railroad terminals. City districting. Sub-surface structures. Esthetic features of the city; the civic center; parks; boulevards; public buildings. BASS, MANN.
- 275.3. INDUSTRIAL SANITATION. Principles of public health. Methods in use for prevention of disease. Sanitation and hospital service in factory buildings and grounds. Housing problems. Welfare work. BASS.
- 265.4. WATER POWER. Detailed design of hollow reinforced concrete arch, and high masonry dams. Design of power house from forebay to tailrace for typical developments. Pipe lines, reservoirs, surge tanks. Inspection of plants.
- 265.5. DRAINAGE AND FLOOD CONTROL. Study of special problems.

- 265.6. RIVER IMPROVEMENTS. River hydraulics and the maintenance of regimen. The improvement of rivers for navigation, etc. The economics of water transportation.
- 235.1. STATICALLY INDETERMINATE STRUCTURES. General theory deflections and statically indeterminate stresses and its application to continuous girders, swing bridges, arches, redundant members, secondary stresses, and wind stresses in office buildings. PARCEL, MANEY.
- 235.2. ADVANCED STRUCTURAL DESIGN. Fundamental theory of stresses applied to special problems. Stress distribution in girders, riveted joints. Bending of straight bar. Built up compression members. Impact and fatigue. Relative economy in design. Comparative study of specifications. PARCEL.
- 255.2. HIGHWAY ADMINISTRATION. Problems of highway administration and finance. BASS,
- 245.3. CEMENT AND CONCRETE LABORATORY. Laboratory technique and experimental investigation of special problems in cement, concrete, and reinforced concrete. LAGAARD.
- 235.3. STRUCTURAL LABORATORY. Similar to 245.3, but dealing mainly with experimental problems in structural steel. Strain gauge study of actual stress distribution in beams, columns, and riveted joints. LAGAARD, MANEY.
- 245.4. REINFORCED CONCRETE ANALYSIS. Critical review of the literature of reinforced concrete and study of the advanced theory. Study of test data and analysis of stresses in reinforced concrete structures. LAGAARD, MANEY.

DRAWING AND DESCRIPTIVE GEOMETRY

Professor WILLIAM H. KIRCHNER; Assistant Professor ROBERT W. FRENCH; Instructors LEON ARCHIBALD, HOWARD D. MYERS.

COURSES

No.	Title	Credits	Required of	Prereq. courses
11.1	Engineering Drawing	2½	Fr. Eng.	Solid geometry
11.2	Engineering Drawing	2½	Fr. Eng.	11.1
21.3	Descriptive Geometry	2½	Fr. Eng.	11.2
42.1	} Drafting	6	Soph. C.E.	21.3
42.2				42.1
42.3				42.2
52.1	} Drafting	6*	Soph. E.E. & M.E.	21.3
52.2				52.1
52.3				52.2

* Students in Mechanical Engineering take only two quarters, four credits, Courses 52.1 and 52.2.

No.	Title	Credits	Required of	Prereq. courses
31.1	} Graphics	4	Fr. Arch.	
31.2				
31.3				
13.2s	Lettering	1 or 2	Elective	
111-12	Advanced Descriptive Geometry.....	6	Elective	21.3, Math. 74
113	Perspective	3	Elective	31.3

- 11.1. **ENGINEERING DRAWING.** The elements of drafting including an introductory course in the science of representation and constructive geometry. Sketching, lettering, projections, working drawings, conventions, standards, tracing and blue printing. Also open to students taking Math. 10.1. **KIRCHNER, FRENCH, ARCHIBALD.**
- 11.2. **ENGINEERING DRAWING.** A continuation of Course 11.1.
- 21.3. **DESCRIPTIVE GEOMETRY.** An elementary course in the methods of representation, correlated in part with analytical geometry. Lectures, demonstrations, and drawing room exercises. **KIRCHNER, FRENCH, ARCHIBALD.**
- 42.1. **DRAFTING (for Civil Engineers).** Drawing of structures and machines. Detail, assembly, and construction drawings. The solution of problems of simple structures. **FRENCH.**
- 42.2. **DRAFTING (for Civil Engineers).** Continuation of Course 42.1. Drafting problems in concrete, highway and topographical work as met by the civil engineering draftsman in practice. Intersections, developments, and other practical geometric problems. **FRENCH.**
- 42.3. **DRAFTING (for Civil Engineers).** Continuation of Course 42.2.
- 52.1. **DRAFTING (for Electrical and Mechanical Engineers).** The application of descriptive geometry to drafting room problems in sheet metal work, belting, conveyors, and connections. Working drawings and tracing.
- 52.2. **DRAFTING (for Electrical and Mechanical Engineers).** The application of elementary formulae in the proportioning of simple machine parts such as shafting, cams, pulleys, helical springs, and toothed gearing. Tracing and blue printing.
- 52.3. **DRAFTING (for Electrical Engineers).** A continuation of Course 52.2, including outline and assembly drawings, structural drafting, the development of simple formulae, and graphical methods.
- 31.1, 31.2, 31.3. **GRAPHICS (for Architects).** Lectures and exercises in constructive and descriptive geometry, with applications. Shades and shadows. Pure and applied perspective. **KIRCHNER.**
- 13.2s. **LETTERING.** The analysis of the alphabets. Exercises in Roman and Gothic lettering. Design and composition of the paragraph and the title. **KIRCHNER and Assistants.**

- 111-12. **ADVANCED DESCRIPTIVE GEOMETRY.** Methods of representation; parallel and central projection. Geometrography, axonometry, and photogrammetry. **KIRCHNER.**
113. **PERSPECTIVE.** The principles and practice of perspective, including shadows, reflections, distortions, corrections, systems, methods, the practical problem, and inverse constructions. **KIRCHNER.**

ECONOMICS

Professors **WILLARD E. HOTCHKISS, GEORGE W. DOWRIE, E. DANA DURAND,* JOHN H. GRAY;** Professorial Lecturer **J. FRANKLIN EBERSOLE;** Associate Professors **ROY G. BLAKEY, WILLIAM W. CUMBERLAND;* Assistant Professors JOHN D. BLACK, J. HUGH JACKSON, E. CLYDE ROBBINS, THOMAS H. SANDERS;** Instructors **HELEN HARRISON, ALBERT C. JAMES, J. WARREN STEHMAN;** in the General Extension Division, Associate Professors **CHARLES H. PRESTON, CLARE L. ROTZEL.**

COURSES

No.	Title	Credits	Required of	Prereq. courses
3f-4w-5s	General Economics	9	Elective	None
15, 16, 17	Economic Problems for Engineers	9	Sr. E.E.	None
25f-26w	Accounting Principles	6	Elective	None
52†	Corporation Finance	3	Elective	3f-4w-5s
85f-86w	Marketing of Products	6	Elective	3f-4w-5s
87†	Advertising	3	Elective	15 cr. incl. 85f-86w
88s	Retail Marketing	3	Elective	15 cr. incl. 85f-86w
95w-96s	Office Management	6	Elective	3f-4w-5s
101-102†	Theory and Practice of Statistics	6	Elective	15 cr. incl. 3f-4w-5s
103f-104w-105s	Adv. Economic Theory	9	Elective	3f-4w-5s
123†	Business Organization and Management	3	Elective	3f-4w-5s
124†	Business and Government	3	Elective	3f-4w-5s
131†	Cost Accounting	3	Elective	25f-26w
134f-135w-136s	Auditing	6	Elective	137w-138s
137w-138s	Accounting Problems	6	Elective	25f-26w
141†	Investments	3	Elective	3f-4w-5s
143f-144w	Principles of Banking	6	Elective	3f-4w-5s
145s	International Exchange	3	Elective	144w
146†	Panics, Commercial Crises, and Cycles of Trade	3	Elective	143f-144w
164w-165s	Constitutional Aspects of Social and Industrial Legislation	6	Elective	Elect. as Pol. Sci. 109s
167s	Industrial Relations	3	Elective	3f-4w-5s
191s	Public Finance	3	Elective	3f-4w-5s

† Quarter in which course is to be given to be announced.

* Absent on leave.

- 3f-4w-5s. GENERAL ECONOMICS. Principles that underlie the present industrial order and the main public economic problems of to-day, such as the labor movement, social insurance, railway, trust and other economic problems. JAMES, ROBBINS, STEHMAN.
- 15, 16, 17. ECONOMIC PROBLEMS FOR ENGINEERS. Effect of industrial development; international commerce; corporation organization and finance; banking and credit; public ownership and finance; trusts, monopolies; transportation problems, insurance, conservation, labor problems. Lectures, textbook, talks by men actively engaged in fields studied.
- 25f-26w. PRINCIPLES OF ACCOUNTING. The purpose and principles of account classification; capital and revenue; accruals; valuation; depreciation, preparation and interpretation of balance sheets, income accounts, and other statements; corporation accounts. A laboratory course with supplementary lectures. JACKSON, SANDERS.
- 52.† CORPORATION FINANCE. The organizing, financing, and managing of corporations. The relation of the government to the corporation. The operations of the stock exchange and a study of corporate securities for purposes of promotion and organization. STEHMAN.
- 85f-86w. MARKETING OF PRODUCTS. Domestic merchandising methods of manufacturers. Problems of wholesalers and commission men; distributing system and market organization; price policies. JAMES.
- 87.† ADVERTISING. Functions and principles of advertising; advertising media; planning and executing an advertising campaign. Copy. JAMES.
- 88s. RETAIL MARKETING. Problems and methods of the so-called regular retailer, department store and chain store. Development of retail trade centers. Coöperation between the retailer and the local board of trade. The retailer and the consumer. JAMES.
- 95w-96s. OFFICE MANAGEMENT. Functions of the office in business, principles of efficiency applied to daily routine; the layout, equipment and flow of work in an office; standardization of stenographic work; filing; proofreading; practice with modern office appliances. HARRISON.
- 101-102.† THEORY AND PRACTICE OF STATISTICS. Principles of collection, tabulation, and interpretation of statistical material, illustrated by present-day statistical data. Lectures, assigned readings, and special investigations by individual members of the class.
- 103f-104w-105s. ADVANCED ECONOMIC THEORY. Intensive study of important economic principles. Special stress upon theory of value and distribution. Critical examination of doctrines of important individual writers and schools of economic thought. DOWRIE.

†Quarter in which course is to be given to be announced.

- 123.† BUSINESS ORGANIZATION AND MANAGEMENT. Organization: principles applying to business in general and to particular concerns, evolution, objects, adjustments, limits, functional division; specialization, functional and other forms. Standardization. Management: coördination of functions, handling of men, employment, external versus internal factors. HOTCHKISS.
- 124.† BUSINESS AND GOVERNMENT. Business expansion, diversification, and conflicting interests. Laissez-faire versus regulation. Enforcement of minimum standards. Administration of business legislation. Coöperation between government and business. Public coördination of business forces. Reaction of emergency measures on permanent policy. HOTCHKISS.
- 131.† COST ACCOUNTING. Analysis of production cost; methods of record materials, labor and machine costs; apportioning indirect expenses; relation of cost to general accounts; use of cost data to enforce operating efficiency. Laboratory with lectures. JACKSON, SANDERS.
- 134f-135w-136s. AUDITING. Preparation for, and conduct of, an audit; the auditor's report and certification, and legal responsibilities. Text-book, assigned readings, class discussions, and lectures. ROTZEL.
- 137w-138s. ACCOUNTING PROBLEMS. A study of the preparation of business and financial statements, chiefly from the standpoint of administrative statistics; based on problems from C.P.A. examinations and other sources. JACKSON.
- 141f. INVESTMENTS. The social process of saving and investment; government, municipal, corporation, and real estate loans; stock exchange operations and money market influences as they affect the prices and net yield of prime securities. EBERSOLE.
- 143f-144w. PRINCIPLES OF MONEY AND BANKING. Contemporary banking institutions, their organization and operation; loans, reserves, note issues, clearing houses, domestic and foreign exchange; the banking systems of foreign countries; and the Federal Reserve Banks of the United States. DOWRIE.
- 145s. INTERNATIONAL EXCHANGE. Theory of international exchange, pars of exchange with gold, silver, and paper standard countries; the rates of exchange; financing imports and exports; bankers' bills; futures; arbitrage; specie movements; the present foreign exchange situation. DOWRIE.
- 146.† PANICS, COMMERCIAL CRISES, AND CYCLES OF TRADE. American business conditions since 1890 with regard to the great cycles of alternate prosperity and depression; and financial panics. Critical

†Quarter in which course is to be given to be announced.

examination of all the available business barometers designed to forecast similar conditions. EBERSOLE.

164w-165s. CONSTITUTIONAL ASPECTS OF SOCIAL AND INDUSTRIAL LEGISLATION.

167s. INDUSTRIAL RELATIONS. Relation of employer and worker in industrial enterprises; theory and mechanism of collective bargaining and joint agreements for establishing wages and other conditions of employment and adjustment of grievances. Recent developments in industrial relations. HOTCHKISS.

191s. PUBLIC FINANCE. Public expenditures; public debt; budgetary legislation, tax systems. BLAKEY.

ELECTRICAL ENGINEERING

Professors GEORGE D. SHEPARDSON, FRANK W. SPRINGER; Assistant Professor WILLIAM T. RYAN; Professorial Lecturer CHARLES L. PILLSBURY; Instructors EDWIN R. MARTIN, GEORGE W. SWENSON.

COURSES

No.	Title	Credits	Required of	Prereq. courses
12.1f	Elements of Electrical Eng.	3	Soph. E.E.	Reg. in Physics
12.3w	Elements of Electrical Eng.	3	Soph. E.E.	12.1
12.5s	Elements of Electrical Eng.	3	Soph. E.E.	12.3
23.1f	Direct Current Machinery.	3	Jr. E.E.	12.5
23.2f	Direct Current Mach. Lab.	2	Jr. E.E.	12.5
23.3w	Direct Current Machinery.	3	Jr. E.E.	23.1
23.4w	Direct Current Mach. Lab.	2	Jr. E.E.	23.2
23.5s	Direct Current Machinery.	3	Jr. E.E.	23.3
23.6s	Direct Current Mach. Lab.	2	Jr. E.E.	23.4
124.51f	Alternating Currents.	3	Sr. E.E.	23.5
124.52f	Alternating Current Lab.	2	Sr. E.E.	23.6
124.53w	Alternating Currents.	3	Sr. E.E.	124.51
124.54w	Alternating Current Lab.	2	Sr. E.E.	124.52
124.55s	Alternating Currents.	3	Sr. E.E.	124.53
124.56s	Alternating Current Lab.	2	Sr. E.E.	124.54
225.14w, s	High Tension Testing.	2	Elective	124.52
225.25f, w, s	Transients.	2	Elective	124.51
225.26f, w	Transients Laboratory.	2	Elective	124.52
225.27w, s	Transients.	2	Elective	225.25
225.28w, s	Transients Laboratory.	2	Elective	225.26
225.29s	Transients.	2	Elective	225.27
225.30s	Transients Laboratory.	2	Elective	225.28
134.58	Electrical Design.	4	Sr. E.E.	124.51
235.62f, w, s	Advanced Design.	2-4	Elective	134.58
235.64w, s	Advanced Design.	2-4	Elective	225.62
144.11f	Electric Wiring and Equip.	2	Sr. Arch.	Physics
144.21f	Electric Power.	3	Sr. Mines	Physics
144.23w	Electric Power.	4	Sr. Civil	Physics
144.25f	Electric Power.	3	Sr. M.E.	Physics
144.27w	Electric Power.	3	Sr. M.E. and Chem.	Physics 144.25

No.	Title	Credits	Required of	Prereq. courses
144.29s	Electric Power	3	Sr. M.E. and Chem.	144.27
144.64f, w, s	Power Plant Operation	1	Elective	23.6 or 144.25
144.67f, w, s	Batteries and Elec. Vehicles	1	Elective	23.5 or 144.25
144.71f, w, s	Railway Electrical Eng.	2	Elective	23.5, 144.23, or 144.29
144.73w, s	Railroad Electrification	2	Elective	144.71
245.5f, w, s	Central Stations	2	Elective	124.51 or 144.29
245.7f, w, s	Electrical Transmission	2	Elective	124.51 or 144.29
245.11f, w, s	Elec. Equip. of Buildings	2	Elective	23.5 or 144.11 or 144.29
154.65f, w, s	Electric Lighting	2	Elective	Physics
154.66f, w, s	Photometric Laboratory	1-2	Elective	23.5, 144.11 or 144.25
255.51f, w, s	Illuminating Engineering	2	Elective	154.65
255.52f, w, s	Illuminating Laboratory	1-2	Elective	154.66
164.83f, w, s	Electrical Communication	2-3	Elective	23.5 or 144.25
265.19f, w, s	Telegraph and Telephone Apparatus	2-3	Elective	123.51
265.21w, s	Tel. and Tel. Circuits	2-3	Elective	265.19
265.23f, w, s	Radio Signaling	2-3	Elective	124.51
265.25w, s	Radio Signaling	2-3	Elective	265.23
184.83w, s	Undergraduate Thesis	2-3	Elective	124.51
285.56f, w, s	Adv. Electrical Laboratory	2-4	Elective	23.6
285.58w, s	Adv. Electrical Laboratory	2-4	Elective	285.56
285.60s	Adv. Electrical Laboratory	2-4	Elective	285.58
285.70f, w, s	Precise Elec. Measurements	2-4	Elective	124.52
285.72w, s	Precise Elec. Measurements	2-4	Elective	285.70
285.74s	Precise Elec. Measurements	2-4	Elective	
285.76	Graduate Thesis	3-9	Gr.	124.55
285.78	Graduate Thesis, continued	3-9	Gr.	285.76
285.80	Graduate Thesis, concluded	3-9	Gr.	285.78
194.77f, w, s	Journal Reading	1	Elective	23.5
194.79w, s	Journal Reading	1	Elective	23.5
194.81s	Journal Reading	1	Elective	23.5
295.8f, w, s	Electrical Ignition	2	Elective	124.53
295.45f, w, s	Electrochemistry	2	Elective	23.6 or 144.29
295.69s	Valuation of Public Utilities	1	Elective	

12.1, 12.3, 12.5. ELEMENTS OF ELECTRICAL ENGINEERING. Introduction to the development, principles, materials, safety, and general application of electrical engineering. Lecture, class, and laboratory. Open to students registered for Physics. SHEPARDSON, SWENSON.

23.1, 23.3, 23.5. DIRECT CURRENT MACHINERY. Electrical engineering measuring instruments and their use, units, theory of dynamo-electric machinery, methods of regulation, construction and operation of generators and motors, methods of testing. SPRINGER.

23.2, 23.4, 23.6. DIRECT CURRENT MACHINERY LABORATORY. To be taken with Courses 23.1, 23.3, 23.5. Electrical engineering measurements, calibration of instruments, operation and characteristic curves of generator and motor. Lectures and practice. SPRINGER, MARTIN.

- 124.51, 124.53, 124.55. ALTERNATING CURRENTS. Phenomena, measurement, and use of alternating currents, theory of line, transformer, generator, and motor, types of apparatus. RYAN.
- 124.52, 124.54, 124.56. ALTERNATING CURRENT LABORATORY. To be taken with Course 124.51, 124.53, and 124.55. Experimental study of alternating currents, regulation and efficiency tests of alternators, transformers, motors, and rotaries. SPRINGER, RYAN.
- 225.14. HIGH TENSION TESTING. Low frequency pressure to 320,000 volts, high frequency to several million volts, applied to study of dielectric phenomena, such as testing of high tension transmission cables, transformer oil, transmission line insulators. Laboratory and library reference course. SPRINGER.
- 225.25, 225.27, 225.29. TRANSIENT ELECTRIC PHENOMENA. Transient phenomena accompanying change of circuit conditions. Abnormal currents, voltages, frequencies produced by switching, short circuits, arcing grounds; distributed capacity, inductance, standing waves, etc.; power and energy of complex circuits.
- 225.26, 225.28, 225.30. TRANSIENTS LABORATORY. Experimental study of transient electric phenomena by oscillographic and other methods.
- 134.58. ELECTRICAL DESIGN. The design of direct current generators and motors, and alternating current transformers; complete working drawings and specifications to accompany each design. The design of alternating current generators and motors and switch-boards. RYAN.
- 235.62, 235.64. ELECTRICAL DESIGN. Special problems. RYAN.
- 144.11f. ELECTRIC WIRING AND EQUIPMENT. Elementary principles of direct and alternating current circuits. Interior wiring and electrical equipment of buildings. Elements of calculation of illumination. Some detailed study of plans and specifications. For senior Architects. RYAN.
- 144.21f. ELECTRIC POWER. Similar to Course 144.23w. For senior students in the School of Mines. Open to seniors in General Engineering, and in Architecture. RYAN, SWENSON.
- 144.23w. ELECTRIC POWER. Elementary principles of continuous currents, generators, and motors. Elementary principles of alternating currents, generators, transformers, and motors. Measurement of power. Elementary principles of transmission and distribution. Lectures, recitations, and laboratory work. For seniors in Civil Engineering. RYAN, SWENSON.
- 144.25, 144.27, 144.29. ELECTRIC POWER. An elementary study of the problems involved in the generation, distribution, measurement, and

utilization of electric power. Lectures, recitations, and laboratory work, supplemented by numerous problems. For seniors in Mechanical Engineering and Chemistry. MARTIN.

- 144.64. POWER PLANT OPERATION. Practice in operation and care of gas producer, gas engine, boilers, engines, turbine, dynamos, battery, switch-boards, and auxiliary apparatus of the University Lighting Plant. RYAN, MARTENIS, DIXON.
- 144.67. BATTERIES AND ELECTRIC VEHICLES. Theory of the storage battery as used in electric trucks and automobiles; electric automobile equipment; charging devices, such as mercury arc and vibrating rectifiers and special synchronous converters. RYAN, MARTIN.
- 144.71. RAILWAY ELECTRICAL ENGINEERING. History, development, economics, principles of mechanics applied to electric train movements, motor characteristics, control systems, substations, railway problems, speed time curves, and time schedules. Lectures and recitations. MARTIN.
- 144.73. STEAM RAILROAD ELECTRIFICATION. Reasons for electrification, study of European and American systems, trolley and third-rail construction, variation in locomotive design, performance as compared to steam locomotives, electrical features, results of electrification as to service and economy. Lectures, assignments. MARTIN.
- 245.5. CENTRAL STATIONS. Electric power generating stations and distributing systems; load diagrams; selection of prime movers and units; cost of electrical energy; methods of charging; maintenance of plants; emergencies. RYAN.
- 245.7. ELECTRICAL TRANSMISSION. Considerations involved in the designing and building of transmission lines, Kelvin's law and its limitations, the transmission line as a mechanical structure, lightning arresters, study of particular high-tension lines. RYAN.
- 245.11. ELECTRIC EQUIPMENT OF BUILDINGS. Lectures on electrical equipment of modern office and factory buildings. Detailed study of plans and specifications. Inspection and reports on jobs under construction and after completion. Special lecturers.
- 154.65. ELECTRIC LIGHTING. Principles of vision, photometers, and measurement of light, methods and calculations of illumination, various sources of light, development of electric illuminants, distribution systems. Lectures and problems. SHEPHARDSON.
- 154.66. PHOTOMETRIC LABORATORY. Photometric studies of incandescent and arc electric lamps, gas and oil lamps. Bench and radial photometers and illuminometers. SHEPHARDSON, MARTIN.
- 255.51f,w,s. ILLUMINATING ENGINEERING. Performance of electric and gas lamps, reflectors and diffusers, luminous efficiency, distribution,

- color characteristics, physiological phenomena, methods of determining location, kind, and quantity of light for obtaining desired illumination. SHEPHARDSON.
- 255.52f,w,s. ILLUMINATION LABORATORY. Laboratory tests of shades and fixtures. Tests of lighting installations. SHEPHARDSON, MARTIN.
- 164.83f,w,s. ELECTRICAL COMMUNICATION. An introductory course on the various methods of electrical communication, discussing the field, the general problems and the limitations of each. Lectures and laboratory. SHEPHARDSON, SWENSON.
- 265.19f,w,s. TELEGRAPH AND TELEPHONE APPARATUS. Theoretical and experimental study of apparatus used for signaling, telegraphy, and telephony. Lecture and laboratory. SHEPHARDSON, SWENSON.
- 265.21w,s. TELEGRAPH AND TELEPHONE CIRCUITS. Theoretical and experimental study of telephone circuits and the phenomena of telephonic transmission, applications of hyperbolic functions to line phenomena. Lectures and laboratory. SHEPHARDSON, SWENSON.
- 265.23f,w,s. RADIO-SIGNALING. Maxwell's electromagnetic theory, Hertz's experimental work, phenomena of electric oscillations, generation and reception of damped and undamped waves, propagation of electromagnetic waves through space, detectors, measuring instruments, effect of earth's curvature. Lecture and laboratory.
- 265.25w,s. RADIO-SIGNALING. Continuation of Course 265.23.
- 184.83w,s. UNDERGRADUATE THESIS. An investigation of some approved problem in electrical engineering. SHEPHARDSON, SPRINGER, RYAN, MARTIN, SWENSON.
- 285.56f,w,s. ADVANCED ELECTRICAL LABORATORY. Efficiency tests and special problems.
- 285.58w,s. ADVANCED ELECTRICAL LABORATORY. Continuation of Course 285.56.
- 285.60s. ADVANCED ELECTRICAL LABORATORY. Continuation of Course 285.58.
- 285.70f,w,s. PRECISE ELECTRICAL ENGINEERING MEASUREMENTS. Lectures and laboratory work. Precise measurements of resistance, voltage, current, self-induction, and capacity; standardization of measuring instruments. SPRINGER.
- 285.72w,s. PRECISE ELECTRICAL ENGINEERING MEASUREMENTS. Continuation of Course 285.70.
- 285.74s. PRECISE ELECTRICAL ENGINEERING MEASUREMENTS. Continuation of Course 285.72.

- 285.76. GRADUATE THESIS. An investigation of an approved problem in Electrical Engineering. The major work of the graduate year will center about the thesis, which should constitute a real contribution to knowledge.
- 285.78w. GRADUATE THESIS. Continuation of Course 285.76.
- 285.80s. GRADUATE THESIS. Continuation of Course 285.78.
- 194.77f,w,s. JOURNAL READING. Weekly discussion of current electrical periodicals. SHEPHARDSON.
- 194.79w,s. JOURNAL READING. Continuation of Course 194.77.
- 194.81s. JOURNAL READING. Continuation of Course 194.79.
- 295.8f,w,s. ELECTRICAL IGNITION AND AUTOMOBILE ELECTRICAL ACCESSORIES. Oscillographic, rotating mirror, rotating gap, and electrical measurements applied to the study of ignition apparatus; characteristics of automobile accessories, such as generators, starters, controllers, electrical transmitting devices, etc Laboratory and lectures. SPRINGER.
- 295.45f,w,s. ELECTROCHEMICAL ENGINEERING. Theoretical and experimental study of the engineering problems of electrolytic and electrothermal processes. SHEPHARDSON.
- 295.69s. VALUATION OF PUBLIC UTILITY PROPERTIES. Cost of organizing and securing capital, discounts on bonds, fees; franchise values. Depreciation and obsolescence, deferred maintenance. Public utilities, fair rates and returns, regulation of natural monopolies. PILLSBURY.

EXPERIMENTAL ENGINEERING

Professors JOHN R. ALLEN, WILLIAM E. BROOKE; Associate Professors WILLIAM F. HOLMAN, FRANK B. ROWLEY, CHARLES F. SHOOP; Instructor AMOS F. MOYER.*

COURSES

No.	Title	Credits	Required of	Prereq. courses
C.E.235.3	Structural Laboratory.....			C.E. 34.3
C.E.245.3	Cement and Concrete Lab...			C.E. 144.3
C.E.265.2	Water and Sewage Lab.....			C.E. 164.2
C.E.265.3	Hydraulic Laboratory.....			C.E. 164.4
M. & M.43.1	Materials Testing Lab.....	1	Juniors	M. & M. 33.1
M. & M.43.2w	Materials Testing Lab.....	1½	Jr. E.M. & Met.E.	
M. & M.63.2	Hydraulic Laboratory.....	1	Juniors	M. & M. 53.2
M.E.83.1f,w	Elementary M.E. Lab.....	1½	Jr. M.E., sr. E.E.	Reg. in 43.2 or 44.4
M.E.83.2s	Steam Laboratory.....	1½	Jr. M.E.	Reg. in 43.3
M.E.83.3f,s	Power Laboratory.....	1½	Jr. M.E. & sr. Met.E.	Reg. in 63.1
M.E.83.4f	Elementary Laboratory.....	1½	Jr. E.M. & Met.E.	
M.E.184.1w	Elementary Laboratory.....	1½	Sr. E.M. & Met. E.	
M.E.184.4f	Power & Gas Engine Lab....	1½	Sr. M.E.	Reg. in 44.8
M.E.184.5w	Power and Steam Lab.....	1½	Sr. M.E.	Reg. in 54.2

* Absent on leave 1919-20.

No.	Title	Credits	Required of	Prereq. courses
M.E.184.6s	Engineering Laboratory	2	Sr. M.E.	Reg. in 54.3
M.E.184.7f,s	Heat Engine Laboratory	1½	Sr. C.E. & jr. Gen.	Reg. in 44.6
M.E.184.8w	Steam & Gas Engine Lab.	1½	Sr. E.E.	Reg. in 44.5
M.E.285.9f,w,s	Engineering Research	3-9	P.-sr. M.E.	

C.E.235.3. STRUCTURAL LABORATORY. Similar to C.E.245.3, but dealing mainly with the experimental problems in structural steel. Strain gage study of actual stress distribution in beams, columns, and riveted joints. LAGAARD, MANEY.

C.E.245.3. CEMENT AND CONCRETE LABORATORY. Laboratory technique and experimental investigation of special problems in cement, concrete, and reinforced concrete. LAGAARD.

C.E.265.2. WATER AND SEWAGE LABORATORY. Principles and practice of operation of typical water purification and sewage disposal works. BASS.

C.E.265.3. HYDRAULIC LABORATORY. Study of special hydraulic problems in laboratory, drafting room, and field.

M. & M.43.1. MATERIALS TESTING LABORATORY. Investigation of the physical properties of the various metals and engineering materials (wood, cement, ropes, etc.). Standard methods of testing. BROOKE, HOLMAN, NEWKIRK, PRIESTER.

M. & M.43.2w. MATERIALS TESTING LABORATORY. Investigation of physical properties of metals and engineering materials; wood, cement, ropes, etc., supplemented by lectures on materials of construction and methods of testing. Mining and Metallurgical Engineers carry Course M. & M. 43.2f for twelve weeks only. BROOKE, HOLMAN.

M. & M.63.2. HYDRAULIC LABORATORY. Experimental and demonstrational work. Pressure head, Piezometer tubes, gages, stability of flotation, Bernouilli's theorem. Venturi meter, flow through orifices, over weirs and through pipes. Open channels, gaging, impact on vanes, pumps and hydraulic machines. BROOKE, HOLMAN, NEWKIRK, PRIESTER.

M.E.83.1f,w. ELEMENTARY MECHANICAL LABORATORY. Calibration of gages, Pitot tubes, indicator springs. Study of steam calorimeters, indicator cards, valve setting. Tests of hoists and gears; power pumps and mechanical appliances. ROWLEY, SHOOP, HIRLEMAN, MOYER.

M.E.83.2s. STEAM LABORATORY. Tests of steam engines, injectors, ejectors, steam separators, steam and power pumps, boilers. SHOOP, HIRLEMAN, MOYER.

M.E.83.3f,s. POWER LABORATORY. Calibration of dynamometers, measurement of power required to drive machinery; calibration of water, meters, Venturi tube. ROWLEY, SHOOP, MOYER.

- M.E.83.4f. **ELEMENTARY LABORATORY.** Calibrations of thermometer, gages, weirs, nozzle orifices, and meters. Efficiency of machine, friction of belting, friction tests, burning point, chill point, viscosity and specific gravity of oils. Tests of water motor, rams, and pulsometers.
- M.E.184.1w. **EXPERIMENTAL LABORATORY.** Indicator practice, valve setting, separating and throttling calorimeter, tests of steam engine, gas engine, pump, air compressor, turbine, boiler, and power plant. ROWLEY, SHOOP.
- M.E.184.4f. **POWER AND GAS ENGINE LABORATORY.** Tests of gas, gasoline and hot air engines, gas producers. Power and lighting plants. MOYER.
- M.E.184.5w. **POWER AND STEAM LABORATORY.** Tests of steam turbines, flow of steam through nozzles and pipes. Tests of compound and triple expansion engines, condensers, superheaters and boilers. SHOOP.
- M.E.184.6s. **ENGINEERING LABORATORY.** Opportunity will be offered for carrying on investigations in connection with tests of complete power plants, refrigerators, air compressors, blowers and fans. Also automobile testing.
- M.E.184.7f,s. **HEAT ENGINE LABORATORY.** Courses 83.1, 83.2, and 184.4 condensed. For students in Civil Engineering, and others taking Course 144.6 in Heat Engines. SHOOP, MOYER, HIRLEMAN.
- M.E.184.8w. **STEAM AND GAS ENGINE LABORATORY.** Courses 83.2 and 184.4 condensed. For students in Electrical Engineering taking Course 144.5 in Heat Engines. SHOOP, MOYER, HIRLEMAN.
- M.E.285.9f,w,s. **ENGINEERING RESEARCH.** Courses may be elected which involve investigation in connection with concrete, structural materials, hydraulics, steam and gas engines, heating and ventilating. Reports, special problems and related tests. ALLEN, FLATHER, HOLMAN, ROWLEY, SHOOP.

FRENCH

Professors EVERETT W. OLMSTED, IRVILLE C. LE COMPTE, COLBERT SEARLES; Assistant Professors FRANCIS B. BARTON, JULES T. FRELIN, RUTH S. PHELPS.

COURSES

No.	Title	Credits	Required of	Prereq. courses
1f, 2w, 3s	Beginning French.....	9	Fr. Architects	None
7-8	Intermediate French.....	10	Fr. Architects	1-2-3, or 2 yrs. preparation

1f,2w,3s. **BEGINNING FRENCH.** Stress on accurate pronunciation, reading vocabulary, and the essentials of grammar. Daily oral and written exercises (dictation and reproduction in French).

7-8. INTERMEDIATE FRENCH. Grammar, composition and reading, increased use of French in the classroom. Selections from modern prose and poetry. This course may be started in any quarter.

GEOLOGY AND MINERALOGY

Professor WILLIAM H. EMMONS; Assistant Professor TERENCE T. QUIRKE.

COURSES

No.	Title	Credits	Required of	Prereq. courses
2w	General Geology.....	3	Elective soph. C.E.	None
15s	Applied Geology.....	3	Elective	2

2w. GENERAL GEOLOGY. Materials of the earth and geologic processes. Application of geology to engineering problems. Lectures, rock study, and field excursions. QUIRKE.

15s. APPLIED GEOLOGY FOR CIVIL ENGINEERS. Occurrence, properties, production, and uses of building stones, cements, clays, fuels, and road metals. A brief introduction to the study of ore deposits and historical geology. QUIRKE.

MATHEMATICS AND MECHANICS

Professor WILLIAM E. BROOKE; Associate Professor WILLIAM F. HOLMAN; Assistant Professors HANS H. DALAKER, CARL A. HERRICK, BURT L. NEWKIRK, GEORGE C. PRIESTER; Instructors FREDERICK W. HOORN, WILLIAM M. MCCLINTOCK, RODERICK W. SILER.

COURSES

No.	Title	Credits	Required of	Prereq. courses
9.1	H. S. Higher Algebra (3 hrs.).....	0	Fr. who lack h.s. credit in it	
10.1	Solid Geometry (3 hrs.).....	0	Fr. who lack h.s. credit in it	
11.1	Applied Mathematics & Mechanics.....	5	Fr.	High. alg. and solid geom.
11.2	Applied Mathematics & Mechanics.....	5	Fr.	M. & M. 11.1
11.3	Applied Mathematics & Mechanics.....	5	Fr.	M. & M. 11.2
12.1	Applied Mathematics & Mechanics.....	5	Soph.	M. & M. 11.3
12.2	Applied Mathematics & Mechanics.....	5	Soph.	M. & M. 12.1
12.3	Applied Mathematics & Mechanics.....	5	Soph.	M. & M. 12.2
13.1	Advanced Calculus.....	5	Elective	M. & M. 12.3
13.2	Advanced Calculus.....	5	Elective	M. & M. 13.1
13.3	Advanced Calculus.....	5	Elective	M. & M. 13.2
23.1	Technical Mechanics.....	3	Jr.	M. & M. 12.3
23.2	Technical Mechanics.....	3	Jr.	M. & M. 23.1
23.3	Technical Mechanics.....	3	Jr.	M. & M. 23.2
33.1	Strength of Materials.....	4	Jr.	M. & M. 12.3
43.1	Materials Testing Laboratory.....	1	Jr.	M. & M. 33.1
43.2f	Materials Testing Laboratory.....	1½	Jr. E.M. & Met. E.	
53.2	Hydraulics.....	3	Jr.	M. & M. 23.2
63.2	Hydraulic Laboratory.....	1	Jr.	M. & M. 53.2

No.	Title	Credits	Required of	Prereq. courses
73.	Differential Equations.....	3	Elective	M. & M. 12.3
124.1	} Advanced Technical Mechanics.....	9	Elective	M. & M. 23.3
124.2				
124.3				
134.1	} Math. Theory of Elasticity.....	9	Elective	M. & M. 33.1
134.2				
134.3				
92.1	Calculus for Architects.....	4	Soph. Arch.	M. & M. 11.3
92.2	Mechanics for Architects.....	4	Soph. Arch.	M. & M. 92.1
92.3	Strength of Materials for Arch.....	4	Soph. Arch.	M. & M. 92.2

9.1. HIGHER ALGEBRA. Fundamental rules, fractions, linear simultaneous equations, graphs, theory of exponents, surds, complex quantities, quadratic equations, binomial theorem, progressions, ratio and proportion, numerical exercises, slide rule. HOORN, SILER,

10.1. SOLID GEOMETRY. Lines and planes in space, dihedral and polyhedral angles, polyhedrons, cylinders, cones, similarity, prismoid formula, sphere, areas, volumes, numerical exercises in areas, volumes, weights, slide rule. HOORN,

11.1. APPLIED MATHEMATICS AND MECHANICS. Review of higher algebra, functions, graphical representation, the straight line, curves, the trigonometric functions, components of force, vectors, conditions of equilibrium of forces. Slide rule computations, elementary applied mechanics with laboratory. HOORN, HERRICK, McCLINTOCK, SILER,

11.2. APPLIED MATHEMATICS AND MECHANICS. Addition formulas for trigonometric functions, double and half angles, the oblique triangle, logarithmic computation, loci, linear equations, quadratic equations, derivatives, velocity, acceleration, elementary applied mechanics with laboratory. HOORN, HERRICK, McCLINTOCK, SILER,

11.3. APPLIED MATHEMATICS AND MECHANICS. General equation of the second degree. Transformation of coördinates. Polar coördinates, parametric equations. Geometry of three dimensions, forces in space, spherical trigonometry. Elementary applied mechanics with laboratory. HOORN, HERRICK, McCLINTOCK, SILER,

12.1. APPLIED MATHEMATICS AND MECHANICS. Problems in maxima and minima, curvature, elementary integration, planimeter. Applications to mechanical and physical problems. Applied mechanics with laboratory. DALAKER, NEWKIRK, PRIESTER.

12.2. APPLIED MATHEMATICS AND MECHANICS. Expansion of functions, series, De Moivre's theorem, integration of standard forms, volumes, lengths of curves, center of gravity, moment of inertia, applied mechanics with laboratory. DALAKER, NEWKIRK, PRIESTER.

- 12.3. APPLIED MATHEMATICS AND MECHANICS. Application of the calculus to concrete problems. Some differential equations. Applied mechanics with laboratory. DALAKER, NEWKIRK, PRIESTER.
- 13.1, 13.2, 13.3. ADVANCED CALCULUS WITH APPLICATIONS. Text, Wilson's *Advanced Calculus*. BROOKE, NEWKIRK.
- 23.1. TECHNICAL MECHANICS. Statics. Resolution of forces, moments, conditions of equilibrium, free body method, catenary. HERRICK, NEWKIRK, PRIESTER.
- 23.2. TECHNICAL MECHANICS. Center of gravity, moment of inertia, stresses in framed structures and machines. Dynamics of a particle, Newton's laws of motion, kinematics of circular, harmonic and curvilinear motion in general. HERRICK, NEWKIRK, PRIESTER.
- 23.3. TECHNICAL MECHANICS. Theorems of work and energy, impulse and momentum, d'Alembert's principle. Elementary dynamics of rigid bodies. HERRICK, NEWKIRK, PRIESTER.
- 33.1. STRENGTH OF MATERIALS. Mechanical and elastic properties of materials of construction, beams, shafts, columns, combined stresses, dynamic stresses, hollow cylinders and spheres, roller plates, curved bars, springs, plates. True stresses. Theory of internal stress. BROOKE, HOLMAN, NEWKIRK, PRIESTER.
- 43.1. MATERIALS TESTING LABORATORY. Investigation of the physical properties of various metals and engineering materials (wood, cement, ropes, etc.). Standard methods of testing. BROOKE, HOLMAN, NEWKIRK, PRIESTER.
- 43.2f. MATERIALS TESTING LABORATORY. Investigation of physical properties of metals and engineering materials: wood, cement, ropes, etc., supplemented by lectures on materials of construction and methods of testing. Mining and Metallurgical Engineers carry Course M. & M. 43.2f for twelve weeks only. BROOKE, HOLMAN.
- 53.2. HYDRAULICS. Laws of equilibrium of fluids, flow through orifices and over weirs, pressure and flow through tubes and pipes, flow in conduits and rivers. Dynamic pressure of water, elementary principles of turbines and pumps. BROOKE, HOLMAN, NEWKIRK, PRIESTER.
- 63.2. HYDRAULIC LABORATORY. Experimental and demonstrational work. Pressure head, Piezometer tubes, gages, stability of flotation, Bernoulli's theorem. Venturi meter, flow through orifices, over weirs and through pipes. Open channels, gaging, impact on vanes, pumps and hydraulic machines. BROOKE, HOLMAN, NEWKIRK, PRIESTER.
- 73.1. DIFFERENTIAL EQUATIONS. Differential equations and their solutions. First order and first degree, first order and higher degree, singular solutions, total differential equations, linear differential equations,

miscellaneous methods, systems of simultaneous equations, integration in series. Partial differential equations. BROOKE.

124.1, 124.2, 124.3. ADVANCED TECHNICAL MECHANICS. Special problems in the dynamics of machinery; vibrations, balancing, whirling shafts, rapidly rotating disks, dynamical stability, gyroscope. NEWKIRK.

134.1, 134.2, 134.3. MATHEMATICAL THEORY OF ELASTICITY. BROOKE.

92.1. CALCULUS (Course in Architecture). A short course. Derivatives, maxima and minima, integration of simple forms, definite integrals, areas. DALAKER.

92.2. MECHANICS (Course in Architecture). Statics, resolution of forces, conditions of equilibrium, center of gravity, moment of inertia of plane sections, stresses in framed structures. DALAKER.

92.3. STRENGTH OF MATERIALS (Course in Architecture). Mechanical and elastic properties of materials of construction, design of riveted joints, beam theory, columns, arches. DALAKER.

MECHANICAL ENGINEERING

Professors JOHN J. FLATHER, JOHN R. ALLEN; Associate Professors JOHN V. MARTENIS, FRANK B. ROWLEY, S. CARL SHIPLEY, CHARLES F. SHOOP; Instructors WILLIAM E. BRYANT, RALPH R. GRIFFITH, CLARK W. HIRLEMAN, AMOS F. MOYER, EDWARD P. QUIGLEY, WILLIAM H. RICHARDS.

COURSES

No.	Title	Credits	Required of	Prereq. courses
	Elementary Shop Practice.....	2½	Fr. Engrs.	
11.1	Woodworking.....	}	Each course is repeated every nine weeks.	
11.2	Foundry.....			
11.3	Forge.....			
11.4	Machine Work.....			
12.5f	Pattern and Foundry.....	2½	Soph. M.E.	11.1 to 11.4
12.6w	Machine Shop Practice.....	2½	Soph. M.E.	11.1 to 11.4
12.7su	Advanced Machine Shop Practice	5	Jr. M.E.	12.6
10.8	Industrial Education.....	3	Schl. of Ed.	None.
215.9f	Tool Design.....	3	P.-sr. Elect.	12.7
215.10w	Tool Construction.....	3	P.-sr. Elect.	12.7
22.1f	Mechanical Technology.....	1½	Soph. M.E.	Regis. in 12.5
22.2w	Mechanical Technology.....	1	Soph. M.E.	Regis. in 12.6
225.3f	Industrial Management.....	3	P.-sr. Elect.	12.7
225.4w	Industrial Management Lab.....	3	P.-sr. Elect.	225.3
225.5s	Industrial Management Problems..	3	P.-sr. Elect.	225.4
225.6s	Safety Engineering.....	2	P.-sr. Elect.	
32.1s	Elementary Machine Design.....	2	Soph. M.E.	Drawing 7
33.2f	Mechanism and Kinematics.....	3	Jr. M.E.	Math 74
33.3w	Mechanism and Kinematics.....	3	Jr. M.E.	Math. 74
33.4w	Mechanism and Kinematics.....	3	Jr. E.E.	Math. 74
33.5s	Machine Design.....	3	Jr. M.E.	33.3

DESCRIPTION OF COURSES

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No.	Title	Credits	Required of	Prereq. courses
134.6f	Machine Design.....	3	Sr. M.E.	33.5
33.7s	Machine Design.....	4	Jr. E.E.	33.4
235.8f	Steam Engine Design.....	3	P.-sr. Elect.	43.3
235.9f	Gas Engine Design.....	3	P.-sr. Option	144.8
235.10f	Advanced Engineering Design.....	3	P.-sr. Option	134.6
235.11w	Advanced Engineering Design.....	3	P.-sr. Option	134.6
235.12s	Advanced Engineering Design.....	3	P.-sr. Option	134.6
235.13w	Gas Tractor Design.....	3	P.-sr. Option	235.9
42.1s	Automotives.....	3	Soph. M.E.	12.6
43.2w	Steam Engines.....	2½	Jr. M.E.	Math. 23.1
43.3s	Steam Engines and Boilers.....	2½	Jr. M.E.	Math. 23.1
144.4f	Heat Engines.....	2½	Sr. E.E.	Math. 23.1
144.5w	Heat Engines.....	2½	Sr. E.E.	Math. 23.1
144.6f	Heat Engines.....	2½	Sr. C.E.	Math. 23.1
144.7s	Heat Engines.....	2½	Jr. Gen.	Math. 23.1
144.8f	Gas Engines and Producers.....	2½	Sr. M.E.	Math. 23.1
154.1f	Thermodynamics.....	3	Sr. M.E.	Math. 23.3
154.2w	Steam Turbines.....	2½	Sr. M.E.	154.1
154.3s	Heating and Ventilation.....	3	Sr. M.E. & Arch.	Phys.
255.4	Adv. Heating and Ventilation.....	3	P.-sr. Elect.	154.3
255.5s	Comp. Air and Refrig. Machinery.....	3	P.-sr. Elect.	154.1
255.6s	Mech. Equipment of Bldgs.....	3	P.-sr. Elect.	154.3
63.1s	Measurement of Power.....	2	Jr. M.E.	Mech. 152w
265.2f	Power Engineering.....	3	P.-sr. M.E.	63.1
265.3f	Power Plant Management.....	2	P.-sr. Elect.	43.3
265.4w	Power Plant Management.....	2	P.-sr. Elect.....	43.3
265.5s	Power Plant Management.....	2	P.-sr. Elect.	43.3
265.6w	Power Plant Design.....	3	P.-sr. Elect.	43.3
265.7s	Power Plant Design.....	3	P.-sr. Elect.	43.3
275.1f	Railway Technology.....	3	P.-sr. Elect.	43.3
275.2f	Railway Design.....	3	P.-sr. Elect.	275.1
275.3w	Railway Design.....	3	P.-sr. Elect.	275.2
275.4s	Railway Design.....	3	P.-sr. Elect.	275.3
275.5f	Locomotive Construction.....	1	P.-sr. Elect.	Regis. in 275.2
275.6w	Locomotive Construction.....	1	P.-sr. Elect.	Regis. in 275.3
275.7s	Locomotive Construction.....	1	P.-sr. Elect.	Regis. in 275.4
275.8s	Locomotive Road Tests.....	3	P.-sr. Elect.	75.1
83.1w	Elementary M.E. Laboratory.....	1½	Jr.M.E.,sr.E.E.	Reg. in 43.2 or 144.4
83.2s	Steam Laboratory.....	1½	Jr. M.E.	Reg. in 43.3
83.3s	Power Laboratory.....	1½	Jr. M.E.	Reg. in 63.1
83.4w	Elementary Laboratory.....	1½	Jr.E.M. & Met.E.	
184.1w	Experimental Laboratory.....	1½	Sr.E.M. & Met.E.	
184.4f	Power and Gas Engine Lab.....	1½	Sr. M.E.	Reg. in 144.8
184.5w	Power and Steam Lab.....	1½	Sr. M.E.	Reg. in 154.2
184.6s	Engineering Laboratory.....	2	Sr. M.E.	Reg. in 154.3
184.7f, s	Heat Engine Laboratory.....	1½	Sr.C.E. & Jr.Gen.	Reg. in 144.6
184.8w	Steam and Gas Engine Lab.....	1½	Sr. E.E.	Reg. in 144.5
285.9f,w,s	Engineering Research.....	3-9	P.-sr. M.E.	
295.1w	Contracts and Specifications.....	2	P.-sr. M.E.	P.S. 26
93.2f	Seminar.....	2	Jr. Option	
93.3w				
93.4s				

52 COLLEGE OF ENGINEERING AND ARCHITECTURE

No.	Title	Credits	Required of	Prereq. courses
194.5f	Seminar.....	2	Sr. M.E.	
194.6w				
194.7s				
295.8f				
295.9w	Seminar.....	2	P.-sr. Elect.	
295.10s				
295.11	Aeronautical Engineering.....	3	P.-sr. Elect.	154.1
295.12	Aeroplane Design.....	3	P.-sr. Elect.	154.1
295.13	Thesis.....	5	P.-sr. M.E.	

11.1, 11.2, 11.3, 11.4. **ELEMENTARY SHOP PRACTICE.** A general course in shop practice, which includes pattern making, foundry, forge, and machine work. Each course is given every nine weeks. SHIPLEY, BRYANT, GRIFFITH, QUIGLEY, RICHARDS.

12.5f or w. **PATTERN MAKING AND FOUNDRY PRACTICE.** Patterns for parts of steam and gas engines, machine tools, and special machinery; molding, core making, mixing for the casting of machine parts in iron, brass, bronze, and aluminum. Machine molding and special processes. BRYANT, RICHARDS.

12.6f or w. **MACHINE SHOP PRACTICE.** Machine operations. Manufacturing methods. Also heat treatment of steel, autogenous welding, welding and brazing. Shop practice, lectures, and recitations. SHIPLEY, GRIFFITH, QUIGLEY, and Assistants.

12.7. **ADVANCED MACHINE SHOP PRACTICE.** Machine construction, and special problems. Summer course of four weeks, during the vacation period following the sophomore year. SHIPLEY and Assistants.

10.8 **INDUSTRIAL EDUCATION.** Special course in shop work including sloyd. For teachers in College of Education. RICHARDS.

215.9f,w,s. **TOOL DESIGN.** Design of tools for manufacturing interchangeable parts; jigs and milling fixtures. SHIPLEY.

215.10f,w,s. **TOOL CONSTRUCTION.** Construction of tools, jigs, and fixtures for manufacturing interchangeable parts. SHIPLEY, GRIFFITH.

22.1f. **MECHANICAL TECHNOLOGY.** Study of mechanical processes involved (a) in various manufacturing industries; (b) in production of materials of construction, including the metallurgy of iron and steel; (c) in development and utilization of power. Lectures by various specialists.

225.3f. **INDUSTRIAL MANAGEMENT.** Shop and factory organization and management; cost and wage systems. Depreciation of equipment. Machine burden. Time studies. FLATHER.

225.4w. **INDUSTRIAL MANAGEMENT LABORATORY.** An advanced course in shop practice with especial reference to production. Time studies;

- stores and follow-up systems. Investigations in local factories. Lectures, assigned reading, practice, and reports. FLATHER, SHIPLEY.
- 225.5s. INDUSTRIAL MANAGEMENT PROBLEMS. Special investigations of practical problems and suggested methods of procedure. Lectures, assigned reading and reports. FLATHER.
- 225.6s. SAFETY ENGINEERING. A study of the methods employed to promote safety in the factory; fire hazards, fire protection; automatic sprinkler apparatus; workmen's compensation laws. SHIPLEY.
- 32.1s. ELEMENTARY MACHINE DESIGN. Empirical proportion and design of machine parts; tracings; working drawings from sketches; drawing room systems and conventional methods. Taken in conjunction with the work of the postgraduates in Engineering Design. FLATHER, SHIPLEY, HIRLEMAN.
- 32.2f,33.3w. MECHANISM AND KINEMATICS. Transmission of motion. Levers, gearing, linkwork, belts, screws, epicyclic trains, parallel motions, quick-return movements. Graphical determination of paths, speeds, accelerations of important mechanisms; centroids, analysis of mechanisms; cams; roulettes, tooth profiles; kinematic pairs, machine parts. MARTENIS.
- 33.4w. MECHANISM AND KINEMATICS. The transmission of motion without consideration of the strength of parts. Levers, gearing, linkwork, kinematic pairs; machine parts, construction of tooth profiles. Paths and velocities of mechanisms. A short course arranged for electrical engineers. MARTENIS.
- 33.5s. MACHINE DESIGN. Calculation and design of machine parts; fastenings riveted and screwed; bearings, pulleys, flywheels; belting, rope driving. FLATHER, MARTENIS, HIRLEMAN.
- 134.6f. MACHINE DESIGN. Spur gearing, bevel gearing, spiral (helical) gearing. Valves—D slide, piston, double ported, riding cut-off, Corliss, Stephenson link, Walschaert gear. FLATHER, MARTENIS, HIRLEMAN.
- 33.7s. MACHINE DESIGN. Calculation and design of such machine parts as fastenings, bearings, rotating pieces, pulleys and belting, spur gearing, bevel gears, spiral gears, and rope driving. Recitations, lectures, drawing room practice. Arranged for students in Electrical Engineering. FLATHER, MARTENIS, HIRLEMAN.
- 225.8f. STEAM ENGINE DESIGN. Calculations and working drawings for a high speed automatic or Corliss steam engine. Theoretical diagrams, inertia forces; determination of details. FLATHER,
- 225.9f. GAS ENGINE DESIGN. Calculations and working drawings for a gas motor,—heavy duty tractor, truck, marine or other service. Theoretical diagrams and details of parts. FLATHER, MOYER.

- 235.10f. **ADVANCED ENGINEERING DESIGN.** Original design, including machinery for changing size and form, cranes, pumping, transmission machinery, and engineering appliances. Lectures, problems, and drawing room practice. FLATHER,
- 235.13w. **GAS TRACTOR DESIGN.** Selection of wheel sizes; horsepower weight and drawbar pull. Bearing pressures; ratios and strength of gearing. Details of principal parts. MOYER.
- 42.1s. **AUTOMOTIVES.** A study of mechanical problems involved in automobiles, trucks, and tractors, starting and ignition devices, carburetors, lubrication, cooling, and transmissions. SHIPLEY.
- 43.2w. **STEAM ENGINES.** The steam engine, including elementary thermodynamics. Types and details. Mechanics of the steam engine, steam distribution, reciprocating parts, indicator cards. Valve gears, Zeuner diagram; governors. Compound engines. Elementary study of steam turbines. Taken in connection with Course 83.1. FLATHER.
- 43.3s. **STEAM ENGINES AND BOILERS.** Continuation of the preceding course, together with an elementary study of condensers and air pumps, also steam boilers and stokers. Smoke prevention. To be taken in connection with 83.2. FLATHER.
- 144.4f. **HEAT ENGINES.** Elementary thermodynamics. Properties of steam; combustion and fuels; boilers. types and details of steam engines; valve gears; governors; compound engines. Condensers and air pumps. Elementary study of steam turbines and gas engines. SHOOP, HIRLEMAN.
- 144.5w. **HEAT ENGINES.** Continuation of the preceding (144.4). Both courses are arranged for students in electrical engineering and must be taken in connection with Courses 83.1 and 184.8. SHOOP, HIRLEMAN.
- 144.6f. **HEAT ENGINES.** Courses 144.4 and 144.5 condensed for students in Civil Engineering. To be taken in connection with Course 184.7. SHOOP, HIRLEMAN.
- 144.7s. **HEAT ENGINES.** The same course as 144.6 repeated in the spring quarter for students taking general engineering, chemical engineering, and others. SHOOP, HIRLEMAN.
- 144.8f. **GAS ENGINES AND PRODUCERS.** Laws of gases; gas cycles. Otto, semi-Diesel, and Diesel engines. Mechanism of various types. Carburetion, governing, cooling, lubrication. Principles of design. Gas producers; types, suction, pressure, blast, furnace. By-products recovery. MOYER.
- 154.1. **THERMODYNAMICS.** The mechanical theory of heat as applied to steam, oil, gas and hot-air engines and allied power plant machinery

and accessory equipment, including compressors, injectors, reheaters, and refrigerating apparatus. SHOOP.

- 154.2. STEAM TURBINES. Theory and practice applied to various types. Thermodynamics and mechanical analysis of problems involved in the design of nozzles, blades, rotors, bearings and governors. Condition of operation; systems of transmissions; lubrication; economy; field of service. SHOOP.
- 154.3s. HEATING AND VENTILATING. Principles of heating and ventilating. Construction and operation of heating apparatus. Steam, hot water, exhaust, vacuum, and fan systems. Lectures, recitations, and designs. ALLEN, MARTENIS.
- 255.4. ADVANCED HEATING AND VENTILATING. An advanced course for post-seniors. To be taken in connection with research work in the laboratory, Course 285.9. ALLEN, ROWLEY.
- 255.5s. COMPRESSED AIR AND REFRIGERATING MACHINERY. (a) Air compressors and motors; power transmission by compressed air. (b) Principles of refrigeration. Various types of refrigerating machines, refrigerants, applications to ice making, cold storage, cooling of air, liquids, and solids. Lectures and recitations. MARTENIS.
- 255.6s. MECHANICAL EQUIPMENT OF BUILDINGS. Appliances used; heating, ventilating, plumbing systems; piping for fire protection, compressed air, gas, and vacuum cleaning; elevators. Choice of systems. Theory and practice of designing and detailing layouts. Equipment designs for various types of buildings. MARTENIS, ROWLEY.
- 63.1s. MEASUREMENT OF POWER. Methods employed in measuring power. Dynamometers, friction brakes, railway dynamometer cars, ship dynamometers, power required to drive machine tools and shafting, selection of motors, calculation of circuits. Lectures, recitations and drawing room work. To be taken in conjunction with 83.3. FLATHER.
- 265.2f. POWER ENGINEERING. Advanced study and application of engines, stokers, boilers; coal handling equipment and accessories. Layout of manufacturing shops. Routing of work, transmission systems and selection of motors, factory lighting and heating. Lectures, recitations, drawing room work. FLATHER.
- 265.3f, 265.4w, 265.5s. POWER PLANT MANAGEMENT. Operation and maintenance of boilers, engines, gas producers, gas engines, steam turbines, and accessory apparatus. Smoke prevention. Flue gas analysis. Daily logs and power costs. FLATHER, HIRLEMAN.
- 265.6w. POWER PLANT DESIGN. Problems, designs, and estimates for power plants and central stations. Selection of motive powers, relative advantages of steam and producer gas plants, choice of engines and boilers; pumps, shafting, piping, and accessories. FLATHER.

- 275.1f. RAILWAY TECHNOLOGY. The practical details of construction of locomotives. A systematic course of visits to the various railroad shops in the vicinity. Lectures and recitations.
- 275.2f, 275.3w, 275.4s. RAILWAY DESIGN. Locomotive and car details; the locomotive boiler, linkages, and assembled parts. To be taken in connection with the following course.
- 275.5f, 275.6w, 275.7s. LOCOMOTIVE CONSTRUCTION. Construction of locomotives. Carriage; frames, springs, equalizing arrangements, running gear, brakes, trucks, lubrication. Boilers, grates, flues, smokebox, stacks; riveted joints, staying. Engine details; heat insulation, cylinder proportions. Lectures and assigned reading.
- 275.8s. LOCOMOTIVE ROAD TESTING. Tests on locomotives and trains. Dynamometer car and drawbar pull. FLATHER and Assistants.
- 83.1fw. ELEMENTARY MECHANICAL LABORATORY. Calibration of gages, Pitot tubes, indicator springs. Study of steam calorimeters, indicator cards, valve setting. Tests of hoists and gears; power pumps and mechanical appliances; viscosity and specific gravity of oils. SHOOP, MOYER, HIRLEMAN.
- 83.2s. STEAM LABORATORY. Tests of steam engines, injectors, ejectors, steam separators, steam and power pumps, boilers. SHOOP, MOYER, HIRLEMAN.
- 83.3s. POWER LABORATORY. Calibration of dynamometers, measurement of power required to drive machinery; calibration of water meters, Venturi tube. SHOOP, MOYER.
- 83.4w. ELEMENTARY LABORATORY. Calibration of thermometers, gages, weirs, nozzle orifices, and meters. Efficiency of machines, friction of belting, friction tests; burning point, chill point, viscosity and specific gravity of oils. Tests of water motor, rams, and pulsometers.
- 184.1w. EXPERIMENTAL LABORATORY. Indicator practice, valve setting, separating and throttling calorimeter, tests of steam engine, gas engine, pump, air compressor, turbine, boiler, and power plant. ROWLEY, SHOOP.
- 184.4f. POWER AND GAS ENGINE LABORATORY. Tests of gas, gasoline and hot air engines, gas producers. Power and lighting plants. MOYER.
- 184.5w. POWER AND STEAM LABORATORY. Tests of steam turbines, flow of steam through nozzles and pipes. Tests of compound and triple expansion engines, condensers, superheaters, and boilers. SHOOP.
- 184.6s. ENGINEERING LABORATORY. Opportunity will be offered for carrying on investigations in connection with tests of complete power plants, refrigerators, air compressors, blowers, and fans. Also automobile testing.

- 184.7f. HEAT ENGINE LABORATORY. Courses 83.1, 83.2, and 184.4 condensed. For students in civil engineering, and others taking Course 144.6 in Heat Engines. SHOOP, MOYER, HIRLEMAN.
- 184.8w. STEAM AND GAS ENGINE LABORATORY. Courses 83.2 and 184.4 condensed. For students in electrical engineering taking Course 144.5 in Heat Engines. SHOOP, MOYER, HIRLEMAN.
- 285.9, 285.10, 285.11. ENGINEERING RESEARCH. Courses may be elected which involve investigations in connection with concrete, structural materials, hydraulics, steam and gas engines, heating and ventilating. Reports, special problems, and related tests. ALLEN, FLATHER, HOLMAN, ROWLEY, SHOOP.
- 295.1w. CONTRACTS AND SPECIFICATIONS. A study of engineering specifications. Classes of specifications; essential features; clauses; details. Bids and bidders, engineering contracts. Examples. Ethical and business relations. Lectures, recitations, and practice in writing specifications. FLATHER.
- 93.2f, 93.3w, 93.4s. SEMINAR. Reading of assigned articles in current technical press. Preparation of synopsis and presentation of principal features. Arranged for juniors. MARTENIS.
- 194.5f, 194.6w, 194.7s. SEMINAR. Same as Course 93. Arranged for seniors. FLATHER.
- 295.8, 295.9, 295.10. SEMINAR. Same as Course 93. Arranged for post-seniors. FLATHER.
- 295.11. AERONAUTICAL ENGINEERING. Design of aerial propellers, aeroplane engines. Application of theory of propellers and gasoline engines to aeroplanes. Includes calculations and drawings for high speed multicylinder light weight engine; balancing reciprocating parts; uniform torque; theoretical diagrams, etc.
- 295.12. AEROPLANE DESIGN. Calculations and drawings for a given aeroplane; stability, strength, propulsion, and motive power required.

METALLURGY

Professor WILLIAM R. APPLEBY; Instructor RALPH L. DOWDELL.

COURSES

No.	Title	Credits	Required of	Prereq. courses
156w	Metallography for Engineers.....	3	Sr. M.E.	.....
157s	Advanced Metallography.....	2 or 3	Sr. M.E.	156w

156w. METALLOGRAPHY FOR ENGINEERS. Metallurgy of iron and steel. Microscopic and thermal analysis of steel and cast iron; heat and mechanical treatment. Laboratory work. HOYT, DOWDELL.

157s. ADVANCED METALLOGRAPHY. Continuation of Met. 156w. Metallography applied to engineering practice; commercial heat treatment; uses and properties of alloy steels. Engineering specifications involving the use of metals and alloys. Laboratory work. HOYT, DOWDELL.

MILITARY SCIENCE AND TACTICS

Colonel FRANK H. BURTON, U. S. Army, Professor of Military Science and Tactics, Head of the Department, Commandant; Lieutenant HENRY C. BERTELSEN, U. S. Army, Assistant Professor of Military Science and Tactics; Captain ALLEN T. NEWMAN, U. S. Army, Assistant Professor of Military Science and Tactics; Sergeant JOSEPH HAVLICEK, U. S. Army, Retired, Instructor.

REQUIRED WORK

All physically fit male students are required to take military training during the first two undergraduate years of their course unless they have secured such training at an approved institution endorsed by the Military Department. When this course is entered upon it must be carried to completion as a prerequisite for graduation. No credits are allowed for this work.

ELECTIVE WORK

(a) All students who have completed two years of military instruction may register for the course required by General Orders No. 49, War Department, for members of the Reserve Officers' Training Corps. Such students sign a written agreement to continue in this corps for the remainder of the college course; the completion of this work is a prerequisite to promotion.

Juniors and seniors who take the course required by General Orders No. 49, will receive an allowance of forty cents per day for subsistence while pursuing the course and will have all expenses paid to and from the encampments. They also are eligible for appointment as temporary second lieutenants in the Infantry branch of the Regular Army for six months with a salary of one hundred dollars per month upon graduation and commission in the Reserve Corps. The Reserve Corps furnishes officers for Citizens Training Camps in time of peace and commission in the United States Volunteers in time of war, such officers having preference for commissions in the volunteers immediately below experienced officers in the federal service.

The course includes three hours a week of practical and two of theoretical work in the Military Department and also includes recommended

courses offered by the respective colleges which have a direct bearing on the work of the Corps, such as Military History and International Law in the Liberal Arts College. The work carries three credits in each semester in the Military Department, and such additional credits as the respective curricula of the colleges may permit.

(b) Any student having completed the two years of required Military Training may continue the work for credit in the third and fourth years. Credit for such work is allowed in practically all of the colleges of the University, the maximum being three credits a year.

PERSONAL HYGIENE AND FIRST AID

Associate Professor RICHARD O. BEARD; Instructor JAMES A. JOHNSON.

COURSES

No.	Title	Credits	Required of	Prereq. courses
1.	Personal Hygiene and First Aid to the Sick or Injured.....	1	Fr.	None

1. PERSONAL HYGIENE AND FIRST AID TO THE SICK OR INJURED. Lectures and demonstrations of first aid procedure. One hour weekly during second quarter of school year. BEARD, JOHNSON.

PHYSICS

Professors HENRY A. ERIKSON, W. FRANCIS G. SWANN, ANTHONY ZELENY; Associate Professors LOUIS W. MCKEEHAN, JOHN T. TATE; Professorial Lecturer LOUALLEN F. MILLER.

COURSES

No.	Title	Credits	Required of	Prereq. courses
23f,w,s,su	Elements of Mechanics and Sound.....	3	Soph. Arch. & Engrs.	Trigonometry
24f,w,s,su	Mechanics Lab.....	1	Soph. Arch. & Engrs.	Trigonometry
47w	Heat and Light.....	3	Soph. Arch. & Engrs.	23 and 24
48w	Heat and Light Lab.....	1	Soph. Arch. & Engrs.	23 and 24, 47 or reg. in 47
63s,su	Electricity and Magnetism....	3	Soph. Arch. & Engrs.	23 and 24
64s,su	Electricity and Magnetism Lab.	1	Soph. Arch. & Engrs.	23 and 24, 63 or reg. in 63
144f	Advanced Heat Meas.....	3	Jr. M.E.	48
164f	Electrical Measurements.....	3	Jr. E.E.	64

23f,w,s,su. ELEMENTS OF MECHANICS AND SOUND. Mechanics of solids, liquids, gases, wave motion, and sound. Treatment mainly experimental and mathematical. One lecture, three recitations. The first part of a general course 23, 47, 63. ERIKSON, MCKEEHAN, MILLER, TATE.

24f,w,s,su. MECHANICS LABORATORY. Open to all who have completed or are taking Course 23. One two-hour session per week.

47w. HEAT AND LIGHT. A study of the principles underlying heat and light phenomena. Treatment experimental and mathematical. Should

be taken in conjunction with Course 48. One lecture and three recitations per week. ERIKSON, MCKEEHAN, TATE.

48w. HEAT AND LIGHT LABORATORY. Open to all who have completed or are taking Course 47. One two-hour session per week. MILLER.

63s, su. MAGNETISM AND ELECTRICITY. A study of the principles underlying magnetic and electric phenomena. Treatment experimental and mathematical. Should be taken in conjunction with Course 64. One lecture and three recitations per week. ERIKSON, MCKEEHAN, TATE.

64s, su. ELECTRICITY AND MAGNETISM LABORATORY. Open to all who have completed or are taking Course 63. ZELENY.

144f. ADVANCED HEAT MEASUREMENTS. An experimental study of pyrometry, heat quantity, heat transfer, hygrometry, and gas liquefaction, especially adapted for engineers. Two three-hour sessions a week. MILLER.

164f. ELECTRICAL MEASUREMENTS. Devoted mainly to the study of the potentiometer, capacity, inductance, magnetic flux, and temperature measurement by electrical methods. Three two-hour laboratory periods a week. ZELENY.

For electives in Department of Physics see Bulletin of the College of Science, Literature, and the Arts.

POLITICAL SCIENCE

Professors CEPHAS D. ALLIN, JEREMIAH S. YOUNG; Assistant Professor WILLIAM A. ANDERSON; Instructor ALBERT J. LOBB.

COURSES

No.	Title	Credits	Required of	Prereq. courses
25-26	American Government.....	4	Elective	None
27	Business Law.....	2	Elective	26

25-26. AMERICAN GOVERNMENT. The origin, development, and actual workings of the National and State Governments. LOBB.

27. BUSINESS LAW. A course in Business Law arranged for Engineers including the law of contracts, suretyship, agency, partnership, corporations, negotiable instruments, conveyance patents, and riparian rights. LOBB.

11. MUNICIPAL GOVERNMENT. A study of the organization and chief functions of American cities; their growth, relation to the state, forms of charters, inefficiency and corruption, reform measures; and the administration of finance, police, health, and other activities. ANDERSON.

RHETORIC AND PUBLIC SPEAKING

Professor JOSEPH M. THOMAS; Associate Professor FRANK M. RARIG;
Assistant Professor CHARLES W. NICHOLS; Instructors SIGURD B.
HUSTVEDT, RIVERDA H. JORDAN.

COURSES

No.	Title	Credits	Required of	Prereq. courses
4f, 5w, 6s	Rhetoric and Composition.....	9	Fr.	None
31f	Technical Writing.....	3	Elective	4-5-6
41-42-43	Public Speaking.....	9	Elective	4-5-6

4f, 5w, 6s. RHETORIC AND COMPOSITION. Training in writing; study of the work of writers who have handled scientific subjects with clearness and power; outside reading. NICHOLS, HUSTVEDT, JORDAN.

31. TECHNICAL WRITING. A quarter course in business letters, reports, etc., planned to meet the professional needs of engineering students. NICHOLS.

41-42-43. PUBLIC SPEAKING. A general course in public speaking. RARIG.

SUMMER READING

All engineering students are advised to take general courses in reading of a non-professional character, during their college course. The purpose of this general reading is to increase the acquaintance of the student with literature, history, and general science; to develop in him a taste for good reading; and to impress him with the importance of such knowledge not only as a source of individual enjoyment but as a practical aid to engineers in their social and business relations.

A circular on general reading has been prepared and may be secured at the Dean's office. This contains a list of books from which the student may make his own selection. The books have been chosen for their value in providing general training, but an attempt has been made to include only readable and attractive works. Most of the books in the list are available in standard low-priced editions, and each student is urged to purchase his own copy and thus add to the value and pleasure of the reading. A statement of the books read during the college year is required at the close of the year, and a statement of those read during the summer vacation is required at the beginning of the next college year. In addition the student may be asked to give the substance of the books read and his impressions concerning them. One credit will be allowed for each course satisfactorily completed.

The Bulletin of the University of Minnesota

*The College of Agriculture, Forestry,
and Home Economics
Announcement of
Courses in Agriculture for the Year
1919-1920*



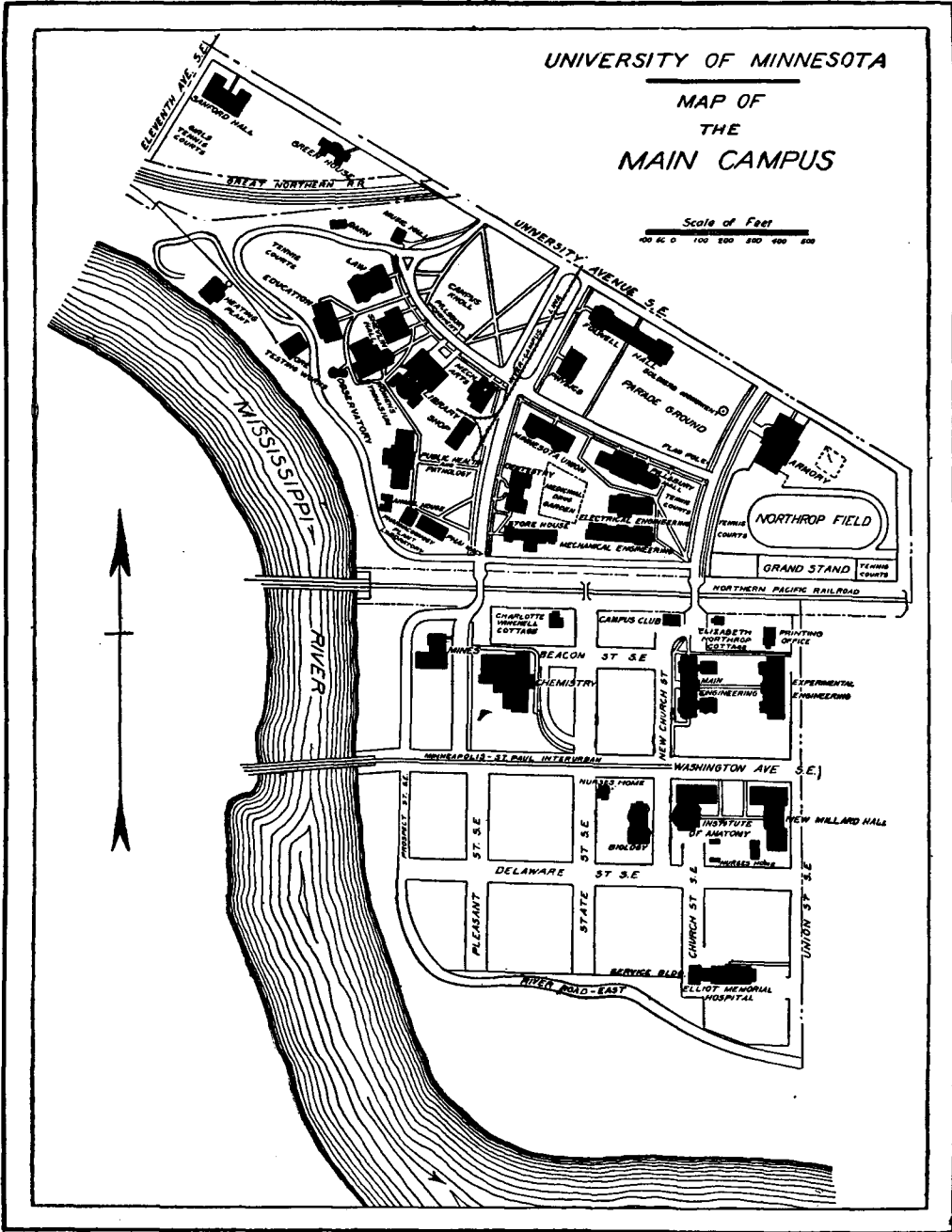
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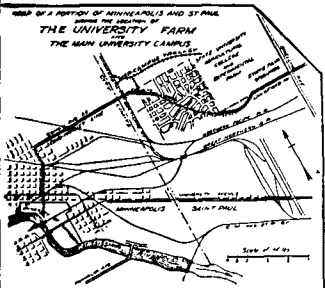
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UNIVERSITY OF MINNESOTA
 MAP OF
 THE
 MAIN CAMPUS

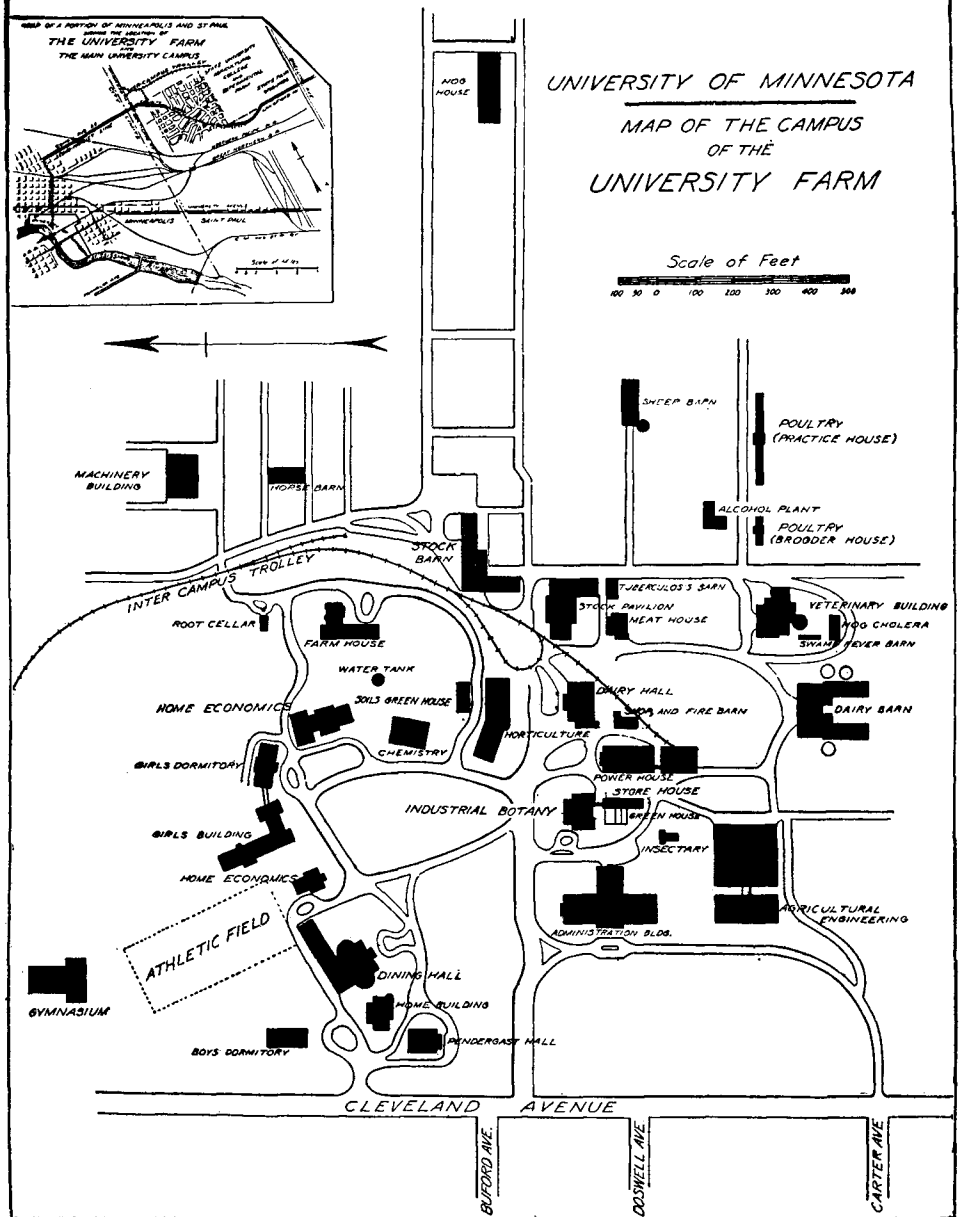
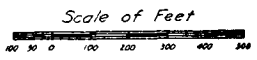
Scale of Feet
 0 100 200 300 400 500



Area of Main Campus, 108.5 acres



UNIVERSITY OF MINNESOTA
MAP OF THE CAMPUS
OF THE
UNIVERSITY FARM



O. S. Zeller.

Area of University Farm, 422.56 acres

1919							1920													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	1	2	3	4	5	..	..	..	..	1	2	3	..	..	..	..	1	2	3
6	7	8	9	10	11	12	4	5	6	7	8	9	10	4	5	6	7	8	9	10
13	14	15	16	17	18	19	11	12	13	14	15	16	17	11	12	13	14	15	16	17
20	21	22	23	24	25	26	18	19	20	21	22	23	24	18	19	20	21	22	23	24
27	28	29	30	31	..	..	25	26	27	28	29	30	31	25	26	27	28	29	30	31
..
AUGUST							FEBRUARY							AUGUST						
..	..	..	..	..	1	2	1	2	3	4	5	6	7	1	2	3	4	5	6	7
3	4	5	6	7	8	9	8	9	10	11	12	13	14	8	9	10	11	12	13	14
10	11	12	13	14	15	16	15	16	17	18	19	20	21	15	16	17	18	19	20	21
17	18	19	20	21	22	23	22	23	24	25	26	27	28	22	23	24	25	26	27	28
24	25	26	27	28	29	30	29	..	..	..	..	..	..	29	30	31	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
SEPTEMBER							MARCH							SEPTEMBER						
..	1	2	3	4	5	6	..	1	2	3	4	5	6	..	1	2	3	4	5	6
7	8	9	10	11	12	13	7	8	9	10	11	12	13	5	6	7	8	9	10	11
14	15	16	17	18	19	20	14	15	16	17	18	19	20	12	13	14	15	16	17	18
21	22	23	24	25	26	27	21	22	23	24	25	26	27	19	20	21	22	23	24	25
28	29	30	..	..	..	..	28	29	30	31	..	..	..	26	27	28	29	30	..	..
..
OCTOBER							APRIL							OCTOBER						
..	..	..	1	2	3	4	..	..	..	..	1	2	3	..	..	..	..	..	1	2
5	6	7	8	9	10	11	4	5	6	7	8	9	10	3	4	5	6	7	8	9
12	13	14	15	16	17	18	11	12	13	14	15	16	17	10	11	12	13	14	15	16
19	20	21	22	23	24	25	18	19	20	21	22	23	24	17	18	19	20	21	22	23
26	27	28	29	30	31	..	25	26	27	28	29	30	..	24	25	26	27	28	29	30
..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	..	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER						
..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	1	2	3	4	5	6
2	3	4	5	6	7	8	2	3	4	5	6	7	8	7	8	9	10	11	12	13
9	10	11	12	13	14	15	9	10	11	12	13	14	15	14	15	16	17	18	19	20
16	17	18	19	20	21	22	16	17	18	19	20	21	22	21	22	23	24	25	26	27
23	24	25	26	27	28	29	23	24	25	26	27	28	29	28	29	30	..	..	..	..
30	..	..	..	..	..	..	30	31	..	..	..	..	..	..	..	..	..	..	..	..
DECEMBER							JUNE							DECEMBER						
..	1	2	3	4	5	6	..	..	1	2	3	4	5	..	..	..	1	2	3	4
7	8	9	10	11	12	13	6	7	8	9	10	11	12	5	6	7	8	9	10	11
14	15	16	17	18	19	20	13	14	15	16	17	18	19	12	13	14	15	16	17	18
21	22	23	24	25	26	27	20	21	22	23	24	25	26	19	20	21	22	23	24	25
28	29	30	31	..	..	..	27	28	29	30	..	..	..	26	27	28	29	30	31	..
..

CALENDAR

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

1919-1920

1919

September	24	Wednesday	Registration closes except for new students
September	24-30	Week	Examinations for removal of winter and spring quarter conditions and entrance examinations Registration of new students. Payment of fees
September	29	Monday	School of Agriculture, first term begins
October	1	Wednesday	Fall quarter begins
October	16	Thursday	Senate meeting, 4:00 p.m.
October	17	Friday	Half holiday. Annual freshman-sophomore contest
October	31	Friday	Last day for removal of spring quarter incompletes
November	17	Monday	Creamery Butter Makers' Short Course (ten-day session) and Cheese Makers' Short Course (four-weeks session) begin
November	27	Thursday	Thanksgiving Day; a holiday
December	1-6	Week	Ice-cream Makers' Short Course
December	8-13	Week	Milk Plant Operators' Short Course
December	18	Thursday	Senate meeting, 4:00 p.m.
December	19	Friday	Last day for winter quarter registration except for new students
December	23	Tuesday	School of Agriculture, first term closes Fall quarter closes, Christmas vacation begins 9:00 p.m.
December	24	Week	Registration of new students. Payment of winter quarter fees
January	1		
December	29	Week	Farmers' and Home Makers' Week Short Course
January	3		
January	2	Friday	Winter quarter begins
January	5	Monday	School of Agriculture, second term begins
February	2	Monday	Last day for removal of fall quarter incompletes
February	12	Thursday	Lincoln's Birthday; a holiday
February	19	Thursday	Senate meeting, 4:00 p.m.

March	17	Wednesday	Last day for spring quarter registration except for new students
March	24	Wednesday	Winter quarter closes. School of Agriculture, second term closes
March	25-30	Week	Registration of new students. Payment of spring quarter fees. Examinations for removal of fall quarter conditions
March	29	} Week	Boys' and Girls' Week Short Course
April	3		
March	31	Wednesday	Spring quarter begins
April	2	Friday	Good Friday; a holiday
April	30	Friday	Last day for removal of winter quarter incompletes
May	17	Monday	Traction Engineering Short Course begins
May	20	Thursday	Senate meeting, 4:00 p.m.
June	7	Monday	Last day for summer quarter registration except for new students
June	13	Sunday	Baccalaureate service
June	14-19	Week	Threshers' Week Short Course
June	14-19	Week	Registration of new students. Payment of fees Examinations for removal of winter quarter conditions
June	16	Wednesday	Spring quarter closes
June	17	Thursday	Forty-eighth annual commencement
June	19	Saturday	Traction Engineering Short Course closes
June	21	Monday	*Summer quarter begins
July	19	Monday	Last day for removal of spring quarter incompletes
September	3	Friday	Summer quarter closes

* Final arrangements for the summer quarter in 1919-20 have not been made. See later announcements.

THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

FACULTY

MARION LeROY BURTON, Ph.D., D.D., LL.D., President
CYRUS NORTHROP, LL.D., President Emeritus
ROSCOE W. THATCHER, M.A., Dean of the Department of Agriculture
EDWARD M. FREEMAN, Ph.D., Dean of the College
EDWARD E. NICHOLSON, M.A., Dean of Student Affairs
....., Dean of Women
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JOHN H. ALLISON, Ph.B., M.F., Professor of Forestry
FREDERICK J. ALWAY, Ph.D., Professor of Soil Chemistry
PHILIP A. ANDERSON, B.S., Assistant Professor of Animal Husbandry
ALBERT C. ARNY, B.S., in Agr., Associate Professor of Farm Crops
CLYDE H. BAILEY, M.S., Associate Professor of Agricultural Biochemistry
LOUIS B. BASSETT, Assistant Professor of Farm Management
JERE BAXTER, Major, U.S.A., Assistant Professor of Military Science and
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HENRY C. BERTELSEN, First Lieutenant, U.S.A., Assistant Professor of
Military Science and Tactics
ALICE BIESTER, M.A., Assistant Professor of Nutrition
ALMA L. BINZEL, B.S., Assistant Professor of Child Training
GUY R. BISBY, B.S., Assistant Professor of Plant Pathology
JOHN D. BLACK, M.A., Assistant Professor of Economics
ANDREW BOSS, Professor of Agronomy and Farm Management
WILLIAM BOSS, Professor of Farm Engineering
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JOSEPH C. CORT, M.S., Assistant Professor of Dairy Husbandry
WILLIAM W. CUMBERLAND, Ph.D., Associate Professor of Economics
MAXWELL J. DORSEY, Ph.D., Associate Professor of Horticulture
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WILLIAM P. DYER, B.A., Assistant Professor of Agricultural Education

- CLARENCE H. ECKLES, M.S., D.Sc., Professor of Dairy Husbandry
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 THEOPHILUS L. HAECCKER, Professor Emeritus of Dairy Husbandry
 EDWIN O. HANSON, Assistant Professor of Dairy Husbandry
 HERBERT K. HAYES, M.S., Associate Professor of Plant Breeding
 FRANCIS JAGER, Professor of Bee Culture
 WILLIAM H. KENETY, M.S., Assistant Professor of Forestry
 HOWARD C. H. KERNKAMP, D.V.M., Assistant Professor of Veterinary
 Medicine
 WILLIAM P. KIRKWOOD, B.A., Professor of Journalism
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 Women
 ROBERT C. LANSING, M.A., Assistant Professor of Rhetoric
 DEXTER D. MAYNE, Professor of Agricultural Pedagogics
 MAUDE MILLER, B.S., Assistant Professor of Home Economics
 WILLIAM MOORE, B.A., Associate Professor of Research in Economic
 Zoology
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 chemistry
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 LEROY S. PALMER, Ph.D., Associate Professor of Agricultural Biochem-
 istry
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 CLAYTON O. ROST, M.A., Assistant Professor of Soils
 ARTHUR G. RUGGLES, M.A., Associate Professor of Entomology

¹ On leave of absence, 1919-20.

FACULTY

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- ARTHUR C. SMITH, B.S., Professor of Poultry Husbandry
ELVIN C. STAKMAN, Ph.D., Professor of Plant Pathology
FREDERICK H. STEINMETZ, B.S. in Agr., Assistant Professor of Agronomy
JOHN T. STEWART, C.E., Professor of Agricultural Engineering
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ROBERT M. WASHBURN, M.S.A., Professor of Dairy Husbandry
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 ANNA WENTZ, Assistant in Entomology and Economic Zoology

EXTENSION STAFF

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 CLARENCE H. WELCH, Secretary, Agricultural Extension Division
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 Work

EDWIN HASLERUD, Assistant in charge of Cow Testing Associations
 GEORGE F. HOWARD, Assistant State Leader Boys' and Girls' Club Work
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 MAY SECREST, State Leader in Home Economics
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 ARNE G. TOLAAS, M.S., Plant Pathology Specialist

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 HOME ECONOMICS

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 FRANCIS B. BARTON, Docteur de l'Université de Paris, Assistant Professor
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 LUTHER L. BERNARD, Ph.D., Associate Professor of Sociology
 ROY G. BLAKEY, Ph.D., Associate Professor of Economics
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 WILLIAM S. COOPER, Ph.D., Assistant Professor of Botany
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 chology
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 ROSS L. FINNEY, Ph.D., Assistant Professor of Sociology

WILLIAM S. FOSTER, Ph.D., Associate Professor of Psychology
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 SOLOMON M. DELSON, Ph.B., Instructor in Romance Languages
 MARGUERITE GUINOTTE, Brevet Supérieur l'Académie, Instructor in Romance Languages
 ALBERT J. LOBB, Ph.B., LL.B., Instructor in Political Science
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 FRANCES M. MOREHOUSE, M.A., Instructor in History, University High School
 VICTOR H. PELZ, M.A., Instructor in Economics
 GERTRUDE REEVES, Instructor in Pianoforte
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 J. WARREN STEHMAN, M.A., Instructor in Economics
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 GUY H. WOOLLETT, Ph.D., Instructor in Chemistry
 ROBERT G. GREEN, B.A., Assistant in Bacteriology
 SIEGFRIED F. HERRMANN, B.S., M.B., Assistant in Bacteriology

FACULTY COMMITTEES

1919-1920

Executive.—The Executive Committee of the Department of Agriculture

Enrollment.—WEST, BIESTER, MORROW, PIERCE, WENTLING

Curriculum.—FREEMAN, BOSS, BIESTER, CHEYNEY, GAY, WENTLING, RILEY, STORM, WEIGLEY, WELLER, WENTLING, WEST

Students' Work.—FREEMAN, CHEYNEY, NICHOLSON, WEIGLEY, WEST

Student Organizations.—LANSING, FITCH, FREEMAN, MILLER, WELLER

Appointment.—STORM, WEIGLEY

Farm Experience.—BOSS, BRIERLEY

Faculty Business.—GORTNER, RUGGLES, STAKMAN, VERMILYE

GENERAL INFORMATION

ADMISSION

New students are admitted at the opening of any quarter.

All students entering for the first time must submit their credentials to the Enrollment Committee

Admission is either by certificate or by examination. Candidates must have completed the equivalent of a four-year high-school course and must present:

1. Four units of English; or three units of English and four units of a foreign language; or three units of English and two units in each of two foreign languages.
2. One unit of elementary algebra and one unit of plane geometry.
3. Enough additional work to make in all fifteen units, of which not more than four may be in subjects not listed in the admission groups in the General Information Bulletin.

Graduates of the School of Agriculture of the University of Minnesota who have completed the two summers of supervised work offered in the School course, one additional School year, and one additional summer's work, or the equivalent thereof, will be admitted to the College of Agriculture, Forestry, and Home Economics.

For details of admission requirements and definition of "unit," see the Bulletin of General Information.

Every prospective student is urged to obtain before entering college at least six months' practical experience on a farm. Entering students whose farm experience credentials are not satisfactory will be examined as to their familiarity with farm practices, and farm experience will be required during the college course in accordance with the results of these examinations. For students specializing in Dairy Husbandry at least three of the six months of approved farm experience must be on an accredited dairy farm.

Applicants for admission are urged to present physics (1 unit), chemistry (1 unit), and higher algebra ($\frac{1}{2}$ unit), for entrance credits. If these subjects are not completed in the high school, they will have to be taken in the University, thus postponing some of the vocational courses.

FEES

Free tuition.—The State will pay the tuition of any student who served in the army, navy, or marine corps of the United States during any war in which the United States has been involved, including members of the National Guard or who, upon the call of the president, performed military service outside the borders of Minnesota in any trouble with Mexico; and of any student who performed overseas service as a regularly enlisted full-time worker of the Red Cross, engaged in nursing the sick or assisting in the care of soldiers in any government hospital, field or camp, which service has been officially recognized by the National Government. The amount of this free tuition is not to exceed \$200 for any

one person and the benefits of this act will not extend beyond July 1, 1924. The amount to be paid in any year will be limited by the legislative appropriation for that year.

Application for this free tuition should be made to the Secretary's Office at the time of registration. This applies only to students, who at the time of enlistment were citizens and residents of the State of Minnesota.

Tuition includes all of the regular quarter charges listed below except the deposit and penalty fees for change of registration, late registration, condition examinations, etc.

Tuition fee (per quarter)	
Residents of Minnesota.....	\$14.00
Non-residents	28.00
Deposit (first quarter only).....	5.00
Health fee (per quarter).....	2.00
Minnesota Union (per quarter).....	.70
Special fees	
Examination for removal of conditions.....	1.00
Examinations for credit (after the first quarter in residence).....	5.00
Special examinations	5.00
Change of registration.....	2.50

Late registration.—Old students must indicate their registration not later than two weeks before the day set for classes to begin. All students must complete their registration (including payment of fees) before the day set for classes to begin. Penalty for delay in either indicating or completing registration, five dollars. An additional dollar is charged for each day of delay after the last day set for the completion of registration and a similar charge is made for each day of delay after the last day set for payment of fees.

Important.—The regulations require that no student be allowed to register after the quarter opens except by special committee action.

FACULTY REGULATIONS

Students are held responsible for compliance with all Faculty regulations. These regulations are published in a booklet issued to students at the time of registration.

REQUIREMENTS FOR GRADUATION AND DEGREES

After the completion of the prescribed course of study, including all of the required work and the requisite amount of elective work equivalent to a total of 204 (213 in June, 1920) credit hours, candidates will be recommended for graduation with the degree of Bachelor of Science.

PROFESSIONAL CERTIFICATES

Beginning with the year 1920-21 students entering the junior class who expect to receive the teacher's certificate from the University of Minnesota shall be registrants in the College of Education.

The University State Teachers' Certificate in Agricultural Education will be granted in 1919-20 to graduates of the College of Agriculture, Forestry, and Home Economics, who have completed fifteen hours in approved professional courses, and to graduates of the College of Education who have carried the prescribed course leading to such a certificate.

COURSES OF STUDY

The work of the freshman year and a majority of that of the sophomore year is the same for all students. The work of the junior and senior years is arranged to permit specialization.

The College recognizes four principal groups of students:

1. Those who are preparing for general agricultural pursuits, such as county agent work, dairying, stock raising, vegetable and fruit farming, grain farming, and the management of general and specialized types of farms.

2. Those who are preparing to become specialists in any of the above lines for the practice of professional agriculture in college or experiment station. For these students graduate work after the completion of the prescribed course is advised.

3. Those who are preparing to become teachers of agriculture and manual training in secondary schools.

4. Those who expect to become specialists in some one of the special agricultural sciences such as Agricultural Biochemistry, Agricultural Economics, Entomology, Plant Breeding, Plant Pathology, Soils, etc. For thorough preparation in any of the lines listed in this group, graduate work, after the completion of the four-year course, is essential.

Groups of courses, supplementary to those required of all students, are outlined on pages 19 to 25. Some one of these should be chosen not later than the close of the freshman year.

Any student who has in mind some definite field of work not covered by these suggested lines of specialization should consult the Dean of the College for advice in the modification of his course of study or for the arrangement of a curriculum particularly suited to the vocation for which he desires to prepare himself.

After selecting or arranging such a course of study, each student should consult frequently with the head of the division, or divisions, giving the major work in his curriculum, advising particularly with reference to electives and practical vacation work which may be of value in his chosen line of specialization.

EXPLANATION OF COURSE NUMBERS

The quarters in which courses are offered are indicated by the letters *f* (fall), *w* (winter), *s* (spring), and *su* (summer) following the course number. For example: 5*f,w,s* indicates that Course 5 is given in the fall quarter and is repeated in the winter quarter and again in the spring quarter; 5*f-6w* indicates a two-quarter course extending through the fall and winter quarters; and 5*f,w-6w,s* indicates that Course 5-6 is given in the fall and winter quarters and repeated through the winter and spring quarters.

All undergraduate courses are numbered from 1 to 100. All courses open to undergraduates and graduates are numbered from 101 to 200.

Numbers following the descriptive name of a course indicate the number of credit hours.

Course numbers in parentheses, following the number of credit hours indicate prerequisite courses.

Descriptions of the courses listed in the following outline of the curricula, together with those of additional courses offered as electives will be found on pages 27 to 74. The divisional statements are arranged alphabetically according to the names of the divisions.

One credit hour is equivalent to (1) one lecture or recitation period requiring two hours of preparation, (2) two periods of laboratory work requiring one hour of preparation, or (3) three periods of laboratory work with no preparation, each week for one quarter.

GROUP I. GENERAL REQUIREMENTS FOR ALL STUDENTS IN AGRICULTURE

FRESHMAN YEAR

All of the following work is required of every student except for the exemptions indicated. For some students this represents more than the regular amount of work of seventeen credit hours per quarter. In such cases those subjects listed below which cannot be taken in the freshman year must take precedence the following year. Registration for from fifteen to eighteen credit hours of work each quarter will be allowed without special permission. Care should be taken in registration to give precedence to courses offered only one quarter.

1. *Non-credit courses* required for graduation in addition to the 204 credit hours.
 - Freshman Lectures. A course of nine lectures intended primarily to familiarize the new student with the College, college customs, and methods of procedure. Offered only in the fall quarter.
 - Military Drill. Three hours per week throughout the year. Students found to be physically unfit may be required to substitute special corrective exercises in gymnasium.
 - Physical Education 3w. Gymnasium and Swimming. Two hours per week for one quarter.
2. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and the prerequisites must be observed. Ordinarily, if Botany is registered for in the freshman year, registration for Zoology should be postponed until the sophomore year, and vice versa.
 - Agron. 1f,w,s, Farm Crops, 3.
 - An. Biol. 1f,w,s-2w,s,su, General Zoology, 10. Should be postponed until the sophomore year by those who take Bot. 1-2.
 - An. Husb. 1f,w, Types and Breeds of Livestock, 5.
 - Bot. 1f,s-2w,f, General Botany, 10. Students entering college with a year of high-school botany satisfactory to the Department may omit Bot. 1 (see foot note on page 40) and substitute five credits elective later in their course of study. These courses should be postponed until the sophomore year by those registered for An. Biol. 1-2.
 - Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high-school chemistry may omit this course and register for Chem. 9-10. Those required to take this course because of inability to carry successfully Chem. 9-10 will be allowed not more than ten credits.

- Chem. 9f-10w, Advanced General Inorganic Chemistry, 10. Those required to take Chem. 1-2-3 are exempt.
- Dy. Husb. 1f,s, Elements of Dairying, 5.
- Econ. 5f,s, General Economics, 5. Open to freshmen only during their third quarter.
- Farm Eng. 10f,w, Farm Engineering, 3.
- Farm Eng. 11f,w, Applied Mathematics, 5. Students presenting a half year of high-school higher algebra may omit this course and substitute five credits elective later in their course of study.
- Hort. 90f,s, General Horticulture, 3. This course should be omitted by those intending to specialize in Horticulture or in Agricultural Education and three credits elective substituted later in their course of study.
- Phys. Educ. 1f, Personal Hygiene, 1.
- Rhet. 1f,w,s,¹ Rhetoric I, 3
- Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1)
- Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2)
- Rhet. 4f,w,s, Elementary Rhetoric, 3. Required only of those who are found to be unable to carry Rhet. 1.

SOPHOMORE YEAR

1. *Non-credit courses* required for graduation in addition to the 204 credit hours. Military Drill. Three hours per week throughout the year. Students found to be physically unfit may be required to substitute special corrective exercises in gymnasium.
2. *Freshman courses* which were not completed during the freshman year.
3. *General courses*.—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and the prerequisites must be observed.

Agr. Biochem. 7f,su-8w,su, General Agricultural Biochemistry, 10 (Chem. 10 cred.)

Bact. 6f,w,s, Elementary Bacteriology, 4

Econ. 6f,w, Agricultural Economics, 3 (Econ. 5)

Farm Eng. 3f,s, Mechanical Drawing, 3

Farm Eng. 21f-22w, Agricultural Physics, 10. Those presenting a year of high-school physics, and those selecting a line of specialization requiring Phys. 21, 41, 61 may omit this course and substitute ten credits elective later in their course of study.

Pol. Sci. 1f, American Government, 5

Rhet. 11f,w,s, Argumentation, 5 (Rhet. 3)

Rhet. 22f,w,s, Public Speaking, 5 (Rhet. 3)
4. *Special courses* as prescribed by the curriculum of the line of specialization selected. Enough of these courses should be selected to make up, with those listed in 2 and 3 above, from 15 to 18 credit hours each quarter. See special requirements on pages 19 to 25. Full work for the year (3 quarters) consists of 51 credit hours.

JUNIOR YEAR

1. *General course*. Soils 1s, Soils, 5 (Chem. 10 credits).
2. *Special courses* as prescribed by the curriculum of the line of specialization selected, see special requirements on pages 19 to 25.
3. *Electives*. Enough elective credits should be selected to make up, with those listed in 1 and 2 above, from 15 to 18 credit hours each quarter. Full work for the year (3 quarters) consists of 51 credit hours.

SENIOR YEAR

1. *Special courses* as prescribed by the curriculum of the line of specialization selected. See special requirements on pages 19 to 25.

¹ Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 70.

2. *Electives*.—Enough elective credits should be selected to make up, with those listed in 1 above, from 15 to 18 credit hours each quarter. Full work for the year (3 quarters) consists of 51 credit hours.

GROUP II. SPECIAL REQUIREMENTS IN THE DIFFERENT
LINES OF SPECIALIZATION (SUPPLEMENTARY
TO GROUP I)

AGRICULTURAL BIOCHEMISTRY

General statement.—Students specializing in Agricultural Biochemistry are advised to include among their electives the following courses or their equivalents: German 1; Rom. Lang. 4-5; Bot. 52, 54, 141, 142, 143; or Physiol. 103, 104 and as much mathematics as practicable. The following sequence of mathematics courses is suggested as desirable: Higher Algebra, Plane Trigonometry, Plane and Solid Analytical Geometry, Differential Calculus, and Integral Calculus. (See bulletin of the College of Science, Literature, and the Arts, and of the Medical School.)

Sophomore year:

- Phys. 21f,w,s,su, Elements of Mechanics, 4 (Trigonometry)
Phys. 22f,w,s,su, Elements of Mechanics Laboratory, 1 (Phys. 21 or parallel)
Phys. 41w, Sound and Heat, 4 (Phys. 21)
Phys. 42w, Sound and Heat Laboratory, 1 (Phys. 22, 41 or parallel)
Phys. 61s, Magnetism and Electricity, 4 (Phys. 21)
Phys. 62s, Magnetism and Electricity Laboratory, 1 (Phys. 22, 61 or parallel)

Junior year:

- Agr. Biochem. 101f,su²:102w,su,¹ Agricultural Quantitative Analysis, 6 (Agr. Biochem. 7-8)
Agr. Biochem. 108s,su,² Chemistry of Wheat and Wheat Products, 3 (Agr. Biochem. 3 or 7-8)
Agr. Biochem. 110s,su,² Flour Laboratory Methods, 5 (Agr. Biochem. 101-102 or Chem. 20, 21, parallel Agr. Biochem. 108) or Agr. Biochem. 103f,su,¹ Dairy Chemistry, 5 (Agr. Biochem. 7-8)
Chem. 35f-36w, Organic Chemistry, 10 (Chem. 1-2-3 or 9-10)

Senior year:

- Agr. Biochem. 111f,su-112w,su, Phytochemistry, 6 (Biology 10 cred., Organic Chemistry)
Agr. Biochem. 113f,su-114w,su, Biochemical Laboratory Methods, 4 (Quant. Anal., Agr., Biochem. 111-112 parallel)
Agr. Biochem. 116f,w,s,su, Chemistry of "Vitamines" and Deficiency Diseases, 3 or 5 (Agr. Biochem. 111-112 and 113-114 or Physiol. 101-102) or Agr. Biochem. 118f,w,s,su, Laboratory Problems in Biochemistry, 3 or 5 (Agr. Biochem. 111-112 and 113-114, or 110)

AGRICULTURAL ECONOMICS

General statement.—Students specializing in Agricultural Economics are expected to choose their electives in Economics and some of their electives in other departments to suit the particular field of Agricultural Economics in which they are doing most of their advanced work. They should, therefore, consult the Chief of the Division before registering for their work in the junior and senior years.

Sophomore year:

- Econ. 18s, Problems in Agricultural Economics, 5 (Economics 6)

¹ Offered in alternate summers, offered in 1920.

² Offered in alternate summers, not offered in 1920.

Junior year:

- Agron. 101s, Farm Management I, 3 (Agron. 1, Econ. 6)
- Agron. 121f, Cereal Crops, 3 (Agron. 1, Bot. 10 cred.)
- An. Husb. 8s, Elements of Feeding, 3
- Econ. 19f, Principles of Agricultural Marketing, 5 (Econ. 6)
- Econ. 150s, Farm Finance, 3 (Econ. 6)
- Econ. Elective, 10
- Ent. 3f, Elementary Economic Entomology, 3 (An. Biol. 10 cred.)
- Pl. Path. 1f,su, Plant Pathology, 5 (Bot. 10 cred.)

Senior year:

- Agron. 102f,w,su, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 1)
- Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)
- Econ. 11f, Statistics, 3 (Econ. 6)
- Econ. 107f, Land Tenure, 5 (Econ. 6)
- Econ. 108w, Agricultural Statistics, 5 (Econ. 11)
- Econ. Elective, 6
- Farm Mgt. Elective, 3

AGRICULTURAL EDUCATION

General statement.—Students desiring to procure a State Professional Certificate should consult the Chief of the Division of Agricultural Education before registering for the work of the sophomore year.

Beginning with the year 1920-21 all juniors who expect to receive the teacher's certificate from the University of Minnesota shall be registrants in the College of Education.

Sophomore year:

- An. Husb. 2f, Livestock Judging, 3 (An. Husb. 1)
- Vet. Med. 8s, Veterinary Studies, 5

Junior year:

- Agr. Edu. 68w-69s, Home and School Gardening, 6
- Agr. Educ. 11f,w,s, Principles of Vocational Education, 3
- Agr. Educ. 21f,w, Vocational Education, 3, or Educ. 5w, American School, 3 (Psychol. 1-2)
- Agron. 11s, Farm Machinery, 3
- Agron. 121f, Cereal Crops, 3 (Agron. 1, Bot. 10 cred.)
- Agron. 122w, Corn and Potato Crops, 3 (Agron. 1, Bot. 10 cred.)
- Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1, Bot. 10 cred.)
- An. Husb. 5w, Livestock Breeding, 3 (No prereq. for students in Agr. Educ.)
- An. Husb. 8s, Elements of Feeding, 3
- Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
- Ent. 3f, Elementary Economic Entomology, 3 (An. Biol. 10 cred.)
- Pl. Path. 1f,su, Plant Pathology, 5 (Bot. 10 cred.)

Senior year:

- Agr. Educ. 41f,w-42w,s, Teaching, 6 (Agr. Educ. 131, Agron. 121, 122, 123. (See Course description.)
- Agr. Educ. 131f,w,s, Methods in Teaching High-School Agriculture, 5 (Agr. Educ. 11)
- Agr. Educ. 151f,w-152w,s, Organization and Management, 6 (Agr. Educ. 68-69)
- Agron. 102f,w,su, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 1)
- Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)
- Farm Eng. 7w, Farm Structures, 3 (Farm Eng. 3)
- Pl. Path. 6s, Plant Pest Control, 3 (Pl. Path. 1, Ent. 3)
- Pl. Path. 9f,su, Weeds and Seed Testing, 3 (Bot. 10 cred.)
- Poultry Husb. 1f,w,s, Poultry, 3

AGRICULTURAL EDUCATION—MANUAL TRAINING

General statement.—Students desiring to procure a State Professional Certificate should consult the Chief of the Agricultural Education Division before registering for the work of the sophomore year.

Beginning with the year 1920-21 all juniors who expect to receive the teachers' certificate from the University of Minnesota will be registrants in the College of Education.

In order to be certified for the industrial certificate in manual training and agriculture, the following courses must be completed in addition to the required work outlined below: An. Husb. 5w, 8s; Poultry Husb. 1f,w,s, and Ent. 16s.

Sophomore year:

An. Husb. 2f, Livestock Judging, 3 (An. Husb. 1)

Vet. Med. 8s, Veterinary Studies, 5

Junior year:

Agr. Educ. 68w-69s, Home and School Gardening, 6

Agr. Educ. 11f,w,s, Principles of Vocational Education, 3

Agr. Educ. 21f,w, Vocational Education, 3 or Educ. 5w, American School, 3 (Psychol. 1-2)

Agron. 11s, Farm Machinery, 3

Agron. 121f, Cereal Crops, 3 (Agron. 1, Bot. 10 cred.)

Agron. 122w, Corn and Potato Crops, 3 (Agron. 1, Bot. 10 cred.)

Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1, Bot. 10 cred.)

Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)

Ent. 3f, Elementary Economic Entomology, 3 (An. Biol. 10 cred.)

Pl. Path. 1f,su, Plant Pathology, 5 (Bot. 10 cred.)

Senior year:

Agr. Educ. 41f,w-42w,s, Teaching, 6 (Agr. Educ. 131, Agron. 121, 122, 123. (See course description.)

Agr. Educ. 131f,w,s, Methods in Teaching High-School Agriculture, 5 (Agr. Educ. 11)

Agr. Educ. 133f,w,s, Organization and Methods for Manual Training, 3 (Instructor's permission)

Agr. Educ. 151f,w-152w,s, Organization and Management, 6 (Agr. Educ. 68-69)

Agron. 102f,w,su, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 1)

Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)

Farm Eng. 4w, Blacksmithing, 3 or Farm Eng. 13f,s, Farm Motors, 3

Farm Eng. 5f, Carpentry, 3

Farm Eng. 7w, Farm Structures, 3 (Farm Eng. 3)

Advanced Wood Work or Advanced Drawing, 3

AGRONOMY

Sophomore year:

Bot. 7s, Taxonomy of Flowering Plants, 5 (Bot. 2)

Bot. Elective, 5

Junior year:

Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)

Agron. 121f, Cereal Crops, 3 (Agron. 1, Bot. 10 cred.)

Agron. 122w, Corn and Potato Crops, 3 (Agron. 1, Bot. 10 cred.)

Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1, Bot. 10 cred.)

Bot. 52f, Plant Physiology, 5 (Bot. 15 cred.)

Ent. 3f, Elementary Economic Entomology, 3 (An. Biol. 10 cred.)

Pl. Path. 1f,su, Plant Pathology, 5 (Bot. 10 cred.)

Vet. Med. 8s, Veterinary Studies, 5

COURSES IN AGRICULTURE

Senior year:

- Agron. 102f,w,su, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 1)
 Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)
 Agron. 131f, Principles of Genetics, 3 (Bot. 10 cred., An. Biol. 10 cred.)
 Agron. 132s,su, Farm Crops Plant Breeding, 3 (Agron. 131)
 Agron. Elective, 3
 An. Husb. 6w, Livestock Feeding, 5 (Agr. Biochem. 15)
 Farm Eng. 7w, Farm Structures, 3 (Farm Eng. 3)
 Pl. Path. 9f,su, Weeds and Seed Testing, 3 (Bot. 10 cred.)

ANIMAL HUSBANDRY

Sophomore year:

- An. Husb. 2f, Livestock Judging, 3 (An. Husb. 1)
 Vet. Med. 2f, Anatomy of Domestic Animals, 5

Junior year:

- Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
 Agron. 131f, Principles of Genetics, 3 (Bot. 10 cred., An. Biol. 10 cred.)
 An. Husb. 3f-4w, Market Classes of Livestock, 6 (An. Husb. 2)
 Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
 Poultry Husb. 1f,w,s, Poultry, 3
 Vet. Med. 3w-4s, Comparative Physiology, 6 (Vet. Med. 2)

Senior year:

- Agron. 102f,w,su, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 1)
 Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)
 An. Husb. 5w, Livestock Breeding, 3 (Vet. Med. 6, Agron. 131)
 An. Husb. 6w, Livestock Feeding, 5 (Agr. Biochem. 15)
 An. Husb. 7f, Meats, 3 (Agr. Biochem. 15)
 An. Husb. 9s, Pedigree and Herd Book Work, 3 (An. Husb. 5)
One of the following:
 An. Husb. 102s, Horse Husbandry, 3 (An. Husb. 3-4, 5, 6)
 An. Husb. 103s, Beef Cattle Husbandry, 3 (An. Husb. 3-4, 5, 6)
 An. Husb. 104s, Sheep Husbandry, 3 (An. Husb. 3-4, 5, 6)
 An. Husb. 105s, Swine Husbandry, 3 (An. Husb. 3-4, 5, 6)
 An. Husb. Elective, 6
 Farm Eng. 7w, Farm Structures, 3 (Farm Eng. 3)
 Vet. Med. 6f, Physiology and Hygiene of Breeding, 3 (Vet. Med. 3-4)
 Vet. Med. 12w, Infectious Diseases, 3 (Vet. Med. 3-4, Bact. 6)
 Vet. Med. 13s, Non-infectious Diseases, 3 (Vet. Med. 3-4)

DAIRY HUSBANDRY

General statement.—Two lines of specialization are recognized in Dairy Husbandry: (a) Production, and (b) Dairy Products. Those specializing in Dairy Production may omit Dy. Husb. 3, 4, 5 and Agr. Biochem. 103. Those specializing in Dairy Products may omit An. Husb. 5; Dy. Husb. 104; Vet. Med. 6, 12, 13; from the required courses listed below.

The following electives are recommended: Econ. 18, 19; Poul. Husb. 1; Pub. and Rur. Journ. 10-11-12. Those specializing in Dairy Products are also advised to take Agr. Biochem. 101-102.

Sophomore year:

- An. Husb. 2f, Livestock Judging, 3 (An. Husb. 1)
 Dy. Husb. 2w, Dairy Bacteriology, 3 (Bact. 6)
 Vet. Med. 2f, Anatomy of Domestic Animals, 5

Junior year:

- Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
 Agron. 131f, Principles of Genetics, 3 (Bot. 10 cred., An. Biol. 10 cred.)

- An. Husb. 3f-4w, Market Classes of Livestock, 6 (An. Husb. 2)
 Dy. Husb. 3f, Factory Management, 5 (Dy. Husb. 1, 2)
 Dy. Husb. 4su, Cheese Factory Practice, 3 (Dy. Husb. 1, 3) or Dy. Husb. 5 su,
 Creamery Practice (Dy. Husb. 1, 3)
 Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
 Dy. Husb. 102s, Market Milk, 3 (Dy. Husb. 1, 2)
 Vet. Med. 3w-4s, Comparative Physiology, 6 (Vet. Med. 2)

Senior year:

- Agr. Biochem. 103f,su, Dairy Chemistry, 5 (Agr. Biochem. 7-8)
 Agron. 102f,w,su, Farm Management II: Organization, 3 (Agron. 1, Econ. 6,
 An. Husb. 6 or 8, Soils 1)
 Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)
 An. Husb. 5w, Livestock Breeding, 3 (Vet. Med. 6, Agron. 131)
 Dy. Husb. 103w, Dairy Stock Feeding, 3 (Agr. Biochem. 15, Dy. Husb. 101)
 Dy. Husb. 104s, Advanced Study of Dairy Breeds, 3 (Dy. Husb. 1, 101)
 Dy. Husb. 105f, Seminar I, 1 (3 courses in Dy. Husb.)
 Dy. Husb. 106w, Seminar II, 1 (3 courses in Dy. Husb.)
 Dy. Husb. 107s, Seminar III, 1 (3 courses in Dy. Husb.)
 Farm Eng. 7w, Farm Structures, 3 (Farm Eng. 3)
 Vet. Med. 6f, Physiology and Hygiene of Breeding, 3 (Vet. Med. 3-4)
 Vet. Med. 12w, Infectious Diseases, 3 (Vet. Med. 3-4, Bact. 6)
 Vet. Med. 13s, Non-infectious Diseases, 3 (Vet. Med. 3-4)

ENTOMOLOGY AND ECONOMIC ZOOLOGY

General statement.—Students planning to specialize in Entomology and Economic Zoology are advised to register for the required course in Animal Biology during their freshman year. It is believed that the best interests of such students will be served by leaving a margin for the choice of approved electives during the junior and senior years. Students planning to fit themselves for positions along entomological lines should consult the Chief of the Division early in their course. A reading knowledge of French and German is desirable and is essential to graduate work.

Sophomore year:

- Ent. 1f, s,su, Introductory Entomology, 5 (An. Biol. 10 cred.)
 Ent. 2w,su, Economic Entomology, 5 (Ent. 1)

Junior year:

- Agron. Elective, 3
 Ent. 125f-126w-127s, Advanced General Entomology, 9 (Ent. 1 and 2, or 37-38-39)
 Ent. or Hort. Elective, 3
 Hort. Elective, 3
 Pl. Path. 1f,su, Plant Pathology, 5 (Bot. 10 cred.)

Senior year:

- Ent. 117f-118w-119s, General Ecology of Insects, 9 (Ent. 1 and 2, or 37-38-39)
 Pl. Path. 14s, Plant Disease Control, 5 (Pl. Path. 1, Ent. 1 or 3)
 Pl. Path. 108f-109w, Methods, 6 (Pl. Path. 1, Bact. 6)

FARM MANAGEMENT

Sophomore year:

- Econ. 18s, Problems in Agricultural Economics, 5 (Econ. 6)

Junior year:

- Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
 Agron. 101s, Farm Management I, 3 (Agron. 1, Econ. 6)
 Agron. 121f, Cereal Crops, 3 (Agron. 1, Bot. 10 cred.)
 Agron. 122w, Corn and Potato Crops, 3 (Agron. 1, Bot. 10 cred.)
 Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1, Bot. 10 cred.)
 Ent. 3f, Elementary Economic Entomology, 3 (An. Biol. 10 cred.)
 Pl. Path. 1f,su, Plant Pathology, 5 (Bot. 10 cred.)

Vet. Med. 8s, Veterinary Studies, 5

Senior year:

- Agron. 102f,w,su, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 1)
 Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)
 An. Husb. 6w, Livestock Feeding, 5 (Agr. Biochem. 15)
 Econ. Elective, 5
 Farm Eng. 7w, Farm Structures, 3 (Farm Eng. 3)
 Farm Mgt. Elective, 3
 Pl. Path. 9f,su, Weeds and Seed Testing, 3 (Bot. 10 cred.)

HORTICULTURE

General statement.—Electives should include courses in Botany, Economics, Entomology, and Plant Pathology

Sophomore year:

- For. 21w, Tree Crops, 3
 Hort. 32s, Vegetable Gardening, 3 (Bot. 10 cred.)

Junior year:

- An. Husb. 8s, Elements of Feeding, 3
 Bot. Elective, 10
 Ent. 1f,s,su, Introductory Entomology, 5 (An. Biol. 10 cred.)
 Ent. 2w,su, Economic Entomology, 5 (Ent. 1)
 Hort. 6s, Principles of Fruit Growing, 3 (Bot. 10 cred.)
 Hort. Elective, 3
 Pl. Path. 1f,su, Plant Pathology, 5 (Bot. 10 cred.)
 Pl. Path. 14s, Plant Disease Control, 5 (Pl. Path. 1, Ent. 1 or 3)

Senior year:

- Agron. 102f,w,su, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 1)
 Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)
 Hort. 107f, Orchard Management, 3 (Hort. 90 or 6) or Hort. 131f, Advanced Market Gardening, 3 (Hort. 32)
 Hort. Elective, 9
 Hort. 109f, Principles of Genetics, 3 (Bot. 10 cred., An. Biol. 10 cred.)
 Hort. 110w, Fruit Breeding, 3 (Hort. 109)

PLANT PATHOLOGY

General statement.—Students specializing in Plant Pathology should consult the Chief of the Division with reference to requirements in mathematics before registering for the work of the sophomore year.

Sophomore year:

- Bot. Elective, 10

Junior year:

- Ent. 3f, Elementary Economic Entomology, 3 (An. Biol. 10 cred.)
 Phys. 21f,w,s,su, Elements of Mechanics, 4 (Trigonometry)
 Phys. 22f,w,s,su, Elements of Mechanics Laboratory, 1 (Phys. 21 or parallel)
 Phys. 41w, Sound and Heat, 4 (Phys. 21)
 Phys. 42w, Sound and Heat Laboratory, 1 (Phys. 22, 41 or parallel)
 Phys. 61s, Magnetism and Electricity, 4 (Phys. 21)
 Phys. 62s, Magnetism and Electricity Laboratory, 1 (Phys. 22, 61 or parallel)
 Pl. Path. 1f,su, Plant Pathology, 5 (Bot. 10 cred.)
 Pl. Path. 14s, Plant Disease Control, 5 (Pl. Path. 1, Ent. 1 or 3)

Senior year:

- Agr. Biochem. 111f,su-112w,su, Phytochemistry, 6 (Biol. 10 cred, Organic Chemistry)
 Agron. 131f, Principles of Genetics, 3 (Bot. 10 cred., An. Biol. 10 cred.)
 Bot. or Ent. Elective, 10
 Hort. Elective, 3

- Pl. Path. 108f-109w, Methods, 6 (Pl. Path. 1, Bact. 6)
 Pl. Path. 110s, Principles of Pathology, 3 (Pl. Path. 1, Bact. 6)

SOILS

General statement.—Students specializing in Soils should consult the Chief of the Division with reference to requirements in mathematics before registering for the work of the sophomore year.

Sophomore year:

- Chem. 12s-13f, Qualitative Chemical Analysis, 10 (Chem. 9-10)
 Geol. 1f,s-2w,su, General Geology, 10

Junior year:

- An. Husb. 8s, Elements of Feeding, 3
 Chem. 20w, Quantitative Analysis, 5 (Chem. 12-13)
 Chem. 35f-36w, Organic Chemistry, 10 (Chem. 1-2-3 or 9-10)
 Phys. 21f,w,s,su, Elements of Mechanics, 4 (Trigonometry)
 Phys. 22f,w,s,su, Elements of Mechanics Laboratory, 1 (Phys. 21 or parallel)
 Phys. 41w, Sound and Heat, 4 (Phys. 21)
 Phys. 42w, Sound and Heat Laboratory, 1 (Phys. 22, 41 or parallel)
 Phys. 61s, Magnetism and Electricity, 4 (Phys. 21)
 Phys. 62s, Magnetism and Electricity Laboratory, 1 (Phys. 22, 61 or parallel)
 Pl. Path. 1f,su, Plant Pathology, 5 (Bot. 10 cred.)

Senior year:

- Agr. Biochem. 111f,su-112w,su, Phytochemistry, 6 (Biol. 10 cred., Organic Chemistry)
 Agron. 102f,w,su, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 1)
 Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)
 Ent. 3f, Elementary Economic Entomology, 3 (An. Biol. 10 cred.)
 Geol. 21w-22s, Elements of Mineralogy, 10. (See course description.)
 Soils 101f, Chemical Analysis of Soils, 5 (Soils 1, Chem. 20)
 Soils 102f,w,s, Special Problems in Soils,¹ (Soils 101, 103)
 Soils 103f, Mechanical Analysis of Soils, 3 (Soils 1)
 Soils 105w, Minnesota Soils, 3 (Soils 1)

ELECTIVES

Students should consult with the division in which they are specializing with reference to the elective courses which must be chosen to make up the 204 credit hours required for graduation.

Only a limited number of elective courses are open to freshmen. First-year students, who for any reason are unable to follow the regular curriculum, are advised to fill their program with a required course from the sophomore schedule, if possible, and postpone the choice of electives until the sophomore year. This plan will enable the student to obtain a better viewpoint from which to select his electives and allow a wider range of subjects from which to choose.

In selecting electives, note particularly (a) prerequisites, (b) classes of students (fr., soph., jr., or sr.) to which courses are offered, (c) number of credits, (d) quarter or quarters offered, and be sure that provision is made in registration for the proper sequence of continuation courses.

¹ Credit according to amount of work.

FRESHMAN ELECTIVES

The following divisions and departments offer elective work to freshmen. For the description of available courses see pages 27 to 74, and for departments marked S., L., and A., see bulletin of the College of Science, Literature, and the Arts.

Farm Engineering

Forestry

German

History (S., L., and A.)

Home Economics

Mathematics (S., L., and A.)

Poultry Husbandry

Romance Languages

SOPHOMORE, JUNIOR, AND SENIOR ELECTIVES

Nearly all of the divisions offer elective work to sophomores, juniors, and seniors.

Elective courses in the college of Science, Literature, and the Arts, are separated into Junior College courses, open to freshmen and sophomores, and Senior College courses, open to juniors and seniors. In addition to satisfying other prerequisites an average grade of C must be maintained for the first two years in order to register for a Senior College elective.

DESCRIPTION OF COURSES

For explanation of course numbers and credits see page 16.

AGRICULTURAL BIOCHEMISTRY

Professor ROSS A. GORTNER; Associate Professors CLYDE H. BAILEY,
LEROY S. PALMER; Assistant Professors R. ADAMS DUTCHER, CLAR-
ENCE A. MORROW, JOHN J. WILLAMAN.

General statement.—This Division offers two types of work, namely, courses in those phases of chemistry which have special application in agriculture or home economics for students whose major work is in other divisions; and courses designed to train chemists for research or instruction in the special field of Agricultural Biochemistry. For specialization in this Division, see special requirements in Course of Study.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
7f,su ¹ -8w, su. ²	General Agricultural Biochem- istry.....	10	Soph., jr., sr.	Chem. 10 cred.
15f,su. ¹	Principles of Animal Nutrition.	3	Soph., jr., sr.	7-8
<i>Advanced Courses</i>				
101f,su- 102w,su.	Agricultural Quantitative Anal- ysis.....	6	Jr., sr.	7-8
103f,su. ¹	Dairy Chemistry.....	5	Jr., sr.	7-8
106f.	Agricultural Products and By- Products.....	5	Sr.	101-102
108s,su. ²	Chemistry of Wheat and Wheat Products.....	3	Jr., sr.	7-8
110s,su. ²	Flour Laboratory Methods....	5	Jr., sr.	101-102, or Chem. 131- 132, parallel 108
111f,su- 112w,su.	Phytochemistry.....	6	Sr.	Biol.10 cred., Org.Chem.
113f,su- 114w,su.	Biochemical Laboratory Meth- ods.....	4	Sr.	Quant. Anal., parallel 111-112
116f,w,s .su.	Chemistry of "Vitamines" and Deficiency Diseases.....	3 or 5	Sr.	111-112, 113-114, or Physiol. 101-102, or 7-8 and 15.
118f,w,s, su.	Laboratory Problems in Bio- chemistry.....	3 or 5	Sr.	111-112, 113-114; or 103 or 110.

¹ Offered in alternate summers, offered in 1920.

² Offered in alternate summers, not offered in 1920.

INTRODUCTORY COURSES

- 7f,su¹-8w,su.² GENERAL AGRICULTURAL BIOCHEMISTRY. A lecture and laboratory course involving a qualitative and quantitative study of the types of organic and inorganic compounds found in plants and animals and of the chemical changes involved in metabolism, growth, and maintenance. DUTCHER.
- 15f,su.¹ PRINCIPLES OF ANIMAL NUTRITION. A course consisting of lectures, recitations, and collateral reading emphasizing the chemical and physiological principles underlying digestion, metabolism, utilization of feeds, maintenance, growth, fattening, milk production, vitamin hypothesis, and deficiency diseases. DUTCHER.

ADVANCED COURSES

- 101f,su¹-102w,su.¹ AGRICULTURAL QUANTITATIVE ANALYSIS. The estimation of inorganic and organic constituents of agricultural products, the proximate analysis of foods and feeding stuffs, the use of the polariscope, immersion refractometer, colorimeter and nephelometer, viscosimeter, and other special apparatus. MORROW.
- 103f,su.¹ DAIRY CHEMISTRY. Lectures, library, and laboratory work involving a study of the chemical composition of dairy products and the quantitative analysis of these products as practiced in control laboratories, together with qualitative examination for preservatives and adulterations. PALMER.
- 106f. AGRICULTURAL PRODUCTS AND BY-PRODUCTS. The composition of the principal products and by-products of agriculture and their utilization as raw material in various industries, and the methods of chemical control work in these industries. BAILEY.
- 108s,su.² CHEMISTRY OF WHEAT AND WHEAT PRODUCTS. A lecture course, with collateral library reference work, on the chemical technology of the production and milling of wheat and the conversion of its products into human food. BAILEY.
- 110s,su.² FLOUR LABORATORY METHODS. A laboratory course in methods of analyses of wheat and its products; milling tests of wheat, baking and special tests of flour. Designed to train students for research and control work in the cereal industry. BAILEY.
- 111f,su-112w,su. PHYTOCHEMISTRY. Advanced course dealing with the colloidal state, and the chemistry of proteins, carbohydrates, glucosides, tannins, fats, plant acids, enzymes and pigments and their physico-chemical relations to the vital processes involved in growth and nutrition. MORROW.

¹ Offered in alternate summers, offered in 1920.

² Offered in alternate summers, not offered in 1920.

113f,su-114w,su. **BIOCHEMICAL LABORATORY METHODS.** A laboratory course paralleling the lectures in 111, using recent methods for the investigation of biologically important compounds, with especial reference to the detection and estimation of such compounds in cells or tissues. MORROW.

116f,w,s,su. **THE CHEMISTRY OF "VITAMINES" AND DEFICIENCY DISEASES.** Lectures, consultations, and library work on special nutritional problems accompanied by chemical and biological studies of food materials from the standpoint of their "vitamine" content. DUTCHER.

118f,w,s,su. **LABORATORY PROBLEMS IN BIOCHEMISTRY.** Special laboratory work in the preparation and isolation of pure compounds which occur in living cells, the study of biochemical reactions, and special methods of identification or determination of biochemical products. GORTNER, BAILEY, PALMER, DUTCHER, MORROW, WILLAMAN.

AGRICULTURAL ECONOMICS

See Economics (page 45).

AGRICULTURAL EDUCATION

Professors ASHLEY V. STORM, DEXTER D. MAYNE; Assistant Professors WILLIAM P. DYER, ALBERT M. FIELD; Instructor JOHN V. ANKENEY; Extension Specialists THEODORE A. ERICKSON, GEORGE F. HOWARD.

General statement.—For specialization in this Department, see special requirements in Course of Study.

COURSES					
No.	Title	Credits	Offered to	Prereq. courses	
<i>Introductory Courses</i>					
11f,w,s.	Principles of Vocational Education.....	3	Jr., sr. ²	None	
21f,w	Vocational Education.....	3	Jr., sr. ²	None	
41f,w-42w, s.	Teaching.....	6	Sr. ²	131, Agron. 121, 122, 123, see course description	
63f-64w- 65s.	General Agriculture.....	9	All	None	
68w-69s.	Home and School Gardening....	6	Jr., sr. ²	None	
<i>Advanced Courses</i>					
121w.	Teachers' Course—Home and School Garden Supervision...	2	Approval of Division		
131f,w,s.	Methods in Teaching High-School Agriculture.....	5	Jr., ¹ sr. ²	11	
133f,w,s.	Organization and Methods for Manual Training.....	3	Jr., sr.	11	

¹ Open to juniors on approval of the Chief of the Division.

² Offered only to those preparing to teach.

COURSES IN AGRICULTURE

No.	Title	Credits	Offered to	Prereq. courses
151f,w-				
152w,s.	Organization and Management.	6	Sr. ²	68-69
153su.	Consolidated Rural Schools....	3	All ²	None
161f-162w-				
163s.	Fundamentals of Agriculture...	9	Jr., sr. ²	None
171f,w.	Extension Work.....	3	Sr.	None
173f,w,s.	History of Agriculture.....	3	Soph., jr., sr.	None
175f,w.	Visual Presentation.....	3	Jr., sr.	None
176s.	Advanced Visual Presentation..	3	Jr., sr.	175
181w.	Agricultural Statistics and Graphic Representation.....	3	Soph., jr., sr.	None
191f-192w-				
193s.	Seminar in Agricultural Educa- tion.....	3-9	Sr. ²	None

² Offered only to those preparing to teach.

INTRODUCTORY COURSES

11f,w,s. PRINCIPLES OF VOCATIONAL EDUCATION. The fundamental principles upon which education is based. Emphasis is placed on those phases which are most closely related to vocational education. DYER.

21f,w. VOCATIONAL EDUCATION. A short history of vocational education; present status in Europe and the United States; manual training, and home arts in an educational system; place of agriculture in the public schools with special reference to Minnesota. MAYNE.

41f,w-42w,s. TEACHING¹. Observation of regular classes; interpretation of class practices; preparation of lesson plans and actual teaching of classes under careful supervision in recitation and laboratory; criticism and discussion of plans, methods, and results of student's teaching. Students are admitted to this course only when recommended by the faculty of the division in which they are specializing and when accepted by the Division of Agricultural Education. STORM, ANKENY, DYER, FIELD.

63f-64w-65s. GENERAL AGRICULTURE. For students specializing in such divisions as Agricultural Biochemistry, Entomology, and Economic Zoology, Plant Pathology, and in other colleges. A series of units by division chiefs and other agricultural specialists. STORM, MAYNE.

68w-69s. HOME AND SCHOOL GARDENING. Lecture and laboratory. The elements of horticulture as applied to high-school instruction, plant propagation, fruit growing, home gardening, school gardening, and the planning of home and school grounds. Same as Hort. 94-95. FIELD, BRIERLEY.

ADVANCED COURSES

121w. TEACHERS' COURSE—HOME AND SCHOOL GARDEN SUPERVISION. A lecture and laboratory course designed to give teachers the prepara-

¹ Students who are prepared may be required to do their teaching in manual training.

- tion necessary for the proper planning, management, and supervision of home and school gardens. FIELD, ANKENY.
- 131f,w,s. METHODS IN TEACHING HIGH-SCHOOL AGRICULTURE. Fundamental elements of method in teaching as related to teaching agriculture in high school. Organizing subject-matter of daily work; selection and manipulation of devices. Classroom and laboratory method. Specific plans for teaching secondary agriculture. FIELD.
- 133f,w,s. ORGANIZATION AND METHODS FOR MANUAL TRAINING.
- 151f,w-152w,s. ORGANIZATION AND MANAGEMENT. Organization and management of work in secondary schools, particularly of Minnesota, with special reference to agricultural work, courses of study, programs, equipment, laboratory and class management, extension work, plots, and coordination of work. STORM, DYER.
- 153su. CONSOLIDATED RURAL SCHOOLS. Building arrangements, selection of teachers, equipment, transportation of pupils, health supervision, home project work, and other problems in organization and management of consolidated rural schools from the viewpoint of the special needs of rural life. DYER.
- 161f-162w-163s. FUNDAMENTALS OF AGRICULTURE. Essential for principals and superintendents of schools in which agriculture is taught, and valuable for students of other colleges whose time for agriculture is limited. Agricultural college experts will give work in their special fields. STORM,
- 171f,w. EXTENSION WORK. Federal, state, and local extension aims, organization. Assembling and use of extension data and equipment. Development of extension methods especially as applied to the work in Minnesota.
- 173f,w,s. HISTORY OF AGRICULTURE. A history of agricultural progress with special reference to the greater movements and to sources from which modern agriculture has received its most valuable acquisitions. Comparisons of our own agriculture with that of other countries. DYER.
- 175f,w. VISUAL PRESENTATION. To prepare persons for presenting materials by means of slides, films, charts, etc. Students assisted in assembling materials for their own use and in acquiring skill and technique in preparation and operation of various mediums. ANKENY.
- 176s. ADVANCED VISUAL PRESENTATION. Continuation of 175. Further work in design and construction of charts and lantern slides. Special study of motion picture machines. Actual practice in effective use of visual aids in lecture and recitation. ANKENY.

181. AGRICULTURAL STATISTICS AND GRAPHIC REPRESENTATION. Course teaches application of statistical methods to agriculture and different means of representing agricultural statistics graphically. Of value to all students to enable them to interpret, present, and use agricultural statistics and graphic representations. _____

191f-192w-193s. SEMINAR IN AGRICULTURAL EDUCATION. Critical studies of important problems in agricultural education; opportunity for individual investigation and research; review and interpretation of current educational literature. STORM, FIELD.

AGRONOMY AND FARM MANAGEMENT

Professor ANDREW BOSS; Associate Professors ALBERT C. ARNY, HERBERT K. HAYES, FRANCIS W. PECK;¹ Assistant Professors LOUIS B. BASSETT, RALPH J. GARBER, FREDERICK H. STEINMETZ; Extension Specialists WILLIAM L. CAVERT, THOMAS B. MCCULLOUGH.

General statement.—For specialization in this Department, see special requirements in Course of Study.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f,w,s,su.	Farm Crops	3	All	None
11s.	Farm Machinery	3	Jr., sr.	None
<i>Advanced Courses</i>				
101s.	Farm Management I	3	Jr., sr.	1, Econ. 6
102f,w,su.	Farm Management II: Organization	3	Sr.	1, Econ. 6, An. Husb 6 or 8, Soils 1
103w,s.	Farm Management II: Operation	3	Sr.	102
104s.	Farm Management III	3	Sr.	101, 103
121f.	Cereal Crops	3	Jr., sr.	1, Bot. 10 cred.
122w.	Corn and Potato Crops	3	Jr., sr.	1, Bot. 10 cred.
123s.	Forage and Fiber Crops	3	Jr., sr.	1, Bot. 10 cred.
131f.	Principles of Genetics	3	Jr., sr.	Bot. 10 cred., An. Biol. 10 cred.
132s,su.	Farm Crops Plant Breeding	3	Jr., sr.	131

INTRODUCTORY COURSES

- 1f,w,s,su. FARM CROPS. An elementary study of the important field crops of the United States with emphasis upon those of local importance; distribution, economic importance, agricultural classification, cultural methods, and principles of improvement. GARBER, STEINMETZ.
- 11s. FARM MACHINERY. Lectures and laboratory work covering classification, mechanical construction, adjustment, and operation of the different kinds of farm machinery. BASSETT.

¹ On leave of absence.

ADVANCED COURSES

- 101s. FARM MANAGEMENT I. Farm Records—A study of simple farm accounting and of the forms and methods employed in making cost of production studies, and farm management surveys. Practice given in the art of record keeping and accounting. —————
- 102f,w,su. FARM MANAGEMENT II: ORGANIZATION. A course in which the business side of farming is emphasized. Special attention is given to farm organization and equipment. BOSS.
- 103w,s. FARM MANAGEMENT II: OPERATION. Continuation of 102, Special attention is given to farm operation. BOSS.
- 104s. FARM MANAGEMENT III. An advanced seminar course, including cost of production studies, farm business analyses, and farm practices. BOSS.
- 121f. CEREAL CROPS. An advanced study of the cereal crops. Structure, group classification, improvement, growing and utilization. Brief score-card practice and a limited amount of placing on intrinsic value included. ARNY.
- 122w. CORN AND POTATO CROPS. A study of the corn and potato crops similar to that outlined for Course 121. ARNY.
- 123s. FORAGE AND FIBRE CROPS. A study of forage plants through assigned reading, laboratory and field work. Following the study of each crop some attention is given to score-card practice and comparative placing of representative samples. ARNY.
- 131f. PRINCIPLES OF GENETICS. Lectures and laboratory work designed to familiarize the student with the underlying principles of breeding. Heredity variation, biometry, and evolution are emphasized. Same as Hort. 109. HAYES, DORSEY.
- 132s,su. FARM CROPS PLANT BREEDING. Applied genetics is emphasized. Methods of breeding each of the important agricultural and horticultural crops with special attention to experiment station investigations and to the methods used by plant breeders. HAYES, GARBER.

ANIMAL BIOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors HENRY C. NACHTRIEB, WILLIAM A. RILEY, THOMAS S. ROBERTS, CHARLES P. SIGERFOOS; Associate Professor HAL DOWNEY; Assistant Professors ROYAL N. CHAPMAN, ELMER J. LUND, OSCAR W. OESTLUND; Instructors GEORGE D. ALLEN, ADOLPH RINGOEN.

General statement.—Courses in this Department are closely correlated with those offered by the Division of Entomology and Economic Zoology

of the College of Agriculture, Forestry, and Home Economics. For courses of that Division, see page 50.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f,w,s-2w, s,su.	General Zoology.....	10 ¹	All	None
9f,s-10w.	Histology and Embryology....	10 ¹	Soph., jr., sr.	1-2
17f-18w.	General Physiology.....	10 ¹	Soph., jr., sr.	15 cred. or 10 cred. and Chem. or Phys. 10 cred.
23s.	Morphogenesis and Behavior of Organisms.....	5	All	15 cred. or 10 cred. and Chem. or Phys. 10 cred.
27s.	Comparative Anatomy.....	5	All	1-2
35s.	General Embryology.....	5	All	1-2
37f-38w.	General Entomology.....	10 ¹	Soph., jr., sr.	1-2
43s,su.	Introductory Entomology....	5	All	1-2
44f,s.	Animal Parasites.....	5	Soph., jr., sr.	1-2
45w,su.	Insects and Disease.....	3	Soph., jr., sr.	44
59s.	General Ecology.....	5	All	1-2
<i>Advanced Courses</i>				
107s.	Protozoology.....	3	Jr., sr.	15 cred. incl. 1-2
109f-110w.	General Physiology.....	10 ¹	Jr., sr.	20 cred.
114w-115s.	Ornithology.....	6 ¹	Jr., sr.	1-2
117f-118w- 119s.	Ecology of Insects.....	9 ¹	Jr., sr.	43
124 su.	Advanced Ecology.....	5	Jr., sr.	117-118-119
125f-126w- 127s.	Advanced Entomology.....	9 ¹	Jr., sr.	37-38 or 43
130w.	Biology and Taxonomy of the Aphididae.....	3	Jr., sr.	20 cred. incl. 1-2.
139s,su.	Histology and Development of Insects.....	5	Soph., jr., sr.	37-38 or 43
182w.	Genetics and Eugenics.....	3	Jr., sr.	9-10

For additional courses, see the bulletin of the College of Science, Literature, and the Arts.

¹ The full course must be completed before credit will be allowed.

INTRODUCTORY COURSES

1f,w,s-2w,s,su. **GENERAL ZOOLOGY.** A survey of the animal kingdom, emphasizing the principles of development and structure in relation to functions and habit, heredity and evolution, and the animals of economic importance. Lectures, quizzes and laboratory. NACHTRIEB, SIGERFOOS, LUND, ALLEN, RINGOEN.

9f,s-10w. **HISTOLOGY AND EMBRYOLOGY.** A comparative microscopic study of the origin and structure of the tissues of vertebrates and invertebrates, and of the organs of mammals. Textbook, lectures, and laboratory. DOWNEY.

17f-18w. **GENERAL PHYSIOLOGY.** Physical and chemical properties of living protoplasm and cells. Various organisms are selected which show

- the nature of physiological processes and introduce the student to quantitative experimental methods in biology. Laboratory, lectures, and reading. LUND.
- 23s. MORPHOGENESIS AND THE BEHAVIOR OF ORGANISMS. Physiology of development of the egg. Regeneration. Production of heat, light, and electricity in animals. Comparative physiology of the nervous system, sense organs, and reactions in lower animals. Laboratory, lectures, and reading. LUND.
- 27s. COMPARATIVE ANATOMY OF VERTEBRATES. Lectures, quizzes, and laboratory work. _____, _____.
- 35s. GENERAL EMBRYOLOGY. A survey of general embryology and the organogeny of the vertebrates. Conference, reference, and laboratory work. NACHTRIEB.
- 37s-38w. GENERAL ENTOMOLOGY. Elements of entomology leading up to discussion of the principles of taxonomy and their application to the classification of insects. OESTLUND.
- 43s. INTRODUCTORY ENTOMOLOGY. The structure, development, and classification of insects. An introductory course in entomology and preparatory for courses in economic entomology. OESTLUND.
- 44f,s. ANIMAL PARASITES AND PARASITISM. Lectures and laboratory work. A consideration of the origin and biological significance of parasitism, and the structure, life history, and economic relations of representative parasites. Methods of control and prevention will be emphasized. RILEY.
- 45w,su. RELATION OF INSECTS TO DISEASE. The causation and transmission of disease by insects and other arthropods. Life history, habits, and methods of control of hominoxious species. RILEY.
- 59s. GENERAL ECOLOGY. A general course covering the relationships of animals, animal societies and faunas to the inorganic and organic factors of the environment. The course consists of lectures, assigned reading, recitations, laboratory and field work. CHAPMAN.

ADVANCED COURSES

- 107s. PROTOZOOLOGY. Lectures, reference and laboratory work on the structure and life histories of Protozoa, with special reference to the relation of the Protozoa to diseases of animals. SIGERFOOS.
- 109f-110w. GENERAL PHYSIOLOGY. A thoro survey of fundamental physiological processes in organisms. Based on Bayliss's "*Principles of General Physiology*." Laboratory, lectures, and reading. LUND.
- 114w-115s. ORNITHOLOGY. Structure, classification, and habits of birds with special reference to the birds of Minnesota. Considerable time devoted to field study. Bird or field-glasses and handbook required. Laboratory, lectures, and quizzes. Class limited to ten. ROBERTS.

- 117f-118w-119s. **ECOLOGY OF INSECTS.** General principles of ecology with special reference to the insects of Minnesota. Lectures, laboratory, assigned reading, and field work. CHAPMAN.
- 124su. **ADVANCED ECOLOGY.** Similar to 117-118-119 with special field work. CHAPMAN.
- 125f-126w-127s. **ADVANCED ENTOMOLOGY.** Advanced work in the lines of morphology and classification of insects, with lectures on the history of entomology. OESTLUND.
- 130w. **BIOLOGY AND TAXONOMY OF THE APHIDIDAE.** Intensive study of the natural history, bibliography, and classification of the Aphididae. OESTLUND.
- 139s,su. **HISTOLOGY AND DEVELOPMENT OF INSECTS.** Lectures and laboratory work on the histology, embryonic and postembryonic development of insects. RILEY.
- 182w. **GENETICS AND EUGENICS.** Facts and theories of heredity and the application of the laws governing natural inheritances for the improvement of the race. Lectures, references, quizzes, and demonstrations. (Not offered in 1919-20.) _____.

ANIMAL HUSBANDRY

ANIMAL INDUSTRY GROUP

Professors CARL W. GAY, WALTER H. PETERS, HENRY W. VAUGHAN; Assistant Professor PHILLIP A. ANDERSON; Instructors ARTHUR L. ANDERSON, NORRIS K. CARNES.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f,w.	Types and Breeds of Livestock...	5	All	None
2f.	Livestock Judging.....	3	Soph., jr., sr.	1
3f-4w.	Market Classes of Livestock.....	6	Soph., jr., sr.	2
5w.	Livestock Breeding.....	3	Sr.	Vet. Med. 6, Agron. 131
6w.	Livestock Feeding.....	5	Sr.	Agr. Biochem. 15
7f.	Meats.....	3	Sr.	3, Agr. Biochem. 15
8s.	Elements of Feeding.....	3	Jr., sr.	None
9s.	Pedigrees and Herd Books.....	3	Sr.	5
<i>Advanced Courses</i>				
101f.	Advanced Stock Judging.....	3	Sr.	3-4
102s.	Horse Husbandry.....	3	Sr.	3-4, 5, 6
103s.	Beef Cattle Husbandry.....	3	Sr.	3-4, 5, 6
104s.	Sheep Husbandry.....	3	Sr.	3-4, 5, 6
105s.	Swine Husbandry.....	3	Sr.	3-4, 5, 6,
106w.	Advanced Meats.....	3	Sr.	7
107s.	Meat Problems.....	3	Sr.	106
108s.	Seminar.....	3	Sr.	5, 6

INTRODUCTORY COURSES

- 1f,w. TYPES AND BREEDS OF LIVESTOCK. The types as related to performance or production in horses, beef cattle, sheep, and swine, and the origin, history, characteristics, and economic importance of the breeds, classified according to type. GAY, CARNES.
- 2f. LIVESTOCK JUDGING. Practice in judging horses, cattle, sheep, and hogs from both the type and the breed standpoint. A. L. ANDERSON.
- 3f-4w. MARKET CLASSES OF LIVESTOCK. Livestock markets and marketing methods. The market classes of horses, cattle, sheep, and swine. Practice in classifying, judging, and appraising livestock. VAUGHAN.
- 5w. LIVESTOCK BREEDING. The application of the principles of genetics to the breeding of livestock; a review of the master-breeders' methods and consideration of the practical breeders' problems. GAY.
- 6w. LIVESTOCK FEEDING. Feeding livestock under farm conditions; efficiency and economy in growing and fattening meat animals; feeding draft horses and colts. Consideration of experimental work and present practice. Practical feeding problems. Only three credits allowed to those who have completed Course 8. PETERS.
- 7f. MEATS. General course in the dressing of animals and the cutting of carcasses. Lectures and laboratory work. P. A. ANDERSON.
- 8s. ELEMENTS OF FEEDING. A general course giving a brief survey of livestock and dairy feeding designed for those students not specializing in either animal or dairy husbandry. Not open to those who have completed Course 6 or Dy. Husb. 103. PETERS, CORT.
- 9s. PEDIGREES AND HERD BOOKS. Pedigree registration; laboratory practice in the use of the stud, herd, and flock records; tracing and tabulating pedigrees. VAUGHAN.

ADVANCED COURSES

- 101f. ADVANCED STOCK JUDGING. Competitive judging of all types, breeds, and classes of livestock supplemented by visits to nearby stock farms. PETERS.
- 102s. HORSE HUSBANDRY. Stud-farm management; the selection of foundation stock and the breeding, feeding, and marketing of horses. Horse-power; factors determining a horse's efficiency for work. GAY.
- 103s. BEEF CATTLE HUSBANDRY. The management of pure blood and grade herds; selection of foundation stock, sales, and shows, building, equipment, labor. Practicums in fitting cattle for show and sale, animal photography, preparation of feeds, and the care of cattle. PETERS.
- 104s. SHEEP HUSBANDRY. The care and management of pure-bred sheep, Study of pedigrees, registrations, fitting for show purposes, market-

- ing. Practicums in feeding, shearing, blocking, and caring for young lambs. P. A. ANDERSON.
- 105s. SWINE HUSBANDRY. Cost of producing pork; equipment; swine types; pure-bred versus market hogs; building a breeding herd; feeding; marketing breeding stock; herd management; pedigree studies; fitting and showing. Barn work and feeding practice. VAUGHAN.
- 106w. ADVANCED MEATS. Practice work in dressing animals and cutting carcasses giving particular attention to conformation as related to dressing percentage and the carcass; also a study of the physical and chemical composition of meat. P. A. ANDERSON.
- 107s. MEAT PROBLEMS. The wholesale cuts and grades of meat; the packing industry and the utilization of by-products. Special problems and trips to packing establishments. P. A. ANDERSON.
- 108s. SEMINAR. Special problems and review of investigations pertaining to the livestock industry. GAY.

BACTERIOLOGY AND IMMUNOLOGY

MEDICAL SCHOOL

Professor WINFORD P. LARSON; Instructor ANNE G. BENTON; Assistants ROBERT G. GREEN, SIEGFRIED F. HERRMANN.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Course</i>				
6f,w,s.	Elementary Bacteriology	4	Soph., jr., sr.	None

For additional courses see the bulletin of the Medical School.

INTRODUCTORY COURSE

6f,w,s. ELEMENTARY BACTERIOLOGY. Lecture and laboratory course. The principles and technique of general bacteriology. Studies in the morphologic and biologic characters of the common bacteria. Preparation of culture media. Disinfectants and disinfection. Bacteriology of water and food products. LARSON, BENTON, GREEN, HERRMANN.

BEE CULTURE

Professor FRANCIS JAGER; Instructor LLOYD V. FRANCE.

General statement.—Theoretical and practical instruction on bees, honey, and wax production. At least one year of botany should be completed before electing these courses. General zoology and economic entomology are also desirable. If not already completed they should be taken at same time as the courses in bee culture.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1s.su.	Elements of Beekeeping I.....	3	Jr., sr.	None
2f.w.	Elements of Beekeeping II.....	3	Jr., sr.	None
3w-4s.	Advanced Beekeeping.....	6	Jr., sr.	1 or 2
5su.	Queen Raising.....	3	Jr., sr.	1 or 2

INTRODUCTORY COURSES

- 1s.su. ELEMENTS OF BEEKEEPING I. Fundamentals of bee behavior during the honey season. Modern equipment for beekeeping practice. Fundamentals of beekeeping practice during the honey season. Production of comb and extracted honey. JAGER.
- 2f.w. ELEMENTS OF BEEKEEPING II. Fundamentals of bee behavior outside of the active season. Fundamentals of beekeeping practice outside of active season. Indoor and outdoor wintering. JAGER.
- 3w-4s. ADVANCED BEEKEEPING. Bee anatomy, bee botany, bee geography in their relations to commercial honey production. JAGER.
- 5su. QUEEN RAISING. Selecting queens, principles of reproduction, grafting, drone raising, mating. Nuclei, mailing, introducing. Bee diseases. In connection with Zumbra Heights queen bee raising station. JAGER.

BOTANY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors C. OTTO ROSENDAHL, ELIAS J. DURAND, LEE I. KNIGHT, JOSEPHINE E. TILDEN; Assistant Professors FREDERIC K. BUTTERS, WILLIAM S. COOPER, NED L. HUFF.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f,s-2w.f.	General Botany.....	10 ¹	All	None
7s.	Taxonomy of Flowering Plants.....	5	All	2
11f.	Algae and Fungi.....	5	Soph., jr., sr.	2
12w.	Bryophytes and Pteridophytes.....	5	Soph., jr., sr.	2
13s.	Angiosperms and Gymnosperms.....	5	Soph., jr., sr.	7 or 12
17w.	Anatomy of Vascular Plants.....	5	Soph., jr., sr.	2
51f.	Histological Methods.....	3	Jr., sr.	15 cred.
52f.	Plant Physiology.....	5	Jr., sr.	15 cred.
53w.	Botany of Economic Plants.....	5	Jr., sr.	15 cred.
54s.	Elementary Ecology.....	5	Jr., sr.	52
<i>Advanced Courses</i>				
101f-102w-				
103s.	Fungi.....	9	Jr., sr.	7, 11
105s.	Algae.....	5	Jr., sr.	11
107w.	Bryophytes.....	5	Jr., sr.	7, 12
108s.	Pteridophytes.....	5	Jr., sr.	7, 12

¹ Course 2 must be completed before credit is allowed.

No.	Credits	Title	Offered to	Prereq. courses
110s.		Gymnosperms.....	5 Jr., sr.	7, 13
113f-114w-				
115s.		Advanced Taxonomy.....	9 Jr., sr.	7
118w-119s.		Cytology.....	6 Jr., sr.	51
131f.		Field Ecology.....	5 Sr.	54
133s.		Forest Geography of North America..	5 Sr.	54, 131 advised
141f.		Advanced Plant Physiology I.....	5 Sr.	52, Org. Chem.
142w.		Advanced Plant Physiology II.....	5 Sr.	52, Org. Chem.
143s.		Advanced Plant Physiology III.....	5 Sr.	52, Org. Chem.

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

INTRODUCTORY COURSES

- 1f,s-2w,f. **GENERAL BOTANY.**¹ Fundamental principles of botany. Survey of organs of the flowering plant; its internal structure and physiology. Representatives of the algae, fungi, liverworts, etc., examined with special reference to tracing evolution of the vegetable kingdom. DURAND, BUTTERS, HUFF and Assistants.
- 7s. **TAXONOMY OF FLOWERING PLANTS.** A general study of the classification and relationships of flowering plants. Laboratory and field practice in the determination of species, together with lectures and quizzes. ROSENDAHL.
- 11f. **GENERAL MORPHOLOGY OF ALGAE AND FUNGI.** A general survey of the structure, evolution, and classification of the algae and fungi. Lecture, laboratory, and field work. TILDEN.
- 12w. **GENERAL MORPHOLOGY OF BRYOPHYTES AND PTERIDOPHYTES.** A general survey of the structure, evolution, and classification of the liverworts, mosses, and ferns. HUFF.
- 13s. **GENERAL MORPHOLOGY OF ANGIOSPERMS AND GYMNASPERMS.** A general survey of the structure, evolution, and classification of seed plants. BUTTERS.
- 17w. **ANATOMY OF VASCULAR PLANTS.** A study of the microscopic structure of vascular plants, the cell, tissues and tissue systems with particular attention to the development and evolution of the vascular system in the root, stem, and leaf. BUTTERS.
- 51f. **HISTOLOGICAL METHODS.** Training in methods used in the preparation and preservation of class material. Special attention is given to methods of killing, imbedding, sectioning, staining, and mounting. DURAND.

¹ Students entering college with a year of high-school botany satisfactory to the Department may be admitted directly to Course 2. All such must present to the Department before registration, their high-school note-book and a statement from their teacher showing the amount and proficiency of their work.

- 52f. PLANT PHYSIOLOGY. An introductory course giving a general survey of plant functions. KNIGHT.
- 53w. BOTANY OF ECONOMIC PLANTS. A survey course treating the most important botanical features of the common plants. KNIGHT.
- 54s. ELEMENTARY ECOLOGY. An introduction to the study of plants and their environment; investigation of the habitat; its effects upon plants as individuals and in mass; plant communities; plant successions. Laboratory and field work, lectures, and discussion. COOPER.

ADVANCED COURSES

- 101f-102w-103s. FUNGI. A general course in the morphology and classification of the fungi. Fall quarter: Phycomycetes. Winter quarter: Ascomycetes. Spring quarter: Basidiomycetes. DURAND.
- 105s. ALGAE. A study of freshwater forms, based on collections made by the class. Lectures, laboratory, and field work. TILDEN.
- 107w. MORPHOLOGY AND TAXONOMY OF THE BRYOPHYTES. A special study of the structure and classification of the liverworts and mosses. (Not offered in 1919-20.) DURAND.
- 108s. MORPHOLOGY AND TAXONOMY OF THE PTERIDOPHYTES. An intensive study of lycopods, ferns, and their allies, their structure and history, with special attention to the classification of living forms. Lectures, reference reading, and laboratory work. (Not offered in 1919-20.) BUTTERS.
- 110s. MORPHOLOGY AND TAXONOMY OF THE GYMNOSPERMS. An intensive study of cycads, conifers, and their allies, their structure and history, with special attention to the classification of living forms. Lectures, reference reading, and laboratory work. BUTTERS.
- 113f-114w-115s. ADVANCED TAXONOMY. An advanced course in which special attention is given to the taxonomy of difficult natural groups, involving systematic principles and practice, rules of nomenclature, systems of classification, etc. ROSENDAHL.
- 118w-119s. CYTOLOGY. A survey of cell structure and the various phenomena of division, fusion, and metamorphosis, together with a review of the history of cytological investigation. Methods of cytological research indicated in the laboratory. ROSENDAHL.
- 131f. FIELD ECOLOGY. A careful study of the local plant communities and successions, followed by a written report, and by a study of the general principles of plant association and succession. COOPER.
- 133s. FOREST GEOGRAPHY OF NORTH AMERICA. Preliminary discussion of principles of plant distribution, followed by detailed study of the forest regions of North America; reading, discussion, lantern slides, distribution maps, microscopic work, written reports. COOPER.

- 141f. **ADVANCED PLANT PHYSIOLOGY I.** Physical phases of plant physiology. A course dealing with the intake of materials and their translocation, also the energy relations of the plant. KNIGHT.
- 142w. **ADVANCED PLANT PHYSIOLOGY II.** Plant metabolism. A course dealing with the synthesis of plant food, its transformation and utilization by the plant. KNIGHT.
- 143s. **ADVANCED PLANT PHYSIOLOGY III.** Plant metabolism and growth. Continuation of 142, also introducing certain fundamental phases of growth. KNIGHT.

CHEMISTRY

THE SCHOOL OF CHEMISTRY

Professors LAUDER W. JONES, CHARLES F. SIDENER; Associate Professors WILLIAM H. HUNTER, FRANK H. MACDOUGALL; Assistant Professors ISAAC W. GEIGER, FRANK C. WHITMORE; Instructor GUY H. WOOLLET.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f-2w-3s.	General Inorganic Chemistry.....	12	All	None
9f-10w.	Advanced General Inorganic Chemistry.....	10	All	H.-S. chem.
11s.	Qualitative Chemical Analysis.....	4	Soph., jr., sr.	1-2-3
12s-13f.	Qualitative Chemical Analysis.....	10	Soph., jr., sr.	9-10
20w.	Quantitative Analysis.....	5	Soph., jr., sr.	11 or 12-13
21s.	Quantitative Analysis.....	5	Soph., jr., sr.	20
35f-36w.	Organic Chemistry.....	10	Soph., jr., sr.	1-2-3 or 9-10
<i>Advanced Courses</i>				
126s.	Sanitary Water Analysis.....	1 or 2	Sr.	21
141f-142w-				
143s.	Physical Chemistry.....	9, 12, or 15	Jr., sr.	30 cred., Phys. 15 cred.

For additional courses see the bulletin of the School of Chemistry.

INTRODUCTORY COURSES

- 1f-2w-3s. **GENERAL INORGANIC CHEMISTRY.** Designed for those who have had no high-school chemistry. 1-2—A study of the general laws of chemistry and of the non-metals and their compounds. 3—Metals and their compounds. WHITMORE.
- 9f-10w. **ADVANCED GENERAL INORGANIC CHEMISTRY.** Designed for those who have had one year of high-school chemistry. 9—General laws of chemistry, the non-metals and their compounds. 10—Metals and their compounds and ionic equilibrium, considered quantitatively.
- 11s. **QUALITATIVE CHEMICAL ANALYSIS.** Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and

physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. ———.

- 12s-13f. **QUALITATIVE CHEMICAL ANALYSIS.** Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. WHITMORE.
- 20w. **QUANTITATIVE ANALYSIS.** An introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems will be assigned and attention given to proper laboratory practice. SIDENER, GEIGER.
- 21s. **QUANTITATIVE ANALYSIS.** Supplementary to Course 20. Further discussion of the principles and methods together with laboratory work on additional typical problems in gravimetric and volumetric analysis. SIDENER, GEIGER.
- 35f-36w. **ORGANIC CHEMISTRY.** An introduction to the chemistry of carbon compounds. The laboratory work will include the preparation of characteristic substances. HUNTER, WOOLLETT.

ADVANCED COURSES

- 126s. **SANITARY WATER ANALYSIS.** Lectures and laboratory practice in the chemical examination of potable waters. SIDENER, GEIGER.
- 141f-142w-143s. **PHYSICAL CHEMISTRY.** A general survey of the subject. Three lectures and one recitation. Laboratory work three or six hours per week. Nine, twelve, or fifteen credits, depending on amount of laboratory work. MACDOUGALL.

DAIRY HUSBANDRY

ANIMAL INDUSTRY GROUP

Professors CLARENCE H. ECKLES, ROBERT M. WASHBURN; Professor Emeritus THEOPHILUS L. HAECKER; Assistant Professors JOSEPH C. CORT, EDWIN O. HANSON; Instructor LESLIE V. WILSON; Extension Specialists ARTHUR J. MCGUIRE, WILLIAM A. MCKERROW, ALLAN B. RAYBURN.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f.s.	Elements of Dairying	5	All	None
2w.	Dairy Bacteriology	3	Soph., jr., sr.	Bact. 6
3f.	Factory Management	5	Jr., sr.	1, 2
4su.	Cheese Factory Practice	3	Jr., sr.	1, 3
5su.	Creamery Practice	3	Jr., sr.	1, 3
<i>Advanced Courses</i>				
101f.	Milk Production	5	Jr., sr.	1
102s.	Market Milk	3	Jr., sr.	1, 2

No.	Title	Credits	Offered to	Prereq. courses
103w.	Dairy Stock Feeding.....	3	Sr.	101 Agr. Biochem. 15
104s.	Advanced Study of Dairy Breeds	3	Jr., sr.	1, 101
105f.	Seminar I.....	1	Sr.	3 courses in Dy. Husb
106w.	Seminar II.....	1	Sr.	3 courses in Dy. Husb.
107s.	Seminar III.....	1	Sr.	3 courses in Dy. Husb.

INTRODUCTORY COURSES

- 1f,s. ELEMENTS OF DAIRYING. Composition of milk. Causes of variation in composition; milk constituents and their uses in dairy manufactures and as food; Babcock test; sanitary handling of milk and cream on the farm; cream separating and farm buttermaking. WASHBURN, CORT, HANSON, WILSON.
- 2w. DAIRY BACTERIOLOGY. Lectures and demonstrations. Types of milk organisms; the contamination of milk and how prevented; relation of milk to the public health; the bacteriology of buttermaking and cheesemaking. _____
- 3f. FACTORY MANAGEMENT. History and organization of dairy associations. Location, construction and equipment of butter, cheese, condensed milk, and ice cream factories; lectures and practice work in creamery buttermaking and scoring; creamery accounting. WASHBURN.
- 4su. CHEESE FACTORY PRACTICE. A minimum of one month's experience in an approved practical cheese factory. Records are kept and reports made. WASHBURN.
- 5su. CREAMERY PRACTICE. A minimum of one month's experience in an approved practical creamery. Records are kept and a report made. WASHBURN.

ADVANCED COURSES

- 101f. MILK PRODUCTION. Problems of the dairy farmer, such as characteristics and adaptations of the dairy breeds; selection and management of the dairy herd and sire; calf raising; dairy barns. Laboratory: comparative judging and study of breed type. ECKLES, CORT, WILSON.
- 102s. MARKET MILK. Lectures and laboratory work. Classes of market milk; transportation and marketing; sanitary inspection; equipment of plants; problems of public control. WASHBURN.
- 103w. DAIRY STOCK FEEDING. Application of principles of nutrition to feeding the dairy cow and growing young animals. Feeding standards; characteristics of various feeding stuffs; formulation of rations. Only two credits allowed those who have completed An. Husb. 8. ECKLES, CORT, WILSON.

- 104s. **ADVANCED STUDY OF DAIRY BREEDS.** Practice in comparative judging of dairy cattle representing different breeds and ages; selection and valuation of cattle according to type and pedigree; a study of important strains and families; visits to pure-bred herds. **CORT, WILSON.**
- 105f. **SEMINAR I.** Special investigation and study of selected topics. Each student presents papers and reports on assigned subjects and reviews recent scientific investigations along dairy husbandry lines. **ECKLES, WASHBURN.**
- 106w. **SEMINAR II.** Continuation of 105, but 105 not a prerequisite. **ECKLES, WASHBURN.**
- 107s. **SEMINAR III.** Continuation of 106, but 106 not a prerequisite. **ECKLES, WASHBURN.**

DRAINAGE

AGRICULTURAL ENGINEERING GROUP

Professor JOHN T. STEWART.

COURSES

Introductory Course

1. Farm Drainage..... 3 Jr., sr. F. Eng. 18

For additional courses see later announcement in fall quarter program.

INTRODUCTORY COURSE

1. **FARM DRAINAGE.** Principles and practice of farm drainage. Field technique of drainage construction by hand and machine. This course is for students wishing to do special work in drainage. _____.

ECONOMICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors **WILLARD E. HOTCHKISS, GEORGE W. DOWRIE, N. S. BRIEN GRAS;** Associate Professors **ROY G. BLAKEY, WILLIAM W. CUMBERLAND, ALVIN H. HANSEN, BRUCE D. MUDGETT;** Assistant Professors **JOHN D. BLACK, Z. CLARKE DICKINSON, CLARENCE L. HOLMES, THOMAS S. SANDERS;** Professorial Lecturers **J. FRANKLIN EBERSOLE, JOHN H. SHERMAN;** Instructors **VICTOR H. PELZ, J. WARREN STEHMAN.**

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f-2w.	Introduction to Economic History...	10	All	None
3f-4w.	Principles of Economics	10	Soph., jr., sr.	None
5f,s. ¹	General Economics	5	All ²	None
6w ¹	Agricultural Economics	3	Soph., jr., sr.	5

¹ Given at the University Farm.

² Not offered to first and second quarter freshmen.

COURSES IN AGRICULTURE

No.	Title	Credits	Offered to	Prereq. courses
11f-12w.	Statistics.....	6 ²	Soph., jr., sr.	3-4, or 5, 6
18s. ¹	Problems in Agricultural Economics..	5	Soph., jr., sr.	3-4, or 5, 6
19f. ¹	Principles of Agricultural Marketing..	5	Jr., sr.	3-4, or 5, 6
20w.	Problems in Rural Economics.....	5	Soph., jr., sr.	3-4, or 5, 6
23s.	Business Organization and Management.....	5	Soph., jr., sr.	3-4, or 5, 6
25f-26w.	Principles of Accounting.....	6 ²	Soph., jr., sr.	None
41s.	Financial History of the United States	3	Jr., sr.	3-4, or 5, 6
150s. ¹	Farm Finance.....	3	Jr., sr.	3-4, or 5, 6
54f.	Corporation Finance.....	3	Jr., sr.	3-4, or 5, 6
55w.	Advanced Corporation Finance.....	3	Jr., sr.	54
85f.	Principles of Marketing.....	5	Jr., sr.	3-4, or 5, 6
88w.	Retail Marketing.....	3	Jr., sr.	85
<i>Advanced Courses</i>				
107f.	Land Tenure.....	5	Jr., sr.	3-4, or 5, 6
108w. ¹	Agricultural Statistics.....	5	Jr., sr.	11
109s. ¹	Economics of Consumption.....	5	Jr., sr.	3-4, or 5, 6
110w. ¹	Farm Marketing Problems.....	5	Jr., sr.	19
116f-117w-				
118s. ¹	Advanced Agricultural Economics...	9	Sr.	15 cr.
119f-120w-				
121s. ¹	Seminar in Agricultural Economics...	9	Sr.	20 cr.
126f-127w-				
128s. ¹	Special Research Problems in Agricultural Economics.....	9	Sr.	15 cr.
143f-144w.	Money and Banking.....	10	Jr., sr.	3-4, or 5, 6
161f.	Labor Problems.....	3	Jr., sr.	3-4, or 5, 6
191f-192w.	Public Finance.....	6	Jr., sr.	3-4, or 5, 6, or Pol. Sci. 13 cr.
193s.	State and Local Taxation.....	3	Jr., sr.	191-192

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

¹ Given at the University Farm.

² Students in the College of Agriculture, Forestry and Home Economics may receive credit at end of first quarter.

INTRODUCTORY COURSES

- 1f-2w. INTRODUCTION TO ECONOMIC HISTORY WITH SPECIAL EMPHASIS ON THE UNITED STATES. Lectures and section work. A general survey of the development of agriculture, manufacture, transportation, storage, and the exchange of goods; economic crises; land, capital, management, and labor; the interplay of economic and political forces. GRAS, DICKINSON.
- 3f-4w. PRINCIPLES OF ECONOMICS. Principles that underlie the present industrial order. Application of principles to economic problems such as labor, insurance, finance, transportation, industrial combination, government control. HANSEN.
- 5s,f. GENERAL ECONOMICS. Principles of economics combined with the necessary descriptive facts, as relating to economic life in general and to agriculture and forestry in particular. HOLMES.

- 6w. AGRICULTURAL ECONOMICS. Principles of agricultural economics with special emphasis upon production. HOLMES.
- 11f-12w. STATISTICS. Principles of collection, tabulation, and interpretation of statistical material, illustrated by present-day statistical data. Lectures, assigned readings and special investigations by individual members of the class. MUDGETT.
- 18s. PROBLEMS IN AGRICULTURAL ECONOMICS. Practice in the economic analysis of a number of problems confronting the farmer as producer and consumer. BLACK.
- 19f. PRINCIPLES OF AGRICULTURAL MARKETING. The organization and methods of marketing; the function of middleman; the costs of marketing various farm products; coöperative marketing. ———.
- 20w. PROBLEMS IN RURAL ECONOMICS. A survey of the economic aspects of the important problems of rural life, such as rural population, rural migration, tenancy, agricultural labor, marketing of farm products, coöperation, rural credit, land settlement. CUMBERLAND.
- 23s. BUSINESS ORGANIZATION AND MANAGEMENT. Organization, principles applying to business in general and to particular concerns; evolution, objects, adjustments, limits, functional division; specialization—functional and other forms; standardization. Management, coördination of functions, handling of men, employment, external versus internal factors. HOTCHKISS, PEIZ.
- 25f-26w. PRINCIPLES OF ACCOUNTING. The purpose and principles of account classification; capital and revenue; accruals; valuation; depreciation; preparation and interpretation of balance sheets, income accounts and other statements; corporation accounts. A laboratory course with supplementary lectures. SANDERS.
- 41s. FINANCIAL HISTORY OF THE UNITED STATES. American financial legislation from colonial times with especial emphasis upon the distinction between maintaining a standard of value and the providing of a revenue for the needs of government. BLAKEY.
- 54f. CORPORATION FINANCE. The organizing, financing, and managing of corporations. A study of corporate securities for purposes of promotion and reorganization and of facilities for marketing them. STEHMAN.
- 55w. ADVANCED CORPORATION FINANCE. A study of the financial history of certain typical corporations with special reference to their promotion and reorganization. STEHMAN.
- 85f. PRINCIPLES OF MARKETING. Domestic merchandising methods of manufacturers. Problems of wholesalers and commission men; distributing system and market organization; price policies. SHERMAN.

88w. **RETAIL MARKETING.** Problems and methods of the so-called regular retailer, department stores, and chain stores. Development of retail trade centers. Coöperation between the retailer and the local board of trade. The retailer and the consumer. PELZ.

ADVANCED COURSES

107f. **LAND TENURE.** Problems arising out of the land basis of civilization: property in land; land utilization; rents and land values; land taxation; urban and rural housing and planning; land classification and settlement; farm labor; tenancy, ownership. BLACK.

108w. **AGRICULTURAL STATISTICS.** Study and practice of the special methods of statistical investigation, analysis and presentation which have been developed for agriculture, together with descriptive statistics of agriculture. BLACK.

109s. **ECONOMICS OF CONSUMPTION.** Nature of human wants; standards of living; cost of living; income; administration of income; nature of demand; demand and price; relation of consumption to production; consumption and the population problem.

110w. **FARM MARKETING PROBLEMS.** Studies in the methods of private and coöperative marketing of selected farm products.

116f-117w-118s. **ADVANCED AGRICULTURAL ECONOMICS.** Economic theory of production, consumption, exchange, and value and distribution applied to agriculture. CUMBERLAND, BLACK, HOLMES.

119f-120w-121s. **SEMINAR IN AGRICULTURAL ECONOMICS.** Subjects for group study selected from the following: competition of types of farming; markets and transportation of farm products; farmers' coöperation; prices of farm products; rural credit; land valuation; land settlement; land taxation. CUMBERLAND, BLACK, HOLMES.

126f-127w-128s. **SPECIAL RESEARCH PROBLEMS IN AGRICULTURAL ECONOMICS.** Intensive individual research work on problems not being studied in the seminar during the quarter. CUMBERLAND, BLACK, HOLMES.

143f-144w. **MONEY AND BANKING.** Relation to industrial system. Monetary principles with special reference to United States. American banking and bank organization, principles of commercial banking, non-commercial banking, relation of government to banking, comparative study of leading foreign systems. DOWRIE, EBERSOLE, STEHMAN.

150s. **FARM FINANCE.** The financial needs of typical farmers. Present facilities for supplying them—institutions, their organization and operation, interest rates, defects and proposed remedies. The financing of the various farmers' organizations. The farmer as an investor. DOWRIE.

- 161f. LABOR PROBLEMS. Modern labor problems; woman and child labor, industrial hygiene, welfare work, profit-sharing, coöperation, labor unions, strikes, boycotts, conciliation, and arbitration; economic causes and effects of immigration. _____.
- 191f-192w. PUBLIC FINANCE. Public expenditures; public debt; budgetary legislation; tax systems. BLAKEY.
- 193s. STATE AND LOCAL TAXATION. Problems of state and local taxation. Historic survey of various taxes and examination of present procedure in taxing different kinds of property; tax reforms. Particular attention given to conditions in Minnesota. BLAKEY.

EDUCATION

COLLEGE OF EDUCATION

Professors LOTUS D. COFFMAN, FLETCHER H. SWIFT; Assistant Professors HERMIONE L. DEALLEY, MARVIN J. VAN WAGENEN; Instructors JEAN H. ALEXANDER, FRANCES MOREHOUSE.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f,w-2w,s.	Brief Course in the History of Education.....	6	Jr., sr.	Psychol. 1-2-3
5w. ¹	The American School.....	3	Jr., sr.	Psychol. 1-2
11f,w,s.	Technique of Teaching.....	3	Jr., sr.	Psychol. 1-2-3
55f,w,s.	Elementary Educational Psychology..	3	Jr., sr.	Psychol. 9 cred.
<i>Advanced Courses</i>				
101f-102w-				
103s.	Historical Foundations of Modern Education.....	9	Jr., sr.	Psychol. 1-2-3, Hist. 6 cred.
106f-107w-				
108s.	Advanced Educational Psychology...	9	Sr.	Psychol. 1-2-3
109f.s.	Educational Diagnosis.....	2	Sr.	1 or 101-102-103

For additional courses see the bulletin of the College of Education.

¹ Given at the University Farm.

INTRODUCTORY COURSES

- 1f,w-2w,s. A BRIEF COURSE IN THE HISTORY OF EDUCATION. Current school problems and educational theories in the light of their history. Emphasis upon secondary education and those aspects of education of most immediate concern to high-school teachers. Not open to those who have credit in Course 5. ALEXANDER.
- 5w. THE AMERICAN SCHOOL. A brief survey of the factors determining the problem of public education in America, followed by a brief account of the development and organization of typical state school systems. Not open to those who have credit in Course 1. SWIFT.

- 11f,w,s. **TECHNIQUE OF TEACHING.** Types of classroom exercises; preparation of teaching plans; hygiene of instruction; classroom management; the professional ethics of teaching; observation of high-school work. MOREHOUSE.
- 55f,w,s. **ELEMENTARY EDUCATIONAL PSYCHOLOGY.** Brief scientific study of individual behavior from standpoint of learning process. Certain topics receive special emphasis, e.g., economy of time and energy in learning; instinctive and emotional reactions, habit formation, methods of learning, fatigue. DEALEY.

ADVANCED COURSES

- 101f-102w-103s. **FOUNDATIONS OF MODERN EDUCATION.** Interpretative historical study of elements in modern education derived from Hebrews, Greeks, Romans, Middle Ages, Renaissance. Emphasis upon secondary and higher education, origin and results of monopoly of cultural conception of education and cultural studies. SWIFT.
- 106f-107w-108s. **EDUCATIONAL PSYCHOLOGY.** Psychology of learning. Methods of measuring rate of learning; study of typical learning experiments and examination of the conditions of the most economic learning, study of individual differences, and psychology of the school subjects. VAN WAGENEN.
- 109f,s. **EDUCATIONAL DIAGNOSIS.** A study of educational scales and standard tests for measurement of efficiency in school subjects. The course will deal with the nature of the tests, methods of their use, and an analysis of results obtained. VAN WAGENEN.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Professors WILLIAM A. RILEY, FREDERIC L. WASHBURN; Associate Professors WILLIAM MOORE, ARTHUR G. RUGGLES; Assistant Professors ROYAL N. CHAPMAN, OSCAR W. OESTLUND; Assistants SAMUEL A. GRAHAM, ANNA WENTZ.

General statement.—For specialization in this department see Course of Study. Courses in this Department are closely correlated with those offered by the Department of Animal Biology of the College of Science, Literature, and the Arts. Courses 37-38-39, 44, 45, 116, 117-118-119, 125-126-127, 130, and 197 of this Division are also offered under these numbers by the Department of Animal Biology.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f,s,su.	Introductory Entomology	5	Soph., jr., sr.	An. Biol. 10 cred.
2w,su.	Economic Entomology	5	Soph., jr., sr.	1
3f.	Elementary Economic Entomology . .	3	Soph., jr., sr.	An. Biol. 10 cred.
4f.	Economic Vertebrate Zoology	3	Jr., sr.	An. Biol. 10 cred.

No.	Title	Credits Offered to	Prerequisite courses
12w.	Forest Zoology.....	3 Jr., sr.	3
14w.	Insects and Public Health.....	3 Jr., sr.	An. Biol. 10 cred.
16s.	Plant Pest Control.....	3 Jr., sr.	1-2, or 3, Pl. Path. 1
37f-38w-			
39s.	General Entomology.....	9 Soph., jr., sr.	An. Biol. 10 cred.
44f.s.	Animal Parasites and Parasitism.....	3 Soph., jr., sr.	An. Biol. 10 cred.
45w.su.	Relation of Insects to Disease.....	3 Soph., jr., sr.	1 or equiv.
<i>Advanced Courses</i>			
117f-118w-			
119s.	General Ecology of Insects.....	9 Jr., sr.	1-2 or 37-38-39
125f-126w-			
127s.	Advanced General Entomology.....	9 Jr., sr.	1-2 or 37-38-39
130w.	Biology and Taxonomy of the Aphid- idae.....	5 Sr.	1-2 or 37-38-39
139s.su.	Histology and Development of Insects	5 Jr., sr.	1-2 or 37-38-39
140f.su.	Insecticides and Their Action.....	3 or 6 Jr., sr.	1-2, or 37-38-39 Agr. Biochem., 7-8 or equiv.
197f,w,s,			
su.	Introduction to Research.....	5 or more Sr.	1-2 or 37-38-39 and other work as prescribed by the Division

INTRODUCTORY COURSES

- 1f,s,su. INTRODUCTORY ENTOMOLOGY. Lectures and laboratory work on the characteristics and habits of insects. OESTLUND, RILEY.
- 2w,su. ECONOMIC ENTOMOLOGY. The life histories, habits and methods of control of the insect pests of orchard, field, and garden. Laboratory work in the determination of the more important forms. RUGGLES.
- 3f. ELEMENTARY ECONOMIC ENTOMOLOGY. A brief course dealing with the characteristics and habits of insect pests and beneficial insects and methods of control. Not open to students planning to specialize in entomology. GRAHAM.
- 4f. ECONOMIC VERTEBRATE ZOOLOGY. Relation of birds and wild animals to agriculture. Lectures, laboratory, and field work. Identification and studies of Minnesota birds and wild animals affecting the horticulturist and agriculturist, methods of combating injuries and conserving useful forms. WASHBURN.
- 12w. FOREST ZOOLOGY. Forest Animals. Relation of birds and of various four-footed animals to forest protection. Habits, range, usefulness; the manner of protecting the important large and small game, fish, and birds; fish culture. WASHBURN.
- 14w. INSECTS AND PUBLIC HEALTH. The agency of insects and related forms in the transmission of disease; methods of sanitation related to their control and disease transmission. Not open for credit to students specializing in entomology. (See Courses 44, 45.) RILEY.

- 16s. PLANT PEST CONTROL. The theory and practice of control of insect and fungous pests of crop plants. Practical applications. Not open to those who have completed Pl. Path. 14. Same as Plant Pathology 6. RUGGLES, BISBY, STAKMAN.
- 37f-38w-39s. GENERAL ENTOMOLOGY. A more extended course than 1, leading up to discussion of the principles of taxonomy and their application to the classification of insects. Textbook, lectures, quizzes, and laboratory. OESTLUND.
- 44f,s. ANIMAL PARASITES AND PARASITISM. Lectures and laboratory work. A consideration of the origin and biological significance of parasitism, and of the structure, life history, and economic relations of representative animal parasites. Methods of control and prevention will be emphasized. RILEY.
- 45w,su. RELATION OF INSECTS TO DISEASE. The causation and transmission of disease by insects and other arthropods. Life histories, habits, and methods of control of hominoxious species. RILEY.

ADVANCED COURSES

- 117f-118w-119s. GENERAL ECOLOGY OF INSECTS. General ecology with special reference to the insects of Minnesota. Frequent field trips. Lectures, laboratory, and field work. CHAPMAN.
- 125f-126w-127s. ADVANCED GENERAL ENTOMOLOGY. Advanced work in the lines of morphology and classification of insects with lectures on the history of entomology. Lectures and laboratory. OESTLUND.
- 130w. BIOLOGY AND TAXONOMY OF THE APHIDIDAE. Intensive study of the natural history, bibliography, and classification of the aphididae. Additional work is offered in Course 197. OESTLUND.
- 139s,su. HISTOLOGY AND DEVELOPMENT OF INSECTS. Lectures and laboratory work on the histology, embryonic and postembryonic development of insects. Individual work along these lines is available to properly qualified students in Course 197. RILEY.
- 140f,su. INSECTICIDES AND THEIR ACTION. A study of the chemical composition, the physical properties, and the physiological action of standard, of little known, and of new insecticides. MOORE.
- 197f,w,s,su. INTRODUCTION TO RESEARCH. Preparation for investigational work in lines of entomology, parasitology, or economic zoology. Advanced laboratory, field and library work; training in the preparation of bibliographies and manuscripts; special problems. Summer work should be planned when possible. OESTLUND, Systematic Entomology; RUGGLES, General Economic Entomology; CHAPMAN, Insect Ecology; MOORE, Insecticides; RILEY, Parasitology; Insect Morphology; WASHBURN, Economic Vertebrate Zoology.

FARM ENGINEERING

AGRICULTURAL ENGINEERING GROUP

Professor WILLIAM BOSS; Assistant Professors HARRY B. ROE, HALL B. WHITE; Instructors J. GRANT DENT, RASMUS M. HALL, MAURICE G. JACOBSON, ALLEN D. JOHNSTON, JAMES B. TORRANCE.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
3f,s.	Mechanical Drawing.....	3	All	None
4w.	Blacksmithing.....	3	All	None
5f.	Carpentry.....	3	All	None
7w.	Farm Structures.....	3	Jr., sr.	3
10f,w.	Farm Engineering.....	3	All	None
11f,w.	Applied Mathematics.....	5	All	None
13f,s.	Farm Motors.....	3	All	None
15f,s.	Mechanics Laboratory.....	2	All	None
17f.	Advanced Blacksmithing.....	3	All	4
18s.	Surveying.....	5	Soph., jr., sr.	3, 11 or equiv.
21f-22w	Agricultural Physics.....	10	All	None
28w.	Land Clearing.....	3	Soph., jr., sr.	None

INTRODUCTORY COURSES

- 3f,s. MECHANICAL DRAWING. Mechanics of drawing. Exercises in the use of drawing instruments, lettering, and water colors. The mechanics of working drawings with their practical value. JACOBSON.
- 4w. BLACKSMITHING. The management of forge and fire in bending, shaping and welding iron. JOHNSTON.
- 5f. CARPENTRY. The use of carpentry tools and methods of farm building construction. WHITE.
- 7w. FARM STRUCTURES. The planning, designing, and location of farm buildings including specifications and estimates of cost. WHITE.
- 10f,w. FARM ENGINEERING. A general course of farm engineering. Lectures on farm measurements, drainage, water supply, irrigation, sanitation, buildings, roads, power, machinery, and land clearing. BOSS.
- 11f,w. APPLIED MATHEMATICS. Rules of practical mathematics with special attention to formulas and problems directly related to agricultural work; e.g., areas, volumes, percentages, proportions, variations, investments, cost problems, etc. ROE.
- 13f,s. FARM MOTORS. Theory, operation, care, and repair of gasoline engines. TORRANCE.
- 15f,s. MECHANICS LABORATORY. Exercises in harness repair, knots and rope splicing, belt lacing, soldering, babbiting, pipe fitting, drilling, and work with cold metals. DENT.
- 17f. ADVANCED BLACKSMITHING. Bending, shaping, welding, and tempering of steel. JOHNSTON.

- 18s. SURVEYING. Plain surveying as applied to farm problems. Mensuration, leveling, simple grade determination, elements of topography, and farm mapping. ROE.
- 21f-22w. AGRICULTURAL PHYSICS. Mechanics of solids and fluids, sound and heat, light, electricity, and magnetism, and their application to farm problems. HALL.
- 28w. LAND CLEARING. A study of land clearing methods, explosives, and machinery.

FORESTRY

Professor EDWARD G. CHEYNEY.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f.s.	General Forestry.....	4	All	None
21w.	Tree Crops.....	3	All	None

For additional courses see the bulletin of the Courses in Forestry.

INTRODUCTORY COURSES

- 1f,s. GENERAL FORESTRY. A brief history of the development of forestry in Europe and America; description of the United States forests. Lectures and collateral reading. CHEYNEY.
- 21w. TREE CROPS. The part trees play in the successful development of the farm. The relation of the forests to agriculture and animal husbandry. The farm and the timber supply. CHEYNEY.

GEOLOGY AND MINERALOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors WILLIAM H. EMMONS, FRANK F. GROUT; Assistant Professors A. WALFRED JOHNSTON, CHESSLEY J. POSEY, TERENCE T. QUIRKE; Instructor THOMAS M. BRODERICK.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f,s-2w,su.	General Geology.....	10 ¹	Soph., jr., sr.	None
4w.	Geology of Minnesota.....	5	Soph., jr., sr.	1-2
5f-6w.	Economic Geology.....	6 ¹	Jr., sr.	1-2
7f,s-8w,su.	Laboratory Work.....	2 ¹	Soph., jr., sr.	Supports 1-2
21w-22s.	Elements of Mineralogy.....	10 ¹	Soph., jr., sr.	See statement
29f.	General Physiography.....	5	Soph., jr., sr.	None
34w.	Meteorology.....	3	Soph., jr., sr.	None
37s.	Economic and Commercial Geography	3	All	None

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

¹ Both quarters must be completed before credit will be given.

INTRODUCTORY COURSES

- 1f,s-2w,su. GENERAL GEOLOGY. A synoptical treatment of materials of the earth and of geologic processes. Physiographic, dynamic, and structural geology, with a brief introduction to historical geology. Lectures, laboratory work, field excursions, map study, and conferences. EMMONS, JOHNSTON.
- 4w. GEOLOGY OF MINNESOTA. The physical geography and geologic history of Minnesota. The relations of industrial development to geological features. The principles of pre-Cambrian geology as exemplified in Minnesota. (Not offered in 1919-20.) JOHNSTON.
- 5f-6w. ECONOMIC GEOLOGY. The mineral resources of the United States. The origin, occurrence, distribution, and uses of the more important minerals and mineral fuels of economic value. Lectures, and field excursions. QUIRKE.
- 7f,s-8w,su. LABORATORY WORK. Open only to students taking Course 1-2. Supplements Course 1-2 with study of rocks and ores, topographic and geologic maps, and reference reading. JOHNSTON.
- 21w-22s. ELEMENTS OF MINERALOGY. Open to students taking Chemistry. The crystal systems; morphological, physical, and chemical character of minerals; occurrence, genesis, and uses of minerals; classification and description of common minerals. Determinative work in laboratory, blowpipe analysis, sight identification. GROUT, BRODERICK.
- 29f. GENERAL PHYSIOGRAPHY. Principles of earth sculpture; physiographic changes in progress, and agencies causing them; hydrography and oceanography; planetary relations; climatology; field excursions. POSEY.
- 34w. METEOROLOGY. The properties and phenomena of the atmosphere, including composition, temperature, pressure, and circulation; the work of the Weather Bureau; the major climatic divisions of the earth and their climates.
- 37s. ECONOMIC AND COMMERCIAL GEOGRAPHY. A study of the geographic factors influencing production and trade. Natural resources in their relation to commerce and industry and the major trade routes will be emphasized. POSEY.

GERMAN

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor CARL SCHLENKER; Assistant Professors OSCAR C. BURKHARD, JAMES DAVIES, ALFRED E. KOENIG, SAMUEL KROESCH, WALTER R. MYERS,

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f,s.	Beginning	5	All	None
2f,w.	Beginning, Intermediate	5	All	1 or 1 yr. prep. German
3f,s.	Beginning, Advanced	5	All	2
10f,s.	Rapid Reading	5	All	3
11w,s.	Advanced Rapid Reading	5	All	10
12f,s.	Narrative Prose	5	All	2 yrs. prep. Ger- man
13f,w.	Advanced Narrative Prose	5	All	12
14w,s.	Prose and Poetry	5	All	13
28f,w-29w,s.	Advanced Chemical German	6 ¹	All	15
31f,w-32w,s.	Medical German	6 ¹	All	10 or 12
50f-51w-52s.	Composition	3 ¹	Soph., jr., sr.	11 or 14 ²
53f-54w-55s.	Conversation	3 ¹	Soph., jr., sr.	11 or 14 ²
62f,s.	German Comedies	3	Soph., jr., sr.	11 or 14 ²
63w.	Modern Drama	3	Soph., jr., sr.	11 or 14 ²
64s.	Classic Drama	3	Soph., jr., sr.	62 or 63

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

¹ All quarters must be completed before credit is granted.

² Adjustments permitted, for the year 1919-20 only, on account of the changes in the curriculum. Students with credit for Course 7-8-9 (old numbering), Prose and Poetry, may register for Course 62, 63, 64. Students with credit for Course 24-25-26 (old numbering), Elementary Composition, may register for Course 50-51-52. Students with credit for Course 27-28-29 (old numbering), Elementary Conversation, may register for Course 53-54-55.

INTRODUCTORY COURSES

- 1f,s. BEGINNING. Pronunciation, conversation, grammar and composition; selected readings in easy prose and verse.
- 2f,w. BEGINNING, INTERMEDIATE. Continuation of Course I.
- 3f,s. BEGINNING, ADVANCED. Selected texts from modern writers.
- 10f,s. RAPID READING. Modern narrative prose. KROESCH.
- 11w,s. ADVANCED RAPID READING. Continuation of Course 10. Selected dramas from the eighteenth and nineteenth centuries. KROESCH.
- 12f,s. NARRATIVE PROSE. Reading texts selected from modern prose writers. Grammar review and composition.
- 13f,w. ADVANCED NARRATIVE PROSE. Continuation of Course 13.
- 14w,s. PROSE AND POETRY. Narrative readings and selected poetry; composition.
- 28f,w-29w,s. ADVANCED CHEMICAL GERMAN. Selections from more difficult works on chemistry. DAVIES.
- 31f,w-32w,s. MEDICAL GERMAN. Readings from general works on physiology, anatomy, and bacteriology. BURKHARD.

- 50f-51w-52s. COMPOSITION. Aims to develop grammatical correctness. Translations from English selections. Essay writing on assigned subjects. MYERS.
- 53f-54w-55s. CONVERSATION. Aims to develop ease and correctness of oral expression. Organized on the laboratory plan—one hour credit with two hours of recitation and one hour of outside reading. MYERS.
- 62f,s. GERMAN COMEDIES. Reading of the best comedies of the eighteenth and nineteenth centuries. DAVIES, MYERS.
- 63w. MODERN DRAMA. Plays of modern dramatists; Hauptmann, Sudermann, Fulda, and others. DAVIES, MYERS.
- 64s. CLASSIC DRAMA. Plays of Lessing, Goethe, and Schiller. DAVIES, MYERS.

HOME ECONOMICS

Professor MILDRED WEIGLEY.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Course</i>				
24s.	Camp Cookery.....	3	All	None
For additional courses see the bulletin of the Courses in Home Economics.				

INTRODUCTORY COURSE

- 24s. CAMP COOKERY. Designed to give prospective foresters, engineers, and others a knowledge of the simpler cookery processes, and of such adaptations as are practicable in the several types of out-of-doors camps. Given in alternate years. (Offered in 1919-20.)

HORTICULTURE

Associate Professors WILFRID G. BRIERLEY, LEROY CADY, MAXWELL J. DORSEY; Extension Specialist ROGER S. MACKINTOSH.

General statement.—For specialization in this department, see special requirements in Course of Study.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
6s.	Principles of Fruit Growing...	3	Soph., jr., sr.	Bot. 10 cred.
13f.	Fruit Handling.....	3	Jr., sr.	6
21w.	Small Fruit Culture.....	3	Soph., jr., sr.	Bot. 10 cred.
32s.	Vegetable Gardening.....	3	Soph., jr., sr.	Bot. 10 cred.
33w.	Vegetable Forcing.....	3	Jr., sr.	32
50s.	Floriculture.....	3	All	None
54w.	Greenhouse Construction and Management.....	2	All	None

COURSES IN AGRICULTURE

No.	Title	Credits	Offered to	Prereq. courses
56w.s.	Plant Propagation.....	2	All	None
71f.s.	Landscape Gardening.....	3	All	None
73f.	Nursery Practice.....	2	All	None
90f.	General Horticulture.....	3	All	None
94w-95s.	Home and School Gardening..	6	Jr., sr. ¹	None
<i>Advanced Courses</i>				
107f.	Orchard Management.....	3	Jr., sr.	6 or 90
109f.	Principles of Genetics.....	3	Jr., sr.	Bot. 10 cred. An. Biol. 10 cred.
110w.	Fruit Breeding.....	3	Jr., sr.	109
111f.	Fruit Variety Studies.....	3	Jr., sr.	6 or 90
131f.	Advanced Market Gardening..	3	Sr.	32
151f.	Advanced Floriculture.....	3	Sr.	50, 56
191w-192s.	Special Problems.....	6	Sr.	107 or 131
193f-194w-195s.	Hort. Seminar.....	3	Sr.	9 cred. excl. of 90 and 94

¹ Open only to those intending to teach.

INTRODUCTORY COURSE

- 6s. PRINCIPLES OF FRUIT GROWING. The fundamental principles of fruit-growing. Sites, soils, nursery stock, planting and planting plans, tillage, fertilization, cover crops, pollination, frost avoidance, pruning, and thinning. Lectures, recitations, references, and laboratory work. BRIERLEY.
- 13f. FRUIT HANDLING. Lectures on early development, packages, harvesting, packing, by-products, coöperation, marketing, and storage. Laboratory and reference work. BRIERLEY.
- 21w. SMALL FRUIT CULTURE. Lectures, references, and problems. Botanical relationship, important species, origin, commercial development, importance, climatic range, sites, soils, propagation, planting plans, planting, pruning, cultivation, irrigation, cover-crops and mulching, inter-cropping and varieties. BRIERLEY.
- 32s. VEGETABLE GARDENING. The principles of vegetable growing for home and market, including all important vegetable crops from seed to harvest. Lectures, recitations, references, laboratory work, and excursions.
- 33w. VEGETABLE FORCING. The growing and handling of the vegetable forcing crops; types and management of houses. Lectures, reference reading, field trips, and laboratory.
- 50s. FLORICULTURE. Designed to give the student a working knowledge of the culture and uses of common house plants, annuals, perennials, and greenhouse plants. Lectures, reference reading, and laboratory. CADY.
- 54w. GREENHOUSE CONSTRUCTION AND MANAGEMENT. The evolution of the greenhouse, types of houses, materials, and methods of construction. Lectures, field trips, and laboratory work. CADY.

- 56w,s. PLANT PROPAGATION. Methods of propagation of plants by seed, cuttings, layers, grafting, and budding. The principles of greenhouse management, transplanting, watering, and ventilation. Lectures, reference reading, field and laboratory work. CADY.
- 71f,s. LANDSCAPE GARDENING. The practice and principles of landscape gardening as applied to the home and community. Lectures and field trips to parks and private grounds. CADY.
- 73f. NURSERY PRACTICE. Lectures and practice work in management of nursery stock, seeds, bulbs, and plants, particular attention being given to ornamental stock propagation, planting, and storage. CADY.
- 90f,s.¹ GENERAL HORTICULTURE. Lectures and laboratory. A study of the elementary principles of fruit growing, and vegetable gardening as related to home production, and the planting and care of home grounds. BRIERLEY.
- 94w-95s. HOME AND SCHOOL GARDENING. Lectures and laboratory. The elements of horticulture as applied to high-school instruction, plant propagation, fruit growing, home gardening, school gardening, and the planning of home and school grounds. Same as Agr. Educ. 68-69. BRIERLEY, CADY, FIELD.

ADVANCED COURSES

- 107f. ORCHARD MANAGEMENT. Lectures, references, laboratory, and special problems. The principal problems connected with the management of orchard and small fruit tracts. BRIERLEY.
- 109f. PRINCIPLES OF GENETICS. Lectures and laboratory work designed to familiarize the student with the underlying principles of breeding. Heredity, variation, biometry, and evolution are emphasized. Same as Agron. 103. DORSEY, HAYES.
- 110w. FRUIT BREEDING. Applied genetics is emphasized. The method of breeding each of the important horticultural crops with special attention to experiment station investigations and to the methods used by plant breeders. DORSEY.
- 111f. FRUIT VARIETY STUDIES. The classification and regional distribution of fruits; technical description, identification, and general study of the more important varieties; judging of fruits; fruit literature. Lectures, laboratory work, references.
- 131f. ADVANCED MARKET GARDENING. Lectures, references, and special problems. A study in detail of the various vegetables.

¹ Students specializing in Horticulture may substitute for Hort. 90 any course in Horticulture for which they are eligible. Students majoring in other divisions who desire to take more specialized work in Horticulture may substitute Hort. 6, 21, 32, 50, or 71, provided that a second course from the same group be elected later. Students majoring in Agricultural Education will take Hort. 94 in the junior year.

- 151f. **ADVANCED FLORICULTURE.** Lectures, assigned readings, laboratory, and special problems dealing with the culture, botany, and history of florists' plants and methods of greenhouse management. CADY.
- 191w-192s. **SPECIAL PROBLEMS.** A study of problems based upon the work given in Courses 107 to 131. BRIERLEY.
- 193f-194w-195s. **HORTICULTURAL SEMINAR.** Reports and discussions of problems and investigational work. HORTICULTURE STAFF.

MILITARY SCIENCE AND TACTICS

Professor FRANK H. BURTON, Colonel, U.S.A.; Assistant Professors JERE BAXTER, Major, U.S.A., ARTHUR E. CLARK, ALLEN T. NEWMAN, Captains U.S.A., HENRY C. BERTELSEN, ERNEST A. NUOFFER, Lieutenants, U.S.A.; Instructors JOHN J. BOWENS, FRANK CRAIN, ELDEN R. FOSSEY, JOSEPH HAVLICEK, HERBERT KETTLE, WILLIAM G. PALMS, Sergeants.

REQUIRED WORK

All physically fit male students are required to take military training during their first two years in school. This course is a prerequisite for graduation from the University.

All students, registered for military training, of any class are members of the Reserve Officers' Training Corps, and as such are issued all necessary uniform clothing and equipment by the government free of charge.

After completing the two years required, students may discontinue military work if they wish.

ELECTIVE WORK

Students who have completed the two years of required military work, and are selected for advanced work by the Professor of Military Science and Tactics, and who sign an agreement with the Government, to continue the work for their remaining course in college but not to exceed two years, are eligible for the advanced course in military training, which is prescribed in General Order 49, W.D. 1916, and requires five hours per week—three practical and two theoretical. Three credits for each quarter are allowed for this work.

All advanced course students should take a course in International Law, Military Law, and Military History. These courses are given by the Departments of Political Science and History and are arranged especially for the Military Department.

All members of the advanced course receive their uniforms, equipment, and commutation for subsistence at the rate of forty cents per day during the school year.

All students who complete the advanced course in the Military Department and who graduate from the University, will, if recommended by the Professor of Military Science and Tactics and the President of

the University, be commissioned by the President of the United States, in the Officers' Reserve Corps.

MUSIC

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor CARLYLE M. SCOTT; Assistant Professor DONALD N. FERGUSON;
Instructors ABE PEPINSKY, GERTRUDE REEVES.

General statement.—Credit is offered to seniors and juniors in the College of Agriculture, Forestry, and Home Economics, who may wish to elect work in the Department of Music. Nine credits may be obtained.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
14f-15w-16s.	History of Music.....	9 ²	Soph., jr., sr.	None
17f-18w-19s.	Appreciation of Music.....	3 ²	Jr., sr.	None
51f-52w-53s. ¹	Violin.....	6-12 ²	Jr., sr.	None
91f-92w-93s. ¹	Orchestra.....	3 ²	Jr., sr.	See statement

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

¹ Given at the University Farm.

² The full course must be completed before credit will be allowed.

INTRODUCTORY COURSES

14f-15w-16s. HISTORY OF MUSIC. Some account of primitive systems and of the early Christian modal and harmonic development, leading to a general survey of musical literature from Bach to the present time. FERGUSON.

17f-18w-19s. APPRECIATION OF MUSIC. A non-technical course. REEVES.

51f-52w-53s. VIOLIN. Candidate must be able to play the first ten of Kreutzer's forty etudes, and the easier Handel and Mozart sonatas. PEPINSKY.

91f-92w-93s. ORCHESTRA. FERGUSON, PEPINSKY.

PHYSICAL EDUCATION

FOR MEN

Director LOUIS J. COOKE; Assistant Director WILLIAM K. FOSTER; Instructors EDWIN S. BROWN, PERCY C. GLIDDEN, D. C. MITCHELL; Assistants KARL P. BUSWELL, HARRY GOLDIE.

General statement.—The purpose of the Department is to provide all men of the University opportunity for exercise in order to maintain and build up their general health. It also provides special training for the correction of physical defects and functional derangements.

A physical examination is required of all new matriculants, and of all others using the department privileges, at the beginning of the year, and as often during their college course as their physical condition may indicate. Students taking the required work in physical education are examined at the close of the year. A study of these records shows a marked improvement in the standard of health of the average student during his college course.

The gymnasium, swimming pool, and baths are open to all students of the University, who are free to use the apparatus and to pursue a course in physical training under the supervision of the Director and his assistants.

Those students, taking the required course in physical education, who can not swim must make a reasonable effort, as determined by the Department, to pass the swimming and life-saving requirements, and will be assigned special hours for instruction.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f.	Personal Hygiene.....	1	Fr.	None
2f-3w ¹ -4s.	Gymnasium and Swimming...	None	Fr.	None
5f-6w-7s.	Advanced Leaders.....	3 ²	Soph., jr., sr.	Instructor's permission
8f-9w-10s.	Corrective Gymnastics.....	None	All	None
11w-12s.	Wrestling.....	None	All	Instructor's permission
13f-14w-15s.	Intermediate Swimming.....	None	All	Instructor's permission
16f-17w-18s.	Advanced Swimming.....	None	All	Instructor's permission
19w-20s.	Boxing.....	None	Fr.	None
21f-22w-23s.	Intramural Athletics.....	None	All	None

¹ Given at the University Farm.

² Full course must be completed before credit is allowed.

COURSES

- 1f. PERSONAL HYGIENE. Two hours per week; first six weeks of fall quarter. Examinations at close of course. Four hours per week collateral work with themes. COOKE.
- 2f-3w-4s. GYMNASIUM AND SWIMMING. Two hours a week for the winter quarter. Required qualifications in swimming, life-saving, bar-vaulting, jumping, sprinting, running, and on heavy apparatus. MITCHELL.
- 5f-6w-7s. ADVANCED LEADERS. Three hours a week. FOSTER.
- 8f-9w-10s. CORRECTIVE GYMNASTICS. Three hours a week. Special individual courses for students physically defective. BROWN.
- 11w-12s. WRESTLING. Three times per week. Students admitted by special assignment.
- 13f-14w-15s. INTERMEDIATE SWIMMING. Life-saving, efficiency swimming, and fancy diving. Instruction is given in rescuing and restoring the apparently drowned and other useful swimming accomplishments. GLIDDEN, BUSWELL.

16f-17w-18s. **ADVANCED SWIMMING.** Life-saving, efficiency swimming, and fancy diving. Instruction is given in rescuing and restoring the apparently drowned and other useful swimming accomplishments. GLIDDEN, BUSWELL.

19w-20s. **BOXING.** By special arrangement a few students may be accommodated in this class which meets twice per week. GOLDIE.

21f-22w-23s. **INTRAMURAL ATHLETICS.** Competitive games in the various athletic leagues in football, basket-ball, hockey, track, and field events, baseball, tennis, swimming, handball, bowling, etc. FOSTER.

PHYSICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors HENRY A. ERIKSON, ANTHONY ZELENY; Associate Professor JOHN T. TATE; Professorial Lecturer LOUALLEN F. MILLER.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
21f,w,s,su.	Elements of Mechanics.....	4	All	Trigonometry
22f,w,s,su.	Elements of Mechanics Laboratory..	1	All	21 or parallel
31f.	Acoustics.....	3	All	None
41w.	Sound and Heat.....	4	All	21
42w.	Sound and Heat Laboratory.....	1	All	22, 41 or parallel
51f.	Light.....	4	All	21
52f.	Light Laboratory.....	1	All	22, 51 or parallel
61s.	Magnetism and Electricity.....	4	All	21
62s.	Magnetism and Electricity Laboratory.....	1	All	22, 61 or parallel

For additional courses see bulletin of the College of Science, Literature, and the Arts.

INTRODUCTORY COURSES

21f,w,s,su. **ELEMENTS OF MECHANICS.** Mechanics of solids, fluids, and wave motion. A study of the simpler fundamental principles. First part of a general Course 21, 41, 51, 61. Course 22 should be taken in conjunction with this course. ZELENY, MILLER, TATE.

22f,w,s,su. **ELEMENTS OF MECHANICS LABORATORY.** Measurements in the mechanics of solids, fluids, and wave motion; the laboratory part supplementing Course 21. MILLER.

31f. **ACOUSTICS.** A study of the fundamental principles of sound. A course designed primarily for the students in the Department of Music. Open also to other students. ERIKSON.

41w. **SOUND AND HEAT.** A study of the principles underlying sound and heat phenomena. Course 42 should be taken in conjunction with this course. ZELENY, MILLER.

- 42w. SOUND AND HEAT LABORATORY. The laboratory part supplementing Course 41. MILLER.
- 51f. LIGHT. A study of the principles underlying light phenomena. Course 52 should be taken in conjunction with this course. ZELENY, MILLER.
- 52f. LIGHT LABORATORY. The laboratory part supplementing Course 51. MILLER.
- 61s. MAGNETISM AND ELECTRICITY. A study of the principles underlying magnetic and electric phenomena. Course 62 should be taken in conjunction with this course. ZELENY, MILLER.
- 62s. MAGNETISM AND ELECTRICITY. The laboratory part supplementing Course 61. ZELENY.

PLANT PATHOLOGY AND BOTANY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Professors EDWARD M. FREEMAN, ELVIN C. STAKMAN; Assistant Professor GUY R. BISBY; Instructors ROBERT C. DAHLBERG, ALVIN H. LARSON, ALLEN G. NEWHALL; Extension Specialist ARNE G. TOLAAS.

General statement.—For specialization in this department, see special requirements in Course of Study.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f-su.	Plant Pathology.....	5	Jr., sr.	Bot. 10 cred.
6s.	Plant Pest Control.....	3	Jr., sr.	1, Ent. 3.
7w-8s.	Weeds and Grasses.....	6	Soph., jr., sr.	Bot. 10 cred.
9f,su.	Weeds and Seed Testing.....	3	Soph., jr., sr.	Bot. 10 cred.
10s.	Forest Pathology.....	5	Soph., jr., sr.	Bot. 10 cred.
12w.	Seed Problems.....	3	Jr., sr.	9
14s.	Plant Disease Control.....	5	Jr., sr.	1, Ent. 1 or 3
<i>Advanced Courses</i>				
105f-106w-107s.	Mycology.....	9	Jr., sr.	Bot. 7,11 or equiv.
108f-109w.	Methods.....	6	Jr., sr.	1, Bact. 6
110s.	Principles of Pathology.....	3	Jr., sr.	1, Bact. 6
111w,su.	Diseases of Field Crops.....	3	Jr., sr.	1
112s,su.	Diseases of Fruit and Vegetable Crops.....	3	Jr., sr.	1

INTRODUCTORY COURSES

- 1f,su. PLANT PATHOLOGY. Elementary study of plant diseases due to fungi, bacteria, and slime molds; life histories and preventive methods. Lectures, laboratory, and reference. Not open to those who have completed 10. FREEMAN, STAKMAN, BISBY.
- 6s. PLANT PEST CONTROL. The theory and practice of control of insect and fungous pests of crop plants, Practical applications. Same as

- Ent. 16. Not open to those who have completed 14. STAKMAN, BISBY, NEWHALL.
- 7w-8s. WEEDS AND GRASSES. Agricultural and applied botanical study of weeds and grasses with special reference to agricultural importance. DAHLBERG.
- 9f,su. WEEDS AND SEED TESTING. Detailed study of seed-testing methods and seed legislation. Weed and crop seeds and weed plants studied with special reference to identification. DAHLBERG, LARSON.
- 10s. FOREST PATHOLOGY. Elementary study of plant diseases due to fungi, bacteria, and slime molds; life histories and preventive methods. Lectures, laboratory, and reference. Not open to those who have completed 1. (Offered in alternate years. Not given in 1919-20.) FREEMAN, STAKMAN.
- 12w. SEED PROBLEMS. Special seed problems are assigned. Advanced work in seed-testing methods. DAHLBERG.
- 14s. PLANT DISEASE CONTROL. A detailed study of methods of controlling diseases of plants of parasitic origin. Spray materials and spray machinery. Practical applications. Not open to those who have completed 6. Given in alternate years. (Not offered in 1919-20.) BISBY, NEWHALL.

ADVANCED COURSES

- 105f-106w-107s. MYCOLOGY. A general study of the taxonomy and biology of fungi. Lectures, laboratory, greenhouse, and field work. FREEMAN, STAKMAN, BISBY.
- 108f-109w. METHODS. Plant pathological methods including mycological and bacteriological technique, laboratory, field, and inoculation investigational technique. Laboratory and lecture. Special problems. STAKMAN, BISBY.
- 110s. PRINCIPLES OF PATHOLOGY. Comparative biology of plant pathogens; pathological plant anatomy; parasitism, biologic specialization, resistance, and immunity. Will be given in close coöperation with Agricultural Biochemistry Division and divisions offering work in plant breeding. STAKMAN.
- 111w,su. DISEASES OF FIELD CROPS. Special detailed study of diseases of cereal and forage crops, including symptomology, etiology, and practical methods of control. Laboratory, lecture, and field work. STAKMAN.
- 112s,su. DISEASES OF FRUIT AND VEGETABLE CROPS. Special study of diseases of fruit and vegetable crops, especially of Minnesota crops including diseases of crops raised under glass. Laboratory, lecture, and greenhouse work. BISBY, NEWHALL.

COURSES IN AGRICULTURE

POLITICAL SCIENCE

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors JEREMIAH S. YOUNG, CEPHAS D. ALLIN; Associate Professor
RAYMOND MOLEY; Instructor ALBERT J. LOBB.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f. ¹	American Government.....	5	Soph., jr., sr.	None
7f.w.	State and Local Government.....	5	Soph., jr., sr.	1
28s. ¹	Business Law.....	5	Jr., sr.	10 cred. in Pol. Sci. or Econ.
41s.	Rural Government.....	3	All	1

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

¹ Given at University Farm.

INTRODUCTORY COURSES

- 1f. AMERICAN GOVERNMENT. Organization and actual workings of the national government; nature and origin of the American governmental system. ALLIN.
- 7f.w. STATE AND LOCAL GOVERNMENT. Comparison of American state governments, especially Minnesota; relation of states to the United States and to local units of government; recent experiments such as initiative and referendum, the recall and primaries; social and economic legislation. MOLEY, LOBB.
- 28s. BUSINESS LAW. A course in Business Law (arranged for students in the College of Agriculture, Forestry, and Home Economics), including contracts, agency, mortgages, conveyances, and negotiable instruments. LOBB.
- 41s. RURAL GOVERNMENT. The organization and functions of towns, school districts, villages, and counties; the assessment and taxation of property; road laws; and drainage. LOBB.

POULTRY HUSBANDRY

ANIMAL INDUSTRY GROUP

Professor ARTHUR C. SMITH; Extension Specialist NORTON E. CHAPMAN.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f.w.s.	Poultry.....	3	All	None
2w.	Poultry Judging.....	3	All	1
4s.	Incubating and Brooding.....	3	All	None

INTRODUCTORY COURSES

- 1f,w,s. **POULTRY.** The poultry industry; best methods of care and management of fowls, turkeys, ducks, and geese, and the most important breeds of same. SMITH.
- 2w. **POULTRY JUDGING.** The history, standard-requirements, and common defects of the leading commercial, standard breeds and varieties and determination and standard values by the score-card and comparison methods. SMITH.
- 4s. **INCUBATING AND BROODING.** Instruction and practice in incubation and brooding, selection of breeding stock and eggs for hatching, and feeding young chicks. Of practical value to teachers of agriculture and poultry raisers. SMITH.

PSYCHOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Associate Professors RICHARD M. ELLIOTT, WILLIAM S. FOSTER, HERBERT WOODROW; Assistant Professors MABEL R. FERNALD, KARL S. LASHLEY, JOHN J. B. MORGAN; Instructor FRANCES E. LOWELL.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f-2w-3s.	General Psychology.....	9	Soph., jr., sr.	None
<i>Advanced Courses</i>				
101f-102w.	Experimental Psychology.....	6	Jr., sr.	1-2-3
103s.	Quantitative Psychology.....	3	Jr., sr.	1-2-3
108w-109s.	Advanced General Psychology...	6	Jr., sr.	1-2-3
114w-115s.	Human Behavior.....	6	Jr., sr.	1-2-3
119f-120w	Animal Behavior.....	6	Jr., sr.	1-2-3
121s.	Neuro-Psychology.....	3	Jr., sr.	1-2-3
125f-126w.	Differential Psychology.....	6	Jr., sr.	1-2-3
127s.	Social Psychology.....	3	Jr., sr.	1-2-3
131f-132w-133s.	Child Mind.....	9	Jr., sr.	1-2-3
137f-138w.	Applied Psychology.....	6	Jr., sr.	1-2-3
144w-145s.	Abnormal Psychology.....	6	Jr., sr.	1-2-3

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

INTRODUCTORY COURSES

- 1f-2w-3s. **GENERAL PSYCHOLOGY.** An introductory survey of psychology; its material, fundamental laws, applications, and relations to other sciences. Laboratory experiments provide illustrative material and training in methods. All instructors.

ADVANCED COURSES

- 101f-102w. **EXPERIMENTAL PSYCHOLOGY.** A laboratory course of standard experiments in the analysis and measurement of mental phenomena. WOODROW.

- 103s. QUANTITATIVE PSYCHOLOGY. Psychophysics and the theory of mental measurement. WOODROW.
- 108w-109s. ADVANCED GENERAL PSYCHOLOGY. A systematic presentation of the laws of mental activity. FOSTER.
- 114w-115s. HUMAN BEHAVIOR. An analysis from the point of view of the objective school of psychologists. ELLIOTT.
- 119f-120w. ANIMAL BEHAVIOR. The development of reaction-system in animals, with emphasis upon the application of studies of animals to the solution of general problems in physiological psychology. LASHLEY.
- 121s. NEURO-PSYCHOLOGY. Specialization of function in the nervous system in relation to behavior. Discussion from the standpoint of psychology of current theories of integration and localization. LASHLEY.
- 125f-126w. DIFFERENTIAL PSYCHOLOGY. Important distinguishing characteristics (psychological) of individuals and of groups. Emphasis on experimental and statistical methods of discovering differences and of making comparisons. Each student participates in investigation of definite problems and in analysis of results. FERNALD.
- 127s. SOCIAL PSYCHOLOGY. A study of the dependence of familiar forms of social organization and behavior upon the fundamental laws of mental activity. The adjustment of the innate mental equipment of the individual to the forms of social groups. FERNALD.
- 131f-132w-133s. CHILD MIND. General intelligence and special mental abilities; their development and their relation to heredity, physiological factors, education, speech defects, and delinquency. LOWELL.
- 137f-138w. APPLIED PSYCHOLOGY. A survey of the application of psychology, with especial reference to business. MORGAN.
- 144w-145s. ABNORMAL PSYCHOLOGY. A systematic review of psychopathology in relation to normal behavior. MORGAN.

RURAL PUBLICATIONS AND JOURNALISM

Professor WILLIAM P. KIRKWOOD; Assistant Professor NORMAN J. RADDER.

General statement.—The aim of this Division is to give practical training in rural and in agricultural journalism. The work in rural journalism includes the editing and managing of the country newspaper. The work in agricultural journalism covers writing for the rural press, for the agricultural press, bulletin writing, and agricultural publicity.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
7f.	Editorial Administration	5	Sr.	16-17
8w.	Business Administration	5	Sr.	16-17
10f-11w-12s.	Agricultural Journalism	9	Jr., sr.	Rhet. 19 cred. or Rhet. 9 cred., Eng. 9 cred. ¹
13f,w,s-14w, s,f-15s,f,w.	Reporting	9	Soph., jr., sr.	Rhet. 9 cred.
16f-17w.	Copy Reading	6	Jr., Sr.	13-14-15
18s.	News Editing	3	Jr., sr.	16-17
19s.	Bulletin Writing and Agricul- tural Publicity	3	Sr.	10-11-12

¹ Rur. and Agr. Jour. 13-14-15 also advised.

INTRODUCTORY COURSES

- 7f. EDITORIAL ADMINISTRATION. The editor in his capacity as editor; formulation of policy; organization of news-gathering staff; presentation of the news to the public. KIRKWOOD.
- 8w. BUSINESS ADMINISTRATION. The business problems of the rural weekly including general accounting, job cost finding, circulation building, and advertising problems.
- 10f-11w-12s. AGRICULTURAL JOURNALISM. Gathering and writing agricultural news and the writing of articles for the agricultural press and other class papers. Lectures and practical work on Agricultural College publications. KIRKWOOD.
- 13f,w,s-14w,s,f-15s,f,w. REPORTING. Organization, methods, and material in newspaper production; forms of newspaper stories; methods of gathering and writing news; laboratory practice by assignments on University publications. RADDER.
- 16f-17w. COPY READING. Study and practice in editing copy for the newspaper and in writing headlines. Laboratory practice. RADDER.
- 18s. NEWS EDITING. Continuation of 16 with special attention to type, make up, and printing. Laboratory practice on University publications. RADDER.
- 19s. BULLETIN WRITING AND AGRICULTURAL PUBLICITY. Application of the rules of writing for the press to preparation of popular and technical bulletins. Mediums and methods through which information may be brought to attention of communities and people of the open country. KIRKWOOD.

RHETORIC

Assistant Professor ROBERT C. LANSING; Instructors ESTELLE COOK,
GEORGE G. GLICK, RUTH MOHL.

General statement.—Rhetoric credits will not be granted officially until the close of the second quarter of the senior year.

Any instructor who finds that a student is deficient in English will submit the name of the student together with the evidence to the chairman of the Students' Work Committee. If the evidence warrants, the Committee will send the student to the Section of Rhetoric for such additional work in English as is needed. This work the student must take, without credit, to validate his freshman and sophomore rhetoric credits.

Students whose work in the rhetoric courses shows at any time an inadequate knowledge of the conventions of English will be required to drop the course and enter a class in elementary rhetoric. These students will be required to complete twenty-two credit hours in rhetoric.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f,w,s.	Rhetoric I.....	3	All	None
2f,w,s.	Rhetoric II.....	3	All	1
3f,w,s.	Rhetoric III.....	3	All	2
4f,w,s.	Elementary Rhetoric.....	3	All	None
11f,w,s.	Argumentation.....	5	Soph., jr., sr.	3
22f,w,s.	Public Speaking.....	5	Soph., jr., sr.	3
24f,w,s.	Advanced Public Speaking.....	3	Soph., jr., sr.	22
25f,w,s.	Fundamentals of Effective Speaking.....	3	Soph., jr., sr.	3

INTRODUCTORY COURSES

- 1f,w,s. RHETORIC I. Note-taking, gathering and organizing material, oral and written exposition, paragraph structure, supplementary reading. LANSING, MOHL.
- 2f,w,s. RHETORIC II. Sentence structure, exposition and argumentation, supplementary reading. LANSING, MOHL.
- 3w,s. RHETORIC III. Description, narration, diction, supplementary reading. LANSING, MOHL.
- 4f,w,s. ELEMENTARY RHETORIC. Elementary grammatical and rhetorical principles. MOHL.
- 11f,w,s. ARGUMENTATION. Gathering evidence, reasoning, briefing, formal and informal argument, persuasion, debating. LANSING, GLICK, MOHL.
- 22f,w,s. PUBLIC SPEAKING. A practical course in fundamentals of speech-making. Rules of order and practice in conducting assemblies included. GLICK.
- 24f,w,s. ADVANCED PUBLIC SPEAKING. A course in preparing and delivering occasional addresses and informal lectures. GLICK.
- 25f,w,s. FUNDAMENTALS OF EFFECTIVE SPEAKING. The fundamental principles of voice production, articulation, gesture, platform deportment, and expression. COOK.

ROMANCE LANGUAGES

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor EVERETT W. OLMSTED; Associate Professors RALPH E. HOUSE, EDWARD H. SIRICH; Assistant Professors FRANCIS B. BARTON, JULES F. FRELIN, RUTH S. PHELPS; Professorial Lecturer PEDRO HENRIQUEZ URENA; Instructors HERBERT E. CLEFTON, SOLOMON M. DELSON, MARGUERITE GUINOTTE, SAMUEL VASCONCELOS.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
4f,w,s-5w,s,f.	Beginning French	10 ¹	All	None
7f,w,s-8w,s,f.	Intermediate French	10 ¹	All	4-5 or 2 yrs. H.S.
13f-14w-15s.	Survey of French Literature	9 ¹	All	7-8 or 3 yrs. H.S.
16f-17w-18s.	Elementary French Conversation	3 ¹	All	7-8 or 3 yrs. H.S.
19f-20w-21s.	Elementary French Composition	3 ¹	All	7-8 or 3 yrs. H.S.
31f,w,s-32w, s,f.	Beginning Spanish	10 ¹	All	None
34f,w,s-35w, s,f.	Intermediate Spanish	10 ¹	All	31-32 or 2 yrs. H.S.
37f-38w-39s.	Survey of Spanish Literature	9 ¹	All	34-35 or 3 yrs. H.S.
40f-41w-42s.	Elementary Spanish Conversa- tion	3 ¹	All	34-35 or 3 yrs. H.S.
43f-44w-45s.	Elementary Spanish Composition	3 ¹	All	34-35 or 3 yrs. H.S.

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

¹ The full course must be completed before credit will be allowed.

INTRODUCTORY COURSES

- 4f,w,s-5w,s,f. BEGINNING FRENCH. Pronunciation, grammar, oral exercises, translation. FRELIN, DELSON, GUINOTTE.
- 7f,w,s-8w,s,f. INTERMEDIATE FRENCH. Review of grammar, connected prose composition, conversation, and reading of representative authors. FRELIN, CLEFTON, GUINOTTE.
- 13f-14w-15s. SURVEY OF FRENCH LITERATURE. This course will outline the history of French literature from 1600 to present day, and is prerequisite for the courses devoted to special periods. Representative texts will be read. SIRICH, PHELPS, CLEFTON.
- 16f-17w-18s. ELEMENTARY FRENCH CONVERSATION. A small amount of outside preparation will be required. BARTON, FRELIN, GUINOTTE.
- 19f-20w-21s. ELEMENTARY FRENCH COMPOSITION. BARTON, FRELIN, GUINOTTE.
- 31f,w,s-32w,s,f. BEGINNING SPANISH. Pronunciation, grammar, oral exercises and translation. OLMSTED, HENRIQUEZ, VASCONCELOS.
- 34f,w,s-35w,s,f. INTERMEDIATE SPANISH. Review of grammar, conversation, connected prose composition, and reading of representative authors. HOUSE, VASCONCELOS.

COURSES IN AGRICULTURE

- 37f-38w-39s. SURVEY OF SPANISH LITERATURE. An outline of the history of Spanish literature from 1500 to the present day, based upon texts and collateral reading. Prerequisite for courses devoted to special periods. HOUSE.
- 40f-41w-42s. ELEMENTARY SPANISH CONVERSATION. A small amount of outside preparation will be required. VASCONCELOS.
- 43f-44w-45s. ELEMENTARY SPANISH COMPOSITION. VASCONCELOS.

SOCIOLOGY AND SOCIAL WORK

Professors ARTHUR J. TODD, ALBERT ERNEST JENKS; Associate Professors LUTHER L. BERNARD, MANUEL C. ELMER; Assistant Professors ROSS L. FINNEY, GUSTAF A. LUNDQUIST.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f,w,s.	Introduction to Sociology.....	3	5 ² Soph., jr., sr.	None
6w.	Modern Social Reform Movements.....	3	Soph., jr., sr.	1
14f,w.	Rural Sociology.....	3	Jr., sr.	1 ¹
<i>Advanced Courses</i>				
114s.	Rural Social Institutions.....	3	Jr., sr.	14

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

¹ No prerequisite for seniors in the College of Agriculture, Forestry, and Home Economics.

² Offered as a three-credit course at University Farm, fall quarter. Open only to students in Agriculture, Forestry, and Home Economics.

INTRODUCTORY COURSES

- 1f,w,s. INTRODUCTION TO SOCIOLOGY. A study of the origin and development of human societies; various agencies which have determined the type of social life; social organization, institutions, and progress; bearing of sociology upon other social sciences and arts. TODD, JENKS, BERNARD, ELMER, FINNEY, LUNDQUIST.
- 6w. MODERN SOCIAL REFORM MOVEMENTS. A survey of attempts to overcome certain social maladjustments: child labor, the city, bad housing, poverty, degeneracy; movements for public health, industrial democracy, social insurance, protection of infancy and youth, public recreation, etc. TODD, ELMER, FINNEY.
- 14f,w. RURAL SOCIOLOGY. The background and evolution of country life; rural conveniences, communication, coöperation; rural social institutions, especially the family, school, church and social center; rural leadership, surveys, organization, social agencies. BERNARD, LUNDQUIST.

ADVANCED COURSES

- 114s. RURAL SOCIAL INSTITUTIONS. A detailed study of the problems of organization and efficiency of selected rural institutions, especially re-

ligious, educational, civic, and recreational. Lectures, discussion, reports. LUNDQUIST.

SOILS

Professor FREDERICK J. ALWAY; Assistant Professor CLAYTON O. ROST; Instructor PAUL R. McMILLER; Extension Specialist GEORGE H. NESOM.

General statement.—For specialization in this Department see special requirements in Course of Study.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Course</i>				
1s.	Soils.....	5	Jr., sr.	Chem. 10 cred.
<i>Advanced Courses</i>				
101f.	Chemical Analysis of Soils.....	5	Sr.	1, Quant. Anal.
102f,w,s.	Special Problems in Soils.....	†	Sr.	101, 103
103f.	Mechanical Analysis of Soils.....	3	Jr., sr.	1
104s.	Soil Surveying.....	3	Jr., sr.	103
105w.	Minnesota Soils.....	3	Sr.	1

† Credit according to the amount of work.

INTRODUCTORY COURSE

1s. SOILS. Formation, physical properties, and chemical composition of soils; micro-organisms of the soil; farm manures, green manures, commercial fertilizers, and soil amendments; causes of unproductivity. Lectures, recitations, laboratory, and field work. ALWAY.

ADVANCED COURSES

- 101f. CHEMICAL ANALYSIS OF SOILS. A laboratory course on the chemical examination of soils, fertilizers, and soil amendments. ROST.
- 102f,w,s. SPECIAL PROBLEMS IN SOILS. Individual laboratory or field work upon some special soil problem in soil physics, soil chemistry, or soil management. Arrangement must be made in advance. ALWAY.
- 103f. MECHANICAL ANALYSIS OF SOILS. A laboratory course on the beaker, and centrifuge methods of mechanical analysis. McMILLER.
- 104s. SOIL SURVEYING. Field practice in surveying soils and the preparation of soil maps. McMILLER.
- 105w. MINNESOTA SOILS. Detailed study of the soils of Minnesota. Origin, formation, and classification; physical and chemical characteristics; moisture relations; response to manures, fertilizers, and soil amendments; naturally unproductive types and their reclamation. Lectures, laboratory, and field work. ALWAY.

COURSES IN AGRICULTURE

VETERINARY MEDICINE

ANIMAL INDUSTRY GROUP

Professors CLIFFORD P. FITCH, WILLARD L. BOYD, MYRON H. REYNOLDS;
Assistant Professor HOWARD C. H. KERNKAMP; Instructor WILLIAM A. BILLINGS; Assistant CLAUDE D. GRINNELLS.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
2f.	Anatomy of Domestic Animals.....	5	Jr., sr.	None
3w-4s.	Comparative Physiology.....	6	Jr., sr.	2
6f.	Physiology and Hygiene of Breeding.....	3	Sr.	3-4
8s.	Veterinary Studies.....	5	Soph., jr., sr.	None
12w.	Infectious Diseases.....	3	Jr., sr.	3-4, Bact. 6
13s.	Non-infectious Diseases.....	3	Sr.	3-4

INTRODUCTORY COURSES

- 2f. ANATOMY OF DOMESTIC ANIMALS. Anatomy of the common farm animals with special reference to bones, muscles, and viscera. Lectures and demonstrations. KERNKAMP.
- 3w-4s. COMPARATIVE PHYSIOLOGY. A recitation and lecture course in physiology with special reference to the physiology of domesticated animals. Special emphasis is given to digestion and metabolism. FITCH.
- 6f. PHYSIOLOGY AND HYGIENE OF BREEDING. Anatomy and physiology of reproduction. Embryology, obstetrics, sterility, hygiene, and common diseases of breeding animals. BOYD.
- 8s. VETERINARY STUDIES. Study of diseases; causes, prevention, treatment of common diseases; simple surgical operations; lameness and unsoundness; common medicines. Planned especially for students taking only one quarter veterinary work. Not open to those who have completed 12-13. REYNOLDS.
- 12w. INFECTIOUS DISEASES. Etiology, morbid anatomy, symptomology, diagnosis, prevention, and the basis of treatment of the common infectious diseases of animals. Special instruction will be given in preparation and use of vaccines, bacterins, serums, and anti-toxins. Those who have completed Course 8 can obtain only half credit for this course. FITCH.
- 13s. NON-INFECTIOUS DISEASES. General principles of diagnosis, causes, morbid anatomy, symptomatology, prevention, and the basis of treatment of the non-infectious diseases of animals. Those who have completed Course 8 can obtain only half credit for this course. BOYD.

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*The Bulletin
of the University of
Minnesota*

*The College of Agriculture, Forestry,
and Home Economics
Supplement to Announcement of
Courses in Agriculture for the Year
1919-1920*



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SPECIAL ANNOUNCEMENT

The faculty of the College of Agriculture, Forestry, and Home Economics has approved a new curriculum for students in agriculture, in which a group elective plan replaces the old "lines of specialization." The new curriculum will be effective beginning with the fall quarter 1920-21 for all students except those who will complete the requirements for their degree in June, 1921.

Seniors who will graduate in June, 1921 will have the option of completing their requirements for the degree according to either the new or old curriculum.

All members of the present sophomore class, and all juniors who wish to take advantage of the provisions of the new curriculum, should report to the secretary's office at once on receipt of this bulletin to designate their choice of a major and a major adviser.

The new curriculum and the regulations pertaining to its administration will be found in this supplement to the bulletin.

R. M. WEST, *Secretary*
University Department of Agriculture

COURSES OF STUDY

The following statement supersedes the section on Courses of Study in pages 16 to 26, inclusive, of the Announcement of Courses in Agriculture for the year 1919-1920, Vol. XXII, No. 32 of the Bulletin of the University of Minnesota.

GENERAL STATEMENT

The course of study is made up of 204* credit hours of work including:

1. Required courses, 104 to 127 credit hours, which every student must complete. These constitute approximately half of the curriculum and are considered as fundamental to any course in agriculture. In most cases these will be completed in the freshman and sophomore years.
2. Elective courses, 77 to 100 credit hours, distributed as follows:
 - a. A major of from 24 to 36 credit hours
 - b. A minor of 18 credit hours
 - c. Limited electives amounting to fifty per cent of the remaining number of credit hours, which must be selected outside of the groups from which the major and minor have been chosen, and
 - d. Free electives, sufficient to meet the number of credit hours required for graduation chosen from any of the courses offered in the University.

*Students graduating in June, 1921 will be required to complete 210 credit hours, and those graduating in June, 1922, 207 credit hours, for their degree.

The major and minor must be selected from different elective groups, except that students whose major is chosen from group 4 (see page 2), Agricultural Sciences and Plant Industry, may also select their minor from a different field of work in the same group.

REGULATIONS

Each sophomore in agriculture who has completed the equivalent of five quarters in residence must file with the secretary's office on the forms provided (a) the name of the group from which he wishes to select his major, and (b) the name of the member of the staff of some division included in that group whom he wishes to have act as his adviser.

After selecting a group in which to major, and an adviser, each student must report to his adviser, and in conference with him outline (a) his major sequence, and (b) his minor sequence, on the form furnished by the secretary's office. Electives may also be included on this form as suggestions to the student.

The major and minor, approved by the adviser, must then be filed with the secretary and will constitute the curriculum requirements for graduation.

After arranging a course of study, each student should consult frequently with his adviser, particularly with reference to electives and practical vacation work which may be of value in his chosen line of preparation.

Changes from this course of study can be made with the approval of the Students' Work Committee.

The secretary's office will furnish copies of the approved course of study to the student, the adviser, and the chairman of the Students' Work Committee.

EXPLANATION OF TERMS AND COURSE NUMBERS

The quarters in which courses are offered are indicated by the letters f (fall), w (winter), s (spring), and su (summer) following the course number. For example: 5f,w,s indicates that Course 5 is given in the fall quarter and is repeated in the winter and again in the spring quarter; 5f-6w indicates a two-quarter course extending through the fall and winter quarters; and 5f,w-6w,s indicates that Course 5-6 is given in the fall and winter quarters and repeated through the winter and spring quarters.

All undergraduate courses are numbered from 1 to 100. All courses open to undergraduates and graduates are numbered from 101 to 200.

Numbers following the descriptive name of a course indicate the number of credit hours.

Course numbers in parentheses, following the number of credit hours, indicate prerequisite courses.

Descriptions of the courses listed in the following outline of the curricula, together with those of additional courses offered as electives, will be found on pages 27 to 74 of the announcement for 1919-20. The di-

visional statements are arranged alphabetically according to the names of the divisions.

One *credit hour* is equivalent to (1) one lecture or recitation period requiring two hours of preparation, (2) two periods of laboratory work requiring one hour of preparation, or (3) three periods of laboratory work with no preparation, each week for one quarter.

A *major* is a series of courses equivalent to from 24 to 36 credit hours chosen from one of the elective groups.

A *minor* is a series of courses equivalent to 18 credit hours chosen from one of the elective groups.

A *required* course is a course required of all students for graduation, irrespective of their major sequence.

A *limited elective* course is an elective which may not be chosen from the same group as the major or minor.

A *free elective* course may be chosen from any courses offered in the University for which the student has completed the prerequisites.

REQUIRED COURSES

All of the following work is required of every student except for the exemptions indicated. For some students this represents more than the regular amount of work of seventeen credit hours per quarter. In such cases those subjects listed below which can not be taken in the freshman and sophomore year must take precedence the following year. Registration for from fifteen to eighteen credit hours of work each quarter will be allowed without special permission. Care should be taken in registration to give precedence to courses offered only one quarter.

1. *Non-credit courses* required for graduation in addition to the 204 credit hours.

Freshman lectures. A course of nine lectures intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter. Must be taken in the freshman year.

Military drill. Three hours per week throughout the freshman and sophomore years. Students found to be physically unfit may be required to substitute special corrective exercises in gymnasium.

Physical Education 3w. Gymnasium and Swimming. Two hours per week for one quarter. Must be taken in the freshman year.

2. *General courses*.—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and the prerequisites must be observed. Ordinarily, if botany is registered for in the freshman year, registration for zoology should be postponed until the sophomore year, and vice versa.

Agr. Biochem. 7f-8w, General Agricultural Biochemistry, 10 (Chem. 1-2-3 or 9-10)

Agron. 1f,w,s, Farm Crops, 3 (Sbils 2)

An. Biol. 1f,w,s-2w,s,su, General Zoology, 10.

An. Husb. 1f,w, Types and Breeds of Livestock, 5.

Bact. 6f,w,s, Elementary Bacteriology, 4 (Chem. 1-2-3 or 9-10)

Bot. 1f,s-2w,f, General Botany, 10. Students entering college with a year of high-school botany satisfactory to the department may omit Bot. 1 (see footnote on page 40) and substitute five credits elective later in their course of study.

Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high-school chemistry may omit this course and register for Chem. 9-10. Those required to take this course because of inability to carry successfully Chem. 9-10 will be allowed not more than ten credits.

Chem. 9f-10w, Advanced General Inorganic Chemistry, 10. Those required to take Chem. 1-2-3 are exempt.

Dy. Husb. 1f,s, Elements of Dairying, 5.

Econ. 5f,s, General Economics, 5. Open to freshmen only during their third quarter.

Econ. 6f,w, Agricultural Economics, 3 (Econ. 5)

Farm Eng. 3f,s, Mechanical Drawing, 3.

Farm Eng. 10f,w, Farm Engineering, 5.

Farm Eng. 11f,w, Applied Mathematics, 5. Students presenting a half-year of high-school higher algebra may omit this course and substitute five credits elective later in their course of study.

Farm Eng. 21f-22w, Agricultural Physics, 10. Those presenting a year of high-school physics may omit this course and substitute ten credits elective later in their course of study.

*For. 22f, Tree Crops, 1. Should be taken in freshman year parallel with Soils 2.

Hort. 90f,s, General Horticulture, 3 (Soils 2)

Phys. Educ. 1f, Personal Hygiene, 1.

Pol. Sci. 1f, American Government, 5 (Not open to freshmen).

Rhet. 1f,w,s, ¹Rhetoric I, 3.

Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1)

Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2)

Rhet. 4f,w,s, Elementary Rhetoric, 3. Required only of those who are found to be unable to carry Rhet. 1.

Rhet. 11f,w,s, Argumentation, 5 (Rhet. 3)

Rhet. 22f,w,s, Public Speaking, 5 (Rhet. 3)

*Soils 2f, Soils I, 2.

*Soils 3s, Soils II, 3 (Chem. 1-2-3 or 9-10, Soils 1)

¹ Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 70 of the College of Agriculture bulletin.

ELECTIVE GROUPS

A. Groups from which major, minor, or electives may be chosen.

1. Agricultural Economics and Farm Management, including
Agricultural Economics
Farm Management
2. Agricultural Education and Agricultural Extension, including
Agricultural Education
Agricultural Extension
3. Animal Industry, including
Animal Husbandry
Dairy Husbandry
Poultry Husbandry
Veterinary Medicine
4. Agricultural Sciences and Plant Industry, including
Agricultural Biochemistry
Agronomy
Entomology and Economic Zoology
Horticulture
Plant Pathology and Botany
Soils

B. Group from which minor or electives may be chosen

1. Farm Engineering, including
Farm Engineering
Agron. 3, Farm Machinery

*A new course. The description of this course does not appear in the 1919-20 announcement of courses.

C. Groups from which electives only may be chosen

1. Bee Culture
2. Forestry
3. Home Economics
4. Military Science and Tactics
5. Physical Education
6. Rural Publications and Journalism
7. Courses in departments of other schools and colleges of the University

ELECTIVES

Students should consult with their advisers with reference to their choice of limited and free electives.

In selecting electives, note particularly (a) prerequisites, (b) classes of students (fr., soph., jr., or sr.) to which courses are offered, (c) number of credits, (d) quarter or quarters offered, and be sure that provision is made in registration for the proper sequence of continuation courses.

Registration for courses as electives in other colleges of the University must be in conformity with regulations of the college offering the course.

Elective courses in the College of Science, Literature, and the Arts, are separated into Junior College courses, open to freshmen and sophomores, and Senior College courses, open to juniors and seniors. In addition to satisfying other prerequisites an average grade of C must be maintained for the first two years in order to register for a Senior College elective.

The Bulletin
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Minnesota

The College of Agriculture, Forestry,
and Home Economics
Announcement of
Courses in Forestry for the Year
1919-1920



Vol. XXII No. 41 September 23 1919

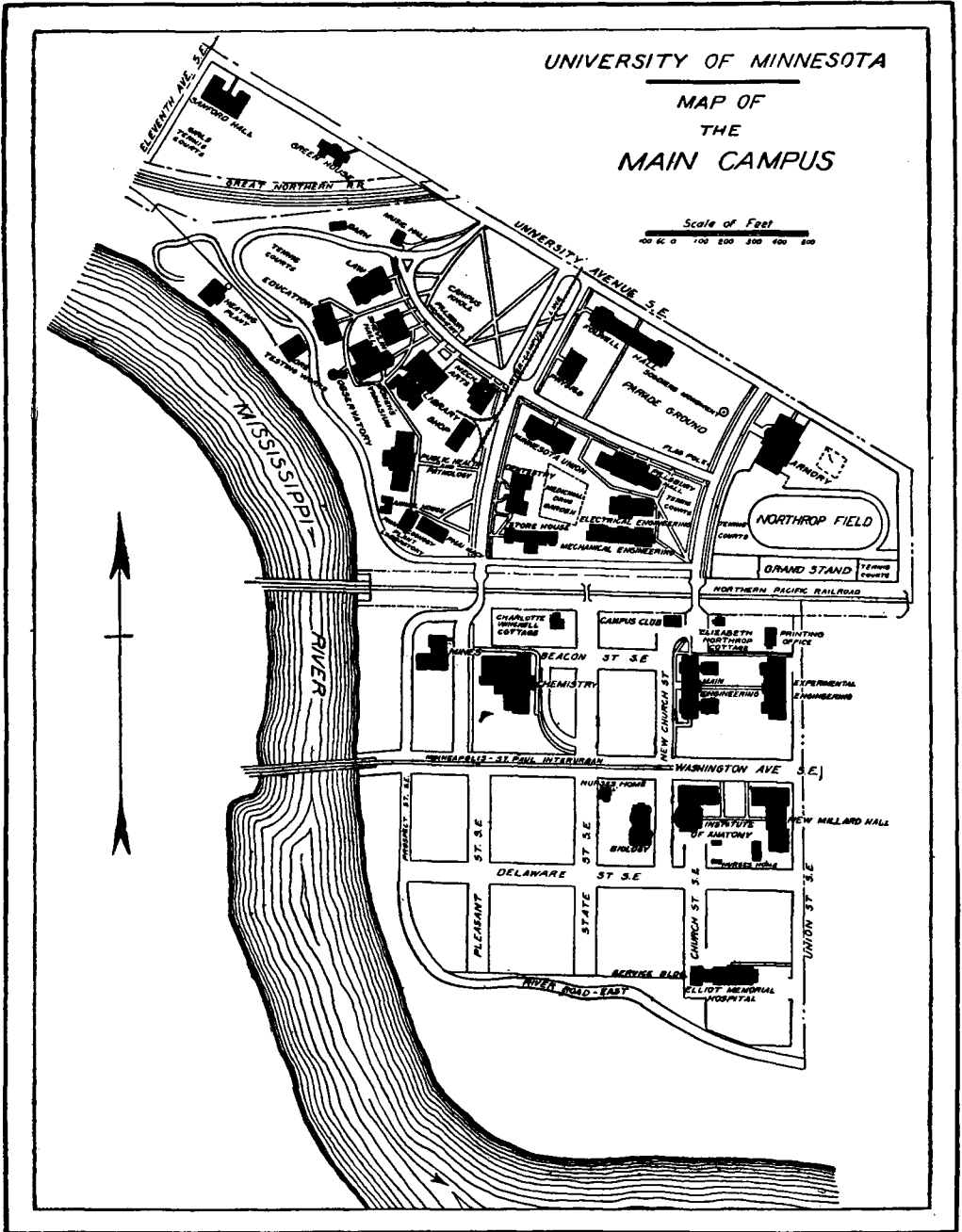
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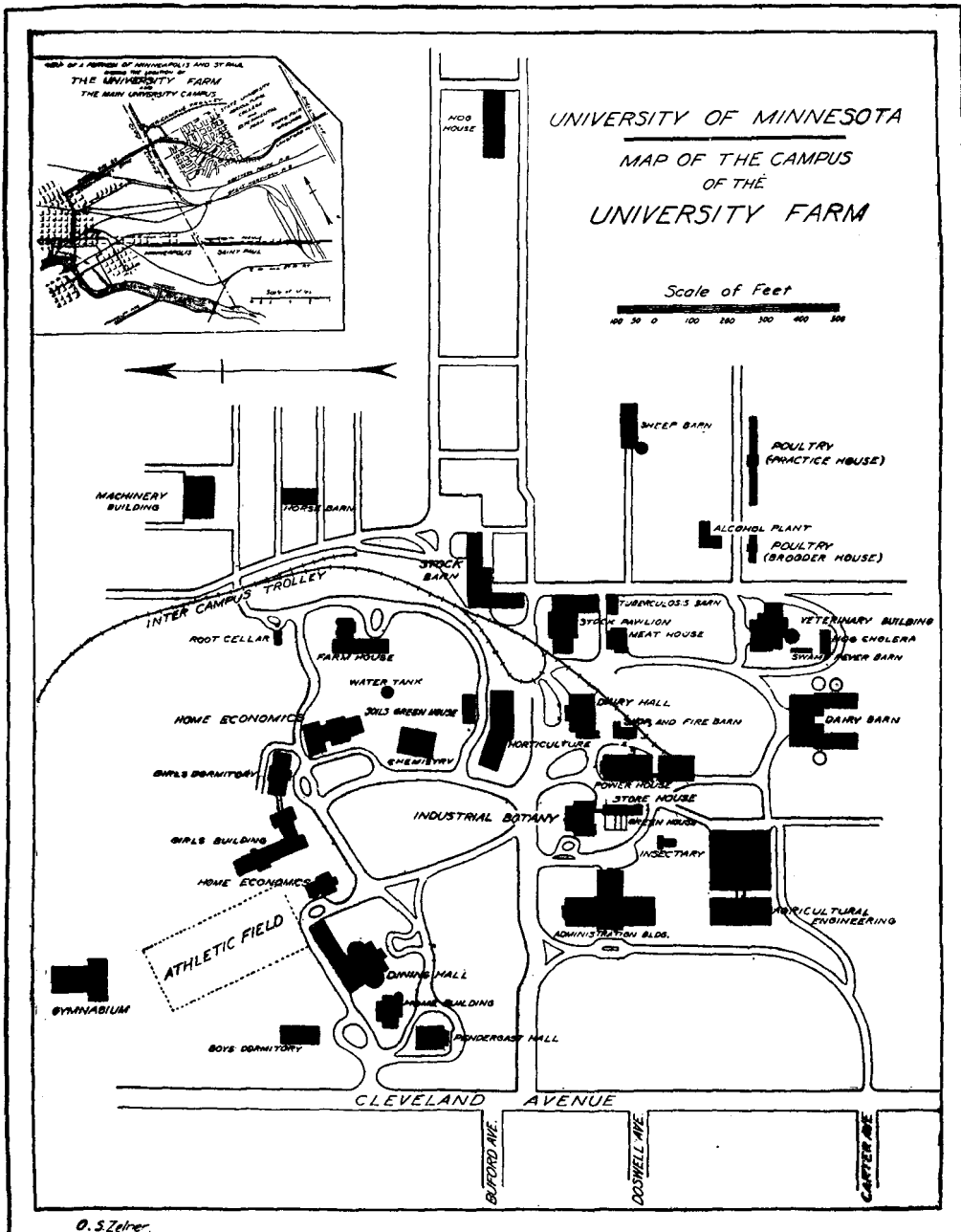
UNIVERSITY OF MINNESOTA

MAP OF
THE
MAIN CAMPUS

Scale of Feet
0 100 200 300 400 500



Area of Main Campus, 108.5 acres



Area of University Farm, 422.56 acres

1919							1920													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	1	2	3	4	5	..	..	..	..	1	2	3	..	..	..	..	1	2	3
6	7	8	9	10	11	12	4	5	6	7	8	9	10	4	5	6	7	8	9	10
13	14	15	16	17	18	19	11	12	13	14	15	16	17	11	12	13	14	15	16	17
20	21	22	23	24	25	26	18	19	20	21	22	23	24	18	19	20	21	22	23	24
27	28	29	30	31	..	..	25	26	27	28	29	30	31	25	26	27	28	29	30	31
..
AUGUST							FEBRUARY							AUGUST						
..	..	..	..	..	1	2	1	2	3	4	5	6	7	1	2	3	4	5	6	7
3	4	5	6	7	8	9	8	9	10	11	12	13	14	8	9	10	11	12	13	14
10	11	12	13	14	15	16	15	16	17	18	19	20	21	15	16	17	18	19	20	21
17	18	19	20	21	22	23	22	23	24	25	26	27	28	22	23	24	25	26	27	28
24	25	26	27	28	29	30	29	..	..	..	..	..	..	29	30	31	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
SEPTEMBER							MARCH							SEPTEMBER						
..	1	2	3	4	5	6	..	1	2	3	4	5	6	..	..	..	1	2	3	4
7	8	9	10	11	12	13	7	8	9	10	11	12	13	5	6	7	8	9	10	11
14	15	16	17	18	19	20	14	15	16	17	18	19	20	12	13	14	15	16	17	18
21	22	23	24	25	26	27	21	22	23	24	25	26	27	19	20	21	22	23	24	25
28	29	30	..	..	..	..	28	29	30	31	..	..	..	26	27	28	29	30	..	..
..
OCTOBER							APRIL							OCTOBER						
..	..	..	1	2	3	4	..	..	..	..	1	2	3	..	..	..	..	..	1	2
5	6	7	8	9	10	11	4	5	6	7	8	9	10	3	4	5	6	7	8	9
12	13	14	15	16	17	18	11	12	13	14	15	16	17	10	11	12	13	14	15	16
19	20	21	22	23	24	25	18	19	20	21	22	23	24	17	18	19	20	21	22	23
26	27	28	29	30	31	..	25	26	27	28	29	30	..	24	25	26	27	28	29	30
..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	..	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER						
..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	1	2	3	4	5	6
2	3	4	5	6	7	8	2	3	4	5	6	7	8	7	8	9	10	11	12	13
9	10	11	12	13	14	15	9	10	11	12	13	14	15	14	15	16	17	18	19	20
16	17	18	19	20	21	22	16	17	18	19	20	21	22	21	22	23	24	25	26	27
23	24	25	26	27	28	29	23	24	25	26	27	28	29	28	29	30	..	..	..	..
30	..	..	..	..	..	..	30	31	..	..	..	..	..	..	..	..	..	..	..	..
DECEMBER							JUNE							DECEMBER						
..	1	2	3	4	5	6	..	..	1	2	3	4	5	..	..	..	1	2	3	4
7	8	9	10	11	12	13	6	7	8	9	10	11	12	5	6	7	8	9	10	11
14	15	16	17	18	19	20	13	14	15	16	17	18	19	12	13	14	15	16	17	18
21	22	23	24	25	26	27	20	21	22	23	24	25	26	19	20	21	22	23	24	25
28	29	30	31	..	..	..	27	28	29	30	..	..	..	26	27	28	29	30	31	..
..

CALENDAR

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

1919-1920

1919

September	24	Wednesday	Registration closes except for new students
September	24-30	Week	Examinations for removal of winter and spring quarter conditions and entrance examinations. Registration of new students. Payment of fees.
September	29	Monday	School of Agriculture first term begins
October	1	Wednesday	Fall quarter begins
October	16	Thursday	Senate meeting, 4:00 p.m.
October	17	Friday	Half holiday. Annual freshman-sophomore contest
October	31	Friday	Last day for removal of spring quarter incompletes
November	17	Monday	Creamery Butter Makers' Short Course (ten-day session) and Cheese Makers' Short Course (four-week session) begin
November	27	Thursday	Thanksgiving Day, a holiday
December	1-6	Week	Ice-cream Makers' Short Course
December	8-13	Week	Milk Plant Operators' Short Course
December	18	Thursday	Senate meeting, 4:00 p.m.
December	19	Friday	Last day for winter quarter registration except for new students
December	23	Tuesday	School of Agriculture, first term closes Fall quarter closes, Christmas vacation begins 9:00 p.m.
December	24	} Week	Registration of new students. Payment of winter quarter fees
January	1		
December	29	} Week	Farmers' and Home Makers' Week Short Course
January	3		
January	2	Friday	Winter quarter begins
January	5	Monday	School of Agriculture, second term begins
February	2	Monday	Last day for removal of fall quarter incompletes
February	12	Thursday	Lincoln's Birthday, a holiday
February	19	Thursday	Senate meeting, 4:00 p.m.
March	17	Wednesday	Last day for spring quarter registration except for new students

COURSES IN FORESTRY

March	24	Wednesday	Winter quarter closes. School of Agriculture, second term closes
March	25-30	Week	Registration of new students. Payment of spring quarter fees. Examinations for removal of fall quarter conditions
March	29	} Week	Boys' and Girls' Week Short Course
April	3		
March	31	Wednesday	Spring quarter begins
April	2	Friday	Good Friday, a holiday
April	30	Friday	Last day for removal of winter quarter incompletes
May	17	Monday	Traction Engineering Short Course begins
May	20	Thursday	Senate meeting, 4:00 p.m.
June	7	Monday	Last day for summer quarter registration except for new students
June	13	Sunday	Baccalaureate service
June	14-19	Week	Threshers' Week Short Course
June	14-19	Week	Registration of new students. Payment of fees. Examinations for removal of winter quarter conditions
June	16	Wednesday	Spring quarter closes
June	17	Thursday	Forty-eighth Annual Commencement
June	19	Saturday	Traction Engineering Short Course closes
June	21	Monday	*Summer quarter begins
July	19	Monday	Last day for removal of spring quarter incompletes
September	3	Friday	Summer quarter closes

* Final arrangements for the 1920 summer quarter have not been completed. See later announcements.

THE COLLEGE OF AGRICULTURE, FORESTRY AND HOME ECONOMICS

FACULTY

MARION LEROY BURTON, Ph.D., D.D., LL.D., President
CYRUS NORTHROP, LL.D., President Emeritus
ROSCOE W. THATCHER, M.A., Dean of the Department of Agriculture
EDWARD M. FREEMAN, Ph.D., Dean of the College
EDWARD E. NICHOLSON, M.A., Dean of Student Affairs
....., Dean of Women
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JOHN H. ALLISON, Ph.B., M.F., Professor of Forestry
FREDERICK J. ALWAY, Ph.D., Professor of Soil Chemistry
PHILIP A. ANDERSON, B.S., Assistant Professor of Animal Husbandry
ALBERT C. ARNY, B.S., in Agr., Associate Professor of Farm Crops
CLYDE H. BAILEY, M.S., Associate Professor of Agricultural Biochemistry
LOUIS B. BASSETT, Assistant Professor of Farm Management
JERE BAXTER, Major, U.S.A., Assistant Professor of Military Science and
Tactics
HENRY C. BERTELSEN, First Lieutenant, U.S.A., Assistant Professor of
Military Science and Tactics
ALICE BIESTER, M.A., Assistant Professor of Nutrition
ALMA L. BINZEL, B.S., Assistant Professor of Child Training
GUY R. BISBY, B.S., Assistant Professor of Plant Pathology
JOHN D. BLACK, M.A., Assistant Professor of Economics
ANDREW BOSS, Professor of Agronomy and Farm Management
WILLIAM BOSS, Professor of Farm Engineering
WILLARD L. BOYD, D.V.S., Professor of Veterinary Medicine and Surgery
WILFRID G. BRIERLEY, M.S., Associate Professor of Horticulture
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MAXWELL J. DORSEY, Ph.D., Associate Professor of Horticulture
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WILLIAM P. DYER, B.A., Assistant Professor of Agricultural Education

- CLARENCE H. ECKLES, M.S., D.Sc., Professor of Dairy Husbandry
 ALBERT M. FIELD, M.S., Assistant Professor of Agricultural Education
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 ROSS AIKEN GORTNER, Ph.D., Professor of Agricultural Biochemistry
 THEOPHILUS L. HAECKER, Professor Emeritus of Dairy Husbandry
 EDWIN O. HANSON, Assistant Professor of Dairy Husbandry
 HERBERT K. HAYES, M.S., Associate Professor of Plant Breeding
 FRANCIS JAGER, Professor of Bee Culture
 WILLIAM H. KENETY, M.S., Assistant Professor of Forestry
 HOWARD C. H. KERNKAMP, D.V.M., Assistant Professor of Veterinary
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 WILLIAM P. KIRKWOOD, B.A., Professor of Journalism
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 WILLIAM MOORE, B.A., Associate Professor of Research in Economic
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 ence and Tactics
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 ERNEST O. NUOFFER, Second Lieutenant, U.S.A., Assistant Professor of
 Military Science and Tactics
 OSCAR W. OESTLUND, Ph.D., Assistant Professor of Animal Biology
 LEROY S. PALMER, Ph.D., Associate Professor of Agricultural Biochem-
 istry
 E. MAUDE PATCHIN, B.S., Assistant Professor of Textiles and Clothing
 FRANCIS W. PECK,¹ M.S., Associate Professor of Farm Management
 WALTER H. PETERS, B.S.A., Professor of Animal Husbandry
 NORMAN J. RADDER, B.A., Assistant Professor of Journalism
 MYRON H. REYNOLDS, B.S.A., D.V.M., M.D., Professor of Veterinary
 Medicine and Surgery
 WILLIAM A. RILEY, Ph.D., Professor of Entomology
 HARRY B. ROE, B.S. in Eng., Assistant Professor of Farm Engineering
 CLAYTON O. ROST, M.A., Assistant Professor of Soils
 ARTHUR G. RUGGLES, M.A., Associate Professor of Entomology

¹ On leave of absence, 1919-20.

- ARTHUR C. SMITH, B.S., Professor of Poultry Husbandry
 ELVIN C. STAKMAN, Ph.D., Professor of Plant Pathology
 FREDERICK H. STEINMETZ, B.S. in Agr., Assistant Professor of Agronomy
 JOHN T. STEWART, C.E., Professor of Agricultural Engineering
 ASHLEY V. STORM, M.A., Professor of Agricultural Education
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 ARTHUR G. TYLER, Assistant Professor of Farm Engineering
 HENRY W. VAUGHN, M.S. in Agr., Professor of Animal Husbandry
 ELIZABETH VERMILYE, B.A., Assistant Professor of Foods and Cookery
 FREDERIC L. WASHBURN, M.A., Professor of Entomology
 ROBERT M. WASHBURN, M.S.A., Professor of Dairy Husbandry
 MILDRED WEIGLEY, B.S., Professor of Home Economics
 MARION WELLER, B.A., Assistant Professor of Textiles
 JOHN P. WENTLING, M.A., Associate Professor of Forestry
 HALL B. WHITE, B.S. in Agr., Assistant Professor of Farm Buildings
 JOHN J. WILLAMAN, M.S., Assistant Professor of Agricultural Analysis
 ARTHUR L. ANDERSON, B.S., Instructor in Animal Husbandry
 JOHN V. ANKENY, B.S., Instructor in Agricultural Education
 GERTRUDE M. BAKER, Instructor in Physical Education for Women
 HELEN A. BARR, B.A., Instructor in Physical Education for Women
 WILLIAM A. BILLINGS, D.V.M., Instructor in Pathology
 JOHN J. BOWENS, Sergeant, U.S.A., Instructor in Military Science and
 Tactics
 CARLOTTA BROWN, Instructor in Millinery
 EDWIN S. BROWN, B.S., M.D., Instructor in Physical Education for Men
 NORRIS K. CARNES, B.S., Instructor in Animal Husbandry
 ESTELLE COOK, Instructor in Rhetoric
 WILLIAM T. COX, B.S., in For., Special Lecturer in Forestry
 FRANK CRAIN, Sergeant, U.S.A., Instructor in Military Science and Tactics
 ROBERT C. DAHLBERG, B.S., in Agr., Instructor in Agricultural Botany
 J. GRANT DENT, Instructor in Farm Engineering
 JEAN MUIR DORSEY, B.S. in H.E., Instructor in Foods Management
 HALLY J. FISHER, R.N., Instructor in Home Nursing
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 Tactics
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 LOYD V. FRANCE, M.S. in Agr., Instructor in Bee Culture
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 PERCY C. GLIDDEN, Instructor in Physical Education for Men
 VETTA GOLDSTEIN, Instructor in Textiles and Clothing
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 Tactics

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 ABE PEPINSKY, Instructor in Violin and Director of Orchestra
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 HARRY GOLDIE, Assistant in Physical Education for Men
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 Zoology
 CLAUDE D. GRINNELLS, D.V.M., Assistant in Veterinary Medicine
 ANNA WENTZ, Assistant in Entomology and Economic Zoology

EXTENSION STAFF

ARCHIE D. WILSON, B.S. in Agr., Director
 CLARENCE H. WELCH, Secretary, Agricultural Extension Division
 MARGARET B. BAKER, Assistant State Leader, Boys' and Girls' Club Work
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 MARY L. BULL, Home Economics Specialist
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 NORTON E. CHAPMAN, M.A., Poultry Husbandry Specialist
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 LUCY CORDINER, Home Economics Specialist
 JOSEPHINE CREELMAN, Home Nursing Specialist
 JAMES M. DREW, Assistant
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 ROY H. GIBERSON, Assistant State Leader Boys' and Girls' Club Work
 ALBERTHA GUSTAFSON, B.S., Assistant State Leader Boys' and Girls' Club
 Work

EDWIN HASLERUD, Assistant in charge of Cow Testing Associations
 GEORGE F. HOWARD, Assistant State Leader Boys' and Girls' Club Work
 J. SENECA JONES, Assistant State Leader County Agents
 KEMPER A. KIRKPATRICK, Assistant State Leader County Agents
 ARTHUR J. KITTELSON, Assistant State Leader Boys' and Girls' Club
 THOMAS B. McCULLOUGH, Demonstration Farm Specialist
 ARTHUR J. MCGUIRE, B.Agr., Reclamation and Livestock Specialist
 WILLIAM A. MCKERROW, Livestock Specialist
 ROGER S. MACKINTOSH, B.S. in Agr., Horticultural Specialist
 WILLIAM E. MORRIS, Assistant State Leader County Agents
 GEORGE H. NESOM, B.S., Soil Specialist
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 RETT E. OLMSTEAD, Farmers' Club Specialist
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 MAY SECREST, State Leader in Home Economics
 JUNIATA L. SHEPPERD, M.A., Home Economics Specialist
 ARNE G. TOLAAS, M.S., Plant Pathology Specialist

MEMBERS OF OTHER FACULTIES GIVING INSTRUCTION IN
 THE COLLEGE OF AGRICULTURE, FORESTRY,
 AND HOME ECONOMICS

CEPHAS D. ALLIN, M.A., LL.B., Professor of Political Science
 FRANCIS B. BARTON, Docteur de l'Université de Paris, Assistant Professor
 of Romance Languages
 ROY G. BLAKEY, Ph.D., Associate Professor of Economics
 OSCAR C. BURKHARD, Ph.D., Assistant Professor of German
 FREDERICK K. BUTTERS, Ph.D., Assistant Professor of Botany
 JAMES DAVIES, Ph.D., Assistant Professor of German
 WILLIAM S. COOPER, Ph.D., Assistant Professor of Botany
 Z. CLARK DICKINSON, Ph.D., Assistant Professor of Economics
 GEORGE W. DOWRIE, Ph.D., Professor of Economics
 ELIAS J. DURAND, B.S.C., Professor of Botany
 J. FRANKLIN EBERSOLE, M.A., Professorial Lecturer in Economics
 WILLIAM H. EMMONS, Ph.D., Professor of Geology
 HENRY A. ERICSON, Ph.D., Professor of Physics
 JULES T. FRELIN, B.A., Assistant Professor of Romance Languages
 ISAAC W. GEIGER, Ph.D., Assistant Professor of Chemistry
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 JOHN H. GRAY, Ph.D., Professor of Economics
 FRANK F. GROUT, M.S., Professor of Geology and Mineralogy
 ALVIN H. HANSEN, B.A., Associate Professor of Economics
 PEDRO HENRIQUEZ URENA, Bachiller en Ciencias y Letras, Abogado, Pro-
 fessorial Lecturer of Romance Languages
 CLARENCE L. HOLMES, M.A., Assistant Professor of Economics
 WILLARD E. HOTCHKISS, Ph.D., Professor of Economics

RALPH E. HOUSE, Ph.D., Associate Professor of Romance Languages
NED L. HUFF, M.A., Assistant Professor of Botany
WILLIAM H. HUNTER, Ph.D., Associate Professor of Chemistry
ALBERT C. JAMES, M.B.A., Assistant Professor of Economics
A. WALFRED JOHNSTON, M.A., Assistant Professor of Geology
LAUDER W. JONES, Ph.D., Professor of Chemistry
LEE I. KNIGHT, Ph.D., Professor of Botany
ALFRED E. KOENIG, M.A., Dr.Theol., Assistant Professor of German
SAMUEL KROESCH, Ph.D., Assistant Professor of German
ELMER J. LUND, Ph.D., Assistant Professor of Zoology
FRANK H. MACDOUGALL, Ph.D., Associate Professor of Chemistry
LOUALLEN F. MILLER, M.A., Professorial Lecturer in Physics
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BRUCE D. MUDGETT, B.A., Associate Professor of Economics
HENRY F. NACHTRIEB, B.S., Professor of Animal Biology
EVERETT W. OLMSTED, Ph.D., Professor of Romance Languages
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CHESLEY J. POSEY, M.S., Assistant Professor of Geography
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THOMAS H. SANDERS, M. of Commerce, Assistant Professor of Economics
CARL SCHLENKER, B.A., Professor of German
JOHN H. SHERMAN, B.A., Professorial Lecturer in Economics
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SOLOMON M. DELSON, Ph.B., Instructor in Romance Languages
MARGUERITE GUINOTTE, Brevet Supérieur l'Académie, Paris, Instructor in Romance Languages
Albert J. Lobb, Ph.B., LL.B., Instructor in Political Science
VICTOR H. PELZ, M.A., Instructor in Economics
ADOLPH R. RINGOEN, M.A., Instructor in Animal Biology
J. WARREN STEHMAN, M.A., Instructor in Economics
SAMUEL VASCONCELOS, B.A., Abogado, Instructor in Romance Languages
GUY H. WOOLLETT, Ph.D., Instructor in Chemistry

FACULTY COMMITTEES

1919-1920

Executive.—The Executive Committee of the Department of Agriculture

Enrollment.—WEST, BIESTER, MORROW, PIERCE, WENTLING

Curriculum.—FREEMAN, BIESTER, BOSS, CHEYNEY, GAY, RILEY, STORM,
WEIGLEY, WELLER, WEST

Students' Work.—FREEMAN, CHEYNEY, NICHOLSON, WEIGLEY, WEST.

Student Organizations.—LANSING, FITCH, FREEMAN, MILLER, WELLER

Appointment.—STORM, WEIGLEY

Farm Experience.—BOSS, BRIERLEY

Faculty Business.—GORTNER, RUGGLES, STAKMAN, VERMILYE

GENERAL INFORMATION

ADMISSION

New students are admitted at the opening of the fall, winter, and spring quarters.

All students upon entering for the first time must submit their credentials to the Enrollment Committee.

Admission is either by certificate or by examination. Candidates must have completed the equivalent of a four-year high school course and must present:

1. Four units of English; or three units of English and four units of a foreign language, or three units of English and two units in each of two foreign languages.
2. One unit of elementary algebra and one unit of plane geometry.
3. Enough additional work to make in all fifteen units, of which not more than four may be in subjects not listed in the admission groups in the General Information Bulletin.

Graduates of the School of Agriculture of the University of Minnesota who have completed the two summers of supervised work offered in the School course, one additional School year, and one additional summer's work, or the equivalent thereof, will be admitted to the College of Agriculture, Forestry, and Home Economics.

For details of admission requirements and definition of "unit" see the Bulletin of General Information.

All students desiring to enter the Forestry courses are urged to present physics and chemistry for entrance credits.

FEES

Free Tuition.—The State will pay the tuition of any student who served in the army, navy, or marine corps of the United States during any war in which the United States has been involved, including members of the National Guard or who, upon the call of the president performed military service outside the border of Minnesota in any trouble with Mexico and of any student who performed overseas service as a regularly enlisted full-time worker of the Red Cross, engaged in nursing the sick or assisting in the care of soldiers in any government hospital, field, or camp which service has been officially recognized by the National Government. The amount of this free tuition is not to exceed \$200 for any person and the benefits of this act will not extend beyond July 1, 1924. The amount to be paid in any year will be limited by the legislative appropriation for that year.

Application for this free tuition should be made to the Secretary's Office at the time of registration. This applies only to students, who at the time of enlistment were citizens and residents of the State of Minnesota.

Tuition includes all of the regular quarter charges listed below except the deposit and penalty fees for change of registration, late registration, condition examinations, etc.

Tuition fee (per quarter)	
Residents of Minnesota	\$14.00
Non-residents	28.00
Deposit (for the year)	5.00
Health fee (per quarter)	2.00
Minnesota Union (per quarter) .....	.70
Itasca Park regular quarter fees	
Special fees	
Examination for removal of conditions	1.00
Examination for credit (after the first semester in residence)	5.00
Special examination	5.00
Change of registration.....	2.50

Late registration.—Old students must indicate their registration not later than two weeks before the day set for classes to begin. All students must complete their registration (including payment of fees) before the day set for classes to begin. Penalty for delay in either indicating or completing registration, five dollars. An additional dollar is charged for each day of delay after the last day set for the completion of registration, and a similar charge for each day of delay after the last day set for payment of fees.

Important.—The regulations require that no student shall be allowed to register after the quarter opens except by special committee action.

FACULTY REGULATIONS

Students are held responsible for compliance with all faculty regulations. These regulations are published in a booklet issued to students at the time of registration.

REQUIREMENTS FOR GRADUATION AND DEGREE

After the completion of the prescribed course of study, including all of the required work and the requisite amount of elective work equivalent to 204 (235½ in 1920) credit hours, candidates will be recommended for graduation with the degree of Bachelor of Science.

COURSES OF STUDY

There are at the present time three specialized branches of work open to forestry students. The curricula for the freshman year are the same, and for the sophomore year nearly the same for all three branches. By the end of the first year the student should be able to decide which of the three prescribed specialized courses he intends to follow for the remaining three years. These courses are distinct, and a change after the sophomore year can not be made without loss of credits.

It is important that the line of specialization be selected with great care, since the student's interest in and aptitude for his work is of prime importance. The choice should not be made without first consulting with some member of the Faculty.

1. Technical Forestry Course. This course has for its object a thoro training in the management of growing forests. Particular emphasis is given to the training for experimental and research work. It includes all the technical forestry courses, together with such allied courses as may aid in their application.

2. Commercial Lumbering. This course is a preparation for the lumber business. It includes such technical forestry courses as are needed in the handling of timber crops and a very thoro series of courses in economics and business methods.

3. Wood Pulp and Distillation Products. This course is intended to prepare men to serve the industries which utilize wood pulp and all the products of wood other than lumber. It includes the necessary technical forestry courses and a complete series of work in chemistry and the technology of wood.

EXPLANATION OF COURSE NUMBERS

The quarters in which courses are offered are indicated by the letters *f* (fall), *w* (winter), *s* (spring), and *su* (summer) following the course number. For example: 5*f,w,s* indicates that Course 5 is given in the fall quarter and repeated in the winter and again in the spring quarter; 5*f*-6*w* indicates a two-quarter course extending through the fall and winter quarters; and 5*f,w*-6*w,s* indicates that Course 5-6 is given in the fall and winter quarters and repeated through the winter and spring quarters.

All undergraduate courses are numbered from 1 to 100. All courses open to undergraduates and graduates are numbered from 101 to 200.

Course numbers in parentheses following the number of credits indicate prerequisite courses.

Descriptions of the courses listed in the following outline of the curricula, together with those of additional courses offered as electives, will be found on pages 21 to 43. The divisional statements are arranged alphabetically according to the names of the divisions.

One credit hour is equivalent to (1) one lecture or recitation period requiring two hours of preparation, (2) two periods of laboratory work requiring one hour of preparation, or (3) three periods of laboratory work with no preparation, each week for one quarter.

GROUP I. GENERAL REQUIREMENTS FOR ALL STUDENTS IN FORESTRY

FRESHMAN YEAR

All of the following work is required of every student except for the exemptions indicated. For some students this represents more than the regular amount of work of seventeen credit hours per quarter. In such cases those subjects listed below which can not be taken in the freshman year must take precedence the following year. Registration for from fifteen to eighteen credit hours of work each quarter (Summer quarter at Itasca Park, eleven credit hours) will be allowed without special permission. Care should be taken in registration to give precedence to courses offered only one quarter.

FRESHMAN YEAR

1. *Non-credit courses* required for graduation in addition to the 204 credit hours.
 - Freshman Lectures. A course of nine lectures intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter.
 - Military Drill. Three hours per week throughout the year. Students found to be physically unfit may be required to substitute special corrective exercises in gymnasium.
 - Physical Education 3w. Gymnasium and Swimming. Two hours per week for one quarter.
2. *General courses.* The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and the prerequisites must be observed.
 - Bot. 1f,s-2w,f, General Botany, 10. Students entering college with a year of high-school botany satisfactory to the Department may omit Bot. 1 (see foot-note on page 22) and substitute 5 credits elective later in their course of study.
 - Bot. 7s, Taxonomy of Flowering Plants, 5 (Bot. 2).
 - Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high-school chemistry may omit this course and register for Chem. 9-10. Those required to take this course because of inability to carry successfully Chem. 9-10 will be allowed not more than 10 credits.
 - Chem. 9f-10w, Advanced General Inorganic Chemistry, 10. Those required to take Chem. 1-2-3 are exempt.
 - Econ. 5f,s, General Economics, 5. Open to freshmen only during their third quarter.
 - Farm Eng. 11f,w, Applied Mathematics, 5. Students presenting a half-year of high-school higher algebra may omit this course and substitute 5 credits elective later in their course of study.
 - For. 1f, General Forestry, 4.
 - Physic. Educ. 1f, Personal Hygiene, 1.
 - Rhet. 1f,w,s, Rhetoric I, 3.¹
 - Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1).
 - Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2).
 - Rhet. 4f,w,s, Elementary Rhetoric, 3. Required only of those who are found to be unable to carry Rhet. 1.

¹Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 40

SOPHOMORE YEAR

1. *Non-credit courses* required for graduation in addition to the 204 credit hours. Military Drill. Three hours per week throughout the year. Students found to be physically unfit may be required to substitute special corrective exercises in gymnasium.
2. *Freshman courses* which were not completed during the freshman year.
3. *General courses.* The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and their prerequisites must be observed.
 - An. Biol. 1f,w,s-2w,s,su, General Zoology, 10.
 - Farm Eng. 3f,s, Mechanical Drawing, 3.
 - Farm Eng. 18s, Surveying, 5 (Farm Eng. 3, 11 or equiv.)
 - For. 2su, Elementary Dendrology, 3. Given at Itasca Park.
 - For. 3f, Dendrology I, 4 (Bot. 1).
 - For. 4w, Dendrology II, 4 (Bot. 1).
 - For. 5su, Elementary Sylviculture, 3 (Bot. 2) given at Itasca Park.
 - For. 9su, Elementary Mensuration, 5. Given at Itasca Park.
 - Plant Pathology 10s, Forest Pathology, 5 (Bot. 10 cred.).
 - Rhet. 11f,w,s, Argumentation, 5 (Rhet. 3).
 - Rhet. 22f,w,s, Public Speaking, 5 (Rhet. 3).
4. *Special courses* as prescribed by the curriculum of the line of specialization selected. See special requirements on pages 18 to 19.
5. *Electives.* Enough electives should be selected to make up with those listed in 2, 3, and 4 above, from 15 to 18 credit hours each quarter. (11 credit hours for the summer quarter at Itasca Park). Full work for the year exclusive of the summer quarter consists of 51 credit hours.

JUNIOR YEAR

1. *General courses.*
 - Ent. 5f, Elementary Forest Entomology, 3 (An. Biol. 10 cred.).
 - For. 6f, Sylviculture I, 3 (For. 1, 4, Bot. 2).
 - For. 11s, Forest Valuation, 5 (For. 6).
 - For. 17f-18w, Wood Technology, 6 (Bot. 1-2).
 - Pol. Sci. 26s, Business Law, 2 (10 cred. in Pol. Sci. or Econ.).
2. *Special courses* as prescribed by the curriculum of the line of specialization selected. See special requirements on pages 18 to 19.
3. *Electives.* Enough elective credits should be selected to make up, with those listed in 1 and 2 above, from 15 to 18 credit hours each quarter. Full work for the year (3 quarters) consists of 51 credit hours.

SENIOR YEAR

1. *Special courses* as prescribed by the curriculum of the line of specialization selected. See special requirements on pages 18 to 19.
2. *Elective courses.* Enough elective credits should be selected to make up, with those listed in 1 above, from 15 to 18 credit hours each quarter at University Farm and 11 credit hours each quarter at Itasca Park and at Cloquet.

GROUP II. SPECIAL REQUIREMENTS IN THE DIFFERENT
LINES OF SPECIALIZATION (SUPPLEMENTARY
TO GROUP I)

TECHNICAL FORESTRY

Sophomore year

- Geol. 29f, General Physiography, 5
- Geol. 34w, Meteorology, 3

Junior year

- Bot. 52f, Plant Physiology, 5 (Bot. 15 cred.)
- Bot. 54s, Elementary Ecology, 5 (Bot. 52)

- For. 7w, Sylviculture II, 3 (For. 6)
 For. 10w, Forest Mensuration, 5 (For. 4)
 For. 24s, Forest By-Products, 5
Senior Year
 Farm Eng. 20su, Forest Engineering, 4 (Farm Eng. 18). Given at Itasca Park
 For. 8su, Practical Sylviculture, 3 (For. 7). Given at Itasca Park
 For. 12w, Forest Protection, 3 (For. 4)
 For. 13w, Lumbering, 3 (For. 1, 4)
 For. 14w, Forest Management, 5 (For. 8, 11, 13 parallel)
 For. 15f, Logging Plans, 6 (For. 1, 4). Given at Cloquet last 7 weeks of quarter
 For. 16f, Forest Working Plans, 5 (For. 8, 11). Given at Cloquet first 5 weeks of quarter
 For. 20w, Grazing, 3
 For. 22su, Forest Utilization, 4. Given at Itasca Park
 For. 104w, Experimental Sylviculture, 3 (For. 8)

COMMERCIAL LUMBERING

General statement. Economics electives should be selected from the following courses: 54, Corporation Finance; 60, Fire Insurance; 86, Advertising and Selling; 161, Labor Problems; 167, Industrial Relations; and 173, Railway Problems.

Sophomore year

- Econ. 25f, Principles of Accounting, 3
 Pol. Sci. 1f,w,s, American Government, 5

Junior year

- Econ. 85f, Principles of Marketing, 5 (Econ. 5)
 Econ. 23s, Business Organization and Management, 5 (Econ. 5)
 Econ. Elective, 8
 For. 7w, Sylviculture I, 3 (For. 6)
 For. 10w, Forest Mensuration, 5 (For. 4)
 For. 24s, Forest By-Products, 5

Senior year

- Econ. Elective, 8
 Farm Eng. 20su, Forest Engineering, 4 (Farm Eng. 18). Given at Itasca Park
 For. 8su, Practical Sylviculture, 3 (For. 7). Given at Itasca Park
 For. 13w, Lumbering, 3 (For. 1, 4)
 For. 15f, Logging Plans, 6 (For. 1, 4) Given at Cloquet last 7 weeks of quarter
 For. 16f, Forest Working Plans, 5 (For. 8, 11). Given at Cloquet first 5 weeks of quarter
 For. 19w, Lumber Manufacturing, 5 (For. 1, 17-18)
 For. 22su, Forest Utilization, 4. Given at Itasca Park

WOOD PULP AND DISTILLATION PRODUCTS

Sophomore year

- Chem. 11s, Qualitative Chemical Analysis, 4 (Chem. 1, 2, 3)
 Chem. 35f-36w, Organic Chemistry, 10 (Chem. 1-2-3 or 9-10)

Junior year

- Chem. 20w, Quantitative Analysis, 5 (Chem. 11)
 Math. (Consult Chief of Division of Forestry) 15
 Phys. 21f,w, s,su, Elements of Mechanics, 4 (Trigonometry)
 Phys. 22f,w,s, su, Elements of Mechanics Laboratory, 1 (Phys. 21 or parallel)
 Phys. 41w, Sound and Heat, 4 (Phys. 21)
 Phys. 42w, Sound and Heat Laboratory, 1 (Phys. 22, 41 or parallel)
 Phys. 61s, Magnetism and Electricity, 4 (Phys. 21)
 Phys. 62s, Magnetism and Electricity Laboratory, 1 (Phys. 22, 61 or parallel)

Senior year

- Bot. 52f, Plant Physiology, 5 (Bot. 15 cred.)
 Chem. or Eng. electives, 20 (Consult Chief of Division of Forestry)
 For. 23su, Factory Experience, 5
 For. 103w, Uses of Wood, 3 (For. 17-18)

ELECTIVES

Students should consult with the division in which they are specializing with reference to the elective courses which must be chosen to make up the 204 credit hours required for graduation.

Only a limited number of elective courses are open to freshmen. First-year students, who for any reason are unable to follow the regular curriculum, are advised to fill their program with a required course from the sophomore schedule, if possible, and postpone the choice of electives until the sophomore year. This plan will enable the student to obtain a better viewpoint from which to select his electives and allow a wider range of subjects from which to choose.

In selecting electives, note particularly (a) prerequisites, (b) classes of students, (fr., soph., jr., or sr.) to which courses are offered, (c) number of credits, (d) quarter or quarters offered, and be sure that provision is made in registration for the proper sequence of continuation courses.

FRESHMAN ELECTIVES

The following divisions and departments offer elective work to freshmen. For the descriptions of available courses see pages 21 to 43, and for departments marked S., L., and A., see Bulletin of the College of Science, Literature, and the Arts.

Agricultural Education
 Farm Engineering
 Forestry
 German
 History (S., L., and A.)
 Mathematics (S., L., and A.)
 Poultry Husbandry
 Romance Languages

SOPHOMORE, JUNIOR, AND SENIOR ELECTIVES

Nearly all of the divisions offer elective work to sophomores, juniors, and seniors. In selecting courses special attention should be paid to prerequisites, the classes to which the courses are offered, and, in the case of courses offered by departments of other schools and colleges of the University, to the regulations of the school or college concerned.

Elective courses in the College of Science, Literature, and the Arts, are separated into Junior College courses, open to freshmen and sophomores, and Senior College courses, open to juniors and seniors. In addition to satisfying other prerequisites an average of C must be maintained for the first two years in order to register for a Senior College elective.

DESCRIPTION OF COURSES

For explanation of course numbers and credits see page 16.

ANIMAL BIOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors HENRY F. NACHTRIEB, THOMAS S. ROBERTS, CHARLES P. SIGERFOOS; Assistant Professor ELMER J. LUND; Instructors GEORGE D. ALLEN, ADOLPH RINGOEN.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Course</i>				
1f,w,s-2w,s,su.	General Zoology	10 ¹	All	None
<i>Advanced Course</i>				
114w-115s.	Ornithology	6 ¹	Jr., sr.	1-2

For additional courses see the Bulletin of the College of Science, Literature, and the Arts.

¹The full course must be completed before credit will be allowed.

INTRODUCTORY COURSE

1f,w,s-2w,s,su. GENERAL ZOOLOGY. A survey of the animal kingdom emphasizing the principles of development and structure in relation to function and habit, heredity and evolution, and animals of economic importance. Lectures, quizzes, and laboratory. NACHTRIEB, SIGERFOOS, LUND, ALLEN, RINGOEN.

ADVANCED COURSE

114w-115s. ORNITHOLOGY. The study of the structure, classification and habits of birds with special reference to birds of Minnesota. Considerable time devoted to field study. Bird or field-glasses and handbook required. Laboratory, lectures, quizzes. Class limited to 10. ROBERTS.

BOTANY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors C. OTTO ROSENDAHL, ELIAS J. DURAND, LEE I. KNIGHT, JOSEPHINE E. TILDEN; Assistant Professors FREDERIC K. BUTTERS, WILLIAM S. COOPER, NED L. HUFF.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
1f,s-2w,f.	General Botany	10 ¹	All	None
7s.	Taxonomy of Flowering Plants	5	All	2
11f.	Algae and Fungi	5	Soph., jr., sr.	2
12w.	Bryophytes and Pteridophytes	5	Soph., jr., sr.	2

¹Course 2 must be completed before credit is allowed.

No.	Title	Credits	Offered to	Prereq. courses
13s.	Angiosperms and Gymnosperms	5	Soph., jr., sr.	7 or 12
17w.	Anatomy of Vascular Plants	5	Soph., jr., sr.	2
51f.	Histological Methods	3	Jr., sr.	15 credits
52f.	Plant Physiology	5	Jr., sr.	15 credits
53w.	Botany of Economic Plants	5	Jr., sr.	15 credits
54s.	Elementary Ecology	5	Jr., sr.	52
101f-102w- 103s.	Fungi	9	Jr., sr.	7 and 11
105s.	Algae	5	Jr., sr.	11
107w.	Bryophytes	5	Jr., sr.	7 and 12
108s.	Pteridophytes	5	Jr., sr.	7 and 13
110s.	Gymnosperms	5	Jr., sr.	7 and 13
113f-114w- 115s.	Advanced Taxonomy	9	Jr., sr.	7
118w-119s.	Cytology	6	Jr., sr.	51
131f.	Field Ecology	5	Sr.	54
133s.	Forest Geography of North America	5	Sr.	54, 131 advised
141f.	Advanced Plant Physiology I	5	Sr.	52, Org. Chem.
142w.	Advanced Plant Physiology II	5	Sr.	52, Org. Chem.
143s.	Advanced Plant Physiology III	5	Sr.	52, Org. Chem.

For additional courses see the Bulletin of the College of Science, Literature, and the Arts.

INTRODUCTORY COURSES

- 1f,s-2w,f. **GENERAL BOTANY.**¹ Fundamental principles of botany. Survey of organs of the flowering plant; its internal structure and physiology. Representatives of the algae, fungi, liverworts, etc., examined with special reference to tracing evolution of the vegetable kingdom. DURAND, BUTTERS, HUFF, and Assistants.
- 7s. **TAXONOMY OF FLOWERING PLANTS.** A general study of the classification and relationships of flowering plants. Laboratory and field practice in the determination of species, together with lectures and quizzes. ROSENDAHL.
- 11f. **GENERAL MORPHOLOGY OF ALGAE AND FUNGI.** A general survey of the structure, evolution and classification of the algae and fungi. Lecture, laboratory, and field work. TILDEN.
- 12w. **GENERAL MORPHOLOGY OF BRYOPHYTES AND PTERIDOPHYTES.** A general survey of the structure, evolution, and classification of the liverworts, mosses, and ferns. HUFF.
- 13s. **GENERAL MORPHOLOGY OF ANGIOSPERMS AND GYMNOSPERMS.** A general survey of the structure, evolution, and classification of seed plants. BUTTERS.

¹ Students entering college with a year of high-school botany satisfactory to the Department may be admitted directly to Course 2. All such must present to the Department before registration, their high-school note-book and a statement from their teacher showing the amount and proficiency of their work.

- 17w. ANATOMY OF VASCULAR PLANTS. A study of the microscopic structure of vascular plants, the cell, tissues and tissue systems with particular attention to the development and evolution of the vascular system in the root, stem, and leaf. BUTTERS.
- 51f. HISTOLOGICAL METHODS. Training in methods used in the preparation and preservation of class material. Special attention is given to methods of killing, imbedding, sectioning, staining, and mounting. DURAND.
- 52f. PLANT PHYSIOLOGY. An introductory course giving a general survey of plant functions. KNIGHT.
- 53w. BOTANY OF ECONOMIC PLANTS. A survey course treating the most important botanical features of the common economic plants. KNIGHT.
- 54s. ELEMENTARY ECOLOGY. An introduction to the study of plants and their environment; investigation of the habitat; its effects upon plants as individuals and in mass; plant communities; plant succession. Laboratory and field work, lectures and discussion. COOPER.
- 101f-102w-103s. FUNGI. A general course in the morphology and classification of the fungi. Fall quarter: Phycomycetes. Winter quarter: Ascomycetes. Spring quarter; Basidiomycetes. DURAND.
- 105s. ALGAE. A study of freshwater forms, based on collections made by the class. Lectures, laboratory, and field work. TILDEN.
- 107w. MORPHOLOGY AND TAXONOMY OF THE BRYOPHYTES. A special study of the structure and classification of the liverworts and mosses. (Not offered in 1919-20.) DURAND.
- 108s. MORPHOLOGY AND TAXONOMY OF THE PTERIDOPHYTES. An intensive study of lycopods, ferns and the allies, their structure and history, with special attention to the classification of living forms. Lectures, reference reading, and laboratory work. (Not offered in 1919-20.) BUTTERS.
- 110s. MORPHOLOGY AND TAXONOMY OF THE GYMNOSPERMS. An intensive study of cycads, conifers, and their allies, their structure and history, with special attention to the classification of living forms. Lectures, reference reading, and laboratory work. BUTTERS.
- 113f-114w-115s. ADVANCED TAXONOMY. An advanced course in which special attention is given to the taxonomy of difficult natural groups, involving systematic principles and practice rules of nomenclature, systems of classification, etc. ROSENDAHL.
- 118w-119s. CYTOLOGY. A survey of cell structure and the various phenomena of division, fusion and metamorphosis, together with a review of the history of cytological investigation. Methods of cytological investigation. Methods of cytological research indicated in the laboratory. ROSENDAHL.

- 131f. FIELD ECOLOGY. A careful study of the local plant communities and successions, followed by a written report, and by a study of the general principles of plant association and succession. COOPER.
- 133s. FOREST GEOGRAPHY OF NORTH AMERICA. Preliminary discussion of principles of plant distribution, followed by detailed study of forest regions of North America; reading, discussion, lantern slides, distribution maps, microscopic work, written reports. COOPER.
- 141f. ADVANCED PLANT PHYSIOLOGY I. Physical phases of Plant Physiology. A course dealing with the intake of materials and their translocation, also the energy relations of the plant. KNIGHT.
- 142w. ADVANCED PLANT PHYSIOLOGY II. Plant Metabolism. A course dealing with the synthesis of plant food, its transformation and utilization by the plant. KNIGHT.
- 143s. ADVANCED PLANT PHYSIOLOGY III. Plant Metabolism and Growth. Continuation of Course 142, also introducing certain fundamental phases of growth. KNIGHT.

CHEMISTRY

THE SCHOOL OF CHEMISTRY

Professors LAUDER W. JONES, CHARLES F. SIDENER; Associate Professors WILLIAM H. HUNTER, FRANK H. MACDOUGALL; Assistant Professors ISAAC W. GEIGER, FRANK C. WHITMORE; Instructor GUY H. WOOLLETT.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f,-2w-3s.	General Inorganic Chemistry...	12	All	None
9f,10w.	Advanced General Inorganic Chemistry.....	10	All	H.S. chem.
11s.	Qualitative Chemical Analysis..	4	Soph., jr., sr.	1-2-3
12s-13f.	Qualitative Chemical Analysis..	10	Soph., jr., sr.	9-10
20w.	Quantitative Analysis.....	5	Soph., jr., sr.	11 or 12-13
21s.	Quantitative Analysis.....	5	Soph., jr., sr.	20
35f-36w.	Organic Chemistry.....	10	Soph., jr., sr.	1-2-3 or 9-10
<i>Advanced Courses</i>				
126s.	Sanitary Water Analysis.....	1 or 2	Sr.	21
141f-142w-				
143s.	Physical Chemistry.....	9,12, or 15	Jr., sr.	Chem. 30 cred.; Phys. 15 credits

For additional courses see the Bulletin of the School of Chemistry.

INTRODUCTORY COURSES

- 1f-2w-3s. GENERAL INORGANIC CHEMISTRY. Designed for those who have had no high-school chemistry. 1-2—General laws of chemistry; the non-metals and their compounds. 3—The metals and their compounds. WHITMORE.

- 9f-10w. **ADVANCED GENERAL INORGANIC CHEMISTRY.** For those who have had one year of high-school chemistry. 9—General laws of chemistry; non-metals and their compounds. 10—The metals and their compounds and ionic equilibrium, considered quantitatively. ———
- 11s. **QUALITATIVE CHEMICAL ANALYSIS.** Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. For students who satisfy the requirements of general chemistry. ———.
- 12s-13f. **QUALITATIVE CHEMICAL ANALYSIS.** Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. For students who satisfy the requirements of general chemistry. WHITMORE.
- 20w. **QUANTITATIVE ANALYSIS.** An introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems will be assigned and attention given to proper laboratory practice. SIDENER, GEIGER.
- 21s. **QUANTITATIVE ANALYSIS.** Supplementary to Course 20. Further discussion of the principles and methods together with laboratory work on additional typical problems in gravimetric and volumetric analysis. SIDENER, GEIGER.
- 35f-36w. **ORGANIC CHEMISTRY.** An introduction to the chemistry of carbon compounds. The laboratory work will include the preparation of characteristic substances. HUNTER, WOOLLETT.

ADVANCED COURSES

- 126s. **SANITARY WATER ANALYSIS.** Lectures and laboratory practice in the chemical examination of potable waters. Three hours laboratory work per week. SIDENER, GEIGER.
- 141f-142w-143s. **PHYSICAL CHEMISTRY.** A general survey of the subject. Three lectures and one recitation. Laboratory work three or six hours per week. Nine, twelve, or fifteen credits, depending on amount of laboratory work. MACDOUGALL.

ECONOMICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors WILLARD E. HOTCHKISS, GEORGE W. DOWRIE, N. S. BRIEN GRAS, JOHN H. GRAY; Associate Professors ROY G. BLAKEY, ALVIN H. HANSEN, BRUCE D. MUDGE; Assistant Professors Z. CLARKE DICKINSON, CLARENCE L. HOLMES, ALBERT C. JAMES, THOMAS S. SANDERS; Professorial Lecturers J. FRANKLIN EBERSOLE, JOHN H. SHERMAN; Instructors VICTOR H. PELZ, J. WARREN STEHMAN.

COURSES IN FORESTRY

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f-2w.	Introduction to Economic History	10	All	None
3f-4w.	Principles of Economics	10	Soph., jr., sr.	None
5f,s ¹ .	General Economics	5	All	None
11f-12w.	Statistics	6	Soph., jr., sr.	3-4, or 5, 6 ²
23s.	Business Organization and Management	5	Soph., jr., sr.	3-4, or 5, 6 ²
25f-26w.	Principles of Accounting	6 ²	Soph., jr., sr.	None
54f.	Corporation Finance	3	Jr., sr.	3-4, or 5-6 ³
55w.	Advanced Corporation Finance	3	Jr., sr.	54
60w.	Fire Insurance	3	Jr., sr.	3-4
76f.	Commercial Policies	3	Jr., sr.	3-4
77w.	Foreign Trade	3	Jr., sr.	76
85f.	Principles of Marketing	5	Jr., sr.	3-4, 5, 6 ³
86f.	Advertising and Selling	3	Sr.	3-4 and 9 add. cr.
88w.	Retail Marketing	3	Jr., sr.	85
<i>Advanced Courses</i>				
109s.	Economics of Consumption	5	Jr., sr.	3-4, or 5, 6 ³
143f-144w.	Money and Banking	10	Jr., sr.	3-4, or 5, 6 ³
161f.	Labor Problems	3	Jr., sr.	3-4, or 5, 6 ³
167w.	Industrial Relations	3	Sr.	3-4, or 5, 6 ³
173s.	Railway Problems	3	Jr., sr.	3-4, or 5, 6 ³

¹Given at the University Farm.

²Students in Agriculture, Forestry, and Home Economics may receive three credits on the completion of Course 25.

³Students in Forestry may enter these courses on the completion of Course 5.

For additional courses see the Bulletin of the College of Science, Literature, and the Arts.

INTRODUCTORY COURSES

1f-2w. INTRODUCTION TO ECONOMIC HISTORY WITH SPECIAL EMPHASIS ON THE UNITED STATES. Lectures and section work. A general survey of the development of agriculture, manufacture, transportation, storage, and the exchange of goods; economic crises; land, capital, management, and labor; the interplay of economic and political forces. GRAS, DICKINSON.

3f-4w. PRINCIPLES OF ECONOMICS. Principles that underlie the present industrial order. Application of principles to economic problems such as labor, insurance, finance, transportation, industrial combination, government control. HANSEN.

5f,s. GENERAL ECONOMICS. Principles of economics combined with the necessary descriptive facts, as relating to economic life in general and to agriculture and forestry, in particular. HOLMES.

11f-12w. STATISTICS. Principles of collection, tabulation, and interpretation of statistical material, illustrated by present-day statistical data. Lectures, assigned readings, and special investigations by individual members of the class. MUDGETT.

- 23s. BUSINESS ORGANIZATION AND MANAGEMENT. Organization, principles applying to business in general and to particular concerns; evolution, objects, adjustments, limits, functional division; specialization—functional and other forms; standardization. Management, coördination of functions, handling of men, employment, external versus internal factors. HOTCHKISS, PELZ.
- 25f-26w. PRINCIPLES OF ACCOUNTING. The purpose and principles of account classification; capital and revenue; accruals; valuation; depreciation; preparation and interpretation of balance sheets, income accounts and other statements; corporation accounts. A laboratory course with supplementary lectures. SANDERS.
- 54f. CORPORATION FINANCE. The organizing, financing, and managing of corporations. A study of corporate securities for purposes of promotion and reorganization and of facilities for marketing them. STEHMAN.
- 55w. ADVANCED CORPORATION FINANCE. A study of the financial history of certain typical corporations with special reference to their promotion and reorganization. STEHMAN.
- 60w. FIRE INSURANCE. Basic theory and critical examination of fire insurance policy. Study of organization of stock and mutual companies, the agency system; reserves, rate making, and fire prevention. Special attention to laws of Minnesota and neighboring states. JAMES.
- 76f. COMMERCIAL POLICIES. Theory of international commerce; free trade, reciprocity and protection, with special emphasis on the tariff history and policy of the United States; commercial treaties and foreign politics. Lectures, assigned readings, and reports. BLAKEY.
- 77w. FOREIGN TRADE. Nature and methods of foreign trade. Present foreign trade situation with special reference to the United States. BLAKEY.
- 85f. PRINCIPLES OF MARKETING. Domestic merchandising methods of manufacture. Problems of wholesalers and commission men; distributing system and market organization; price policies. SHERMAN.
- 86f. ADVERTISING AND SELLING. Functions and principles of advertising; advertising media; planning and executing an advertising campaign. Copy. Sales management and personal salesmanship. SHERMAN, PELZ.
- 88w. RETAIL MARKETING. Problems and methods of the so-called regular retailer, department stores, and chain stores. Development of retail trade centers. Coöperation between the retailer and the local board of trade. The retailer and the consumer. PELZ.

ADVANCED COURSES

- 109s. **ECONOMICS OF CONSUMPTION.** Nature of human wants; standards of living; cost of living; income, administration of income; nature of demand; demand and price; relation of consumption to production; consumption and the population problems. _____.
- 143f-144w. **MONEY AND BANKING.** Relation to industrial system. Monetary principles with special reference to United States. American banking and bank organization. Principles of commercial banking, non-commercial banking, relation of government to banking, comparative study of leading foreign systems. DOWRIE, EBERSOLE, STEHMAN.
- 161f. **LABOR PROBLEMS.** Modern labor problems; woman and child labor, industrial hygiene, welfare work, profit-sharing, coöperation, labor unions, strikes, boycotts, conciliation, and arbitration; economic causes and effects of immigration. _____.
- 167w. **INDUSTRIAL RELATIONS.** Relation of employer and worker in industrial enterprises; theory and mechanism of collective bargaining; joint agreements; shop committees; other plans for workers' participation in management. HOTCHKISS.
- 173s. **ECONOMICS OF TRANSPORTATION.** The theory and practice of rate making. Government regulation, the conflict between state and federal authorities and suggested improvements in control of transportation agencies. GRAY.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Professors WILLIAM A. RILEY, FREDERICK L. WASHBURN; Associate Professor ARTHUR G. RUGGLES; Assistant SAMUEL A. GRAHAM.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
5f.	Elementary Forest Entomology	3	Jr., sr.	An. Biol. 10 cred.
12w.	Forest Zoology	3	Jr., sr.	5

For additional courses see the Bulletin of the Agricultural courses.

INTRODUCTORY COURSES

- 5f. **ELEMENTARY FOREST ENTOMOLOGY.** A study of the life histories and methods of controlling insects affecting shade and forest trees. Not open for credit to students specializing in entomology. (Given in alternate years. Offered in 1919-20.) RUGGLES, GRAHAM.
- 12w. **FOREST ZOOLOGY.** Forest animals. Relation of birds and of various four-footed animals to forest protection. Habits, range, usefulness; the manner of protecting the important large and small game, fish, and birds; fish culture. WASHBURN.

FARM ENGINEERING

AGRICULTURAL ENGINEERING GROUP

Professor WILLIAM BOSS; Assistant Professors HARRY B. ROE, HALL B. WHITE; Instructors MAURICE G. JACOBSON, ALLEN D. JOHNSTON.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
3f.s.	Mechanical Drawing.....	3	All	None
4w.	Blacksmithing.....	3	All	None
5f.	Carpentry.....	3	All	None
11f.w.	Applied Mathematics.....	5	All	None
18s.	Surveying.....	5	Soph., jr., sr.	3, 11 or equiv.
20su.	Forest Engineering.....	4	Jr., sr.	18

For additional courses see the Bulletin of the Agricultural courses.

INTRODUCTORY COURSES

- 3f.s. MECHANICAL DRAWING. Mechanics of drawing. Exercises in the use of drawing instruments, lettering, and water colors. The mechanics of working drawings with their practical value. JACOBSON.
- 4w. BLACKSMITHING. The management of forge and fire in bending, shaping, and welding iron. JOHNSTON.
- 5f. CARPENTRY. The use of carpentry tools and methods of farm building construction. WHITE.
- 11f.w. APPLIED MATHEMATICS. Rules of practical mathematics with special attention to formulas and problems directly related to agricultural work; e.g., areas, volumes, percentages, proportions, variations, investments, cost problems, etc. ROE.
- 18s. SURVEYING. Plain surveying as applied to farm problems. Mensuration, leveling, simple grade determination, elements of topography and farm mapping. ROE.
- 20su. FOREST ENGINEERING. Field practice and mensuration, surveying, and topography. (Given in alternate years. Offered in 1919-20.) ROE.

FORESTRY

Professors EDWARD G. CHEYNEY, JOHN H. ALLISON; Associate Professor JOHN P. WENTLING; Assistant Professor WILLIAM H. KENETY; Special Lecturers WILLIAM T. COX, DILLON P. TIERNEY.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f.s.	General Forestry.....	4	All	None
2su.	Elementary Dendrology.....	3	All	None

No.	Credits	Title	Offered to	Prereq. courses
3f.		Dendrology I.....	4 All	Bot. 1
4w.		Dendrology II.....	4 Soph., jr., sr.	Bot. 1
5su.		Elementary Sylviculture.....	3 All	Bot. 2
6f.		Sylviculture I.....	3 Jr., sr.	1, 4, Bot. 2
7w.		Sylviculture II.....	3 Jr., sr.	6
8su.		Practical Sylviculture.....	3 Soph., jr., sr.	7
9su.		Elementary Mensuration.....	5 All	None
10w.		Forest Mensuration.....	5 Jr., sr.	4
11s.		Forest Valuation.....	5 Soph., jr., sr.	6
12w.		Forest Protection.....	3 Jr., sr.	4
13w.		Lumbering.....	3 Sr.	1, 4
14w.		Forest Management.....	5 Sr.	8, 11, 13 parallel
15f.		Logging Plans.....	6 Sr.	1, 4
16f.		Forest Working Plans.....	5 Sr.	8, 11
17f-18w.		Wood Technology.....	6 ¹ Soph., jr., sr.	Bot. 1-2
19w.		Lumber Manufacturing.....	5 Jr., sr.	1, 17-18
20w.		Grazing.....	3 Jr., sr.	None
22su.		Forest Utilization.....	4 Soph., jr., sr.	None
23su.		Factory Experience.....	5 Soph., jr., sr.	None
24s.		Forest By-Products.....	5 Jr., sr.	None
25f.		Wood Preservation.....	2 Jr., sr.	17-18

Advanced Courses

101w.		Advanced Dendrology.....	3 Jr., sr.	4, Bot. 1-2
103w.		Uses of Wood.....	3 Jr., sr.	17-18
104w.		Experimental Sylviculture...	3 Sr.	8

¹The full course must be completed before credit will be allowed.

INTRODUCTORY COURSES

- 1f.s. GENERAL FORESTRY. A brief history of the development of forestry in Europe and America; its bearing on the forestry problems of the United States; description of the United States forests. Lectures and collateral reading. CHEYNEY.
- 2su. ELEMENTARY DENDROLOGY. A full study of the trees and shrubs found in Itasca Park, with special reference to identification by means of gross characteristics. WENTLING.
- 3f. DENDROLOGY I. Comprehensive study of the forest trees of the United States; their classification, characteristics, and range, with special attention to prominent and constant characteristics. Lectures, assigned reading, special papers, field work. WENTLING.
- 4w. DENDROLOGY II. Continuation of Course 3. WENTLING.
- 5su. ELEMENTARY SYLVICULTURE. Largely field work designed to give the student a working knowledge of the forest. Includes dendrological study of the species found in the north woods and the general principles of underlying reconnaissance. WENTLING.
- 6f. SYLVICULTURE I. The fundamentals forming the basis of sylviculture with special attention to the sylvics of the important tree species. Lectures, reading, and required papers. WENTLING.

- 7w. SYLVICULTURE II. A general presentation of the systems of natural regeneration of wood lands; also of methods of artificial regeneration and a general discussion of the whole field of seeding and planting. Lectures, reading, and laboratory. WENTLING.
- 8su. PRACTICAL SYLVICULTURE. Nursery practice and field planting. Field investigations and planting plans. Seed collecting, extracting, and storing. Daily nursery and field work. WENTLING.
- 9su. ELEMENTARY MENSURATION. Largely field work. Includes elementary work in timber cruising, valuation surveys, stem analysis, and the study of the measurements of stand, volume, and yield. ALLISON.
- 10w. FOREST MENSURATION I. The fundamental principles underlying mensuration. Special attention is given to log rules, cubic contents of trees, volume tables, growth of trees, and yield tables. ALLISON.
- 11s. FOREST VALUATION. The business of forest management. A study of the different factors entering into the valuation of forest property. ALLISON.
- 12w. FOREST PROTECTION. Practical measures for the protection of forests from fires, trespass, and grazing. State and federal forest-fire and trespass laws. Insects and fungi are taken care of in special courses. ALLISON.
- 13w. LUMBERING. Designed to give the student a clear, balanced view of the lumber industry, especially logging. A month's work in a lumber camp in the senior year with a full report is required. CHEYNEY.
- 14w. FOREST MANAGEMENT I. Policy of forest owners; principles of governing all forest management; forest valuation; the calculation of soil rent, forest rent, and the value of growing stock; the values of even and uneven-aged stands. Working plans. ALLISON.
- 15f. LOGGING PLANS. A study of the data essential to the preparation of a logging plan, a plan for a definite operation. The organization of crews and companies. CHEYNEY.
- 16f. FOREST WORKING PLANS. The principles of working plans. Each class will be required to work out a complete plan including surveys, silviculture plans, estimates, field tables, maps, and systems of management. ALLISON.
- 17f-18w. WOOD TECHNOLOGY. A comprehensive study of the important woods used in the United States; their structure, classification, identification, properties, and uses. Lectures, papers, and laboratory. WENTLING.
- 19w. LUMBER MANUFACTURING. A study of sawmills and sawmill machinery, and other processes in the primary manufacture of wood, the general principles and the purpose of grading lumber. A brief study of the lumber market. CHEYNEY.

- 20w. **GRAZING.** History of grazing in the West. Kinds of stock used. Forage plants. Regulations and methods of handling stock. Range management and protection. Lectures, recitations, and reading. ALLISON.
- 22su. **FOREST UTILIZATION.** Practice in the setting up and operation of a portable sawmill, the scaling of logs and the scaling of lumber. Piling, seasoning, grading, and care of lumber. CHEYNEY.
- 23su. **FACTORY EXPERIENCE.** Two or more months in a factory utilizing wood by-products such as pulp or paper mill, wood distillation or wood preservation plant.
- 24s. **FOREST BY-PRODUCTS.** A special study of forest products other than timber. Cellulose for paper, sugar, tanning materials, turpentine, tar, oil, resin, waxes, gum, creosote, wood alcohol, acetic acid, and acetone. ALLISON.
- 25f. **WOOD PRESERVATION.** Lectures and collateral reading upon the history, development, and methods of wood preservation. Different systems now in use and preservatives used. ALLISON.

ADVANCED COURSES

- 101w. **ADVANCED DENDROLOGY.** A continuation of Courses 3 and 4 with special studies in classification and distribution. WENTLING.
- 103w. **USES OF WOOD.** A thoro study of the woods used by the various wood-using industries. Woods for special uses, fancy woods, cabinet woods, wood substitutes. CHEYNEY, WENTLING.
- 104w. **EXPERIMENTAL SYLVICULTURE.** The fundamental principles of silviculture which are broadly applicable; methods used at forest experiment stations in solving problems in forestation, management, protection, and mensuration. A comprehensive thesis on some specific problem is required. KENETY.

GEOLOGY AND MINERALOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors WILLIAM H. EMMONS, FRANK F. GROUT; Assistant Professors A. WOLFRED JOHNSTON, CHESSLEY J. POSEY, TERENCE T. QUIRKE; Instructor THOMAS M. BRODERICK.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f,s-2w,su.	General Geology.....	10 ¹	Soph.,jr.,sr.	None
4w.	Geology of Minnesota.....	5	Soph.,jr.,sr.	1-2
5f-6w.	Economic Geology.....	6 ¹	Jr.,sr.	1-2
7f,s-8w,su.	Laboratory Work.....	2 ¹	Soph.,jr.,sr.	Supports 1-2
21w-22s.	Elements of Mineralogy.....	10 ¹	Soph.,jr.,sr.	See statement

No.	Title	Credits	Offered to	Prereq. courses
29f.	General Physiography.....	5	Soph.,jr.,sr.	None
34w.	Meteorology.....	3	Soph.,jr.,sr.	None
37s.	Economic and Commercial Geography.....	3	All	None

For additional courses see the Bulletin of the College of Science, Literature, and the Arts.

¹Both quarters must be completed before credit will be given.

INTRODUCTORY COURSES

- 1f,s-2w,su. **GENERAL GEOLOGY.** A synoptical treatment of materials of the earth and of geologic processes. Physiographic, dynamic, and structural geology, with a brief introduction to historical geology. Lectures, laboratory work, field excursions, map study, and conferences. EMMONS, JOHNSTON.
- 4w. **GEOLOGY OF MINNESOTA.** The physical geography and geologic history of Minnesota. The relations of industrial development to geological features. The principles of pre-Cambrian geology as exemplified in Minnesota. (Not offered in 1919-20.) JOHNSTON.
- 5f-6w. **ECONOMIC GEOLOGY.** The mineral resources of the United States. The origin, occurrence, distribution, and uses of the more important minerals and mineral fuels of economic value. Lectures, map work, conferences, and field excursions. QUIRKE.
- 7f,s-8w,su. **LABORATORY WORK.** Open only to students taking Course 1-2. Supplements Course 1-2 with study of rocks and ores, topographic and geologic maps, and reference reading. JOHNSTON.
- 21w-22s. **ELEMENTS OF MINERALOGY.** Open to students taking Chemistry. The crystal systems; morphological, physical, and chemical character of minerals; occurrence, genesis, and uses of minerals; classification and description of common minerals. Determinative work in laboratory blowpipe analysis, sight identification. GROUT, BRODERICK.
- 29f. **GENERAL PHYSIOGRAPHY.** Principles of earth sculpture; physiographic changes in progress, and agencies causing them; hydrography and oceanography; planetary relations; climatology; field excursions. POSEY.
- 34w. **METEOROLOGY.** The properties and phenomena of the atmosphere, including composition, temperature, pressure, and circulation; the work of the Weather Bureau; the major climatic divisions of the earth and their climates. —————.
- 37s. **ECONOMIC AND COMMERCIAL GEOGRAPHY.** A study of the geographic factors influencing production and trade. Natural resources in their relation to commerce and industry and the major trade routes will be emphasized. POSEY.

GERMAN

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor CARL SCHLENKER; Assistant Professors OSCAR C. BURKHARD,
JAMES DAVIES, ALFRED E. KOENIG, SAMUEL KROESCH, WALTER R.
MYERS.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f,s.	Beginning	5	All	None
2f,w.	Beginning, Intermediate.	5	All	1 or 1 yr. prep.Ger.
3f,s.	Beginning, Advanced.	5	All	2
10f,s.	Rapid Reading.	5	All	3
11w,s.	Advanced Rapid Reading.	5	All	10
12f,s.	Narrative Prose.	5	All	2 yrs. prep. German
13f,w.	Advanced Narrative Prose.	5	All	12
14w,s.	Prose and Poetry.	5	All	13
28f,w-29w,s	Advanced Chemical German.	6 ²	All	15
31f,w-32w,s	Medical German.	6 ²	All	10 or 12
50f-51w-				
52s.	Composition.	2 ¹	Soph.,jr.,sr. ¹	11 or 14
53f-54w-				
55s.	Conversation.	3 ²	Soph.,jr.,sr. ¹	11 or 14
62f,s.	German Comedies.	3	Soph.,jr.,sr. ¹	11 or 14
63w.	Modern Drama.	3	Soph.,jr.,sr. ¹	11 or 14
64s.	Classic Drama.	3	Soph.,jr.,sr.	62 or 63

For additional courses see the Bulletin of the College of Science, Literature, and the Arts.

¹Adjustments permitted, for the year 1919-20 only, on account of the changes in the curriculum.

Students with credit for Course 7-8-9 (old numbering), Prose and Poetry, may register for Courses 62, 63, 64.

Students with credit for Course 24-25-26 (old numbering), Elementary Composition, may register for Course 50 51-52.

Students with credit for Course 27-28-29 (old numbering), Elementary Conversation, may register for Course 53-54-55.

²The full course must be completed before credit will be allowed.

INTRODUCTORY COURSES

1f,s. BEGINNING. Pronunciation, conversation, grammar and composition; selected readings in easy prose and verse. _____.

2f,w. BEGINNING, INTERMEDIATE. Continuation of Course 1. _____.

3f,s. BEGINNING, ADVANCED. Selected texts from modern writers. _____.

10f,s. RAPID READING. Modern narrative prose. KROESCH.

11w,s. ADVANCED RAPID READING. Continuation of Course 10. Selected dramas from the eighteenth and nineteenth centuries. KROESCH.

12f,s. NARRATIVE PROSE. Reading texts selected from modern prose writers. Grammar review and composition. _____.

13f,w. ADVANCED NARRATIVE PROSE. Continuation of Course 13. _____.

- 14w,s. PROSE AND POETRY. Narrative readings and selected poetry; composition. _____.
- 28f,w-29w,s. ADVANCED CHEMICAL GERMAN. Selections from more difficult works on chemistry. DAVIES.
- 31f,w-32w,s. MEDICAL GERMAN. Readings from general works on physiology, anatomy, and bacteriology. BURKHARD.
- 50f-51w-52s. COMPOSITION. Aims to develop grammatical correctness. Translations from English selections. Essay writing on assigned subjects. MYERS.
- 53f-54w-55s. CONVERSATION. Aims to develop ease and correctness of oral expression. Organized on the laboratory plan—one hour credit with two hours of recitation and one hour of outside reading. MYERS.
- 62f,s. GERMAN COMEDIES. Reading of the best comedies of the eighteenth and nineteenth centuries. DAVIES, MYERS.
- 63w. MODERN DRAMA. Plays of modern dramatists; Hauptmann, Sudermann, Fulda, and others. DAVIES, MYERS.
- 64s. CLASSIC DRAMA. Plays of Lessing, Goethe, and Schiller. DAVIES, MYERS.

HOME ECONOMICS

Professor MILDRED WEIGLEY.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
24s.	Camp Cookery.....	3	All	None

For additional courses see the Bulletin of the Courses in Home Economics.

INTRODUCTORY COURSE

- 24s. CAMP COOKERY. This course is designed to give prospective foresters, engineers, and others a knowledge of the simpler cookery processes; and of such adaptations as are practicable in the several types of out-of-doors camps. (Given in alternate years. Offered in 1919-20.)

HORTICULTURE

Associate Professors WILFRID G. BRIERLEY, LEROY CADY.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
56w,s.	Plant Propagation.....	2	Soph.,jr., sr.	None
71f,s.	Landscape Gardening.....	3	Jr., sr.	None

For additional courses see the Bulletin of the Courses in Agriculture.

INTRODUCTORY COURSES

- 56w,s. PLANT PROPAGATION. Methods of propagation of plants by seeds, cuttings, layers, grafting, and budding. The principles of greenhouse management, transplanting, watering, and ventilation. Lectures, reference reading, field, and laboratory work. CADY.
- 71f,s. LANDSCAPE GARDENING. A general course in the practice and principles of landscape gardening as applied to the home and community. Lectures and field trips to parks and private grounds. CADY.

MILITARY SCIENCE AND TACTICS

Professor FRANK H. BURTON, Colonel, U.S.A.; Assistant Professors JERE BAXTER, Major, U.S.A., ARTHUR E. CLARK, ALLEN T. NEWMAN, Captains, U.S.A.; HENRY C. BERTELSEN, ERNEST A. NUOFFER, Lieutenants, U.S.A.; Instructors JOHN J. BOWENS, FRANK CRAIN, ELDEN R. FOSSEY, JOSEPH HAVLICEK, HERBERT KETTLE, WILLIAM G. PALMS, Sergeants, U.S.A.

REQUIRED WORK

All physically fit male students are required to take Military Training during their first two years in school. This course is a prerequisite for graduation from the University.

All students, registered for Military Training, of any class are members of the Reserve Officers' Training Corps, and as such are issued all necessary uniform clothing and equipment by the government free of charge.

After completing the two years required, students may discontinue military work if they wish.

ELECTIVE WORK

Students who have completed the two years of required military work, and are selected for advanced work by the Professor of Military Science and Tactics, and who sign an agreement with the Government, to continue the work for their remaining course in college but not to exceed two years, are eligible for the advanced course in Military Training, which is prescribed in General Order 49, W.D. 1916, and requires five hours per week—three practical and two theoretical. Three credits for each quarter are allowed for this work.

All advanced course students should take a course in International Law, Military Law, and Military History. These courses are given by the Departments of Political Science and History and are arranged especially for the Military Department.

All members of the advanced course receive their uniforms, equipment, and commutation for subsistence at the rate of forty cents per day during the school year.

All students who complete the advanced course in the Military Department and who graduate from the University, will, if recommended by

the Professor of Military Science and Tactics and the President of the University, be commissioned by the President of the United States, in the Officers' Reserve Corps.

PHYSICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors HENRY A ERIKSON, ANTHONY ZELENY; Associate Professor JOHN T. TATE; Professorial Lecturer LOUALLEN F. MILLER.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
21f,w,s,su.	Elements of Mechanics.....	4	All	Trigonometry
22f,w,s,su.	Elements of Mechanics Laboratory.....	1	All	21 or parallel
31f.	Acoustics.....	3	All	None
41w.	Sound and Heat.....	4	All	21
42w.	Sound and Heat Laboratory.	1	All	22, 41, or parallel
51f.	Light.....	4	All	21
52f.	Light Laboratory.....	1	All	22, 51, or parallel
61s.	Magnetism and Electricity...	4	All	21
62s.	Magnetism and Electricity Laboratory.....	1	All	22, 61, or parallel

For additional courses see the Bulletin of the College of Science, Literature, and the Arts.

INTRODUCTORY COURSES

- 21f,w,s,su. **ELEMENTS OF MECHANICS.** Mechanics of solids, fluids, and wave motion. A study of the simpler fundamental principles. First part of a general Course 21, 41, 51, 61. Course 22 should be taken in conjunction with this course. ZELENY, TATE, MILLER.
- 22f,w,s,su. **ELEMENTS OF MECHANICS LABORATORY.** Measurements in the mechanics of solids, fluids, and wave motion; the laboratory part supplementing Course 21. MILLER.
- 31f. **ACOUSTICS.** A study of the fundamental principles of sound. A course designed primarily for the students in the Department of Music. Open also to other students. ERIKSON.
- 41w. **SOUND AND HEAT.** A study of the principles underlying sound and heat phenomena. Course 42 should be taken in conjunction with this course. ZELENY, MILLER.
- 42w. **SOUND AND HEAT LABORATORY.** The laboratory part supplementing Course 41. MILLER.
- 51f. **LIGHT.** A study of the principles underlying light phenomena. Course 52 should be taken in conjunction with this course. ZELENY, MILLER.
- 52f. **LIGHT LABORATORY.** The laboratory part supplementing Course 51. MILLER.

61s. **MAGNETISM AND ELECTRICITY.** A study of the principles underlying magnetic and electric phenomena. Course 62 should be taken in conjunction with this course. ZELENY, MILLER.

62s. **ELECTRICAL LABORATORY.** The laboratory part supplementing Course 61. ZELENY.

PHYSICAL EDUCATION

FOR MEN

Director LOUIS J. COOKE; Assistant Director WILLIAM K. FOSTER; Instructors EDWIN S. BROWN, PERCY C. GLIDDEN, D. C. MITCHELL; Assistants KARL P. BUSWELL, HARRY GOLDIE.

General statement.—The purpose of the Department is to provide all men of the University opportunity for exercise in order to maintain and build up their general health. It also provides special training for the correction of physical defects and functional derangements.

A physical examination is required of all new matriculants, and of all others using the Department privileges, at the beginning of the year, and as often during their college course as their physical condition may indicate. Students taking the required work in Physical Education are examined also at the close of the year. A study of these records shows a marked improvement in the standard of health of the average student during the college course.

The gymnasium, swimming pool, and baths are open to all students of the University, who are free to use the apparatus and to pursue a course in physical training under the supervision of the Director and his assistants.

Those students, taking the required course in Physical Education, who can not swim, must make a reasonable effort, as determined by the Department, to pass the swimming and life-saving requirements, and will be assigned special hours for instruction.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f.	Personal Hygiene.....	1	Fr.	None
2f-3w ¹ -4s.	Gymnasium and Swimming..	None	Fr.	None
5f-6w-7s.	Advanced Leaders.....	3 ²	Soph., jr. sr.	Instructor's permission.
8f-9w-10s.	Corrective Gymnastics.....	None	All	None
11w-12s.	Wrestling.....	None	All	Instructor's permission.
13f-14w-15s.	Intermediate Swimming.....	None	All	Instructor's permission.
16f-17w-18s.	Advanced Swimming.....	None	All	Instructor's permission.
19w-20s.	Boxing.....	None	Fr.	None
21f-22w-23s.	Intramural Athletics.....	None	All	None

¹Given at the University Farm.

²Full course must be completed before credit will be allowed

INTRODUCTORY COURSES

- 1f. PERSONAL HYGIENE. Two hours per week; first six weeks of fall quarter. Examinations at close of course. Four hours per week collateral work with themes. COOKE.
- 2f-3w-4s. GYMNASIUM AND SWIMMING. Two hours a week for the winter quarter. Required qualifications in swimming, life-saving, bar-vaulting, jumping, sprinting, running, and on heavy apparatus. MITCHELL.
- 5f-6w-7s. ADVANCED LEADERS. Three hours a week. FOSTER.
- 8f-9w-10s. CORRECTIVE GYMNASTICS. Three hours a week. Special individual courses for students physically defective. BROWN.
- 11w-12s. WRESTLING. Three times per week. Students admitted by special assignment.
- 13f-14w-15s. INTERMEDIATE SWIMMING. Life-saving, efficiency swimming, and fancy diving. Instruction is given in rescuing and restoring the apparently drowned and other useful swimming accomplishments. GLIDDEN, BUSWELL.
- 16f-17w-18s. ADVANCED SWIMMING. Life-saving, efficiency swimming, and fancy diving. Instruction is given in rescuing and restoring the apparently drowned and other useful swimming accomplishments. GLIDDEN, BUSWELL.
- 19w-20s. BOXING. By special arrangement a few students may be accommodated in this class which meets twice per week. GOLDIE.
- 21f-22w-23s. INTRAMURAL ATHLETICS. Competitive games in the various athletic leagues in football, basket-ball, hockey, track, and field events, baseball, tennis, swimming, hand-ball, bowling, etc. FOSTER.

PLANT PATHOLOGY AND BOTANY

Professors EDWARD M. FREEMAN, ELVIN C. STAKMAN.

General statement.—For specialization in this Department, see Bulletin of Courses in Agriculture.

No.	Title	COURSE		
		Credits	Offered to	Prereq. courses
		<i>Introductory Course</i>		
10s.	Forest Pathology.....	5	Soph.	Bot. 10 cred.

For additional courses see the Bulletin of the Courses in Agriculture.

INTRODUCTORY COURSE

- 10s. FOREST PATHOLOGY. Elementary study of plant diseases due to fungi, bacteria, and slime-molds; life histories and preventive methods. Lectures, laboratory, and reference. (Offered in alternate years. Not given in 1919-20.) FREEMAN, STAKMAN.

POLITICAL SCIENCE

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors JEREMIAH S. YOUNG, CEPHAS D. ALLIN; Associate Professor
RAYMOND MOLEY; Instructor ALBERT J. LOBB.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f.	American Government ¹	5	Soph., jr., sr.	None
7f, w.	State and Local Government	5	Soph., jr., sr.	1
26s.	Business Law	2	Jr., sr.	10 cred. in Pol. Sci. or Econ.
28s. ¹	Business Law	5	Jr., sr.	10 cred. in Pol. Sci. or Econ.
41s.	Rural Government	3	All	1

For additional courses see the Bulletin of the College of Science, Literature, and the Arts.

¹Given at the University Farm.

INTRODUCTORY COURSES

- 1f. AMERICAN GOVERNMENT. Organization and actual workings of the national government; nature and origin of the American governmental system. ALLIN.
- 7f, w. STATE AND LOCAL GOVERNMENT. Comparison of American state governments, especially Minnesota; relation of states to the United States and to local units of government; recent experiments such as initiative and referendum, the recall and primaries; social and economic legislation. MOLEY, LOBB.
- 26s. BUSINESS LAW. A course in Business Law arranged for engineers including the law of contracts, suretyship, agencies, partnership, corporations, negotiable instruments, patents, and riparian rights. Not open to those who complete Course 28. LOBB.
- 28s. BUSINESS LAW. A course in Business Law (arranged for students in the College of Agriculture, Forestry, and Home Economics), including contracts, agency, mortgages, conveyances, and negotiable instruments. Not open to those who complete Course 26. LOBB.
- 41s. RURAL GOVERNMENT. The organization and functions of towns, school districts, villages, and counties; the assessment and taxation of property; road laws; and drainage. LOBB.

RHETORIC

Assistant Professor ROBERT C. LANSING; Instructors ESTELLE COOK, GEORGE G. GLICK, RUTH MOHL.

General statement.—Rhetoric credits will not be granted officially until the close of the second quarter of the senior year.

Any instructor who finds that a student is deficient in English will submit the name of the student together with the evidence to the chairman of the Students' Work Committee. If the evidence warrants, the Committee will send the student to the Section of Rhetoric for such additional work in English as is needed. This work the student must take, without credit, to validate his freshman and sophomore rhetoric credits.

Students whose work in the rhetoric courses shows at any time an inadequate knowledge of the conventions of English will be required to drop the course and enter a class in elementary rhetoric. These students will be required to complete twenty-two credit hours in rhetoric.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f,w,s.	Rhetoric I.....	3	All	None
2f,w,s.	Rhetoric II.....	3	All	1
3f,w,s.	Rhetoric III.....	3	All	2
4f,w,s.	Elementary Rhetoric.....	3	Fr.	None
11f,w,s.	Argumentation.....	5	Soph.,jr.	3
22f,w,s.	Public Speaking.....	5	Soph.,jr.	3
24f,w,s.	Adv. Public Speaking.....	3	Soph.,jr.,sr.	22
25f,w,s.	Fundamentals of Effective Speaking.....	3	Soph.,jr.,sr.	3

INTRODUCTORY COURSES

- 1f,w,s. RHETORIC I. Note-taking, gathering and organizing material, oral and written exposition, paragraph structure, supplementary reading. LANSING, MOHL.
- 2f,w,s. RHETORIC II. Sentence structure, exposition and argumentation, supplementary reading. LANSING, MOHL.
- 3f,w,s. RHETORIC III. Description, narration, diction, supplementary reading. LANSING, MOHL.
- 4f,w,s. ELEMENTARY RHETORIC. Elementary grammatical and rhetorical principles. MOHL.
- 11f,w,s. ARGUMENTATION. Gathering evidence, reasoning, briefing, formal and informal argument, persuasion, debating. LANSING, GLICK, MOHL.
- 22f,w,s. PUBLIC SPEAKING. A practical course in fundamentals of speech-making. Rules of order and practice in conducting assemblies included. GLICK.
- 24f,w,s. ADVANCED PUBLIC SPEAKING. A course in preparing and delivering occasional addresses and informal lectures. GLICK.
- 25f,w,s. FUNDAMENTALS OF EFFECTIVE SPEAKING. The fundamental principles of voice production, articulation, gesture, platform deportment, and expression. COOK.

ROMANCE LANGUAGES

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor EVERETT W. OLMSTED; Associate Professor RALPH HOUSE; Assistant Professors FRANCIS B. BARTON, JULES T. FRELIN, RUTH S. PHELPS, EDWARD H. SIRICH; Professorial Lecturer, PEDRO HENRIQUEZ UREÑA; Instructors HERBERT E. CLEFTON, SOLOMON M. DELSON, MARGUERITE GUINOTTE, SAMUEL VASCONCELOS.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
4f,w,s-5w, s.f.	Beginning French	10 ¹	All	None
7f,w,s-8w, s.f.	Intermediate French	10 ¹	All	4-5 or 2 yrs. h. s.
13f-14w-15s.	Survey of French Lit.	9 ¹	All	7-8 or 3 yrs. h. s.
16f-17w-18s.	Elementary French Conversation	3 ¹	All	7-8 or 3 yrs. h. s.
19f-20w-21s.	Elementary French Composition	3 ¹	All	7-8 or 3 yrs. h. s.
31f,w,s-32w, s.f.	Beginning Spanish	10 ¹	All	None
34f,w,s-35w, s.f.	Intermediate Spanish	10 ¹	All	31-32 or 2 yrs. h. s.
37f-38w-39s.	Survey of Spanish Lit.	9 ¹	All	34-35 or 3 yrs. h. s.
40f-41w-42s.	Elementary Spanish Conversation	3 ¹	All	34-35 or 3 yrs. h. s.
43f-44w-45s.	Elementary Spanish Composition	3 ¹	All	34-35 or 3 yrs. h. s.

For additional courses see the Bulletin of the College of Science, Literature, and the Arts.

¹The full course must be completed before credit will be allowed.

INTRODUCTORY COURSES

- 4f,w,s-5w,s,f. BEGINNING FRENCH. Pronunciation, grammar, oral exercises, translation. FRELIN, DELSON, GUINOTTE.
- 7f,w,s-8w,s,f. INTERMEDIATE FRENCH. Review of grammar, connected prose composition, conversation, and reading of representative authors. FRELIN, CLEFTON, GUINOTTE.
- 13f-14w-15s. SURVEY OF FRENCH LITERATURE. This course will outline the history of French literature from 1600 to present day, and is prerequisite for the courses devoted to special periods. Representative texts will be read. PHELPS, SIRICH, CLEFTON.
- 16f-17w-18s. ELEMENTARY FRENCH CONVERSATION. A small amount of outside preparation will be required. BARTON, FRELIN, GUINOTTE.
- 19f-20w-21s. ELEMENTARY FRENCH COMPOSITION. FRELIN, BARTON, GUINOTTE.
- 31f,w,s-32w,s,f. BEGINNING SPANISH. Pronunciation, grammar, oral exercises and translation. OLMSTED, HENRIQUEZ, VASCONCELOS.

- 34f,w,s-35w,s,f. INTERMEDIATE SPANISH. Review of grammar, conversation, connected prose composition, and reading of representative authors. HOUSE, VASCONCELOS.
- 37f-38w-39s. SURVEY OF SPANISH LITERATURE. An outline of the history of Spanish literature from 1500 to the present day, based upon texts and collateral reading. Prerequisite for courses devoted to special periods. HOUSE.
- 40f-41w-42s. ELEMENTARY SPANISH CONVERSATION. A small amount of outside preparation will be required. VASCONCELOS.
- 43f-44w-45s. ELEMENTARY SPANISH COMPOSITION. VASCONCELOS.

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*The College of Agriculture, Forestry,
and Home Economics
Announcement of
Courses in Home Economics for the Year
1919-1920*



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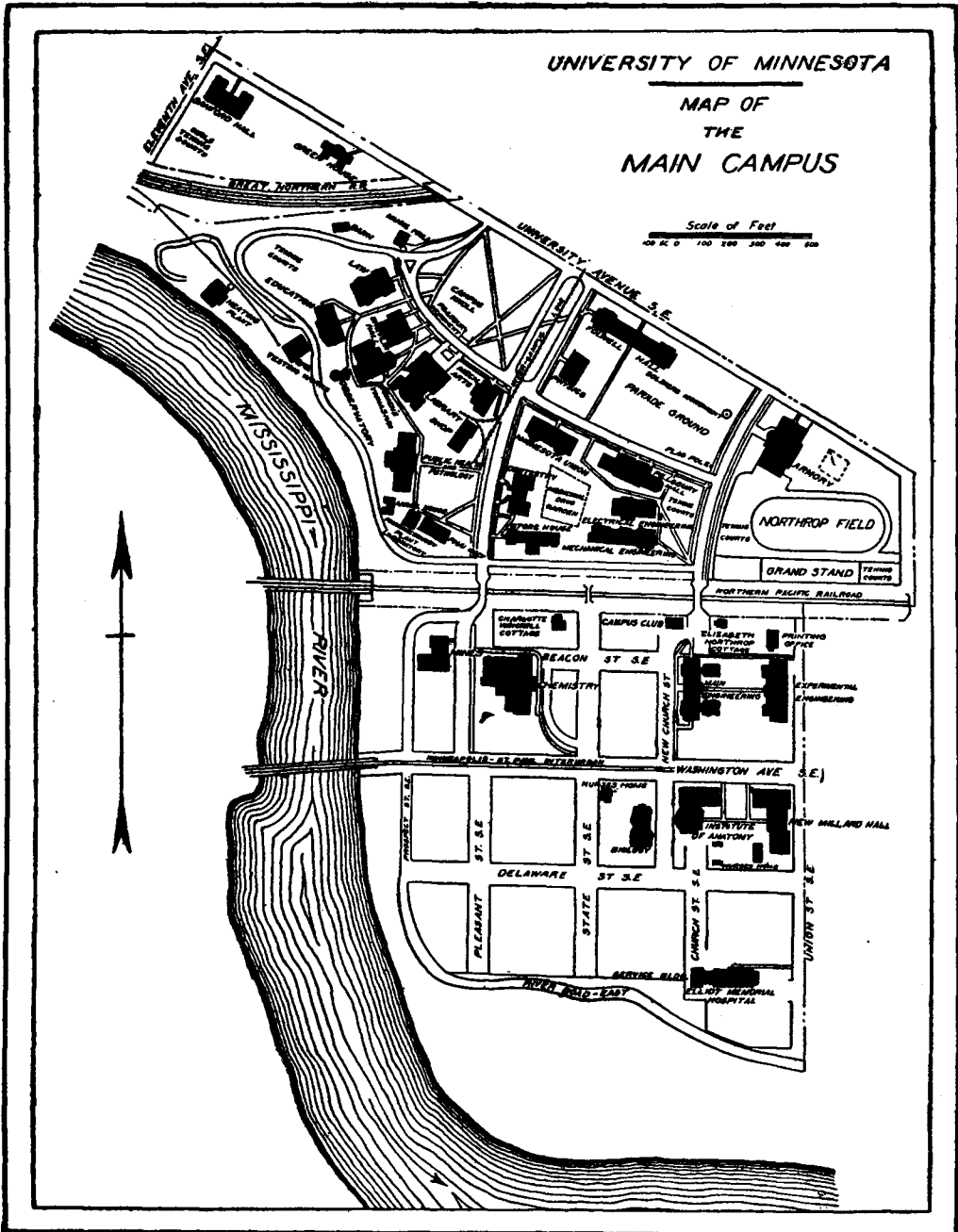
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UNIVERSITY OF MINNESOTA

MAP OF
THE
MAIN CAMPUS

Scale of Feet
0 100 200 300 400 500



Area of Main Campus, 108.5 acres

1919							1920													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	1	2	3	4	5	..	..	..	..	1	2	3	..	..	..	..	1	2	3
6	7	8	9	10	11	12	4	5	6	7	8	9	10	4	5	6	7	8	9	10
13	14	15	16	17	18	19	11	12	13	14	15	16	17	11	12	13	14	15	16	17
20	21	22	23	24	25	26	18	19	20	21	22	23	24	18	19	20	21	22	23	24
27	28	29	30	31	..	..	25	26	27	28	29	30	31	25	26	27	28	29	30	31
..
AUGUST							FEBRUARY							AUGUST						
..	..	..	..	..	1	2	1	2	3	4	5	6	7	1	2	3	4	5	6	7
3	4	5	6	7	8	9	8	9	10	11	12	13	14	8	9	10	11	12	13	14
10	11	12	13	14	15	16	15	16	17	18	19	20	21	15	16	17	18	19	20	21
17	18	19	20	21	22	23	22	23	24	25	26	27	28	22	23	24	25	26	27	28
24	25	26	27	28	29	30	29	..	..	..	..	..	..	29	30	31	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
SEPTEMBER							MARCH							SEPTEMBER						
..	1	2	3	4	5	6	..	1	2	3	4	5	6	..	..	..	1	2	3	4
7	8	9	10	11	12	13	7	8	9	10	11	12	13	5	6	7	8	9	10	11
14	15	16	17	18	19	20	14	15	16	17	18	19	20	12	13	14	15	16	17	18
21	22	23	24	25	26	27	21	22	23	24	25	26	27	19	20	21	22	23	24	25
28	29	30	..	..	..	..	28	29	30	31	..	..	..	26	27	28	29	30	..	..
..
OCTOBER							APRIL							OCTOBER						
..	..	..	1	2	3	4	..	..	..	..	1	2	3	..	..	..	..	..	1	2
5	6	7	8	9	10	11	4	5	6	7	8	9	10	3	4	5	6	7	8	9
12	13	14	15	16	17	18	11	12	13	14	15	16	17	10	11	12	13	14	15	16
19	20	21	22	23	24	25	18	19	20	21	22	23	24	17	18	19	20	21	22	23
26	27	28	29	30	31	..	25	26	27	28	29	30	..	24	25	26	27	28	29	30
..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	..	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER						
..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	1	2	3	4	5	6
2	3	4	5	6	7	8	2	3	4	5	6	7	8	7	8	9	10	11	12	13
9	10	11	12	13	14	15	9	10	11	12	13	14	15	14	15	16	17	18	19	20
16	17	18	19	20	21	22	16	17	18	19	20	21	22	21	22	23	24	25	26	27
23	24	25	26	27	28	29	23	24	25	26	27	28	29	28	29	30	..	..	..	..
30	..	..	..	..	..	..	30	31	..	..	..	..	..	..	..	..	..	..	..	..
DECEMBER							JUNE							DECEMBER						
..	1	2	3	4	5	6	..	..	1	2	3	4	5	..	..	..	1	2	3	4
7	8	9	10	11	12	13	6	7	8	9	10	11	12	5	6	7	8	9	10	11
14	15	16	17	18	19	20	13	14	15	16	17	18	19	12	13	14	15	16	17	18
21	22	23	24	25	26	27	20	21	22	23	24	25	26	19	20	21	22	23	24	25
28	29	30	31	..	..	..	27	28	29	30	..	..	..	26	27	28	29	30	31	..
..

CALENDAR

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

1919-1920

1919			
September	24	Wednesday	Registration closes except for new students
September	24-30	Week	Examinations for removal of winter and spring quarter conditions and entrance examinations Registration of new students. Payment of fees
September	29	Monday	School of Agriculture, first term begins
October	1	Wednesday	Fall quarter begins
October	16	Thursday	Senate meeting, 4:00 p.m.
October	17	Friday	Half holiday. Annual freshman-sophomore contest
October	31	Friday	Last day for removal of spring quarter incompletes
November	17	Monday	Creamery Butter Makers' Short Course (ten-day session) and Cheese Makers' Short Course (four-weeks session) begin
November	27	Thursday	Thanksgiving Day; a holiday
December	1-6	Week	Ice-cream Makers' Short Course
December	8-13	Week	Milk Plant Operators' Short Course
December	18	Thursday	Senate meeting, 4:00 p.m.
December	19	Friday	Last day for winter quarter registration except for new students
December	23	Tuesday	School of Agriculture, first term closes Fall quarter closes, Christmas vacation begins 9:00 p.m.
December	24	Week	Registration of new students. Payment of winter quarter fees
January	1		
December	29	Week	Farmers' and Home Makers' Week Short Course
January	3		
January	2	Friday	Winter quarter begins
January	5	Monday	School of Agriculture, second term begins
February	2	Monday	Last day for removal of fall quarter incompletes
February	12	Thursday	Lincoln's Birthday; a holiday
February	19	Thursday	Senate meeting, 4:00 p.m.

COURSES IN HOME ECONOMICS

March	17	Wednesday	Last day for spring quarter registration except for new students
March	24	Wednesday	Winter quarter closes. School of Agriculture, second term closes
March	25-30	Week	Registration of new students. Payment of spring quarter fees. Examinations for removal of fall quarter conditions
March	29	} Week	Boys' and Girls' Week Short Course
April	3		
March	31	Wednesday	Spring quarter begins
April	2	Friday	Good Friday; a holiday
April	30	Friday	Last day for removal of winter quarter incompletes
May	17	Monday	Traction Engineering Short Course begins
May	20	Thursday	Senate meeting, 4:00 p.m.
June	7	Monday	Last day for summer quarter registration except for new students
June	13	Sunday	Baccalaureate service
June	14-19	Week	Threshers' Week Short Course
June	14-19	Week	Registration of new students. Payment of fees
			Examinations for removal of winter quarter conditions
June	16	Wednesday	Spring quarter closes
June	17	Thursday	Forty-eighth annual commencement
June	19	Saturday	Traction Engineering Short Course closes
June	21	Monday	*Summer quarter begins
July	19	Monday	Last day for removal of spring quarter incompletes
September	3	Friday	Summer quarter closes

* Final arrangements for the summer quarter in 1919-20 have not been made. See later announcements.

THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

FACULTY

MARION LEROY BURTON, Ph.D., D.D., LL.D., President
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ROSCOE W. THATCHER, M.A., Dean of the Department of Agriculture
EDWARD M. FREEMAN, Ph.D., Dean of the College
EDWARD E. NICHOLSON, M.A., Dean of Student Affairs
....., Dean of Women
RODNEY M. WEST, B.A., Secretary
JOHN H. ALLISON, Ph.B., M.F., Professor of Forestry
FREDERICK J. ALWAY, Ph.D., Professor of Soil Chemistry
PHILIP A. ANDERSON, B.S., Assistant Professor of Animal Husbandry
ALBERT C. ARNY, B.S., in Agr., Associate Professor of Farm Crops
CLYDE H. BAILEY, M.S., Associate Professor of Agricultural Biochemistry
LOUIS B. BASSETT, Assistant Professor of Farm Management
JERE BAXTER, Major, U.S.A., Assistant Professor of Military Science and
Tactics
HENRY C. BERTELSEN, First Lieutenant, U.S.A., Assistant Professor of
Military Science and Tactics
ALICE BIESTER, M.A., Assistant Professor of Nutrition
ALMA L. BINZEL, B.S., Assistant Professor of Child Training
GUY R. BISBY, B.S., Assistant Professor of Plant Pathology
JOHN D. BLACK, M.A., Assistant Professor of Economics
ANDREW BOSS, Professor of Agronomy and Farm Management
WILLIAM BOSS, Professor of Farm Engineering
WILLARD L. BOYD, D.V.S., Professor of Veterinary Medicine and Surgery
WILFRID G. BRIERLEY, M.S., Associate Professor of Horticulture
CLARA M. BROWN, B.A. in Educ., Assistant Professor of Home Economics
FRANK H. BURTON, Colonel, U.S.A., Professor of Military Science and
Tactics
LEROY CADY, B.S., in Agr., Associate Professor of Horticulture
ROYAL N. CHAPMAN, M.A., Assistant Professor of Animal Biology
EDWARD G. CHEYNEY, B.A., Professor of Forestry
ARTHUR E. CLARK, Captain, U.S.A., Assistant Professor of Military
Science and Tactics
LOUIS J. COOKE, M.D., Director of Physical Education for Men
JOSEPH C. CORT, M.S., Assistant Professor of Dairy Husbandry
WILLIAM W. CUMBERLAND, Ph.D., Associate Professor of Economics
MAXWELL J. DORSEY, Ph.D., Associate Professor of Horticulture
R. ADAMS DUTCHER, M.S., M.A., Assistant Professor of Agricultural Bio-
chemistry
WILLIAM P. DYER, B.A., Assistant Professor of Agricultural Education

- CLARENCE H. ECKLES, M.S., D.Sc., Professor of Dairy Husbandry
 ALBERT M. FIELD, M.S., Assistant Professor of Agricultural Education
 CLIFFORD P. FITCH, M.S., D.V.M., Professor of Animal Pathology and
 Bacteriology
 EDWARD M. FREEMAN, Ph.D., Professor of Botany and Plant Pathology
 RALPH J. GARBER, M.S., Assistant Professor of Agronomy
 CARL W. GAY, D.V.M., B.S.A., Professor of Animal Husbandry
 HARRIET I. GOLDSTEIN, Assistant Professor of Drawing and Design
 ROSS AIKEN GORTNER, Ph.D., Professor of Agricultural Biochemistry
 THEOPHILUS L. HAECKER, Professor Emeritus of Dairy Husbandry
 EDWIN O. HANSON, Assistant Professor of Dairy Husbandry
 HERBERT K. HAYES, M.S., Associate Professor of Plant Breeding
 FRANCIS JAGER, Professor of Bee Culture
 WILLIAM H. KENETY, M.S., Assistant Professor of Forestry
 HOWARD C. H. KERNKAMP, D.V.M., Assistant Professor of Veterinary
 Medicine
 WILLIAM P. KIRKWOOD, B.A., Professor of Journalism
 MAY S. KISSOCK, B.A., Assistant Professor of Physical Education for
 Women
 ROBERT C. LANSING, M.A., Assistant Professor of Rhetoric
 DEXTER D. MAYNE, Professor of Agricultural Pedagogics
 MAUDE MILLER, B.S., Assistant Professor of Home Economics
 WILLIAM MOORE, B.A., Associate Professor of Research in Economic
 Zoology
 CLARENCE A. MORROW, Ph.D., Assistant Professor of Agricultural Bio-
 chemistry
 AMY P. MORSE, B.A., Assistant Professor of Drawing and Design
 ALLEN T. NEWMAN, Captain, U.S.A., Assistant Professor of Military Sci-
 ence and Tactics
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 ERNEST O. NUOFFER, Second Lieutenant, U.S.A., Assistant Professor of
 Military Science and Tactics
 OSCAR W. OESTLUND, Ph.D., Assistant Professor of Animal Biology
 LEROY S. PALMER, Ph.D., Associate Professor of Agricultural Biochem-
 istry
 E. MAUDE PATCHIN, B.S., Assistant Professor of Textiles and Clothing
 FRANCIS W. PECK,¹ M.S., Associate Professor of Farm Management
 WALTER H. PETERS, B.S.A., Professor of Animal Husbandry
 NORMAN J. RADDER, B.A., Assistant Professor of Journalism
 MYRON H. REYNOLDS, B.S.A., D.V.M., M.D., Professor of Veterinary
 Medicine and Surgery
 WILLIAM A. RILEY, Ph.D., Professor of Entomology
 HARRY B. ROE, B.S. in Eng., Assistant Professor of Farm Engineering
 CLAYTON O. ROST, M.A., Assistant Professor of Soils
 ARTHUR G. RUGGLES, M.A., Associate Professor of Entomology

¹ On leave of absence, 1919-20.

ARTHUR C. SMITH, B.S., Professor of Poultry Husbandry
ELVIN C. STAKMAN, Ph.D., Professor of Plant Pathology
FREDERICK H. STEINMETZ, B.S. in Agr., Assistant Professor of Agronomy
JOHN T. STEWART, C.E., Professor of Agricultural Engineering
ASHLEY V. STORM, M.A., Professor of Agricultural Education
NOLA TREAT, B.S., Assistant Professor of Institutional Management
ARTHUR G. TYLER, Assistant Professor of Farm Engineering
HENRY W. VAUGHN, M.S. in Agr., Professor of Animal Husbandry
ELIZABETH VERMILYE, B.A., Assistant Professor of Foods and Cookery
FREDERIC L. WASHBURN, M.A., Professor of Entomology
ROBERT M. WASHBURN, M.S.A., Professor of Dairy Husbandry
MILDRED WEIGLEY, B.S., Professor of Home Economics
MARION WELER, B.A., Assistant Professor of Textiles
JOHN P. WENTLING, M.A., Associate Professor of Forestry
HALL B. WHITE, B.S. in Agr., Assistant Professor of Farm Buildings
JOHN J. WILLAMAN, M.S., Assistant Professor of Agricultural Analysis
ARTHUR L. ANDERSON, B.S., Instructor in Animal Husbandry
JOHN V. ANKENY, B.S., Instructor in Agricultural Education
GERTRUDE M. BAKER, Instructor in Physical Education for Women
HELEN A. BARR, B.A., Instructor in Physical Education for Women
WILLIAM A. BILLINGS, D.V.M., Instructor in Pathology
JOHN J. BOWENS, Sergeant, U.S.A., Instructor in Military Science and
Tactics
CARLOTTA BROWN, Instructor in Millinery
EDWIN S. BROWN, B.S., M.D., Instructor in Physical Education for Men
NORRIS K. CARNES, B.S., Instructor in Animal Husbandry
ESTELLE COOK, Instructor in Rhetoric
WILLIAM T. COX, B.S., in For., Special Lecturer in Forestry
FRANK CRAIN, Sergeant, U.S.A., Instructor in Military Science and Tactics
ROBERT C. DAHLBERG, B.S., in Agr., Instructor in Agricultural Botany
J. GRANT DENT, Instructor in Farm Engineering
JEAN MUIR DORSEY, B.S. in H.E., Instructor in Foods Management
HALLY J. FISHER, R.N., Instructor in Home Nursing
ELDEN R. FOSSEY, Sergeant, U.S.A., Instructor in Military Science and
Tactics
WILLIAM K. FOSTER, LL.M., Assistant Director of Gymnasium
LLOYD V. FRANCE, M.S. in Agr., Instructor in Bee Culture
GEORGE G. GLICK, B.A., Instructor in Rhetoric
PERCY C. GLIDDEN, Instructor in Physical Education for Men
VETTA GOLDSTEIN, Instructor in Textiles and Clothing
RASMUS M. HALL, Instructor in Agricultural Physics
JOSEPH HAVLICEK, Sergeant, U.S.A., Instructor in Military Science and
Tactics
MAURICE G. JACOBSON, Instructor in Farm Engineering
ALLEN D. JOHNSTON, Instructor in Blacksmithing
HERBERT KETTLE, Sergeant, U.S.A., Instructor in Military Science and
Tactics

VALERIA G. LADD, B.A., Instructor in Physical Education for Women
 ALVIN H. LARSON, B.S. in Agr., Instructor in Agricultural Botany
 RUTH M. LINDQUIST, B.S., Instructor in Foods Management
 MABEL C. MCDOWELL, B.S., Instructor in Foods Management
 PAUL R. MCMILLER, M.S., Instructor in Soils
 OLIVE B. MCCOMBER, Instructor in Textiles and Clothing
 D. C. MITCHELL, B.S. in C.E., Instructor in Physical Education for Men
 RUTH MOHL, M.A., Instructor in Rhetoric
 MARTHA B. MOORHEAD, M.D., Lecturer in Hygiene
 MARGARET K. MUMFORD, B.A., Instructor in Foods and Cookery
 ALLEN G. NEWHALL, B.S., Instructor in Plant Pathology
 WILLIAM G. PALMS, Sergeant, U.S.A., Instructor in Military Science and
 Tactics
 ABE PEPINSKY, Instructor in Violin and Director of Orchestra
 ETHEL L. PHELPS, B.S., Instructor in Textiles and Clothing
 LENORE RICHARDS, B.A., Instructor in Institutional Management
 GERTRUDE B. SCHILL, B.A., Instructor in Physical Education for Women
 LAVINIA STINSON, B.A., Instructor in Foods and Cookery
 DILLON P. TIERNEY, M.F., Special Lecturer in Forestry
 ALICE H. TOLG, M.D., Instructor in Physical Education for Women
 JAMES B. TORRANCE, Instructor in Farm Engineering
 LESLIE V. WILSON, B.S. in D.H., Instructor in Dairy Husbandry
 KARL P. BUSWELL, Assistant in Physical Education for Men
 HARRY GOLDIE, Assistant in Physical Education for Men
 SAMUEL A. GRAHAM, B.S. in For., Assistant in Entomology and Economic
 Zoology
 CLAUDE D. GRINNELLS, D.V.M., Assistant in Veterinary Medicine
 ANNA WENTZ, Assistant in Entomology and Economic Zoology

EXTENSION STAFF

ARCHIE D. WILSON, B.S. in Agr., Director
 CLARENCE H. WELCH, Secretary, Agricultural Extension Division
 MARGARET B. BAKER, Assistant State Leader, Boys' and Girls' Club Work
 FRANK E. BALMER, B.S. in Agr., State Leader County Agricultural Agents
 MARY L. BULL, Home Economics Specialist
 WILLIAM L. CAVERT, M.S., Farm Management Specialist
 NORTON E. CHAPMAN, M.A., Poultry Husbandry Specialist
 SPENCER B. CLELAND, B.S., Assistant State Leader County Agents
 LUCY CORDINER, Home Economics Specialist
 JOSEPHINE CREELMAN, Home Nursing Specialist
 JAMES M. DREW, Assistant
 THEODORE A. ERICKSON, B.A., State Leader Boys' and Girls' Club Work
 LEWIS H. FUDGE, Assistant State Leader Boys' and Girls' Club Work
 ROY H. GIBERSON, Assistant State Leader Boys' and Girls' Club Work
 ALBERTHA GUSTAFSON, B.S., Assistant State Leader Boys' and Girls' Club
 Work

EDWIN HASLERUD, Assistant in charge of Cow Testing Associations
 GEORGE F. HOWARD, Assistant State Leader Boys' and Girls' Club Work
 J. SENECA JONES, Assistant State Leader County Agents
 KEMPER A. KIRKPATRICK, Assistant State Leader County Agents
 ARTHUR J. KITTELSON, Assistant State Leader Boys' and Girls' Club
 THOMAS B. MCCULLOUGH, Demonstration Farm Specialist
 ARTHUR J. MCGUIRE, B.Agr., Reclamation and Livestock Specialist
 WILLIAM A. MCKERROW, Livestock Specialist
 ROGER S. MACKINTOSH, B.S. in Agr., Horticultural Specialist
 WILLIAM E. MORRIS, Assistant State Leader County Agents
 GEORGE H. NESOM, B.S., Soil Specialist
 JULIA O. NEWTON, B.A., Assistant State Leader in Home Economics
 RETT E. OLMSTEAD, Farmers' Club Specialist
 ALLAN B. RAYBURN, B.S., Dairy Specialist
 MAY SECREST, State Leader in Home Economics
 JUNIATA L. SHEPPERD, M.A., Home Economics Specialist
 ARNE G. TOLAAS, M.S., Plant Pathology Specialist

MEMBERS OF OTHER FACULTIES GIVING INSTRUCTION IN
 THE COLLEGE OF AGRICULTURE, FORESTRY, AND
 HOME ECONOMICS

CEPHAS D. ALLIN, M.A., LL.D., Professor of Political Science
 FRANCIS B. BARTON, Docteur de l'Université de Paris, Assistant Professor
 of Romance Languages
 JOSEPH W. BEACH, Ph.D., Associate Professor of English
 RICHARD O. BEARD, M.D., Associate Professor of Physiology
 LUTHER L. BERNARD, Ph.D., Associate Professor of Sociology
¹CARLETON BROWN, Ph.D., Professor of English
 OSCAR C. BURKHARD, Ph.D., Assistant Professor of German
 RICHARD BURTON, Ph.D., Professor of English
 LOTUS D. COFFMAN, Ph.D., Professor of Education
 JAMES DAVIES, Ph.D., Assistant Professor of German
 HERMIONE L. DEALEY, Ph.D., Assistant Professor of Educational Psychol-
 ogy
 RICHARD M. ELLIOTT, Ph.D., Associate Professor of Psychology
 MANUEL C. ELMER, Ph.D., Associate Professor of Sociology
 DONALD FERGUSON, B.A., Assistant Professor of Pianoforte
 MABEL R. FERNALD, Ph.D., Assistant Professor of Psychology
 ROSS L. FINNEY, Ph.D., Assistant Professor of Sociology
 WILLIAM S. FOSTER, Ph.D., Associate Professor of Psychology
 JULES T. FRELIN, B.A., Assistant Professor of Romance Languages
 ISAAC W. GEIGER, Ph.D., Assistant Professor of Chemistry
 NATHANIEL E. GRIFFIN, Ph.D., Professorial Lecturer in English

¹Absent on leave 1919-20.

- PEDRO HENRIQUEZ URENA, Bachiller en Ciencias y Letras, Abogado, Professorial Lecturer in Romance Languages
- WILLARD E. HOTCHKISS, Ph.D., Professor of Economics
- RALPH E. HOUSE, Ph.D., Associate Professor of Romance Languages
- WILLIAM H. HUNTER, Ph.D., Associate Professor of Chemistry
- ALBERT E. JENKS, Ph.D., Professor of Anthropology
- LAUDER W. JONES, Ph.D., Professor of Chemistry
- OSCAR W. JUNEK, Ph.D., Assistant Professor of Anthropology
- FRANCIS B. KINGSBURY, Ph.D., Assistant Professor of Physiological Chemistry
- FREDERICK KLAEBER, Ph.D., Professor of Comparative and English Philology
- ALFRED E. KOENIG, M.A., Dr. Theol., Assistant Professor of German
- SAMUEL KROESCH, Ph.D., Assistant Professor of German
- WINFORD P. LARSON, M.D., Professor of Bacteriology
- KARL S. LASHLEY, Ph.D., Assistant Professor of Psychology
- ELMER J. LUND, Ph.D., Assistant Professor of Zoology
- GUSTAF A. LUNDQUIST, M.A., Assistant Professor of Sociology
- ELIAS P. LYON, Ph.D., M.D., Professor of Physiology
- JESSE F. MCCLENDON, Ph.D., Associate Professor of Physiology
- FRANK H. MACDOUGALL, Ph.D., Associate Professor of Chemistry
- WALTER R. MYERS, Ph.D., Assistant Professor of German
- RAYMOND MOLEY, Ph.D., Associate Professor of Political Science
- CECIL A. MOORE, Ph.D., Associate Professor of English
- JOHN J. B. MORGAN, Ph.D., Assistant Professor of Psychology
- BRUCE D. MUDGETT, B.A., Associate Professor of Economics
- HENRY F. NACHTRIEB, B.S., Professor of Animal Biology
- GEORGE N. NORTHROP, M.A., Assistant Professor of English
- EVERETT W. OLMSTED, Ph.D., Professor of Romance Languages
- CHAUNCEY J. V. PETTIBONE, Ph.D., Assistant Professor of Physiologic Chemistry
- RUTH S. PHELPS, M.A., Assistant Professor of Romance Languages
- RUTH RAYMOND, Assistant Professor of Art Education
- ALBERT W. RANKIN, B.A., Professor of Education
- THOMAS H. SANDERS, M. of Commerce, Assistant Professor of Accounting
- CARL SCHLENKER, B.A., Professor of German
- CARLYLE SCOTT, Professor of Music
- FREDERICK H. SCOTT, Ph.D., D.S.C., Professor of Physiology
- JOHN H. SHERMAN, B.A., Professorial Lecturer in Economics
- CHARLES F. SIDENER, B.S., Professor of Chemistry
- CHARLES P. SIGERFOOS, Ph.D., Professor of Zoology
- EDWARD H. SIRICH, Ph.D., Assistant Professor of Romance Languages
- ELMER E. STOLL, Ph.D., Professor of English
- FLETCHER H. SWIFT, Ph.D., Professor of Education
- ¹ARTHUR J. TODD, Ph.D., Professor of Sociology

¹Absent on leave, 1919-20.

MARVIN J. VAN WAGENEN, Ph.D., Assistant Professor of Education
 FRANK C. WHITMORE, Ph.D., Assistant Professor of Chemistry
 HERBERT WOODROW, Ph.D., Associate Professor of Psychology
 JEREMIAH S. YOUNG, Ph.D., Professor of Political Science
 JEAN H. ALEXANDER, M.A., Instructor in Education
 GEORGE D. ALLEN, M.S., Instructor in Animal Biology
 CAROLINE BEDFORD, B.A., Supervisor of Field Work in Social Work
 ANNE G. BENTON, B.A., Instructor in Bacteriology
 FRANK J. BRUNO, B.A., B.D., Lecturer in Social Work
 CLYDE R. CHAMBERS, B.A., Instructor in Economics
 BERTHA W. CLARK, B.S., M.A., Instructor in Anthropology
 HERBERT E. CLEFTON, M.A., Instructor in Romance Languages
 OTTO W. DAVIS, B.A., Lecturer in Social Work
 SOLOMON M. DELSON, Ph.B., Instructor in Romance Languages
 THADDEUS P. GIDDINGS, Instructor in Music
 ESTHER GREISHEIMER, B.S., Instructor in Physiology
 MARGUERITE GUINOTTE, Brevet Supérieur, l'Académie Paris, Instructor in
 Romance Languages
 ALBERT J. LOBB, Ph.B., LL.B., Instructor in Political Science
 FRANCES E. LOWELL, B.A., Instructor in Psychology
 FRANCES M. MOREHOUSE, M.A., Instructor in History, University High
 School
 VICTOR H. PELZ, M.A., Instructor in Economics
 GERTRUDE REEVES, Instructor in Pianoforte
 ADOLPH RINGOEN, M.A., Instructor in Animal Biology
 KARL SCHEURER, Instructor in Violin
 HAZEL SMALL, Instructor in Art Education
 ARTHUR H. TAYLOR, M.A., Lecturer in Social Work
 SAMUEL VASCONCELOS, B.A., LL.B., Abogado, Instructor in Romance
 Languages
 EDWARD F. WAITE, B.A., LL.M., Lecturer in Social Work
 GUY H. WOOLLETT, Ph.D., Instructor in Chemistry
 ALMENA DAWLEY, M.A., Teaching Fellow in Sociology
 ROBERT G. GREEN, B.A., Assistant in Bacteriology
 SIEGFRIED F. HERRMANN, B.S., M.B., Assistant in Bacteriology
 BRUCE L. MELVIN, M.A., Assistant in Anthropology

FACULTY COMMITTEES

1919-1920

Executive.—The Executive Committee of the Department of Agriculture
Enrollment.—WEST, BIESTER, MORROW, PIERCE, WENTLING
Curriculum.—FREEMAN, BIESTER, BOSS, CHEYNEY, GAY, RILEY, STORM,
 WEIGLEY, WELLER, WEST
Students' Work.—FREEMAN, CHEYNEY, NICHOLSON, WEIGLEY, WEST.
Student Organizations.—LANSING, FITCH, FREEMAN, MILLER, WELLER
Appointment.—STORM, WEIGLEY
Farm Experience.—BOSS, BRIERLEY
Faculty Business.—GORTNER, RUGGLES, STAKMAN, VERMILYE

GENERAL INFORMATION

ADMISSION

New students are admitted at the opening of any quarter.

All students entering for the first time must submit their credentials to the Enrollment Committee.

Admission is either by certificate or by examination. Candidates must have completed the equivalent of a four-year high school course and must present:

1. Four units of English; or three units of English and four units of a foreign language; or three units of English and two units in each of two foreign languages.
2. One unit of elementary algebra and one unit of plane geometry.
3. Enough additional work to make in all fifteen units, of which not more than four may be in subjects not listed in the admission groups in the General Information Bulletin.

Graduates of the School of Agriculture of the University of Minnesota who have completed the two summers of supervised work offered in the School course, one additional School year, and one additional summer's work, or the equivalent thereof, will be admitted to the College of Agriculture, Forestry, and Home Economics.

For details of admission requirements and definition of "unit," see the Bulletin of General Information.

Applicants for admission are urged to present physics (1 unit), and chemistry (1 unit), for entrance credits. If these subjects are not completed in the high school, they will have to be taken in the University, thus postponing some of the vocational courses.

FEEES

Free tuition.—The State will pay the tuition of any student who served in the army, navy, or marine corps of the United States during any war in which the United States has been involved, including members of the National Guard or who, upon the call of the president performed military service outside the borders of Minnesota in any trouble with Mexico and of any student who performed overseas service as a regularly enlisted full-time worker of the Red Cross, engaged in nursing the sick or assisting in the care of soldiers in any government hospital, field, or camp which service has been officially recognized by the National Government. The amount of this free tuition is not to exceed \$200 for any one person and the benefits of this act will not extend beyond July 1, 1924. The amount to be paid in any year will be limited by the legislative appropriation for that year. Application for this free tuition should be made to the Secretary's office at the time of registration. This applies only to students, who at the time of enlistment were citizens and residents of the State of Minnesota.

Tuition includes all of the regular quarter charges listed below except the deposit and penalty fees for change of registration, late registration, condition examinations, etc.

Tuition fee (per quarter)	
Residents of Minnesota.....	\$14.00
Non-residents	28.00
Deposit (first quarter only).....	5.00
Health fee (per quarter).....	2.00
Shevlin Hall fee (per quarter).....	.50
Special fees:	
Examination for removal of conditions.....	1.00
Examinations for credit (after the first quarter in residence).....	5.00
Special examinations	5.00
Change of registration.....	2.50

Late registration.—Old students must indicate their registration not later than two weeks before the day set for classes to begin. All students must complete their registration (including payment of fees) before the day set for classes to begin. Penalty for delay in either indicating or completing registration, five dollars. An additional one dollar is charged for each day of delay after the last day set for the completion of registration and a similar charge for each day of delay after the last day set for payment of fees.

Important.—The regulations require that no student be allowed to register after the quarter opens except by special committee action.

FACULTY REGULATIONS

Students are held responsible for compliance with all faculty regulations. These regulations are published in a booklet issued to students at the time of registration.

REQUIREMENTS FOR GRADUATION AND DEGREES

After the completion of one of the prescribed courses of study, including all of the required work and the requisite amount of elective work equivalent to a total of 186 credit hours (194 for those graduating in 1920), candidates will be recommended for graduation with the degree of Bachelor of Science.

PROFESSIONAL CERTIFICATES

Beginning with the year 1920-21 students entering the junior class who expect to receive the teacher's certificate from the University of Minnesota shall be registrants in the College of Education.

The University State Teachers' Certificate in Home Economics Education will be granted in 1919-20 to graduates of the College of Agriculture, Forestry, and Home Economics who have completed twenty-two and one-half credit hours in approved professional courses, and to graduates of the College of Education who have completed the prescribed course leading to such a certificate.

BOARD AND ROOM

Sanford Hall.—The one dormitory for university women, is located near the Minneapolis Campus. It accommodates ninety women, about one half of whom may be freshmen. The charge for room and board is \$300 for the university year. Applications should be sent to the Director of Sanford Hall, University of Minnesota.

Home Management Houses.—Two residences for women, located near the University Farm campus, are maintained by the Division of Home Economics, furnishing accommodations for a small number of students. The charge is \$85 each quarter, payable in advance. This covers the cost of living in the houses, with the exception of luncheons for the first five days of the week. Applications should be sent to the Chief of the Division of Home Economics, University Farm, St. Paul. A deposit of \$10 is required when a room is reserved.

Private houses.—After June 1 the Registrar will supply a list of approved boarding and rooming places.

COURSES OF STUDY

The following courses of study are designed (a) to prepare women for the responsibilities of citizenship, and of home-making; (b) to prepare teachers for the extension of home economics education; (c) to prepare women for vocations which have as their foundation work of the home economics group. They are planned to meet the needs of seven groups of young women:

1. Students electing to major in home economics as a type of general arts education for women.
2. Students preparing for teaching in the general field of home economics.
3. Students preparing for teaching in the special field of home economics, viz., foods and home management.
4. Students preparing for teaching in the special field of home economics, viz., textiles and clothing.
5. Students preparing for teaching in the special field of home economics, viz., related art.
6. Students preparing for positions as dietitians.
7. Students preparing for positions as institutional managers.

The College of Agriculture, Forestry, and Home Economics, and the College of Education cooperate in the preparation of teachers of home economics as outlined in the Teachers' Course in Home Economics, Teachers' Course in Foods and Home Management, the Teachers' Course in Textiles and Clothing, and the Teachers' Course in Related Art. Beginning with the year 1920-21 students entering the junior class who expect to receive the teacher's certificate from the University of Minnesota shall be registrants in the College of Education.

The required work of the freshman and the sophomore years is the same in each course of study. Specialization is provided for in the junior and senior years.

HOME PRACTICE

Home practice in garment-making is required of students who have completed H.E. 11, as a prerequisite to H.E. 13. The character and amount of the home practice work will be arranged with a member of the section of Textiles and Clothing.

Home practice in foods and cookery is required of students who have completed H.E. 21 and 22, as a prerequisite to H.E. 35. The character and amount of the home practice work will be arranged with a member of the section of Foods and Cookery.

EXPLANATION OF COURSE NUMBERS

The quarters in which courses are offered are indicated by the letters *f* (fall), *w* (winter), *s* (spring), and *su* (summer) following the course number. For example: 5*f,w,s* indicates that Course 5 is given in the fall

quarter and repeated in the winter quarter and again in the spring quarters; 5f-6w indicates a two-quarter course extending through the fall and winter quarters and 5f,w-6w,s indicates that Course 5-6 is given in the fall and winter quarters and repeated through the winter and spring quarters.

All undergraduate courses are numbered from 1 to 100. All courses open to undergraduates and graduates are numbered from 101 to 200.

Numbers following the descriptive name of a course indicate the number of credit hours.

Course numbers in parentheses following the number of credit hours indicate prerequisite courses.

Descriptions of the courses listed in the following outline of the curricula, together with those of additional courses offered as electives, will be found on pages 24 to 58. The divisional statements are arranged alphabetically according to the names of the divisions.

One credit hour is equivalent to (1) one lecture or recitation period requiring two hours of preparation, (2) two periods of laboratory work requiring one hour of preparation, or (3) three periods of laboratory work with no preparation, each week for one quarter.

GROUP I. GENERAL REQUIREMENTS FOR ALL STUDENTS IN HOME ECONOMICS

FRESHMAN YEAR

All of the following work is required of every student except for the exemptions indicated. For some students this represents more than the regular amount of work of 15 credit hours per quarter. In such cases those subjects listed below which can not be taken in the freshman year must take precedence in the following year. Registration for from 14 to 16 credit hours of work each quarter will be allowed without special permission. Care should be taken in registration to give precedence to courses offered only one quarter.

1. *Non-credit courses* required for graduation in addition to the 186 credit hours.

Freshman Lectures. A course of lectures, one hour per week, intended primarily to familiarize the new student with the College, college customs, and methods of procedure. Offered only in the fall quarter.

Phys. Educ. 1f-2w-3s, Elementary Physical Training. Three hours per week throughout the year.
2. *General courses*.—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and the prerequisites must be observed.

An. Biol. 1f,w,s-2w,s,su, General Zoology, 10.

Chem. 1f-2w-3s, General Inorganic Chemistry, 12; Students presenting a year of high-school chemistry may omit this course and register for Chem. 9-10. Those required to take this course because of inability to carry Chem. 9-10 successfully will be allowed not more than 10 credits.

Chem. 9f-10w, Advanced General Inorganic Chemistry, 10. Those required to take Chem. 1-2-3 are exempt.

Farm Eng. 30s, Household Physics, 5. Those presenting a year of high-school physics may omit this course and substitute 5 credits elective later in their course of study.

H. E. 3f,w,s, Textiles, 5.

- H. E. 11f,w,s, Garment Making, 3.
 H. E. 51f,w,s, Drawing and Design, 3.
 Phys. Educ. 11f, Personal Hygiene, 1.
 Rhet. 11f, Rhetoric I, 3.
 Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1.)
 Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2.)
 Rhet. 4f,w,s, Elementary Rhetoric, 3. Required only of those who are found to be unable to carry Rhet. 1.

SOPHOMORE YEAR

1. *Non-credit courses* required for graduation in addition to the 186 credit hours.
 Phys. Educ. 43f,w,s, Elementary Swimming. Not required of those who can pass the swimming test in their freshman year.
2. *Freshman courses* which were not completed during the freshman year.
3. *General courses*.—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and prerequisites must be observed. From 15 to 17 credit hours should be selected each quarter.
 Agr. Biochem. 3f,s,su, Types of Carbon Compounds, 6 (Chem. 10 cred.)
 Bact. 6f,w,s, Elementary Bacteriology, 4.
 H. E. 13f,w,s, Dressmaking, 5 (H. E. 3,11,51, Home Practice in Garment Making.)
 H. E. 21f,w,s, Foods and Cookery, 5 (Chem. 5 cred., Physiol. 3 or parallel.)
 H. E. 22f,w,s, Food Economics, 5 (H. E. 21.)
 Physiol. 3f,w,s, Human Physiology, 5 (Chem. 10 cred., Biol. 10 cred.)
 Psychol. 1f-2w, General Psychology, 6.
 Rhet. 11f,w,s, Argumentation, 5 (Rhet. 3)
 Sociol. 1f, Introduction to Sociology, 3
4. *Electives*.—Enough elective credits should be selected to make up with the required work of the freshman and sophomore years a total of 93 credit hours. The number selected will vary from 1 to 11 credit hours depending upon the specific high-school preparation of each student. Those whose programs permit are advised to register for Rhet. 22, Public Speaking, 5, otherwise required in the junior year.

JUNIOR YEAR

1. *General courses*.—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and prerequisites must be observed.
 Econ. 7w,s, Principles of Economics, 5
 H. E. 37f,s,su, Home Care of the Sick, 3 (Chem. 5 cred., Bact. 6)
 H. E. 40s, Child Training, 3 (Psychol. 1-2)
 H. E. 52f,w, Art History and Appreciation, 3 (H. E. 51)
 H. E. 53f,w,s, Advanced Design, 4 (H. E. 51)
 Rhet. 22f,w,s, Public Speaking, 5 (Rhet. 3)
2. *Special courses* as prescribed by the curriculum of the line of specialization selected. See special requirements on pages 20 to 22.
3. *Electives*. Enough electives should be selected to make up, with those listed in 1 and 2 above, from 15 to 17 credit hours each quarter. Full work for the year consists of 48 credit hours.

SENIOR YEAR

1. *Special courses* as prescribed by the curriculum of the line of specialization selected. See special requirements on pages 20 to 22.
2. *Electives*. Enough electives should be selected to make up, with those listed in 1 above, from 15 to 17 credit hours each quarter. Full work for the year consists of 48 credit hours.

¹ Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 52.

GROUP II. SPECIAL REQUIREMENTS IN THE DIFFERENT
LINES OF SPECIALIZATION (SUPPLEMENTARY
TO GROUP I)

GENERAL COURSE IN HOME ECONOMICS

Junior year:

- H. E. 23f,w, Nutrition I, 5 (H. E. 22, Bact. 6, Agr. Biochem. 3)
H. E. 108w,s,su, Nutrition II, 5 (H. E. 23)

Senior year:

- H. E. 17f,w,s, Advanced Clothing Construction, 3 (H. E. 13, 52, 53)
H. E. 34f,w,s,su, Home Management: Operation and Maintenance, Lectures, 3
(H. E. 22)
H. E. 35f,w,s,su, Home Management: Operation and Maintenance, Laboratory, 6
(H. E. 22, Home Practice in Foods and Cookery, must parallel H. E. 34)
H. E. 45w, Home Economics Survey, 2
H. E. 103f,w,s, Dietetics, 5 (H. E. 108)
H. E. 123f,w,s, Clothing Economics, 3 (H. E. 13, 52, 53, Econ. 7)
H. E. 131f,w,s, Home Management: House Planning and Equipment, 5 (H. E. 52,
53)

TEACHERS' COURSE IN HOME ECONOMICS

General statement.—Beginning with the year 1920-21 students entering the junior class who expect to receive the teachers' certificate from the University of Minnesota shall be registrants in the College of Education.

Junior year:

- Educ. 5s, The American School, 3 (Psychol. 1-2)
Educ. 55f,w,s, Elementary Educational Psychology, 3 (Psychol. 1-2) or Agr. Educ.
11f,w,s, Principles of Vocational Education, 3
H. E. 23f,w, Nutrition I, 5 (H. E. 22, Bact. 6, Agr. Biochem. 3)
H. E. 42w,s,su, Special Methods of Teaching Home Economics, 5 (H. E. 13, 22,
Psychol. 1-2)
H. E. 108f,w,su, Nutrition II, 5 (H. E. 23)

Senior year:

- H. E. 17f,w,s,su, Advanced Clothing Construction, 3 (H. E. 13, 52, 53)
H. E. 34f,w,s,su, Home Management: Operation and Maintenance, Lectures, 3 (H.
E. 22)
H. E. 35f,w,s,su, Home Management: Operation and Maintenance, Laboratory, 6
(H. E. 22, Home Practice in Foods and Cookery, must parallel H. E. 34)
H. E. 45 w, Home Economics Survey, 2
H. E. 49f,w,s, Observation and Teaching, 8 (42, scholarship requirement, see page 38)
H. E. 103f,w,s,su, Dietetics, 5 (H. E. 108)
H. E. 123f,s, Clothing Economics, 3 (H. E. 13, 52, 53, Econ. 7)
H. E. 131f,w,s, Home Management: House Planning and Equipment, 5 (H. E. 52, 53)

TEACHER'S COURSE IN FOODS AND HOME MANAGEMENT

General statement.—Beginning with the year 1920-21 students entering the junior class who expect to receive the teachers' certificate from the University of Minnesota shall be registrants in the College of Education.

Junior year:

- Agr. Biochem. 2w, Quantitative Methods, 5 (Chem. 10 cred.)
Educ. 5s, The American School, 3 (Psychol. 1-2)
Educ. 55f,w,s, Elementary Educational Psychology, 3 (Psychol. 1-2) or Agr. Educ.
11f,w,s, Principles of Vocational Education, 3
H. E. 23f,w, Nutrition I, 5 (H. E. 22, Bact. 6, Agr. Biochem. 3)
H. E. 42w,s,su, Special Methods of Teaching Home Economics, 5 (H. E. 13, 22, Psychol.
1-2)
H. E. 108f,w,su, Nutrition II, 5 (H. E. 23)

Senior year:

- H.E. 25w, Special Problems in Foods and Cookery, 3 (H.E.22)
 H.E. 34f,w,s,su, Home Management: Operation and Maintenance, Lectures, 3 (H. E. 22)
 H.E. 35f,w,s,su, Home Management: Operation and Maintenance, Laboratory, 6 (H.E. 22, Home Practice in Foods and Cookery, must parallel H.E. 34)
 H.E. 45w, Home Economics Survey, 2
 H.E. 47f,w,s, Observation and Teaching, 8 (42, scholarship requirement, see page 38)
 H.E. 103f,w,s, Dietetics, 5 (H.E. 108)
 H.E. 109s, Advanced Nutrition, 5 (H.E. 108, Agr. Biochem. 2)
 H.E. 131f,w,s, Home Management: House Planning and Equipment, 5 (H.E. 52, 53)

TEACHERS' COURSE IN TEXTILES AND CLOTHING

General statement.—Beginning with the year 1920-21 students entering the junior class who expect to receive the teachers' certificate from the University of Minnesota shall be registrants in the College of Education.

Junior year:

- Educ 5s, The American School, 3 (Psychol. 1-2)
 Educ. 55f,w,s, Elementary Educational Psychology, 3 (Psychol. 1-2) or Agr. Educ. 11f,w,s, Principles of Vocational Education, 3
 H.E. 17f,w,s,su, Advanced Clothing Construction, 3 (H.E. 13, 52, 53)
 H.E. 42w,s, Special Methods of Teaching Home Economics, 5 (H.E. 13, 22, Psychol. 1-2)
 H.E. 55f,s, Decorative Needlework and Crafts, 3 (H.E. 3, 11, 51, 53 parallel)
 H.E. 123f,w,s, Clothing Economics 3 (H.E. 13, 52, 53, Econ. 7)

Senior year:

- H.E. 18f,s, Commercial Clothing Manufacture, 4 (H.E. 17)
 H.E. 34f,w,s,su, Home Management: Operation and Maintenance, Lectures, 3¹ (H.E. 22)
 H.E. 35f,w,s,su, Home Management: Operation and Maintenance, Laboratory, 6 (H. E. 22, Home Practice in Foods and Cookery, must parallel H.E. 34)
 H.E. 45w, Home Economics Survey, 2
 H.E. 48f,w,s, Observation and Teaching, 8 (42, scholarship requirement, see page 38)
 H.E. 122f,w, Advanced Textiles, 3 (H.E. 3, 51)
 H.E. 131f,w,s, Home Management: House Planning and Equipment, 5 (H.E. 52, 53)

TEACHERS' COURSE IN RELATED ARTS

General statement.—Beginning with the year 1920-21 students entering the junior class who expect to receive the teachers' certificate from the University of Minnesota shall be registrants in the College of Education.

Junior year:

- Art. Educ. 32f,-33w, Freehand Drawing and Composition, 6
 Educ. 5s, The American School, 3 (Psychol. 1-2)
 Educ. 55f,w,s, Elementary Educational Psychology, 3 (Psychol. 1-2) or Agr. Educ. 11f,w,s, Principles of Vocational Education, 3
 H.E. 42w,s,su, Special Methods of Teaching Home Economics, 5 (H.E. 13, 22, Psychol. 1-2)
 H.E. 55f,s, Decorative Needlework and Other Crafts, 3 (H.E. 3, 11, 51, 53, parallel)
 H.E. 58, ¹Costume Design, 3 (H.E. 11, 53)

Senior year:

- Art Educ. 31s, su, Fundamental Principles of Design, 3 (Art Educ. 29-30 or H.E. 51, 53) or Art. Educ. 40f, Principles of Harmony in Form and Color, 3 (Art. Educ. 29-30-31 or instructor's permission)
 H.E. 17f,w,s, Advanced Clothing Construction, 3 (H.E. 13, 52, 53)
 H.E. 43w, Organization and Methods for Related Art Teaching, 3 (H.E. 52, 53, 131)
 H.E. 48f,w,s, Observation and Teaching, 8 (42, scholarship requirement, see page 38)
 H.E. 57w, Weaving and Other Crafts, 3 (H.E. 3, 51, 53)
 H.E. 54, ¹Interior Design, 3 (H.E. 52, 53, 131)

¹ Not offered in 1919-20.

COURSES IN HOME ECONOMICS

H.E. 123f,w,s, Clothing Economics, 3 (H.E. 13, 52, 53, Econ. 7)

H.E. 131f,w,s, Home Management: House Planning and Equipment, 5 (H.E. 52, 53)

COURSE FOR DIETITIANS

Junior year:

Agr. Biochem. 2w, Quantitative Methods, 5 (Chem. 10 cred.)

Educ. 55f,w,s, Elementary Educational Psychology, 3 (Psychol. 1-2) or Agr. Educ. 11f,w,s, Principles of Vocational Education, 3

H.E. 23f,w, Nutrition I, 5 (H.E. 22, Bact. 6, Agr. Biochem. 3)

H.E. 42w,s,su, Special Methods in Teaching Home Economics, 5 (H.E. 13, 22, Psychol. 1-2)

H.E. 108f,w,su, Nutrition II, 5 (H.E. 23)

H.E. 109s, Advanced Nutrition, 5 (H.E. 108, Agr. Biochem 2)

Senior year:

H.E. 25w, Special Problems in Foods and Cookery, 3 (H.E. 22)

H.E. 34f,w,s,su, Home Management: Operation and Maintenance, Lectures, 3 (H.E. 22)

H.E. 35f,w,s,su, Home Management: Operation and Maintenance, Laboratory, 6 (H.E. 22, Home Practice in Foods and Cookery, must parallel H.E. 34)

H.E. 45w, Home Economics Survey, 2

H.E. 61f,s, Large Quantity Cookery and Marketing, 4 (H.E. 22)

H.E. 63f,w,su, Institutional Experience I, 3 (H.E. 22)

H.E. 67w, Institutional Management, 4 (H.E. 61, 63)

H.E. 103f,w,s,su, Dietetics, 5 (H.E. 108)

H.E. 131f,w,s, Home Management: House Planning and Equipment, 5 (H.E. 52, 53)

COURSE IN INSTITUTIONAL MANAGEMENT

Junior year:

H.E. 23f,w, Nutrition I, 5 (H.E. 22, Bact. 6, Agr. Biochem. 3)

H.E. 34f,w,s,su, Home Management: Operation and Maintenance, Lectures, 3 (H.E. 22)

H.E. 35f,w,s,su, Home Management: Operation and Maintenance, Laboratory, 6 (H.E. 22, Home Practice in Foods and Cookery must parallel H.E. 34)

H.E. 61f,s, Large Quantity Cookery and Marketing, 4 (H.E. 22)

H.E. 63f,w,su, Institutional Experience I, 3 (H.E. 22)

H.E. 108f,w,su, Nutrition II, 5 (H.E. 23)

Senior year:

H.E. 25w, Special Problems in Foods and Cookery, 3 (H.E. 22)

Econ. 85f, Principles of Marketing, 5 (Econ. 7)

Econ. 88w, Retail Marketing, 3 (Econ. 85)

Econ. 25f, Principles of Accounting 5

H.E. 67w, Institutional Management, 4 (H.E. 61, 63)

H.E. 69s, Institutional Management Practice, 5 (H.E. 67)

H.E. 103f,w,s, Dietetics, 5 (H.E. 108)

H.E. 131f,w,s, Home Management: House Planning and Equipment, 5 (H.E. 52, 53)

COURSES OF STUDY FOR TEACHERS OF VOCATIONAL COURSES IN HOME ECONOMICS

The teachers' courses, designed to prepare for the teaching of vocational courses in home economics, are arranged in accordance with the provisions of the Smith-Hughes act.

COURSES OF STUDY FOR EXTENSION TEACHERS

Students desiring to prepare for extension teaching in home economics may pursue the Teachers' Course in Home Economics, or the Teachers' Course in Textiles and Clothing, and may substitute for Observation and Teaching, of the senior year, field work under the supervision of home economics extension specialists.

ELECTIVES

Students should consult with the division in which they are specializing with reference to the elective courses which must be chosen to make up the 186 credit hours required for graduation.

Only a limited number of elective courses are open to freshmen. First-year students, who for any reason are unable to follow the regular curriculum, are advised to fill their program with a required course from the sophomore schedule, if possible, and postpone the choice of electives until the sophomore year. This plan will enable the student to obtain a better viewpoint from which to select electives and allow a wider range of subjects from which to choose.

In selecting electives, note particularly (a) prerequisites, (b) classes of students (fr., soph., jr., or sr.) to which courses are offered, (c) number of credits, (d) quarter or quarters offered, and be sure that provision is made in registration for the proper sequence of continuation courses.

FRESHMAN ELECTIVES

The following divisions and departments offer elective work to freshmen. For the descriptions of available courses see pages 24 to 58, and for departments marked S., L., and A., see the bulletin of the College of Science, Literature and the Arts.

Botany (S., L., and A.)
Dairy Husbandry
German
History (S., L., and A.)
Horticulture
Mathematics (S., L., and A.)
Poultry Husbandry
Romance Languages

SOPHOMORE, JUNIOR, AND SENIOR ELECTIVES

Nearly all of the divisions offer elective work to sophomores, juniors, and seniors.

Elective courses in the College of Science, Literature, and the Arts, are separated into Junior College courses, open to freshmen and sophomores, and Senior College courses, open to juniors and seniors. In addition to satisfying other prerequisites an average grade of C must be maintained for the first two years in order to register for a Senior College elective.

DESCRIPTION OF COURSES

For explanation of course numbers and credits see page 17.

AGRICULTURAL BIOCHEMISTRY

Professor ROSS AIKEN GORTNER; Associate Professor CLYDE H. BAILEY;
Assistant Professors R. ADAMS DUTCHER, CLARENCE A. MORROW,
JOHN J. WILLAMAN.

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
2w,su. ¹	Quantitative Methods.....	5	Jr.,sr.	Chem. 10 cred.
3f,w,su	Types of Carbon Compounds..	6	Soph.,jr.,sr	Chem 10 cred.
<i>Advanced Courses</i>				
101f,su ¹ -102w, su ¹	Agricultural Quantitative Anal- ysis.....	6	Jr., sr.	2, 3
108s,su ²	Chemistry of Wheat and Wheat Products.....	3	Sr.	3
110s,su ²	Flour Laboratory Methods...	5	Sr.	101-102, parallel 108
111f,su-112w,su	Phytochemistry.....	6	Sr.	Biol. 10 cred., Org. Chem.
113f,su-114w,su	Biochemical Laboratory Meth- ods.....	4	Sr.	2, parallel 111-112
116f,w,s,su	Chemistry of "Vitamines" and Deficiency Diseases.....	3 or 5	Sr.	111-112, 113-114, or Physiol. 101-102, or H.E. 108
118f,w,s,su	Laboratory Problems in Bio- chemistry.....	3 or 5	Sr.	111-112, 113-114, or 108-110 or 2, 3, and H.E. 108

For additional courses see the Bulletin of the Courses in Agriculture.

INTRODUCTORY COURSES

2w,su.² **QUANTITATIVE METHODS.** A brief course in the principles of quantitative analysis, including a study of stoichiometric problems, practice in the use of the balance and in typical gravimetric and volumetric manipulations. WILLAMAN.

3f,w,su. **TYPES OF CARBON COMPOUNDS.** An elementary study of the different groups of carbon compounds, with special reference to their relationships and their occurrence in plant and animal materials used as food. MORROW.

ADVANCED COURSES

101f,su¹-102w,su.¹ **AGRICULTURAL QUANTITATIVE ANALYSIS.** Estimation of inorganic and organic constituents of agricultural products, the proximate analysis of foods and feeding stuffs, the use of the polariscope,

¹ Offered in alternate summers, offered in 1920.

² Offered in alternate summers, not offered in 1920.

- immersion refractometer, colorimeter and nephelometer, viscosimeter, and other special apparatus. MORROW.
- 108s,su.² CHEMISTRY OF WHEAT AND WHEAT PRODUCTS. A lecture course, with collateral library reference work on the chemical technology of the production and milling of wheat and the conversion of its products into human food. BAILEY.
- 110s,su.² FLOUR LABORATORY METHODS. Laboratory course in methods of analysis of wheat and its products; milling tests of wheat; baking and special tests of flour. Designed to train students for research and control work in the cereal industry. BAILEY.
- 111f,su-112w,su. PHYTOCHEMISTRY. Advanced course dealing with the colloidal state, and the chemistry of proteins, carbohydrates, glucosides, tannins, fats, plant acids, enzymes and pigments, and their physico-chemical relations to the vital processes involved in growth and nutrition. MORROW.
- 113f,su-114w,su. BIOCHEMICAL LABORATORY METHODS. A laboratory course paralleling the lectures in 111-112, using recent methods for the investigation of biologically important compounds, with especial reference to the detection and estimation of such compounds in cells or tissues. MORROW.
- 116f,w,s,su. CHEMISTRY OF "VITAMINES" AND DEFICIENCY DISEASES. Lectures, consultations, and library work on special nutritional problems accompanied by chemical and biological studies of food materials from the standpoint of the "vitamine" content. DUTCHER.
- 118f,w,s,su. LABORATORY PROBLEMS IN BIOCHEMISTRY. Special laboratory work in the preparation or isolation of pure compounds which occur in living cells, in the study of biochemical reactions, or in special methods of identification or determination of biochemical products. GORTNER, BAILEY, DUTCHER, MORROW, WILLAMAN.

AGRICULTURAL EDUCATION

Professors ASHLEY V. STORM, DEXTER D. MAYNE; Assistant Professor WILLIAM P. DYER.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
11f,w,s	Principles of Vocational Education	3	Jr., sr. ¹	None
21f,w	Vocational Education	3	Jr., sr. ¹	None

For additional courses see the Bulletin of the Courses in Agriculture.

¹ Offered only to those intending to teach.

² Offered in alternate summers, not offered in 1920.

INTRODUCTORY COURSES

- 11f,w,s. PRINCIPLES OF VOCATIONAL EDUCATION. A study of the fundamental principles upon which education is based. Throughout the course emphasis is placed on those phases which are most closely related to vocational education. DYER.
- 21f,w. VOCATIONAL EDUCATION. A short history of vocational education; the present status in Europe and United States; manual training and home arts in an educational system; the place of agriculture in the public schools; trade and vocational schools. MAYNE.

AMERICANIZATION TRAINING AND ANTHROPOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor ALBERT E. JENKS; Assistant Professor OSCAR W. JUNEK; Instructor BERTHA W. CLARK; Assistant BRUCE L. MELVIN.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f,w,s	Introduction to Anthropology.....	5	Soph.,jr.,sr.	None
2w.	General Anthropology.....	3	Soph.,jr.,sr.	1
5f,s.	General Immigration.....	3	Soph.,jr.,sr.	1
<i>Advanced Courses</i>				
112s.	The American Negro.....	3	Soph.,jr.,sr.	2 courses
113f.	The American People, Older Immigrants..	3	Soph.,jr.,sr.	2 courses
114w.	The American People, Newer Immigrants..	3	Jr., sr.	3 courses
115s	The American People, Americanisms and Assimilation	3	Jr., sr.	3 courses
117w.	The Immigrant Woman.....	2	Jr., sr.	3 courses
140f.	Slavic Culture.....	2	Jr., sr.	114

INTRODUCTORY COURSES

- 1f,w,s. INTRODUCTION TO ANTHROPOLOGY. Study of origin and development of human societies; various agencies which have determined type of social life; social organization, institutions, and progress; bearing of sociology upon other social sciences and arts. Same as Sociology 1. JENKS, TODD, BERNARD, ELMER, FINNEY, LUNDQUIST.
- 2w. GENERAL ANTHROPOLOGY. Theories, facts, and factors in the origin and distribution of human races. Early world migrations. Important anthropological problems. JENKS, MELVIN.
- 5f,s. GENERAL IMMIGRATION. Facts of recent world migrations. Chief causes of emigration from the old nests, and of immigration to the United States; federal and state problems of immigrant legislation, control, and distribution. JUNEK, MELVIN.

ADVANCED COURSES

- 112s. THE AMERICAN NEGRO. Development of the American Negro; his characteristics, conditions, and developing tendencies. Negro and immigrant adjustments. JENKS.

- 113f. THE AMERICAN PEOPLE. OLDER IMMIGRANTS. Characteristics, contributions and distribution of the older immigrant peoples in America, their modification and importance to us. JENKS.
- 114w. THE AMERICAN PEOPLE. NEWER IMMIGRANTS. Characteristics, contributions and distribution of the newer immigrant peoples in America, their modification and importance to us. JENKS.
- 115s. THE AMERICAN PEOPLE. AMERICANISMS AND ASSIMILATION. Essential and unique historical Americanisms, and their value and virility for the future in America. Conditions and facts of assimilation. JENKS.
- 117w. THE IMMIGRANT WOMAN. The peculiar problems of the woman immigrant in personal service, in industrial groups, in the home, and out of regular employment. CLARK.
- 140f. SLAVIC CULTURE. The basic Slavic institutions. Characteristics of Slavic culture. JUNEK.

ANIMAL BIOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors HENRY F. NACHTRIEB, CHARLES P. SIGERFOOS; Assistant Professor ELMER J. LUND; Instructors GEORGE D. ALLEN, ADOLPH RINGOEN.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Course</i>				
1f,w,s-2w,s,su	General Zoology.....	10 ¹	All	None

For additional courses see the Bulletin of the College of Science, Literature, and the Arts.

¹ The full course must be completed before credit will be allowed.

INTRODUCTORY COURSE

1f,w,s-2w,s,su. GENERAL ZOOLOGY. A survey of the animal kingdom, emphasizing the principles of development and structure in relation to functions and habit, heredity and evolution, and the animals of economic importance. Lectures, quizzes, and laboratory. NACHTRIEB, SIGERFOOS, LUND, ALLEN, RINGOEN.

ART EDUCATION

COLLEGE OF EDUCATION

Assistant Professor RUTH RAYMOND; Instructor HAZEL SMALL.

COURSES IN HOME ECONOMICS

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
29f,su-30w-31s,su	Fundamental Principles of Design..	9	All	None ¹
32f-33w-34s	Freehand Drawing and Composition	9	All	None
40f,su-41w-42s	Principles of Harmony in Form and Color	9	Soph., jr., sr.	29-30-31 or Instructor's permission

For additional courses see the Bulletin of the College of Education.

¹ Home Economics students who have completed H.E. 51 and 53 will be admitted to the last quarter's work.

INTRODUCTORY COURSES

29f,su-30w-31s,su.	FUNDAMENTAL PRINCIPLES OF DESIGN.	RAYMOND.
32f-33w-34s.	FREEHAND DRAWING AND COMPOSITION.	RAYMOND, SMALL.
40f,su-41w-42s.	PRINCIPLES OF HARMONY IN FORM AND COLOR.	RAYMOND.

BACTERIOLOGY AND IMMUNOLOGY

MEDICAL SCHOOL

Professor WINFORD P. LARSON; Instructor ANNE G. BENTON; Assistants ROBERT G. GREEN, SIEGFRIED F. HERRMANN.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Course</i>				
6f,w,s	Elementary Bacteriology	4	Soph., jr., sr.	None

For additional courses see the Bulletin of the Medical School.

INTRODUCTORY COURSE

6f,w,s. ELEMENTARY BACTERIOLOGY. Lecture and laboratory course. The principles and technique of general bacteriology. Studies in the morphologic and biologic characters of the common bacteria. Preparation of culture media. Disinfectants and disinfection. Bacteriology of water and food products. LARSON, BENTON, GREEN, HERRMANN.

BEE CULTURE

Professor FRANCES JAGER; Instructor LLOYD V. FRANCE.

General statement.—Theoretical and practical instruction on bees, honey, and wax production. At least one year of botany should be completed before electing these courses. General zoology and economic entomology are also desirable. If not already completed they should be taken at same time as the courses in bee culture.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1s,su	Elements of Beekeeping I	3	Jr., sr.	None
2f,w	Elements of Beekeeping II	3	Jr., sr.	None
3w-4s	Advanced Beekeeping	6	Jr., sr.	1 or 2
5su	Queen Raising	3	Jr., sr.	1 or 2

INTRODUCTORY COURSES

- 1s,su. ELEMENTS OF BEEKEEPING I. Fundamentals of bee behavior during the honey season. Modern equipment for beekeeping practice. Fundamentals of beekeeping practice during the honey season. Production of comb and extracted honey. JAGER.
- 2f,w. ELEMENTS OF BEEKEEPING II. Fundamentals of bee behavior outside of the active season. Fundamentals of beekeeping practice outside of active season. Indoor and outdoor wintering. JAGER.
- 3w-4s. ADVANCED BEEKEEPING. Bee anatomy, bee botany, bee geography in their relations to commercial honey production. JAGER.
- 5su. QUEEN RAISING. Selecting queens, principles of reproduction, grafting, drone raising, mating. Nuclei, mailing, introducing. Bee diseases. In connection with Zumbra Heights queen bee raising station. JAGER.

CHEMISTRY

SCHOOL OF CHEMISTRY

Professors LAUDER W. JONES, CHARLES F. SIDENER; Associate Professors WILLIAM H. HUNTER, FRANK H. MACDOUGALL; Assistant Professors ISAAC W. GEIGER, FRANK C. WHITMORE; Instructor GUY H. WOOLLETT.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f-2w-3s	General Inorganic Chemistry	12	All	None
9f-10w	Advanced General Inorganic Chemistry	10	All	H.S. Chem.
11s	Qualitative Chemical Analysis	4	Soph., jr., sr.	1-2-3
12s-13f	Qualitative Chemical analysis	10	Soph., jr., sr.	9-10
20w	Quantitative Analysis	5	Soph., jr., sr.	12-13
21s	Quantitative Analysis	5	Soph., jr., sr.	20
35f-36w	Organic Chemistry	10	Soph., jr., sr	1-2-3 or 9-10
<i>Advanced Courses</i>				
126s	Sanitary Water Analysis	1 or 2	Sr.	21
141f-142w-143s	Physical Chemistry	9, 12 or 15	Jr., sr.	Chem. 30 cred., Phys. 15 cred.

For additional courses see the Bulletin of the School of Chemistry.

INTRODUCTORY COURSES

- 1f-2w-3s. GENERAL INORGANIC CHEMISTRY. Designed for those who have had no high-school chemistry. 1-2—A study of the general laws of chemistry and of the non-metals and their compounds. 3—A study of the metals and their compounds. WHITMORE.
- 9f-10w. ADVANCED GENERAL INORGANIC CHEMISTRY. Designed for those who have had one year of high-school chemistry. 9—General laws of chemistry; the non-metals and their compounds. 10—Metals and their compounds and ionic equilibrium, considered quantitatively.

- 11s. **QUALITATIVE CHEMICAL ANALYSIS.** Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. For students who satisfy the requirements of general chemistry.
- 12s-13f. **QUALITATIVE CHEMICAL ANALYSIS.** Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. For students who satisfy the requirements of general chemistry. WHITMORE.
- 20w. **QUANTITATIVE ANALYSIS.** An introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems will be assigned and attention given to proper laboratory practice. SIDENER, GEIGER, and Assistants.
- 21s. **QUANTITATIVE ANALYSIS.** Supplementary to 20. Further discussion of the principles and methods together with laboratory work on additional typical problems in gravimetric and volumetric analysis. SIDENER, GEIGER, and Assistants.
- 35f-36w. **ORGANIC CHEMISTRY.** An introduction to the chemistry of carbon compounds. The laboratory work will include the preparation of characteristic substances. HUNTER, WOOLLETT, and Assistants.

ADVANCED COURSES

- 126s. **SANITARY WATER ANALYSIS.** Lectures and laboratory practice in the chemical examination of potable waters. SIDENER, GEIGER.
- 141f-142w-143s. **PHYSICAL CHEMISTRY.** A general survey of the subject. Laboratory work three or six hours per week. Nine, twelve, or fifteen credits, depending on amount of laboratory work. MACDOUGALL.

DAIRY HUSBANDRY

ANIMAL HUSBANDRY GROUP

Professors CLARENCE H. ECKLES, ROBERT M. WASHBURN; Assistant Professors JOSEPH C. CORT, EDWIN O. HANSON; Instructor LESLIE V. WILSON.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Course</i>				
1f,s	Elements of Dairying	5	All	None

For additional courses see the Bulletin of the Courses in Agriculture.

INTRODUCTORY COURSE

- 1f,s. **ELEMENTS OF DAIRYING.** Composition of milk. Causes of variation in composition; milk constituents and their uses in dairy manufactures and as food; Babcock test; sanitary handling of milk and cream

on the farm; cream separating and farm buttermaking. WASHBURN, CORT, HANSON, WILSON.

ECONOMICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor WILLARD E. HOTCHKISS; Associate Professors WILLIAM W. CUMBERLAND, BRUCE D. MUDGETT; Professorial Lecturers JOHN H. SHERMAN; Instructors CLYDE R. CHAMBERS, VICTOR H. PELZ.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
7w,s	Principles of Economics	5	Soph., jr., sr.	None
11f-12w	Statistics	6	Soph., jr., sr.	7
19f	Principles of Agricultural Marketing...	5	Jr., sr.	7
20w	Problems in Rural Economics	5	Soph., jr., sr.	7
23s	Business Organization and Management	5	Soph., jr., sr.	7
25f-26w	Principles of Accounting	6 ¹	Soph., jr., sr.	None
85f	Principles of Marketing	5	Jr., sr.	7
88w	Retail Marketing	3	Jr., sr.	85
<i>Advanced Course</i>				
109s	Economics of Consumption	5	Jr., sr.	7

For additional courses see the Bulletin of the College of Science, Literature, and the Arts.

¹ Students in the College of Agriculture, Forestry, and Home Economics may receive credit for the completion of the first quarter.

INTRODUCTORY COURSES

- 7w,s. PRINCIPLES OF ECONOMICS. Fundamentals of economic theory, with more than the usual amount of emphasis upon consumption. CHAMBERS.
- 11f-12w. STATISTICS. Principles of collection, tabulation, and interpretation of statistical material, illustrated by present-day statistical data. Lectures, assigned readings, and special investigations by individual members of the class. MUDGETT.
- 19f. PRINCIPLES OF AGRICULTURAL MARKETING. The organization and methods of marketing; the functions of middlemen; the costs of marketing various products; coöperative marketing.
- 20w. PROBLEMS IN RURAL ECONOMICS. A survey of the economic aspects of the important problems of rural life, such as rural population, rural migration, tenancy, agricultural labor, marketing of farm products, coöperation, rural credit, land settlement. CUMBERLAND.
- 23s. BUSINESS ORGANIZATION AND MANAGEMENT. Organization, principles applying to business in general and to particular concerns; evolution, objects, adjustments, limits, functional division specialization—functional and other forms; standardization. Management, coördination

of functions, handling of men, employment, external versus internal factors. HOTCHKISS, PELZ.

25f-26w. PRINCIPLES OF ACCOUNTING. The purpose and principles of account classification; capital and revenue; accruals; valuation; depreciation; preparation and interpretation of balance sheets, income accounts and other statements; corporation accounts. A laboratory course with supplementary lectures. SANDERS.

85f. PRINCIPLES OF MARKETING. Domestic merchandising methods of manufacture. Problems of wholesalers and commission men; distributing system and market organization; price policies. SHERMAN.

88w. RETAIL MARKETING. Problems and methods of the so-called regular retailer, department stores, and chain stores. Development of retail trade centers. Coöperation between the retailer and the local board of trade. The retailer and the consumer. PELZ.

ADVANCED COURSE

109s. ECONOMICS OF CONSUMPTION. Nature of human wants; standards of living; cost of living; income, administration of income; nature of demand; demand and price; relation of consumption and the population problem.

EDUCATION

COLLEGE OF EDUCATION

Professors LOTUS D. COFFMAN, ALBERT W. RANKIN, FLETCHER H. SWIFT;
Assistant Professors HERMIONE L. DEALEY, MARVIN J. VAN WAGENEN;
Instructors JEAN H. ALEXANDER, FRANCES M. MOREHOUSE.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f,w-2w,s	Brief Course in the Hist. of Educ.	6	Jr., sr.	Psychol. 1-2-3
3f,w-4w,s	Social Aspects of Education.....	3	Jr., sr.	Psychol. 1-2-3
5s ¹	American School.....	3	Jr., sr.	Psychol. 1-2
11f,w,s	Technique of Teaching.....	3	Jr., sr.	Psychol. 1-2-3
55f,w,s	Elementary Educ. Psychology.....	3	Jr., sr.	Psychol. 6 cred
<i>Advanced Courses</i>				
101f-102w- 103s	Historical Foundations of Modern Education.....	9	Jr., sr.	Psychol. 1-2-3, Hist. 10 cred.
106f-107w- 108s	Advanced Educational Psychology...	9	Sr	Psychol. 1-2-3
109f,s	Educational Diagnosis.....	2	Sr.	1-2 or 101-102-103, 3
119f-120w	School Curricula.....	6	Sr.	1-2 or 101-102- 103, 3
141f	School Sanitation and Public Health.	3	Sr.	1-2 or 101-102- 103, 3

For additional courses see the Bulletin of the College of Education.

¹ Given at the University Farm.

INTRODUCTORY COURSES

- 1f,w-2w,s. BRIEF COURSE IN THE HISTORY OF EDUCATION. Current school problems and educational theories in the light of their history. Emphasis upon secondary education and those aspects of education of most immediate concern to high-school teachers. Not open to those who have credit in Course 5. ALEXANDER.
- 3f,w-4w,s. SOCIAL ASPECTS OF EDUCATION. The school as a community factor; the present peculiar relation of the school to social problems; the function of the school in these relations. RANKIN.
- 5s. AMERICAN SCHOOL. A brief survey of the factors determining the problem of public education in America, followed by a brief account of the development and organization of typical state school systems. Not open to those who have credit in Course 1-2. SWIFT.
- 11f,w,s. TECHNIQUE OF TEACHING. Types of classroom exercises; preparation of teaching plans; hygiene of instruction; classroom management; the professional ethics of teaching; observation of high-school work. MOREHOUSE.
- 55f,w,s. ELEMENTARY EDUCATIONAL PSYCHOLOGY. A brief scientific study of individual behavior from the standpoint of the learning process. Special emphasis on economy of time and energy in learning, instinctive and emotional reactions, habit formation, methods of learning, fatigue. DEALEY.

ADVANCED COURSES

- 101f-102w-103s. FOUNDATIONS OF MODERN EDUCATION. Interpretative historical study of elements in modern education derived from Hebrews, Greeks, Romans, Middle Ages, etc. Emphasis on secondary and higher education and origin and results of monopoly of cultural conception of education and cultural studies. SWIFT.
- 106f-107w-108s. ADVANCED EDUCATIONAL PSYCHOLOGY. Psychology of learning. Methods of measuring rate of learning; study of typical learning experiments and examination of the conditions of the most economic learning, study of individual differences, and psychology of the school subjects. VAN WAGENEN.
- 109f,s. EDUCATIONAL DIAGNOSIS. A study of educational scales and standard tests for the measurement of efficiency in school subjects. The course will deal with the nature of the tests, the methods of their use, and an analysis of results obtained. VAN WAGENEN.
- 119f-120w. SCHOOL CURRICULA. The curriculum as related to social, industrial, and economic conditions; a survey of the grammar grades and of the high school. Consideration of the possibilities of developing a curriculum better adapted to the community needs. RANKIN.

- 141f. SCHOOL SANITATION AND PUBLIC HEALTH. A course in school hygiene in its broader aspects. Designed for all teachers and supervisors who are responsible for the health of school children. Treats of medical supervision and other problems arising from school environment. RANKIN.

ENGLISH

Professors CARLETON BROWN,¹ RICHARD BURTON, ELMER E. STOLL; Associate Professors JOSEPH W. BEACH, CECIL A. MOORE; Professorial Lecturer NATHANIEL E. GRIFFIN.

General statement.—The following courses are recommended for election by the students of the College of Agriculture, Forestry, and Home Economics.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f-2w-3s	General Survey of English Literature..	9	Soph., jr., sr.	Rhet. 1-2-3
4f,s	Old English.....	4	Jr., sr.	1-2-3 or parallel
6f,w	Chaucer.....	4	Jr., sr.	1-2-3 or parallel
8f,w	Shakespeare.....	4	Jr., sr.	1-2-3 or parallel
27w	History of the English Language.....	2	Jr., sr.	1-2-3, 4
40f	Bible as Literature.....	3	Soph., jr., sr.	1-2-3 or parallel
51w	Spenser.....	4	Jr., sr.	1-2-3
53s	Seventeenth Century Lyrists.....	4	Jr., sr.	1-2-3
54s	American Literature.....	4	Jr., sr.	1-2-3
58w-59s	Nineteenth Century Prose.....	6	Jr., sr. ¹	1-2-3
64s	Bacon.....	4	Jr., sr.	1-2-3
66f	English Novel.....	4	Jr., sr.	1-2-3

For additional courses see the Bulletin of the College of Science, Literature, and the Arts.

¹ The full course must be completed before credit will be allowed.

INTRODUCTORY COURSES

- 1f-2w-3s. GENERAL SURVEY OF ENGLISH LITERATURE. Lectures, recitations, and assigned readings. Designed to prepare for more minute study of special periods. STOLL, BEACH, MOORE, GRIFFIN.
- 4f,s. OLD ENGLISH. The language, with reading of representative selections of Old English prose and poetry. The relation to modern English is particularly emphasized. Fall quarter, GRIFFIN; spring quarter, KLAEBER.
- 6f,w. CHAUCER. Reading of Tales from the Canterbury collection, with introduction dealing with the grammar and literary forms of fourteenth century English. Fall quarter, BEACH; spring quarter, GRIFFIN.
- 8f,w. SHAKESPEARE. An introductory study of Shakespeare's development as a poet and dramatist up to *King Lear*, with reading of representative plays. Fall quarter, STOLL; winter quarter,

¹ Absent on leave, 1919-20

- 27w. HISTORY OF THE ENGLISH LANGUAGE. Outlines of the history of the language. Lectures and assigned readings. KLAEBER.
- 40f. THE BIBLE AS LITERATURE. A literary study of the Old Testament with special attention to forms and the critical study of selected readings. BURTON.
- 51w. SPENSER. The forms and literary influences in the Elizabethan period illustrated in the poetry of Edmund Spenser, with brief readings from the minor poems and extended study of *The Faerie Queen*. STOLL.
- 53s. SEVENTEENTH CENTURY LYRISTS. The tradition of the Elizabethan lyric traced in the work of the metaphysical and cavalier school of poetry.
- 54s. AMERICAN LITERATURE. Lectures on American literature, with extensive readings from the principal poets and prose writers of the United States. MOORE.
- 58w-59s. NINETEENTH CENTURY PROSE. Studies in the more important prose writers of the nineteenth century, with reference to their styles, personalities, opinions, and relations to their period. Readings by students, and essays on approved topics. BEACH.
- 64s. BACON. A study of Bacon as an essayist and as a promoter of learning.
- 66f. THE ENGLISH NOVEL. Principles and personalities in the evolution of the English novel. Written reports on selected novels. BURTON.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Professor WILLIAM A. RILEY; Associate Professor ARTHUR G. RUGGLES;
Assistant Professor OSCAR W. OESTLUND.

COURSES

No.	Title	Credits Offered to	Prereq. courses
<i>Introductory Courses</i>			
1f,s,su	Introductory Entomology	5 Soph., jr., sr.	An. Biol. 10 cred.
2w,su	Economic Entomology	5 Soph., jr., sr.	1
14w	Insects and Public Health	3 Jr., sr.	An. Biol. 10 cred.

For additional courses see the Bulletin of Courses in Agriculture.

INTRODUCTORY COURSES

- 1f,s,su. INTRODUCTORY ENTOMOLOGY. Lectures and laboratory work on the characteristics and habits of insects. OESTLUND, RILEY.
- 2w,su. ECONOMIC ENTOMOLOGY. The life history, habits, and methods of control of the insect pests of orchard, field, and garden. Laboratory work in the determination of the more important forms. RUGGLES.

14w. INSECTS AND PUBLIC HEALTH. The agency of insects and related forms in the transmission of disease; methods of sanitation related to their control and disease transmission. Not open for credit to students specializing in entomology. RILEY.

FARM ENGINEERING

AGRICULTURAL ENGINEERING GROUP

Professor WILLIAM BOSS; Assistant Professor ARTHUR G. TYLER; Instructor, MAURICE G. JACOBSON.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
3f,s	Mechanical Drawing.....	3	All	None
30s	Household Physics.....	5	All	None

For additional courses see Bulletin of the Courses in Agriculture.

INTRODUCTORY COURSES

3f,s. MECHANICAL DRAWING. Lectures on drawing, exercise in the use of drawing instruments, lettering, and water colors. The making of working drawings with their practical value. JACOBSON.

30s. HOUSEHOLD PHYSICS. Mechanics of solids and fluids; heat, light, sound, electricity, and magnetism. Application of physics to household problems. TYLER.

GERMAN

Professor CARL SCHLENKER; Assistant Professors OSCAR C. BURKHARD, JAMES DAVIES, ALFRED E. KOENIG, SAMUEL KROESCH, WALTER R. MYERS.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f,s	Beginning.....	5	All	None
2f,w	Beginning, Intermediate.....	5	All	1 or 1 yr. prep. German
3f,s	Beginning, Advanced.....	5	All	2
10f,s	Rapid Reading.....	5	All	3
11w,s	Advanced Rapid Reading.....	5	All	10
12f,s	Narrative Prose.....	5	All	2 yrs. prep. German
13f,w	Advanced Narrative Prose.....	5	All	12
14w,s	Prose and Poetry.....	5	All	13
28f,w-29w,s	Advanced Chemical German...	6 ¹	All	15
31f,w-32w,s	Medical German.....	6 ¹	All	10 or 12

¹ All quarters must be completed before credit is granted.

No.	Credits	Title	Offered to	Prereq. courses
50f-51w-52s	Composition	.....	3 ² Soph., jr., sr.	11 or 14 ¹
53f-54w-55s	Conversation	.....	3 ² Soph., jr., sr.	11 or 14 ¹
62f,s	German Comedies	.....	3 Soph., jr., sr.	11 or 14 ¹
63w	Modern Drama	.....	3 Soph., jr., sr.	11 or 14 ¹
64s	Classic Drama	.....	3 Soph., jr., sr.	62 or 63

For additional courses see the Bulletin of the College of Science, Literature, and the Arts.

¹Adjustments permitted, for the year 1919-1920 only, on account of the changes in the curriculum.

Students with credit for Course 7-8-9 (old numbering), Prose and Poetry, may register for Courses 62, 63, 64.

Students with credit for Course 24-25-26 (old numbering), Elementary Composition may register for Course 50-51-52.

Students with credit for Course 27-28-29 (old numbering), Elementary Conversation may register for Course 53-54-55.

² All quarters must be completed before credit is granted.

INTRODUCTORY COURSES

1f,s. BEGINNING. Pronunciation, conversation, grammar, and composition; selected readings in easy prose and verse. _____.

2f,w. BEGINNING INTERMEDIATE. Continuation of 1. _____.

3f,s. BEGINNING, ADVANCED. Selected texts from modern writers. _____.

10f,s. RAPID READING. Modern narrative prose. KROESCH.

11w,s. ADVANCED RAPID READING. Continuation of 10. Selected dramas from the eighteenth and nineteenth centuries. KROESCH.

12f,s. NARRATIVE PROSE. Reading texts selected from modern prose writers. Grammar review and composition. _____.

13f,w. ADVANCED NARRATIVE PROSE. Continuation of 13. _____.

14w,s. PROSE AND POETRY. Narrative readings and selected poetry; composition.

28f,w-29w,s. ADVANCED CHEMICAL GERMAN. Selections from more difficult works on chemistry. DAVIES.

31f,w-32w,s. MEDICAL GERMAN. Readings from general works on physiology, anatomy, and bacteriology. BURKHARD.

50f-51w-52s. COMPOSITION. Aims to develop grammatical correctness. Translations from English selections. Essay writing on assigned subjects. MYERS.

53f-54w-55s. CONVERSATION. Aims to develop ease and correctness of oral expression. Organized on the laboratory plan—one hour credit with two hours of recitation and one hour of outside reading. MYERS.

62f,s. GERMAN COMEDIES. Reading of the best comedies of the eighteenth and nineteenth centuries. DAVIES, MYERS.

- 63w. MODERN DRAMA. Plays of modern dramatists; Hauptmann, Sudermann, Fulda, and others. DAVIES, MYERS.
- 64s. CLASSIC DRAMA. Plays of Lessing, Goethe, and Schiller. DAVIES, MYERS.

HOME ECONOMICS

Professor MILDRED WEIGLEY; Assistant Professors ALICE BIESTER, ALMA L. BINZEL, CLARA M. BROWN, HARRIET I. GOLDSTEIN, MAUDE MILLER, AMY P. MORSE, E. MAUDE PATCHIN, NOLA TREAT, ELIZABETH VERMILYE, MARION WELLER; Instructors CARLOTTA BROWN, JEAN MUIR DORSEY, HALLY J. FISHER, VETTA GOLDSTEIN, RUTH M. LINDQUIST, OLIVE B. MACCOMBER, MABEL C. McDOWELL, MARGARET K. MUMFORD, ETHEL L. PHELPS, LENORE RICHARDS, LAVINIA STINSON; Lecturer MARTHA B. MOORHEAD; Extension Specialists MARY L. BULL, LUCY CORDINER, JOSEPHINE CREELMAN, MAY SECREST, JUNIATA L. SHEPPARD.

General statement.—The following courses are planned primarily for students majoring in Home Economics, and are required in the courses of study in Home Economics, outlined on pages 17 to 22. They are open for election to students in other courses who offer the prerequisites as stated below.

Beginning with the year 1920-21, students entering the junior class, who expect to receive the teachers' certificate from the University of Minnesota, shall be registrants in the College of Education.

Special attention is called to the prerequisites for Courses 47, 48, and 49 required for the professional certificate. No student is admitted to Course 47 who has a grade below C in Courses 21, 22, 23, or 42. No student is admitted to Course 48 who has a grade below C in Courses 11, 13, or 42. In order to enter Course 49 the prerequisites for both 47 and 48 must be satisfied.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
3f,w,s	Textiles.....	5	All	None
11f,w,s	Garment Making.....	3	All	None
13f,w,s	Dressmaking.....	5	Soph., jr., sr.	3, 11, 51, Home Pract. in Garment Making
17f,w,s,su	Advanced Clothing Construction .	3	Jr., sr.	13, 52, 53
18f,s	Commercial Clothing Manufacture	4	Sr.	17
21f,w,s	Foods and Cookery.....	5	Soph., jr., sr.	Chem. 5 cred. Physiol. 3 parallel
22f,w,s	Food Economics.....	5	Soph., jr., sr.	21
23f,w	Nutrition I.....	5	Jr., sr.	22, Agr. Biochem. 3 Bact. 6
24s	Camp Cookery.....	3	All	None
25w	Special Problems in Foods and Cookery.....	3	Sr.	22, 108
34f,w,s,su	Home Management: Operation and Maintenance, Lectures....	3	Jr., ¹ sr.	22, 35, parallel

¹ Open to juniors only in their third quarter.

DESCRIPTION OF COURSES

No.	Credits	Title	Offered to	Prereq. courses
35f,w,s,su	Home Management: Operation and Maintenance, Laboratory..	6	Jr., ³ sr.	22, Home Pract. in Foods and Cookery, 34 parallel Chem. 5 cred., Bact. 6
37f,s,su	Home Care of the Sick.....	3	Jr., sr.	37, Psychol. 1-2
40s	Child Training.....	3	Jr., sr.	37, Psychol. 1-2
42w,s,su	Special Methods of Teaching Home Economics.....	5	Jr., sr.	13, 22, Psychol. 1-2
43w ¹	Organization and Methods for Related Art Teaching.....	3	Sr.	52, 53, 131
45w	Home Economics Survey.....	2	Sr.	None
47f,w,s	Observation and Teaching: Foods and Home Management.....	8	Sr.	42, see general statement above.
48f,w,s ¹	Observation and Teaching: Textiles and Clothing.....	8	Sr.	42, see general statement above
49f,w,s ¹	Observation and Teaching: General Home Economics.....	8	Sr.	42, see general statement above
51f,w,s	Drawing and Design.....	3	All	None
52f,w	Art History and Appreciation...	3	Jr., sr.	51
53f,w,s	Advanced Design.....	4	Jr., sr.	51
54	Interior Design.....	3	Sr.	52, 53, 131
55f,s	Decorative Needlework and Other Crafts.....	3	Jr., sr.	3, 11, 51, 53 or parallel
57w	Weaving and Other Crafts.....	3	Jr., sr.	3, 51, 53
58	Costume Design.....	3	Jr., sr.	11, 53
61f,s	Large Quantity Cookery and Marketing.....	4	Jr., sr.	22
63f,w,su	Institutional Experience.....	3	Jr., sr.	22
67w	Institutional Management.....	4	Sr.	61, 63
69s	Institutional Management Practice.....	5	Sr.	67
70w	Food Preparation in Relation to Social Work.....	3	Soph., ³ jr., sr.	An. Biol. 1-2, Chem. 10 cred. advised
71s	Elementary Dietetics for the Social Workers.....	3	Soph., ³ jr., sr.	70, Physiol 3 or parallel
72f	Home Management Problems...	3	Soph., ³ jr., sr.	71, Econ. 7 or parallel
<i>Advanced Courses</i>				
103f,w,s	Dietetics.....	5	Sr.	108
108f,s,su	Nutrition II.....	5	Jr., sr.	23
109s	Advanced Nutrition.....	5	Jr., sr.	108, Agr. Biochem. 2
122f,w	Advanced Textiles.....	3	Jr., sr.	3, 51
123f,w,s	Clothing Economics.....	3	Jr., sr.	13, 52, 53, Econ. 7
131f,w,s	Home Management: House Planning and Equipment.....	5	Sr.	52, 53

¹ College of Education.

² Open to juniors only in their third quarter.

³ Open to sophomores only in their third quarter. Not open to students in Home Economics except by special permission of the Head of the Division.

INTRODUCTORY COURSES

- 3f,w,s. **TEXTILES.** A study of textile fibers, their structure, properties, and chemical reactions; of fabrics, their structure and processes of manufacture; of art and economic considerations in selection and purchase of materials for clothing and household furnishing. WELLER, PHELPS.
- 11f,w,s. **GARMENT MAKING.** Instruction and laboratory practice in hand sewing; in the reading and adaptation of commercial patterns; in the construction and use of the sewing machine; in designing, cutting, and making simple outer garments from washable materials. PHELPS, McDOWELL.
- 13f,w,s. **DRESSMAKING.** Consideration of quality, suitability, and cost of materials adapted to technique involved in construction of simple wool and silk dresses; adaptation of art principles in selection of designs; instruction and practice in methods of construction. PATCHIN, McDOWELL, PHELPS.
- 17f,w,s,su. **ADVANCED CLOTHING CONSTRUCTION.** Laboratory course involving the application of principles of costume modeling in the construction of one high-grade garment, suit, coat, or dress. One day a week will be given to a millinery problem. WELLER, CARLOTTA BROWN.
- 18f,s. **COMMERCIAL CLOTHING MANUFACTURE.** A study of the organization of the clothing trades and industries; of wages and standards of efficiency in workmanship. Laboratory practice upon a commercial basis, measured by trade standards.
- 21f,w,s. **FOODS AND COOKERY.** (a) Production, manufacture, chemical composition of typical foods; their classification into food principles; changes in digestion; function in nutrition. (b) Fundamental science principles from chemistry, physics, biology, bacteriology, and their application in typical cookery processes. VERMILYE, STINSON.
- 22f,w,s. **FOOD ECONOMICS.** Cost and nutritive value of typical foods; the study of dietaries; preparation and serving of meals, the cost bearing a definite relation to the family budget. VERMILYE, STINSON.
- 23f,w. **NUTRITION I.** A study of the chemistry and physiology of metabolism, involving a qualitative examination of the food principles; of the body tissues; of salivary, gastric, and pancreatic digestion. BIESTER, MUMFORD.
- 24s. **CAMP COOKERY.** This course is designed to give prospective foresters, engineers, and others a knowledge of the simpler cookery processes; and of such adaptations as are practicable in the several types of out-of-doors camps. (Given in alternate years. Offered in 1919-20.)

- 25w. SPECIAL PROBLEMS IN FOODS AND COOKERY. An intensive study of problems in foods and food preparation with individual laboratory problems.
- 34f,w,s,su. HOME MANAGEMENT: OPERATION AND MAINTENANCE, LECTURES. The family budget for varying incomes, and for the "Home Management House"; household accounts. VERMILYE, MUMFORD.
- 35f,w,s,su. HOME MANAGEMENT: OPERATION AND MAINTENANCE, LABORATORY PRACTICE. (a) Twelve weeks' experience as manager and helper in a household of twenty members. (b) A dietary study covering a period of one month in the above household. VERMILYE, MUMFORD.
- 37f,s,su. HOME CARE OF THE SICK. (a) First aid; communicable diseases; their transmission and prevention; hygiene of infancy, maidenhood, maturity. (b) The care of the sick room; observation and care of the patient; elementary symptomatology. MOORHEAD, FISHER.
- 40s. CHILD TRAINING. Application of modern science in rearing, training, and educating children. Emphasis placed on the physical care of the baby; infant feeding; infant diseases; early training; the obligation of the home; the obligation of the nation. BINZEL, FISHER.
- 42w,s,su. SPECIAL METHODS OF TEACHING HOME ECONOMICS. Curricula, equipment, methods of teaching for home economics. Required of all students preparing to teach. MILLER.
- 43w. ORGANIZATION AND METHODS FOR RELATED ART TEACHING. Organization of a related art course and methods of teaching art principles as applied to familiar objects and processes. H. GOLDSTEIN.
- 45w. HOME ECONOMICS SURVEY. A discussion of the historical development of home economics with special emphasis upon current problems. WEIGLEY.
- 47f,w,s. OBSERVATION AND TEACHING: FOODS AND HOME MANAGEMENT. Observation of teaching in regular classes; criticism and discussion of class practice, lesson plans, methods, results, and examinations; preparation of lesson plans, and directed teaching of foods and cookery, and home management. Those who have completed Course 48 or 49 may register and receive two credits. MILLER, DORSEY, LINDQUIST.
- 48f,w,s. OBSERVATION AND TEACHING: TEXTILES AND CLOTHING. A course similar to 47, but dealing with the teaching of textiles and clothing. Those who have completed Course 47 or 49 may register and receive two credits. CLARA BROWN, BACON, MACCOMBER.
- 49f,w,s. OBSERVATION AND TEACHING: GENERAL HOME ECONOMICS. A combination of 47 and 48 giving the student experience in teaching both fields of work. Required of students in the general teaching

- course. Not open to those with credit in 47 or 48. CLARA BROWN, MILLER.
- 51f,w,s. DRAWING AND DESIGN. Composition, perspective, color theory, and color harmonies applied to costume design and interiors; harmony, balance, rhythm, in line and area design. V. GOLDSTEIN.
- 52f,w. ART HISTORY AND APPRECIATION. The historical development of art, architecture, decoration, furniture and costume, studied with special emphasis on design and influence upon modern styles. H. GOLDSTEIN, V. GOLDSTEIN.
- 53f,w,s. ADVANCED DESIGN. Problems in design for house furnishings and for costume, including dress modeling. H. GOLDSTEIN, V. GOLDSTEIN.
54. INTERIOR DESIGN. Form color and texture as applied to the average home. Wood finishes, backgrounds, floor coverings, hangings, furniture, decorative objects, etc. Problems worked out with actual materials as well as in water-color drawings. (Not offered in 1919-20.)
- 55f,s. DECORATIVE NEEDLEWORK AND OTHER CRAFTS. Applied design in needlework, lace, and appliqué, in problems relating to dress and house furnishings. MORSE.
- 57w. WEAVING AND OTHER CRAFTS. Applied design in two and four harness hand-loom weaving, batik and block printing in problems relating to dress and house furnishing. MORSE.
58. COSTUME DESIGN. Study of the proportions of the human figure; lines and colors for different types of individual; designs rendered in fabrics, pencil technique and water color. (Not offered in 1919-20.)
- 61f,s. LARGE QUANTITY COOKERY AND MARKETING. Application of principles of cookery to large quantity preparation; planning of meals for dining-hall and cafeteria; calculation of cost and calories in standard servings; study of problems involved in purchase of institution supplies. RICHARDS.
- 63f,w,su. INSTITUTIONAL EXPERIENCE. Experience in the minor problems of administration. TREAT, RICHARDS.
- 67w. INSTITUTIONAL MANAGEMENT. Lectures and discussions of the problems involved in institution management; organization; service; institution planning, decoration, and equipment; budgets, and the study of different types of institutions. TREAT.
- 69s. INSTITUTIONAL MANAGEMENT PRACTICE. A continuation of 63 with responsibility for management; field work in different types of institutions. TREAT, RICHARDS.

- 70w. FOOD PREPARATION IN RELATION TO SOCIAL WORK. A study of the principles underlying cookery with special emphasis on the preparation of foods to be used in homes with limited incomes. LINDQUIST.
- 71s. ELEMENTARY DIETETICS FOR THE SOCIAL WORKER. Involves principles underlying adequate feeding. Food habits of different economic and racial groups forming the basis for actual planning and preparation of meals. MUMFORD.
- 72f. HOME MANAGEMENT PROBLEMS. Involves the making of sound budgets. Studies are based upon racial groups and the size of the family together with the income. VERMILYE.

ADVANCED COURSES

- 103f,w,s. DIETETICS. The fundamental principles of human nutrition as applied to the feeding of individuals and groups under conditions of health, and under such pathological conditions as are chiefly dependent upon dietetic treatment. BIESTER.
- 108f,s,su. NUTRITION II. A continuation of 23, including the qualitative examination of blood, bile, milk; urine analysis; metabolism experiments. MUMFORD.
- 109s. ADVANCED NUTRITION. Quantitative methods are applied in studying human metabolism. Opportunity is offered for the individual investigation of selected problems pertaining to metabolism. BIESTER.
- 122f,w. ADVANCED TEXTILES. A more intensive study of textile fibers and fabrics; organization of laboratory problems leading to the establishment of a basis for standardization by the general consumer and for a demand for pure textiles. WELLER.
- 123f,w,s. CLOTHING ECONOMICS. General consideration of the economic problems in clothing production; women's responsibility for conditions in textiles and clothing industries; study of the budget for clothing and household textiles; hygiene and standardization of dress. WELLER.
- 131f,w,s. HOME MANAGEMENT: HOUSE PLANNING AND EQUIPMENT. House planning, house furnishing and equipment and construction and furnishing budgets. Types of domestic architecture; site; floor-plans; building materials; details of construction; heating; ventilating; lighting; plumbing; walls; rugs; furniture; color; hangings; pictures; gardens. MORSE.

HORTICULTURE

Associate Professors WILFRED G. BRIERLEY, LEROY CADY.

COURSES IN HOME ECONOMICS

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
50s	Floriculture.....	3	Soph., jr., sr.	None
56w,s	Plant Propagation.....	2	All	None
71f,s	Landscape Gardening.....	3	Soph., jr., sr.	None
90f,s	General Horticulture.....	3	All	None

For additional courses see the Bulletin of the Courses in Agriculture.

INTRODUCTORY COURSES

- 50s. FLORICULTURE. Instruction is given in a variety of subjects designed to give the student a working knowledge of the culture and uses of common house plants, annuals, perennials, and greenhouse plants. Lectures, reference reading, and laboratory. CADY.
- 56w,s. PLANT PROPAGATION. Methods of propagation of plants by seeds, cuttings, layers, grafting, and budding. The principles of greenhouse management, transplanting, watering, and ventilation. Lectures, reference reading, field and laboratory work. CADY.
- 71f,s. LANDSCAPE GARDENING. A general course in the practice and principles of landscape gardening as applied to the home and community. Lectures and field trips to parks and private grounds. CADY.
- 90f,s. GENERAL HORTICULTURE. A general survey of horticulture with a consideration of the elementary principles of fruit growing, vegetable gardening, floriculture, landscape gardening, and plant propagation. BRIERLEY.

MUSIC

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor CARLYLE SCOTT; Assistant Professor DONALD FERGUSON; Instructors THADDEUS P. GIDDINGS, ABE PEPINSKY, GERTRUDE REEVES, KARL SCHEURER.

General statement.—Credit is offered to students in the College of Agriculture, Forestry, and Home Economics who may wish to elect work in the Department of Music. Nine credits may be obtained. The following courses are recommended:

COURSES				
No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f-2w-3s	Harmony.....	9 ²	Jr., sr.	None
14f-15w-16s	History of Music.....	9 ²	Soph., jr., sr.	None
17f-18w-19s	Appreciation of Music.....	3 ²	Jr., sr.	None
39f-40w-41s	Pianoforte.....	6-12	Jr., sr.	See statement
51f-52w-53s ¹	Violin.....	6-12	Jr., sr.	See statement
75f-76w-77s ¹	Public School Music.....	9 ²	Jr., sr.	None
91f-92w-93s ¹	Orchestra.....	3 ²	Jr., sr.	None

For additional courses see the Bulletin of the College of Science, Literature and the Arts.

¹ Given at the University Farm.

² The full course must be completed before credit will be allowed.

INTRODUCTORY COURSES

- 1f-2w-3s. HARMONY. The study of chords, their construction, relations, and progressions. Written exercises on basses, the harmonization of given melodies. SCOTT.
- 14f-15w-16s. HISTORY OF MUSIC. Some account of primitive systems and of the early Christian modal and harmonic developments, leading to a general survey of musical literature from Bach to the present time. FERGUSON.
- 17f-18w-19s. APPRECIATION OF MUSIC. A non-technical course. REEVES.
- 39f-40w-41s. PIANOFORTE. Open to juniors who have mastered technical difficulties of the degree of Czerny's *School of Velocity* and the easier Haydn and Mozart sonatas. The fee is thirty-two or sixty-four dollars a semester. SCOTT, FERGUSON, REEVES.
- 51f-52w-53s. VIOLIN. Candidate must be able to play the first ten of Kreutzers forty études, and the easier Handel and Mozart sonatas. PEPINSKY, SCHEURER.
- 75f-76w-77s. PUBLIC SCHOOL MUSIC. Preparation for teachers and supervisors of music in public, high, and normal schools. Piano playing, singing, and ready reading prerequisite. Four hours in class and one half day weekly in public school visiting. Practice teaching demanded. GIDDINGS.
- 91f-92w-93s. ORCHESTRA. FERGUSON, PEPINSKY.

PHYSICAL EDUCATION FOR WOMEN

Professor J. ANNA NORRIS; Assistant Professor MAY S. KISSOCK; Instructors GERTRUDE M. BAKER, HELEN A. BARR, VALERIA G. LADD, GERTRUDE B. SCHILL, ALICE H. TOLG.

General statement.—This Department aims primarily to promote the health of the women students. It gives physical examination and advice to all on entrance; plans systematically to keep in close touch with them during their first year in college; conducts yearly consultations with, and examines when necessary, all upper-class students; gives courses in hygiene; organizes physical work to meet the varying needs and physical tastes of students; coöperates closely with the Woman's Athletic Association in encouraging and organizing athletic sports; holds regular office hours for the purpose of consultation with all students who desire its advice.

Work in this Department is required of all newly entering students (See Courses 1-2-3 and 11), of all sophomores who can not pass the swimming examination (See Course 43), and of all students permitted, for reasons connected with their physical condition, to carry less than the

maximum number of credit hours. Physical examinations or consultations required annually of all students.

Elective classes arranged in gymnastics, dancing, swimming, field hockey, basket-ball, baseball, and other organized games.

For a special four-year professional course designed to prepare graduates for the responsible direction of physical education activities see Bulletin of the College of Education.

For a teacher's certificate, minor recommendation, the following elective courses must be taken: 4-5-6, 7-8-9, 13, 16-17-18, 31-32-33, 34-35-36, 43. Course 7-8-9 must be taken in the senior year.

Nine credits are the maximum number that can be gained by taking courses in exercise (Courses 4-5-6, 7-8-9); only one of these courses may be taken for credit in a quarter.

COURSES					
No.	Title	Credits	Offered to	Prereq. courses	
<i>Introductory Courses</i>					
1f-2w-3s ¹	Elementary Physical Training...	None	Required of all new students.	None	
4f-5w-6s ¹	Intermediate Physical Training..	4½	Soph., jr., sr.	1-2-3 or equiv. 53. Permission of director	
7f-8w-9s ¹	Advanced Physical Training....	4½	Jr., sr.	4-5-6, Permission of director.	
11f	Preliminary Hygiene.....	1	Required of all new students	None	
13f	Personal Hygiene.....	3	Soph., jr., sr.	An. Biol. 1-2	
14w	Hygiene of the Family.....	3	Jr., sr.	13, or Med. 3	
16f	Anatomy and Kinesiology.....	3	Sr.	An. Biol. 1-2	
17w	Principles of Gymnastic Exercise.	3	Sr.	4-5-6, 13, 16, 31-32-33, 34-35-36	
18s	Teachers' Course in Play.....	3	Sr.	4-5-6, 13, 31-32-33, 34-35-36	
19f-20w-21s	Rhythmic Expression.....	None	Fr., jr., sr.	None	
22f-23w-24s	Sophomore Rhythmic Expression	None	Soph.	1-2-3	
31f-32w-33s	Folk Dancing and Organized Games.....	None	Fr., jr., sr.	None	
34f-35w-36s	Hockey, Basket-ball, and Base-ball.....	None	Fr., jr., sr.	Permission of director	
37f,s	Sophomore Organized Games...	None	Soph.	1-2-3	
38w	Sophomore Folk Dancing.....	None	Soph.	1-2-3	
40f,w,s	Sophomore Major Sports.....	None	Soph.	1-2-3	
43f,w,s	Sophomore Elementary Swimming.....	None	Soph.	None	
44f,w,s	Sophomore Advanced Swimming.	None	Soph.	1-2-3	
45f,w,s	General Swimming.....	None	Fr., jr., sr.	None	
52f,53w	Sophomore Physical Training...	None	Soph.	1-2-3	

¹ The spring quarter of this course is open to those who have not taken the fall and winter quarters' work.

Any course in exercise may be taken any quarter by obtaining permission of the Department.

INTRODUCTORY COURSES

1f-2w-3s. ELEMENTARY PHYSICAL TRAINING. Lighter forms of gymnastics, orthopedic exercise, folk dancing, indoor and outdoor games.

- Study of daily habits of living. Shower bath fee, \$1 per quarter. KISSOCK, BARR, LADD, TOLG.
- 4f-5w-6s. INTERMEDIATE PHYSICAL TRAINING. Gymnastics, and an election of dancing or a sport. Daily habits of living and written abstracts. If taken for no credit, no reading or written work will be required. Shower bath fee, \$1 per quarter. KISSOCK.
- 7f-8w-9s. ADVANCED PHYSICAL TRAINING. Gymnastics, and an election of dancing or a sport. Written abstracts of prescribed reading. If taken without credit, no reading will be required. Shower bath fee, \$1 per quarter. SCHILL.
- 11f. PRELIMINARY HYGIENE. The most essential aspects of the care of the body. Twelve lectures, assigned readings, written reports. NORRIS.
- 13f. PERSONAL HYGIENE. Care of the personal health; elements of anatomy and physiology. NORRIS.
- 14w. HYGIENE OF THE FAMILY. Eugenics, prenatal care, maternity and infancy, puberty, sex education. (Not offered in 1919-20.) NORRIS.
- 16f. ANATOMY AND KINESIOLOGY. Anatomy of bones, joints and muscles as it applies to muscular exercise. Study of gymnastic positions and movements from the standpoint of anatomy. TOLG.
- 17w. PRINCIPLES OF GYMNASTIC EXERCISE. A study of the aims, purposes, and methods of physical education and the arrangement and progression of gymnastic exercises; technique of teaching and practice teaching within the class group. SCHILL.
- 18s. TEACHERS' COURSE IN PLAY. A study of the various play theories, and play periods of childhood and adolescence, also lectures, discussions and actual practice in the building, care, and administration of playgrounds and the conduct of play. KISSOCK.
- 19f-20w-21s. RHYTHMIC EXPRESSION. A scientific, simple, joyous form of exercise with a definite system of technique based upon nature rhythms, with the object of eliminating physical tension, self-consciousness, and repression. LADD.
- 22f-23w-24s. SOPHOMORE RHYTHMIC EXPRESSION. Shower bath fee, \$1 per quarter. LADD.
- 31f-32w-33s. FOLK DANCING AND ORGANIZED GAMES. Graded games and folk dances for the school and playground. Two hours a week. KISSOCK.
- 34f-35w-36s. HOCKEY, BASKET-BALL AND BASEBALL. Hockey in the autumn, basket-ball in winter, baseball in spring. Two hours a week. KISSOCK.

- 37f,s. SOPHOMORE ORGANIZED GAMES. Suitable in strength for C-D girls. Conducted outdoors when weather permits. Shower bath fee, \$1 per quarter. BARR.
- 38w. SOPHOMORE FOLK DANCING. Twice a week. Shower bath fee, \$1 per quarter. BARR.
- 40f,w,s. SOPHOMORE MAJOR SPORTS. Suitable in strength for A-B girls. Shower bath fee, \$1 per quarter. KISSOCK.
- 43f,w,s. SOPHOMORE ELEMENTARY SWIMMING. For beginners. Shower bath fee, \$1 per quarter. BAKER.
- 44f,w,s. SOPHOMORE ADVANCED SWIMMING. Shower bath fee, \$1 per quarter. BAKER.
- 45f,w,s. GENERAL SWIMMING. For both beginners and advanced swimmers and divers. Shower bath tickets may be bought of the matron. BAKER.
- 52f-53w. SOPHOMORE PHYSICAL TRAINING. Floor work, apparatus and games. Orthopedic and remedial exercise for those not able to take regular class work. Shower bath fee, \$1 per quarter. BARR, SCHILL.

PHYSIOLOGY

MEDICAL SCHOOL

Professors ELIAS P. LYON, FREDERICK H. SCOTT; Associate Professors RICHARD O. BEARD, JESSE F. MCCLENDON; Assistant Professors FRANCIS B. KINGSBURY, CHAUNCEY J. V. PETTBONE; Instructor ESTHER GREISHEIMER.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Course</i>				
3f,w,s,su	Human Physiology.....	5	All	Chem. 10 cred., Biol. 10 cred.
<i>Advanced Courses</i>				
103f,su	Physiology of Muscle, Nerve, Blood, Circulation, and Digestion.....	6	Sr.	Org. Chem., An. Biol.
104w,su	Physiology of the Nervous System and Special Senses.....	6	Sr.	Org. Chem., An. Biol.
110f	Physical Chemistry of Vital Phenomena.....	3	Sr.	An. Biol., 2 courses in Chem.
111w	Electro-Physiology.....	3	Sr.	110
112s	Vitamines.....	3	Sr.	111
153f,w,s,su	Advanced Physiologic Chemistry.....	3	Sr.	102
163s	Metabolism.....	1½ or 3	Sr.	102

INTRODUCTORY COURSES

3f,w,s,su. HUMAN PHYSIOLOGY. Lectures and laboratory. LYON, BEARD, GREISHEIMER.

- 103f,su. PHYSIOLOGY OF MUSCLE, NERVE, BLOOD, CIRCULATION, AND DIGESTION. Fourth-year medical students and others. SCOTT, McCLENDON.
- 104w,su. PHYSIOLOGY OF THE NERVOUS SYSTEM AND SPECIAL SENSES Respiration, metabolism, nutrition, and excretion. Fourth-year medical students and others. LYON, SCOTT, BEARD, McCLENDON.
- 110f. PHYSICAL CHEMISTRY OF VITAL PHENOMENA. Osmotic pressure surface tension, electric conductivity, hydrogen-ion concentration. McCLENDON.
- 111w. ELECTRO-PHYSIOLOGY. The bio-electric currents, negative osmose and further work on hydrogen-ion concentration. McCLENDON.
- 112s. VITAMINES. Physico-chemical conditions necessary for the preservation of the vitamins during the storage and cooking and other preparation of foods. McCLENDON.
- 153f,w,s,su. ADVANCED PHYSIOLOGIC CHEMISTRY. Course arranged by instructors with qualified students for special work. Fourth, fifth, or sixth-year medical students and others; may be taken one or more quarters. PETTIBONE, KINGSBURY.
- 163s. METABOLISM. Lectures and laboratory work on special phases of metabolism. Lectures may be taken alone; number of students unlimited; laboratory course limited to ten students. Fourth-, fifth-, or sixth-year medical students and others. PETTIBONE.

POLITICAL SCIENCE

Professors JEREMIAH S. YOUNG, CEPHAS D. ALLIN; Associate Professor RAYMOND MOLEY; Instructor ALBERT J. LOBB.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f	American Government ¹	5	Soph., jr., sr.	None
7f,w	State and Local Government.....	5	Soph., jr., sr.	1
28s	Business Law ¹	5	Jr., sr.	10 cred. in Pol. Sci. or Econ.
41s	Rural Government.....	3	All	1

For additional courses see the Bulletin of the College of Science, Literature, and the Arts.

¹ Given at the University Farm.

INTRODUCTORY COURSE

- 1f. AMERICAN GOVERNMENT. Organization and actual workings of the national government; nature and origin of the American governmental system. ALLIN.
- 7f,w. STATE AND LOCAL GOVERNMENT. Comparison of American state governments, especially Minnesota; relation of states to the United

States and to local units of government; recent experiments such as initiative and referendum, the recall and primaries; social and economic legislation. MOLEY, LOBB.

28s. BUSINESS LAW. A course in business law (arranged for students in the College of Agriculture, Forestry, and Home Economics) including contracts, agency, mortgages, conveyances, and negotiable instruments. LOBB.

41s. RURAL GOVERNMENT. The organization and functions of towns, school districts, villages and counties; the assessment and taxation of property; road laws; and drainage. LOBB.

PSYCHOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Associate Professors RICHARD M. ELLIOTT, WILLIAM S. FOSTER, HERBERT WOODROW; Assistant Professors MABEL R. FERNALD, KARL S. LASHLEY, JOHN J. B. MORGAN; Instructor FRANCES E. LOWELL.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Course</i>				
1f-2w-3s	General Psychology.....	9 ¹	Soph., jr., sr.	None
<i>Advanced Courses</i>				
101f-102w	Experimental Psychology.....	6	Jr., sr.	1-2-3
103s	Quantitative Psychology	3	Jr., sr.	1-2-3
108w-109s	Advanced General Psychology ...	6	Jr., sr.	1-2-3
114w-115s	Human Behavior.....	6	Jr., sr.	1-2-3
119f-120w	Animal Behavior	6	Jr., sr.	1-2-3
121s	Neuro-Psychology.....	3	Jr., sr.	1-2-3
125f-126w	Differential Psychology	6	Jr., sr.	1-2-3
127s	Social Psychology	3	Jr., sr.	1-2-3
131f-132w-133s	Child Mind.....	9	Jr., sr.	1-2-3
137f-138w	Applied Psychology.....	6	Jr., sr.	1-2-3
144w-145s	Abnormal Psychology.....	6	Jr., sr.	1-2-3

For additional courses see the Bulletin of the College of Science, Literature, and the Arts.

¹ Six credits will be allowed for the first two quarters.

INTRODUCTORY COURSE

1f-2w-3s. GENERAL PSYCHOLOGY. An introductory survey of psychology; its material, fundamental laws, applications, and relations to other sciences. Laboratory experiments provide illustrative material and training in methods. All instructors.

ADVANCED COURSES

101f-102w. EXPERIMENTAL PSYCHOLOGY. A laboratory course of standard experiments in the analysis and measurement of mental phenomena. WOODROW.

- 103s. QUANTITATIVE PSYCHOLOGY. Psychophysics and the theory of mental measurement. WOODROW.
- 108w-109s. ADVANCED GENERAL PSYCHOLOGY. A systematic presentation of the laws of mental activity. FOSTER.
- 114w-115s. HUMAN BEHAVIOR. An analysis from the point of view of the objective school of psychologists. ELLIOTT.
- 119f-120w. ANIMAL BEHAVIOR. The development of reaction-system in animals, with emphasis upon the application of studies of animals to the solution of general problems in physiological psychology. LASHLEY.
- 121s. NEURO-PSYCHOLOGY. Specialization of function in the nervous system in relation to behavior. Discussion from the standpoint of psychology of current theories of integration and localization. LASHLEY.
- 125f-126w. DIFFERENTIAL PSYCHOLOGY. The important distinguishing characteristics (psychological) of individuals and of groups. Emphasis on experimental and statistical methods of discovering differences and of making comparisons. Each student participates in investigation of definite problems and analysis of results. FERNALD.
- 127s. SOCIAL PSYCHOLOGY. A study of the dependence of familiar forms of social organization and behavior upon the fundamental laws of mental activity. The adjustment of the innate mental equipment of the individual to the forms of social groups. FERNALD.
- 131f-132w-133s. CHILD MIND. General intelligence and special mental abilities; their development and their relation to heredity, physiological factors, education, speech defects, and delinquency. LOWELL.
- 137f-138w. APPLIED PSYCHOLOGY. A survey of the application of psychology, with especial reference to business. MORGAN.
- 144w-145s. ABNORMAL PSYCHOLOGY. A systematic review of psychopathology in relation to normal behavior. MORGAN.

PUBLICATIONS AND RURAL JOURNALISM

Associate Professor WILLIAM P. KIRKWOOD; Assistant Professor NORMAN J. RADDER.

General statement.—The aim of this Division is to give practical training in rural and in agricultural journalism. The work in rural journalism includes the editing and managing of the country newspaper. The work in agricultural journalism covers writing for the rural press, for the agricultural press, bulletin writing, and agricultural publicity.

COURSES IN HOME ECONOMICS

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
13f,w,s-14w,s,f-15s,f,w	Reporting	9 ¹	Soph., jr., sr.	Rhet. 1 yr.
16f-17w	Copy Reading	6	Jr., sr.	13-14-15

For additional courses see the Bulletin of the Courses in Agriculture.

¹ Six credits will be given for the completion of the first two quarters.

INTRODUCTORY COURSE

13f,w,s-14w,s,f-15s,f,w. **REPORTING.** Organization, methods, and material in newspaper production; forms of newspaper stories; methods of gathering and writing news; laboratory practice by assignments on University publications. **RADDER.**

16f-17w. **COPY READING.** Study and practice in editing copy for the newspaper and in writing headlines. Laboratory practice. **RADDER.**

RHETORIC

Assistant Professor **ROBERT C. LANSING**; Instructors **ESTELLE COOK**, **GEORGE G. GLICK**, **RUTH MOHL.**

General statement.—Rhetoric credits will not be granted officially until the close of the second quarter of the senior year.

Any instructor who finds that a student is deficient in English will submit the name of the student together with the evidence to the Chairman of the Students' Work Committee. If the evidence warrants, the Committee will send the student to the Section of Rhetoric for such additional work in English as is needed. This work the student must take, without credit, to validate his freshman and sophomore Rhetoric credits.

Students whose work in the Rhetoric courses shows at any time an inadequate knowledge of the conventions of English will be required to drop the course and enter a class in elementary rhetoric. These students will be required to complete twenty-two credit hours in Rhetoric.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f,w,s	Rhetoric I	3	All	None
2f,w,s	Rhetoric II	3	All	1
3f,w,s	Rhetoric III	3	All	2
4f,w,s	Elementary Rhetoric	3	All	None
11f,w,s	Argumentation	5	Soph., jr., sr.	3
22f,w,s	Public Speaking	5	Soph., jr., sr.	3
24f,w,s	Adv. Public Speaking	3	Soph., jr., sr.	22
25f,w,s	Fundamentals of Effective Speaking	3	Soph., jr., sr.	3

INTRODUCTORY COURSES

1f,w,s. **RHETORIC I.** Note-taking, gathering and organizing material, oral and written exposition, paragraph structure, supplementary reading. **LANSING, MOHL.**

- 2f,w,s. RHETORIC II. Sentence structure, exposition and argumentation, supplementary reading. LANSING, MOHL.
- 3f,w,s. RHETORIC III. Description, narration, diction, supplementary reading. LANSING, MOHL.
- 4f,w,s. ELEMENTARY RHETORIC. Elementary grammatical and rhetorical principles. MOHL.
- 11f,w,s. ARGUMENTATION. Gathering evidence, reasoning, briefing, formal and informal argument, persuasion, debating. LANSING, GLICK, MOHL.
- 22f,w,s. PUBLIC SPEAKING. A practical course in fundamentals of speech-making. Rules of order and practice in conducting assemblies included. GLICK.
- 24f,w,s. ADVANCED PUBLIC SPEAKING. A course in preparing and delivering occasional addresses and informal lectures. GLICK.
- 25f,w,s. FUNDAMENTALS OF EFFECTIVE SPEAKING. The fundamental principles of voice production, articulation, gesture, platform deportment and expression. COOK.

ROMANCE LANGUAGES

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor EVERETT W. OLMSTED; Associate Professor RALPH E. HOUSE; Assistant Professors FRANCIS B. BARTON, JULES T. FRELIN, RUTH S. PHELPS, EDWARD H. SIRICH; Professorial Lecturer PEDRO HENRIQUEZ URENA; Instructors HERBERT E. CLEPTON, SOLOMON M. DELSON, MARGUERITE GUINOTTE, SAMUEL VASCONCELOS.

COURSES

No.	Title	Credits	Offered to	Prerequisites
<i>Introductory Courses</i>				
4f,w,s-5w,s,f	Beginning French	10 ¹	All	None
7f,w,s-8w,s,f	Intermediate French	10 ¹	All	4-5 or 2 yrs. H. S.
13f-14w-15s	Survey of French Literature	9 ¹	All	7-8 or 3 yrs. H. S.
16f-17w-18s	Elementary French Conversation	3 ¹	All	7-8 or 3 yrs. H. S.
19f-20w-21s	Elementary French Composition	3 ¹	All	7-8 or 3 yrs. H. S.
31f,w,s-32w,s,f	Beginning Spanish	10 ¹	All	None
34f,w,s-35w,s,f	Intermediate Spanish	10 ¹	All	31-32 or 2 yrs.H.S.
37f-38w-39s	Survey of Spanish Literature	9 ¹	All	34-35 or 3 yrs.H.S.
40f-41w-42s	Elementary Spanish Conversation	3 ¹	All	34-35 or 3 yrs.H.S.
43f-44w-45s	Elementary Spanish Composition	3 ¹	All	34-35 or 3 yrs.H.S.

For additional courses see the Bulletin of the College of Science, Literature, and the Arts.

¹ The full course must be completed before credit will be allowed.

FRENCH

- 4f,w,s-5w,s,f. BEGINNING FRENCH. Pronunciation, grammar, oral exercises, translation. FRELIN, DELSON, GUINOTTE.
- 7f,w,s-8w,s,f. INTERMEDIATE FRENCH. Review of grammar, connected prose composition, conversation, and reading of representative authors. FRELIN, CLEFTON, GUINOTTE.
- 13f-14w-15s. SURVEY OF FRENCH LITERATURE. This course will outline the history of French literature from 1600 to present day, and is prerequisite for the courses devoted to special periods. Representative texts will be read. SIRICH, PHELPS, CLEFTON.
- 16f-17w-18s. ELEMENTARY FRENCH CONVERSATION. A small amount of outside preparation will be required. BARTON, FRELIN, GUINOTTE.
- 19f-20w-21s. ELEMENTARY FRENCH COMPOSITION. BARTON, FRELIN, GUINOTTE.

SPANISH

- 31f,w,s-32w,s,f. BEGINNING SPANISH. Pronunciation, grammar, oral exercises and translation. OLMSTED, HENRIQUEZ, VASCONCELOS.
- 34f,w,s-35w,s,f. INTERMEDIATE SPANISH. Review of grammar, conversation, connected prose composition, and reading of representative authors. HOUSE, VASCONCELOS.
- 37f-38w-39s. SURVEY OF SPANISH LITERATURE. An outline of the history of Spanish literature from 1500 to the present day, based upon texts and collateral reading. Prerequisite for courses devoted to special periods. HOUSE.
- 40f-41w-42s. ELEMENTARY SPANISH CONVERSATION. A small amount of outside preparation will be required. VASCONCELOS.
- 43f-44w-45s. ELEMENTARY SPANISH COMPOSITION. VASCONCELOS.

SOCIOLOGY AND SOCIAL WORK

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors ARTHUR J. TODD, ALBERT E. JENKS; Associate Professors LUTHER L. BERNARD, MANUEL C. ELMER; Assistant Professors ROSS L. FINNEY, GUSTAF A. LUNDQUIST; Lecturers FRANK J. BRUNO, OTTO W. DAVIS, ARTHUR H. TAYLOR, EDWARD F. WAITE; Superintendents of State Board of Control Institutions; Teaching Fellow ALMENA DAWLEY; Supervisor of Field Work CAROLINE BEDFORD.

DESCRIPTION OF COURSES

55

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1f,w,s ²	Introduction to Sociology.....	3 or 5	Soph., jr., sr.	None
6w	Modern Social Reform Movements..	3	Soph., jr., sr.	1
14f,w	Rural Sociology.....	3	Jr., sr.	1 ¹
51f	Background for Dependency and Defectiveness.....	3	Jr., sr.	1
52w	Treatment of Dependents and Defectives.....	3	Jr., sr.	51
53f	Treatment of Delinquents.....	3	Jr., sr.	1. Psychol. 1-2-3 recommended
54s	Child Welfare.....	3	Jr., sr.	51 or 52
55f	Housing Problems.....	3	Jr., sr.	1
99f,w,s	Supervised Field Practice Work.....	3	Jr., sr.	Director's consent
<i>Advanced Courses</i>				
101w	Social Organization.....	3	Jr., sr.	3 courses, 1 of which may be in Psychol., Philos., Econ., or Pol. Sci.
102w	Social Control.....	3	Jr., sr.	Same as for 101.
104f	State Care of Dependents, Defectives, and Delinquents in Minnesota....	3	Jr., sr.	51, and 52 or 53
108f	Social Psychology.....	3	Jr., sr.	1 and Psychol. 1-2-3
110w	Community Organization and Social Work in Small Towns.....	2	Jr., sr.	2 courses
114s	Rural Social Institutions.....	3	Jr., sr.	14
119w	The Family.....	3	Jr., sr.	3 courses one of which may be in H. E., Econ., Pol. Sci., Amer. and Anthropol. or Law
120s	Social Progress.....	3	Jr., sr.	3 courses one of which may be in Econ., Pol. Sci., Educ., or Philos
121w	Methods of Social Investigation.....	3	Jr., sr.	3 courses
128s	Charitable Administration, Finance, and Publicity.....	2	Jr., sr.	3 courses
130s	Technique of Family Treatment.....	2	Jr., sr.	51, 52, and one other
132s	Juvenile Courts and Probation.....	2	Jr., sr.	51, 52, 53
133f-134w-135s	Hospital Social Service.....	3	Jr., sr.	Director's consent
137f-138w-139s	Mental Case Work.....	6	Jr., sr.	Director's consent
140s	History of Social Theory.....	3	Jr., sr.	Same as for 101

For additional courses see the Bulletin of the College of Science, Literature, and the Arts.

¹No prerequisite for seniors in the College of Agriculture, Forestry, and Home Economics.

²A three-credit course, open only to students in Agriculture, Forestry and Home Economics will be offered at University Farm in the fall quarter.

INTRODUCTORY COURSE

- 1f,w,s. INTRODUCTION TO SOCIOLOGY. Origin and development of human societies; various agencies which have determined the type of social life; social organization, institutions, and progress; bearing of sociology upon other social sciences and arts. Same as Amer. and Anthropol. 1. TODD, JENKS, BERNARD, ELMER, FINNEY, LUNDQUIST.
- 6w. MODERN SOCIAL REFORM MOVEMENTS. A survey of attempts to overcome certain social maladjustments; child labor, the city, bad housing, poverty, degeneracy; movements for public health, industrial democracy, social insurance, protection of infancy and youth, public recreation, etc. TODD, ELMER, FINNEY.
- 14f,w. RURAL SOCIOLOGY. The background and evolution of country life; rural conveniences, communication, coöperation; rural social institutions, especially the family, school, church and social center; rural leadership, surveys, organization, social agencies. BERNARD, LUNDQUIST.
- 51f. THE BACKGROUND OF DEPENDENCY AND DEFECTIVENESS. This course considers the conditions in contemporary industrial societies out of which the social problems of the dependent and defective arise. BRUNO.
- 52w. TREATMENT OF DEPENDENTS AND DEFECTIVES. This course reviews the methods used or advocated for the prevention and alleviation of poverty and defectiveness. BRUNO.
- 53f. TREATMENT OF DELINQUENTS. The causes of crime; nature of the criminal; criminal procedure; methods of treatment (prisons, reformatories, parole, probation); the juvenile offender; juvenile courts; preventive methods. TODD.
- 54s. CHILD WELFARE. Study of social obligations to the child; development of the child-saving movement in the United States; infant and child mortality, recreation, education; courts, institutions, societies, and other public efforts for the child. TAYLOR.
- 55f. HOUSING PROBLEMS. An examination of housing evils and their causes; the various movements for the prevention or improvement of bad housing; town planning; garden cities. Lectures, readings, field work, and essay. DAVIS.
- 99f,w,s. SUPERVISED FIELD PRACTICE WORK. This is a course in technique open only to selected students who have taken or are taking Courses 51, 52, 53, 54, 55, 110, 130 or 132. Three credits throughout the year. Time and place arranged. BEDFORD.

ADVANCED COURSES

- 101w. SOCIAL ORGANIZATION. The organization and structure of social groups; the selection of group types and values; the disorganization

and reorganization of institutions; purposive social organization. BERNARD.

- 102w. SOCIAL CONTROL. Nature, purpose and methods of social control; institutional and non-institutional controls; the evolution of sanctions in social control; the revision of the social controls under the influence of modern science. BERNARD.
- 104f. STATE CARE OF DEPENDENTS, DEFECTIVES, AND DELINQUENTS IN MINNESOTA. Organization, machinery, and function of such institutions as the state hospitals, asylums, training schools, prison, schools for the feeble-minded, the blind, and the deaf. Lectures and readings. TODD and Specialists from the Board of Control and institutions studied.
- 108f. SOCIAL PSYCHOLOGY. (Primarily for sociology students). The social attitudes; their development and modification under social pressures, the interactions of individuals and groups. BERNARD.
- 110w. METHODS OF COMMUNITY ORGANIZATION AND SOCIAL WORK IN SMALL TOWNS AND COUNTRY. Concrete problems and methods are emphasized. BERNARD.
- 114s. RURAL SOCIAL INSTITUTIONS. A detailed study of the problems of organization and efficiency of selected rural institutions, especially religious, educational, civic, and recreational. For advanced students. Lectures, discussion, reports. LUNDQUIST.
- 119w. THE FAMILY. The evolution of the family; its various forms and their relation to other social institutions; the service of the family in social evolution; contemporary problems of the family (standards of living, birth rate, feminism, etc.). TODD.
- 120s. SOCIAL PROGRESS. A study of the basis for social progress in human nature; analysis of fundamental social institutions with regard to their contributions to human advance; necessary social readjustments to convert drift into progress. TODD.
- 121w. METHODS OF SOCIAL INVESTIGATION. Methods of gathering and presenting community facts; social statistics; social surveys. Lectures, problems, and field work. ELMER, DAWLEY.
- 128s. CHARITABLE ADMINISTRATION, FINANCE, AND PUBLICITY. A technical study of methods of organizing charitable agencies, of financing them, and of making the public aware of their work. Lectures and practice work. DAVIS.
- 130s. TECHNIQUE OF FAMILY TREATMENT. An intensive study of social case work as the basis of practical dealing with problems of dependency and delinquency. Lectures and conferences. BRUNO.

- 132s. JUVENILE COURTS AND PROBATION. Primarily a course in probation practice work, but prefaced by lectures on the social and legal aspects of the juvenile court and probation. TODD, WAITE.
- 133f-134w-135s. HOSPITAL SOCIAL SERVICE. A course open to students who are properly grounded in case work and who wish to specialize in this field., TEBBETS.
- 137f-138w-139s. MENTAL CASE WORK. Specialized social case work with mentally abnormal and subnormal persons. Clinical material from the psycho-educational clinic, psychiatric clinics, and University dispensary. (Registration only with consent of the Director.) FERNALD, DAWLEY.
- 140s. HISTORY OF SOCIAL THEORY. A rapid survey of the leading social theories from the time of the Greeks, with special reference to the development of sociology in the nineteenth century. The theories are related to their social backgrounds. BERNARD.

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