

*The Bulletin*  
*of the University of*  
*Minnesota*

*General Information*  
*For the Year 1917-1918*



**Classes For the Year 1917-18  
Will Begin October 10th.**

*Catalog Series No. 3*  
*Vol. XX, No. 10, May 9, 1917*

*Entered at the post-office*  
*in Minneapolis as second-class matter*  
*Minneapolis, Minnesota*

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

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The Bulletin comprises—

*Catalog Series.* Containing 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, etc.

*General Series.* Containing announcements of departments of instruction, reports of University officers, etc.

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 Series.* 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

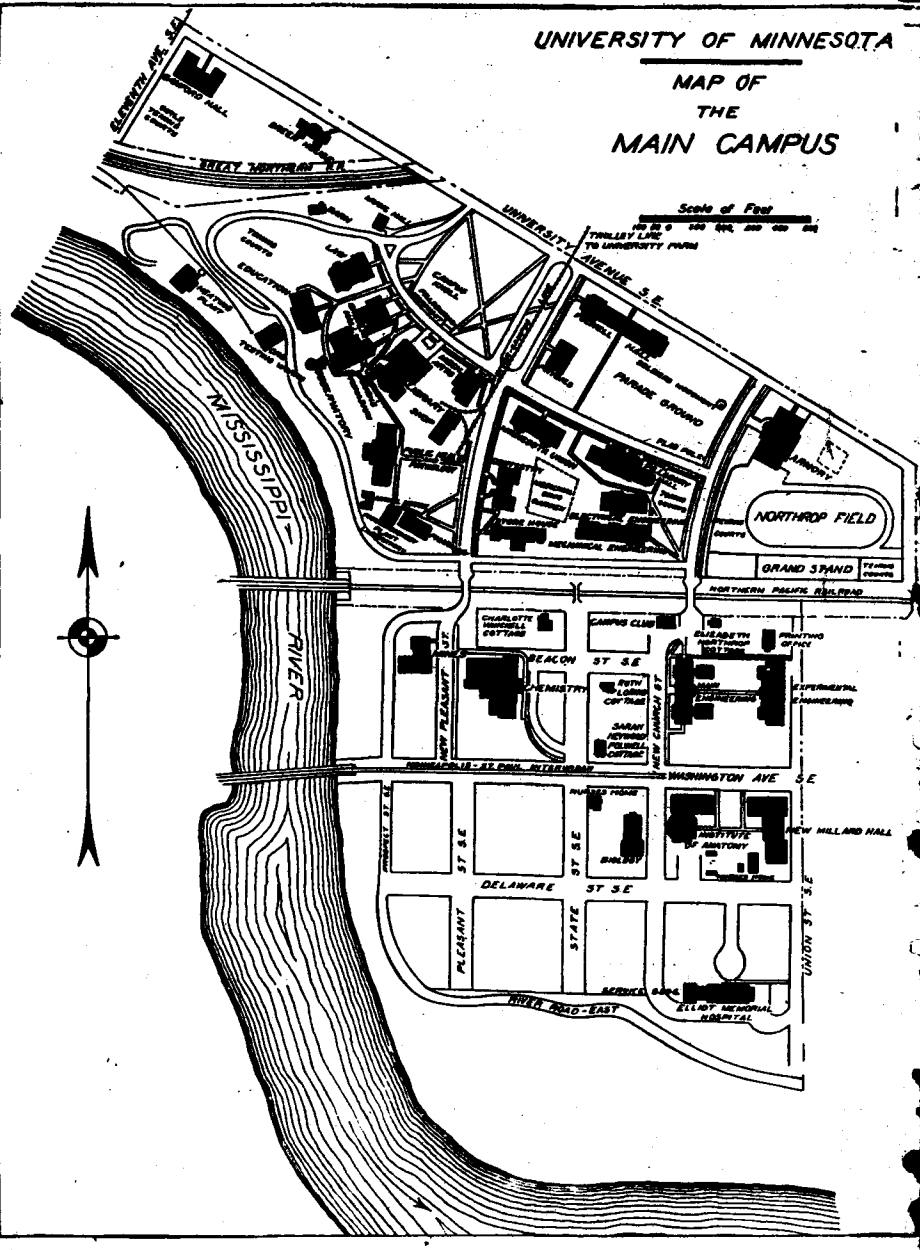
The LIBRARIAN,  
The University of Minnesota,  
Minneapolis, Minnesota.

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UNIVERSITY OF MINNESOTA

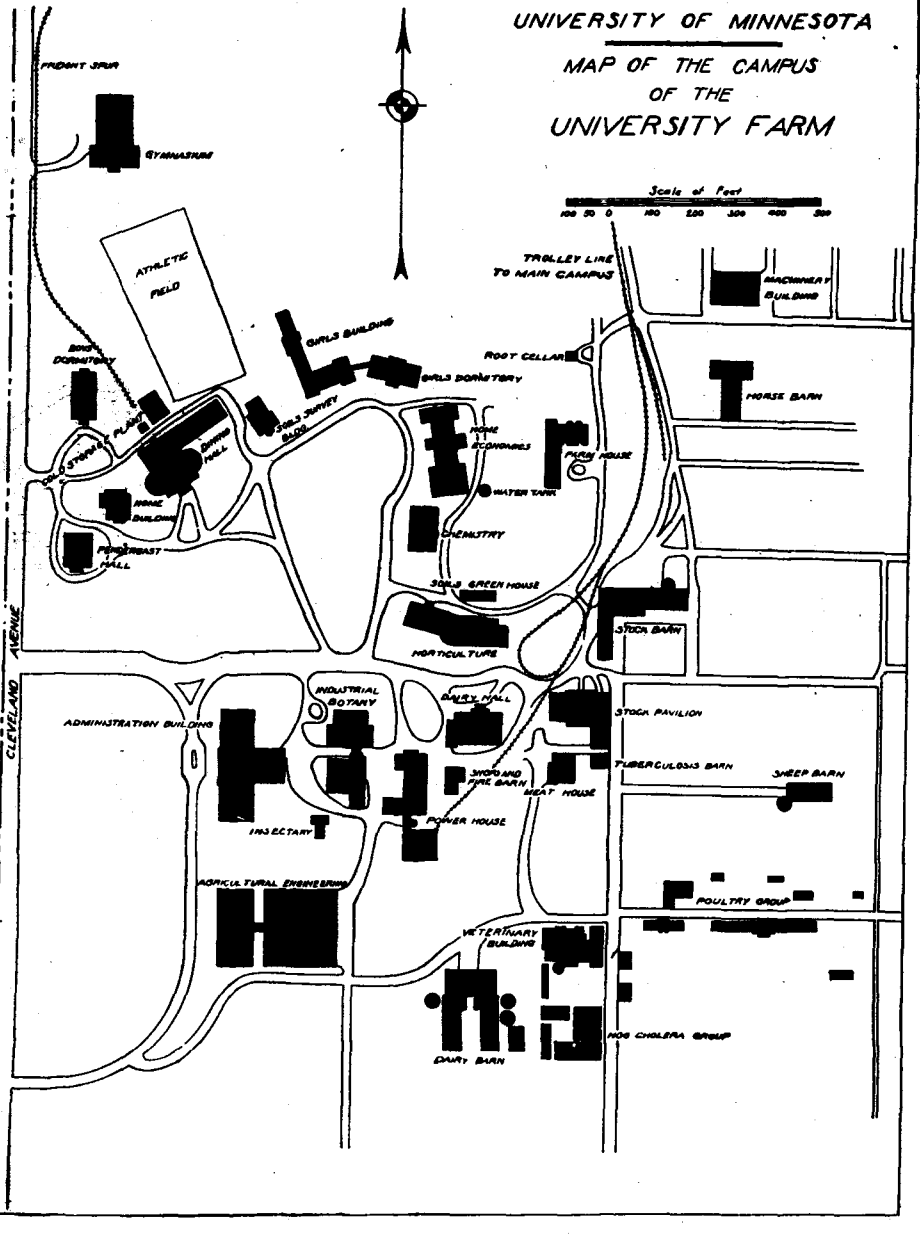
MAP OF  
THE  
MAIN CAMPUS



Area of Main Campus, 108.5 acres

UNIVERSITY OF MINNESOTA

MAP OF THE CAMPUS  
OF THE  
UNIVERSITY FARM



Area of University Farm, 422.56 acres

1917							1918														
JULY							JANUARY							JULY							
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# UNIVERSITY CALENDAR

1917-1918

1917			
September	12	Wednesday	Registration closes for all students
September	12-19	Week	Fees payable for all students
September	18-25	Week	Examinations for removal of conditions (except for Colleges of Agriculture and Forestry), and entrance examinations
September	26	Wednesday	First semester begins
October	1	Monday	Agricultural College, farm experience examinations
October	1	Monday	First semester evening classes begin
October	1	Monday	School of Agriculture, first term begins
October	18	Thursday	Senate meeting, 4:00 p.m.
November	5	Monday	Dairy School opens
November	21	Wednesday	Medical School second quarter begins
November	28	Wednesday	Thanksgiving recess begins 9:00 p.m.
December	1	Saturday	Dairy School closes
December	3	Monday	Thanksgiving recess ends 8:00 a.m.
December	3-8	Week	Second semester condition examinations, Colleges of Agriculture and Forestry
December	3-8	Week	Short course for ice-cream makers
December	20	Thursday	Senate meeting, 4:00 p.m.
December	21	Friday	School of Agriculture, first term closes
December	21	Friday	Christmas vacation begins 9:00 p.m.
1918			
December	31	Week	Farmers' and Home Makers' Week
January	5	Week	Short Course
January	2	Wednesday	Christmas vacation ends 8:00 a.m.
January	2	Wednesday	School of Embalming begins, eight weeks' session
January	8	Tuesday	School of Agriculture, second term begins
January	23	Wednesday	Second semester registration closes
January	25	Friday	First semester evening classes close
January	28	Monday	Final examinations begin
January	30	Wednesday	Payment of fees for second semester closes
February	4	Monday	Second semester evening classes begin
February	4-9	Week	Merchants' Short Course

February	11	Monday	Merchants' Short Course (three weeks) begins
February	6	Wednesday	Second semester begins
February	12	Tuesday	Lincoln's Birthday; a holiday
February	21	Thursday	Senate meeting, 4:00 p.m.
February	22	Friday	Washington's Birthday; a holiday
March	2	Saturday	Merchants' Short Course (three weeks) closes
March	27	Wednesday	School of Agriculture closes
March	28	Thursday	Easter recess begins 9:00 p.m.
April	1-6	Week	Boys' and Girls' Week
April	3	Wednesday	Easter recess ends 8:00 a.m.
April	10	Wednesday	Medical School fourth quarter begins
April	8-13	Week	Condition examinations in certain colleges
April	30	Tuesday	Traction Engineering Short Course begins
May	16	Thursday	Senate meeting, 4:00 p.m.
May	25	Friday	Second semester evening classes close
May	30	Thursday	Memorial Day; a holiday
May	31	Friday	Traction Engineering Short Course closes
June	1	Saturday	Final examinations begin 2:00 p.m.
June	8	Saturday	Second semester closes
June	9	Sunday	Baccalaureate service
June	10	Monday	Senior Class Day exercises
June	12	Wednesday	Alumni Day
June	13	Thursday	Forty-sixth Annual Commencement
June	14	Friday	Summer vacation begins
June	17	Monday	Summer Session begins

The University year for 1918-19 will begin Tuesday, September 17. Classes will begin September 25.

*Program of Entrance Examinations 1917-1918*

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. 18	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. 19	9 a.m.	Astronomy, Botany, Geology, Chemistry, Physiography, Zoology, Physics, Physiology



Wednesday,	Sept. 19	2 p.m.	American Government, History, Economics, Commercial Geography, History of Commerce, Economic History of England, Economic History of the United States
Thursday,	Sept. 20	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 to 12 to give information and advice.

#### *Condition Examinations*

Examinations for the removal of conditions are given at no other times than (1) the week following the Easter recess, (2) the registration week in September, and (3) the week following the Thanksgiving recess, for students in the Colleges of Agriculture and Forestry.

The examinations in second-semester courses are given in the September period and those in first-semester courses are given after the Easter recess or in September, or at both times, as each school or college may determine. No student may take more than one examination to remove a condition.

Examination schedules for the respective schools and colleges may be secured at the Registrar's office.

## 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

THE COLLEGE OF FORESTRY, including—

FOREST EXPERIMENT STATIONS AT ITASCA AND CLOQUET

THE CENTRAL SCHOOL OF AGRICULTURE, UNIVERSITY FARM

THE NORTHWEST SCHOOL OF AGRICULTURE, CROOKSTON

THE WEST CENTRAL SCHOOL OF AGRICULTURE, MORRIS

THE EXPERIMENT STATIONS, including—

THE MAIN STATION, ST. ANTHONY PARK

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 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 ANALYTICAL AND APPLIED CHEMISTRY

THE COLLEGE OF EDUCATION

THE GRADUATE SCHOOL

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
*GEORGE EDGAR VINCENT, Minneapolis	- - - - - <i>Ex officio</i>
The President of the University	
†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. C. G. SCHULZ, St. Paul	- - - - - <i>Ex officio</i>
The 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

- \*GEORGE EDGAR VINCENT, Ph.D., LL.D., President
- †MARION LEROY BURTON, D.D., Ph.D., LL.D., President
- ERNEST B. PIERCE, B.A., Registrar
- GEORGE H. HAYES, University Comptroller and Secretary of the Board of Regents
- JAMES T. GEROULD, B.A., Librarian
- JOHN B. JOHNSTON, Ph.D., Dean of the College of Science, Literature, and the Arts
- EDWARD E. NICHOLSON, M.A., Assistant Dean of the College of Science, Literature, and the Arts
- ....., Dean of the College of Engineering and Architecture
- ....., Dean and Director of the Department of Agriculture
- EDWARD M. FREEMAN, Ph.D., Assistant Dean of the Department of Agriculture
- 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

\* Term of office expires June 30, 1917.

† Term of office begins July 1, 1917.

WILLIAM R. APPLEBY, M.A., Dean of the School of Mines  
 FREDERICK J. WULLING, Phm.D., LL.M., Dean of the College of Pharmacy  
 GEORGE B. FRANKFORTER, 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  
 RICHARD R. PRICE, M.A., Director of University Extension  
 ....., Dean of Women

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# 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 within 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.

*Business Education.*—This is a four-year course designed to give training for positions of responsibility in the modern business world. The first two years are devoted to foundation subjects including geography, history, and the principles of economics and accounting. It is the aim of the later years to give professional training and develop appreciation of the moral and social values and responsibilities in the conduct of business.

*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 especial attention to history, economics, political science, and sociology. The fifth year is devoted to technical subjects with professional training in social work. The B.A. 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.

In this college are given also the first two or three years of the combined courses leading to the degrees of Bachelor of Science or Bachelor of Arts and Doctor of Medicine; the two years of college work required for entrance to the Law School; and various non-professional subjects required in other schools and colleges of the University.

*Journalism.*—See College of Agriculture.

*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 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 serve to fit men for the particular fields anticipated. 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* 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 and 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, and a special teachers' course in Textiles and Clothing.

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.

*Journalism.*—Courses in Journalism, including Reporting, Copy-reading, Editorial-writing and Administration, Business Administration, Rural and Agricultural Journalism, are offered by the College of Agriculture. These courses are open to students in the College of Science, Literature, and the Arts, also.

*The College of Forestry* offers four-year courses leading to the degree of Bachelor of Science. The work 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 also controls a Forest Experiment Station at Cloquet, which offers a good field for graduate students and original research. Provision is made for graduate work in all the various lines of silviculture and utilization.

*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 School* offers a five-weeks' course of practical instruction

in dairying, especially designed for those who are actually engaged in the manufacture of butter and cheese. (November and December.)

*The Dairy Short Course* consists of five weeks of practical instruction in dairying, especially designed for those who are actually engaged in the manufacture of butter and cheese. The beginners' course continues for four weeks, an advanced course being offered in addition during the last two weeks, followed immediately by an ice-cream course of one week.

*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. (May.)

*The Rural Life Short Course* of one week is held in July and is devoted to the educational, social, civic, religious, moral, sanitary, and economic betterment of life in the country.

*The Editors' Short Course*, held in February, 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 the first week 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 College of Agriculture. Its object is the solution of agricultural problems of importance in Minnesota. It offers secondarily educational and research advantages to undergraduate and graduate students of the College of Agriculture. 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.

*The Extension Work* of the Department of Agriculture is correlated with the Farmers' Institute work and aims to bring to the farmers of the state information leading to the improvement of the farm and home. It reaches farmers by 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 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* is the only institution giving medical instruction in the state of Minnesota.

Admission to the Medical School is had through the College of Science, Literature, and the Arts of this or other recognized University.

All students are required to secure the B.S. or B.A. degree before receiving the degree of Doctor of Medicine. 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 24); (b) two years in the scientific department of the Medical School. At the end of this period the B.S. degree is granted; (c) two years in the practical or clinical department 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 eight weeks. 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, organized in connection with the University Hospital service, is under the control of the Faculty of the Medical School. It offers a three-year course, the first six months occupied in preliminary study in the Medical School, in the School of Chemistry, and in the hospital service; the remaining two and one-half years in residence and in hospital and out-patient training.

5. Graduate and research work is offered to qualified students. (See page 16.)

*The College of Dentistry* offers a four-year course of study, of nine months each, leading to the degree of Doctor of Dental Surgery.

The University offers an optional six-year course of study leading to the degrees of Bachelor of Arts 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 Metal-



lurgy, leading to the degrees of Engineer of Mines (E.M.), Engineer of Mines (in Geology) [E.M. (Geology)], and Metallurgical Engineer (Met.E.), respectively.

Students with satisfactory preparation in Elementary and Higher Algebra and Plane and Solid Géometry may graduate in four years. Students presenting high-school credentials to the extent indicated on page 26 may graduate in five years.

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 part of the curriculum and is required of all students who are candidates for degrees.

*The College of Pharmacy* has discontinued its two-year course. Its regular and shortest course now extends over three years and leads to the degree Pharmaceutical Chemist (Phm.C.) A four-year course leading to the degree 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 Analytical and Applied Chemistry* offers three courses. Two of these, the Analytical and the five-year course in Arts and Chemistry, are designed for those who wish to become teachers of chemistry, analysts, and investigators. The four-year Analytical Course 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.

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. 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-years' course of study, beginning with the junior year, leads to the degree of Bachelor of Arts in Education. 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 and Doctor of Philosophy, Master of Science, and Doctor of Science. 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 by the Medical School and the Mayo Foundation for medical education and research, jointly. The degrees of B.S. and M.D. and one year of intern service in an acceptable hospital are prerequisites of registration. A number of fellowships and scholarships are provided for selected students undertaking graduate courses in chosen specialties in medicine. These courses cover a period of three years and lead to the degree of D.S.

The University Summer Session is organized for six weeks 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 credits at one session, except by special permission.

On the main campus, courses are offered in the Colleges of Science, Literature, and the Arts, Education, Engineering, and Dentistry, and the Medical School. At the College of Agriculture 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. A special circular of summer work will be sent upon request.

*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 of the University functions in two main lines, 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.

## ADMISSION

### GENERAL REQUIREMENTS

Admission to the colleges or schools of the University which accept students direct from the high school is either by certificate or examination, or both. 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. The Registrar may, however, authorize substitutions in the list of required subjects to the extent of one unit in case the candidate did not have an opportunity to take all the required subjects, unless otherwise stated in the requirements of the individual college or school.

Freshman students will be admitted at the opening of the second semester in February in the Colleges of Science, Literature, and the Arts, Agriculture, and Forestry. All other students admitted at this time must present credentials of advanced standing from other colleges showing their qualification to continue the second semester's work.

Under List of Entrance Subjects is shown the minimum and maximum number of units of any one subject that will be accepted by any college of the University. For a statement of the specific units required in any subject or group, see Requirements of Individual Colleges, pages 21-27.

#### ADMISSION BY EXAMINATION

Entrance examinations are offered at the University during the opening week, September 18 to 25. Candidates entering by this method must pass examinations 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 satisfies 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, page 20.

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 28-30.

#### 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.

All students are required to have their registration completed two weeks before classes begin, and fees paid one week before such time. Blanks for the purpose are mailed from the Registrar's office in ample time. Those not receiving the material by September 1<sup>st</sup> should notify the Registrar at once. See calendar, page 7, and penalty fees, page 38.

#### LIST OF ENTRANCE SUBJECTS

The term *unit* means not less than five recitations of forty minutes each a 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

###### Greek—

- Grammar, one unit
- Anabasis, four books, one unit

###### German—

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

###### French—

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

\* Three units will satisfy the English requirement in the Colleges of Engineering and Dentistry and the Schools of Mines and Chemistry, and, when the applicant presents four units in one foreign language or two units in each of two foreign languages, will suffice for the other colleges.

Spanish—

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

Scandinavian Languages—

- 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

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

Social Sciences—

- American Government, one-half or one unit

Economic History of the United States, one-half unit

GROUP D: MATHEMATICS

- Elementary Algebra, one unit
- Plane Geometry, one unit
- Higher Algebra, one-half unit

Solid Geometry, one-half unit

Trigonometry, 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

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 (three in Engineering) 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 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. *Academic-Medical Course*

Same as 1 above, except that two units of Latin are required.\*

3. *Academic-Law Course*

Same as 1 above.

4. *Arts and Music Course*

Same as 1 above, also certificate from the Department of Music showing that the applicant is qualified to pursue the courses offered.

5. *Arts and Chemistry Course, five years*

Same as 1 above.

6. *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, 2, 3, or 105, Rhetoric 1-2, or Psychology 1-2 or 5.

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.

This does not include those students of any of the above classes who substitute for the more advanced work of certain courses specialized work in preparation for elementary teaching.

7. *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 semester.

## COLLEGE OF ENGINEERING AND ARCHITECTURE

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

1. English, three units.

2. Mathematics: Elementary Algebra, one unit; Plane Geometry, one unit; Higher Algebra, one-half unit, and Solid Geometry, one-half unit.

\* The Latin does not become essential until the student has completed the two years of pre-medical work, but as the University does not teach the first two years of Latin, the student without this preparation would have to secure the training outside, with considerable inconvenience.

3. Chemistry, one unit.

4. Enough additional work to make in all fifteen units of which not more than three may be in Group F.

One unit may be accepted in lieu of one unit from the above required subjects; but if this be offered as a substitute for Mathematics or Chemistry the resulting deficiency must be removed as hereinafter provided.

Should the deficiency occur in Solid Geometry this must be made up prior to the beginning of the second semester; otherwise deficiencies must be removed before entering upon any work of the sophomore year.

Students looking forward to the study of architecture will find it greatly to their advantage to take as much freehand drawing as possible in high school, to elect French as their language, and to cover the field of general history as far as possible.

#### COLLEGES OF AGRICULTURE AND FORESTRY

##### *Including Courses in Agriculture, Home Economics, and Forestry*

Students entering these colleges 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 before entering college at least six months' practical experience on a farm. 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*

These schools are not of collegiate grade. For further information, see special bulletins. Graduates of these schools may be admitted to the College of Agriculture on the certification of the completion of the following additional work in an accredited high school:

1. English, two units.

2. Mathematics: Elementary Algebra, one unit; Plane Geometry, one unit.

3. Electives, three units, none of which may be from Group F.

#### LAW SCHOOL

##### *Regular Students*

Students desiring to enter the Law School must first complete two full years (not less than fifty-eight 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 21. 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 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 eighty. Applicants will be selected by tests of preliminary training, general information, and personal fitness.

Prospective Medical students must complete two years (not less than sixty credits) of collegiate work in science, literature, and the arts at this or some other university or college of equal rank. The high-school preparation of such students must satisfy the requirements for admission to the College of Science, Literature, and the Arts and should include two units of Latin,\* two of German, and one of Chemistry. The sixty college credits required must include six credits each in Rhetoric, General Chemistry,† Qualitative Analysis,‡ Zoology, Social Science; eight credits in Physics, and enough German to enable the student to read scientific publications in that language with facility. This will usually require two years of collegiate work in addition to high-school credits in this language.

The degree of Doctor of Medicine is conferred only upon those who

\* The Latin does not become essential until the student has completed the two years of pre-medical work, but as the University does not teach the first two years of Latin the student without this preparation would have to secure the training outside with considerable inconvenience.

† Those who have had good training in preparatory Chemistry will take a combined course of six credits in General Chemistry and Qualitative Analysis, and six credits of Organic Chemistry. In 1918 and thereafter Organic Chemistry<sup>§</sup> will be a pre-medical requirement.



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 modern languages (particularly German) 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 submit credentials covering this work and satisfactory evidence of good character. The course begins January 2. Examination is held at the close of the course and, successfully passed, entitles 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.

#### COLLEGE OF DENTISTRY

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.
4. One year of Chemistry, and two or more years of Manual Training are 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

It is recommended that students who come poorly prepared in mathematics enter the five-year courses.

##### *Five-Year Courses*

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.

##### *Four-Year Courses*

1. English, three units.
2. Mathematics: Elementary Algebra, one unit; Plane Geometry, one unit; Higher Algebra, one-half unit; Solid Geometry, one-half unit.
3. Enough additional work to make in all fifteen units of which not more than four may be in Group F.

No substitution for the mathematics requirement can be made in this course.

It is recommended that students who enter the four-year courses review their mathematics, especially Higher Algebra and Solid Geometry. Those who are unable to carry satisfactorily freshman mathematics will be compelled to drop back into the five-year course.

#### COLLEGE OF PHARMACY

Graduation from a four-year high-school course or equivalent training is required for admission to the regular courses in pharmacy. Applicants are advised to secure preparation in two units of Latin and one unit each of Physics, Chemistry, Botany, and Physiology, as these subjects may be required in the near future.

#### SCHOOL OF ANALYTICAL AND APPLIED CHEMISTRY

##### *Arts and Chemistry 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.

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

The requirements are the same as in Arts and Chemistry above, except that in addition to the mathematics indicated one-half unit of Higher Algebra must be presented.

#### 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 sixty 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 credits and are admitted to the College as unclassified students pending the completion of eighteen additional credits.

#### ADMISSION AS UNCLASSIFIED 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 semester 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 semester credits.
- (d) The result. The exact grades should be stated, accompanied by an explanation of the marking system employed.

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 applicants' completing one year of work satisfactorily at the University.

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 (30 credits) of advanced standing. Graduates of such advanced courses are admitted to the College of Education with an allowance of sixty 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 credits of advanced standing. Graduates of such courses are admitted to the College of Education with an allowance of forty-two credits towards graduation.

### 3. 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 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	Barnesville	Cannon Falls
Adrian	Belle Plaine	Cass Lake
Aitkin	Bemidji	Chaska
Akeley	Benson	Chatfield
Albert Lea	Bird Island	Chisholm
Alden	Biwabik	Clarkfield
Alexandria	Blackduck	Cloquet
Amboy	Blooming Prairie	Cokato
Annandale	Blue Earth	Coleraine
Anoka	Brainerd	Greenway
Appleton	Breckenridge	Olcott
Argyle	Brown Valley	Cottonwood
Arlington	Buffalo	Crookston
Atwater	Buhl	Dassel
Aurora	Caledonia	Dawson
Austin	Cambridge	Deer River
Bagley	Canby	Delano

ADMISSION

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

South St. Paul	Villard	West Concord
Springfield	Virginia	Wheaton
Spring Grove	Wabasha	White Bear
Spring Valley	Wadena	Willmar
Staples	Walker	Windom
Stephen	Warren	Winnebago
Stewartville	Waseca	Winona
Thief River Falls	Waterville	Winthrop
Tracy	Wayzata	Worthington
Two Harbors	Welcome	Zumbrota
Tyler	Wells	

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

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

#### 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 21 to 27 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 subject, 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 its best specimens. He should read the books carefully, but his attention should not be so fixed upon details that he fails to appreciate 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.

\* See note on page 20.

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 *Spectator* (about 200 pages); Boswell's Selections 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'Arblay* (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 Traveller*, 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.

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.

\*If not chosen for study under (b).



(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 of 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

In place of the work specified below the University also accepts the work recommended in the report of the Cleveland Commission on College Entrance Requirements in Latin.

*Latin Grammar* (one unit).—This will include the subjects of orthography, etymology, and syntax. Proficiency is particularly desired in the following subjects: the analysis of the verb forms, the rules of syntax, and the principal parts of the irregular verbs.

*Caesar* (one unit).—First four books or selections from the seven books equivalent to four; or three books, with thirty pages of Cornelius Nepos, or two books with sixty pages of Cornelius Nepos. The student is expected to be familiar with the life of Caesar and an account of his wars.

*Cicero* (one unit).—Any six orations from the following list: *Against Catiline*, *Poet Archias*, *Ligarius*, *Marcellus*, *Manilian Law* (to count as two orations), the fourteenth *Philippic*. The student should also be familiar with the life of Cicero.

*Virgil* (one unit).—Six books of the *Aeneid*, or five of the *Aeneid* and one of the *Metamorphoses* of Ovid, or the *Eclues*. The student should be familiar with the life of Virgil and an account of his times and writings. A correct rhythmical reading of the text is to be encouraged.

### Greek

*Greek Grammar* (one unit).

*Xenophon's Anabasis*, four books (one unit).

### 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 everyday 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 students 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 may be supported by occasional translation from English into German, based, preferably, 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.

One or two additional years of work in literature will be accepted. Students presenting four years of high-school German are admitted to advanced standing.

### *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 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 today. 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 text-book 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 text-book, 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 today. 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 text-book 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 manipulation 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).—The course in Botany should extend through the school year whenever it is at all possible, even if as much time can not be given to it each week as when it occupies a single semester. The course should follow as closely as possible the nature and work of plants during the changing seasons of the year. The major portion of the work should be with living plants, naming the common plants of the neighborhood, both cultivated and native, and studying plant parts from the seed to maturity. A detailed outline of such courses will be furnished upon request.

**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 text-book 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 suitable times, 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) must be spent at the University, before such degree shall be granted, and provided that examination, in every case, be held before a committee of the Faculty appointed for that purpose.

For detailed information concerning requirements, see pages 13-18, 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 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. 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 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

### FEEs

#### DEPOSIT FEE

At the beginning of each year, in addition to the first semester incidental fee, a deposit fee of five dollars (Medicine and Dentistry, ten dollars) 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) .....	.50 a year
Locker rental, locker key deposit.....	\$.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 one dollar (\$1.00) 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 twenty-five cents 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) \$1.00 a semester	
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 examinations on first entering the University, if taken within the first six weeks.)	
Military uniform, men .....	*18.00
Gymnasium suit, men and women (approximately).....	5.00

#### INCIDENTAL FEES

One half of the annual incidental fee, which includes all laboratory charges, is payable at the beginning of each semester. Cards entitling the student to admission to classes will not be issued until the fees have been paid.

\* Subject to change, depending upon cost of material.

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

*Science, Literature, and the Arts:*

Annual incidental fee, resident.....	\$ 40.00
Annual incidental fee, non-resident.....	80.00
Military uniform for men.....	*18.00
Gymnasium suit, men and women (approximately).....	5.00
Elective	
Music, Instrumental (one lesson a week), annually.....	64.00
Music, Instrumental (two lessons a week), annually.....	128.00
Music, Vocal (one lesson a week), annually.....	80.00
Music, Vocal (two lessons a week), annually.....	160.00

*College of Engineering and Architecture:*

Annual incidental fee, resident and non-resident.....	\$ 60.00
Military uniform.....	*18.00

*College of Agriculture:*

Annual incidental fee, resident.....	\$ 40.00
Annual incidental fee, non-resident.....	80.00
Military uniform.....	*18.00

*College of Forestry:*

Annual incidental fee, resident.....	\$ 40.00
Annual incidental fee, non-resident.....	80.00
Military uniform.....	*18.00
Itasca Park fee, freshman year.....	3.00
junior year.....	5.00

*Law School:*

Annual incidental fee.....	\$ 65.00
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*Medical School:*

Annual incidental fee.....	\$150.00
Hospital fee (junior and senior years).....	1.00
Course for Embalmers.....	50.00
School for Nurses, preliminary course, tuition fee (no fees thereafter).....	25.00

*College of Dentistry:**Four-year Course*

Annual incidental fee, first year.....	\$100.00
Annual incidental fee, second, third, and fourth years.....	175.00
Military uniform.....	*18.00

*Three-year Course (discontinued September, 1916)*

Annual incidental fee, second year.....	\$175.00
Annual incidental fee, third year.....	150.00
Military uniform.....	*18.00

*Both Courses*

Instruments and appliances, estimated.....	\$350.00
Books, estimated.....	75.00

*School of Mines:*

## First Year Five-Year Courses

Annual incidental fee.....	\$ 55.00
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\* Subject to change, depending upon cost of material.

Note books and supplies (Estimated).....	5.00
Military uniform .....	*18.00

## Freshman Year

Annual incidental fee.....	\$ 55.00
Books (Estimated) .....	25.00
Military uniform .....	*18.00
Draughting instruments (Estimated).....	15.00
Note books and supplies (Estimated).....	5.00

## Sophomore Year

Annual incidental fee.....	\$ 55.00
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

Annual incidental fee.....	\$ 55.00
Field work { Mining } .....	175.00 to 250.00
May 1 to July 1 { Metallurgy } .....	
Books (Estimated) .....	30.00
Note books and supplies (Estimated).....	5.00

## Senior Year

Annual incidental fee.....	\$ 55.00
Books (Estimated) .....	15.00
Note books and supplies (Estimated).....	5.00

*College of Pharmacy:*

Annual incidental fee, three-year course.....	\$ 55.00
Military uniform .....	*18.00

*School of Chemistry:*

Annual incidental fee.....	\$ 55.00
Military uniform .....	*18.00

*College of Education:*

Annual incidental fee, resident.....	\$ 40.00
Annual incidental fee, non-resident.....	80.00

*The Graduate School:*

Annual incidental fee.....	\$ 30.00
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\* Subject to change, depending upon cost of material.

## STUDENTS EXEMPT FROM FEES

All fellows, scholars, assistants, instructors, and all members of the teaching staff and scientific bureaus or experiment stations shall not be required to pay university fees or tuition.

## 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	Minimum
	Fee	Total
Science, Literature, and the Arts.....	\$2.50	\$ 5.00
Engineering .....	3.00	10.00
Agriculture .....	2.50	5.00
Law .....	5.00	10.00
†Medicine .....	3.00	10.00
†Dentistry, freshmen .....	3.00	10.00
sophomores, juniors, and seniors.....	3.50	10.00
Mines .....	2.00	10.00
†Pharmacy .....	3.00	10.00
Chemistry .....	3.00	10.00
Education .....	2.50	5.00
Graduate School .....	2.00	5.00

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

### 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 \$225 for the University year. Applications should be sent to the Director of Sanford Hall, University of Minnesota, before June 1.

Three coöperative cottages, each in charge of a chaperone, offer comfortable homes to about forty 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 given to girls earning a part of their expenses. Application may be made to the Dean of Women.

After July 1 the Registrar will supply a list of approved boarding and rooming places. Women may not engage rooms in houses not on this list without permission of the Dean of Women. 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.

\* 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.

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 11 cents, luncheon 18 cents, dinner 20 cents. Board by the week varied from three to four 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

The following tables give estimates of the freshman student's 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, AND FORESTRY

	Minimum	Average	Liberal
†Annual incidental fee.....	\$40.00	\$40.00	\$40.00
Deposit fee .....	5.00	5.00	5.00
Minnesota Union fee.....	2.00	2.00	2.00
Gymnasium suit .....	4.50	4.50	4.50
Military uniform .....	*18.00	20.00	24.00
Books .....	13.50	16.50	23.00
Laundry .....	14.40	20.00	35.00
Room rent .....	40.00	70.00	108.00
Board .....	126.00	153.00	180.00
Incidentals .....	36.00	144.00	216.00
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	\$299.40	\$475.00	\$637.50

† Annual incidental fee for undergraduate students residing outside the state of Minnesota is \$80.

Funds absolutely necessary for immediate expenses upon entering these colleges, including two weeks' board and first month's room rent in advance: minimum, \$70.00; average, \$75.00.

#### COLLEGE OF ENGINEERING AND ARCHITECTURE

	Minimum	Average	Liberal
Annual incidental fee.....	\$60.00	\$60.00	\$60.00
Deposit fee .....	5.00	5.00	5.00
Minnesota Union fee.....	2.00	2.00	2.00
Military uniform .....	*18.00	20.00	24.00
Books and instruments.....	27.50	33.00	33.50
Laundry .....	14.40	20.00	35.00
Room rent .....	40.00	70.00	108.00
Board .....	126.00	153.00	180.00
Incidentals .....	36.00	144.00	216.00
	<hr/>	<hr/>	<hr/>
	\$328.90	\$507.00	\$668.00

\* Subject to change, depending upon cost of material.

## LAW SCHOOL

	Minimum	Average	Liberal
Annual incidental fee.....	\$65.00	\$65.00	\$65.00
Deposit fee .....	5.00	5.00	5.00
Minnesota Union fee.....	2.00	2.00	2.00
Notebooks .....	5.50	6.60	8.00
Laundry .....	14.40	20.00	35.00
Room rent .....	40.00	70.00	108.00
Board .....	126.00	153.00	180.00
Incidentals .....	36.00	144.00	216.00
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	\$293.90	\$465.60	\$619.00

Necessary for immediate expenses upon entering this School: minimum, \$55.00; average, \$60.00.

## MEDICAL SCHOOL, FIRST YEAR

	Minimum	Average	Liberal
Annual incidental fee.....	\$150.00	\$150.00	\$150.00
Deposit fee .....	10.00	10.00	10.00
Minnesota Union fee.....	2.00	2.00	2.00
Books and instruments.....	27.50	33.00	50.00
Laundry .....	14.40	20.00	35.00
Room rent .....	40.00	70.00	108.00
Board .....	126.00	153.00	180.00
Incidentals .....	36.00	144.00	216.00
	<hr/>	<hr/>	<hr/>
	\$405.90	\$582.00	\$751.00

## COLLEGE OF DENTISTRY

	Minimum	Average	Liberal
Annual incidental fee.....	\$100.00	\$100.00	\$100.00
Deposit fee .....	10.00	10.00	10.00
Minnesota Union fee.....	2.00	2.00	2.00
Military uniform .....	*18.00	20.00	24.00
Books and instruments.....	120.00	137.50	165.00
Laundry .....	14.40	20.00	35.00
Room rent .....	40.00	70.00	108.00
Board .....	126.00	153.00	180.00
Incidentals .....	36.00	144.00	216.00
	<hr/>	<hr/>	<hr/>
	\$466.40	\$655.50	\$840.00

\* Subject to change, depending upon cost of material.

Necessary for immediate expenses upon entering this College: minimum, \$185.00; average, \$215.00.

## SCHOOL OF MINES

	Minimum	Average	Liberal
Annual incidental fee.....	\$55.00	\$55.00	\$55.00
Deposit fee .....	5.00	5.00	5.00
Minnesota Union fee.....	2.00	2.00	2.00
Military uniform .....	*18.00	20.00	24.00
Books, etc. ....	22.00	27.50	27.50
Laundry .....	14.40	20.00	35.00
Room rent .....	40.00	70.00	108.00
Board .....	126.00	153.00	180.00
Incidentals .....	36.00	144.00	216.00
	<hr/>	<hr/>	<hr/>
	\$318.40	\$496.50	\$652.50

Necessary for immediate expenses upon entering this College: minimum, \$75.00; average, \$85.00.

\* Subject to change, depending upon cost of material.

## COLLEGE OF PHARMACY

	Minimum	Average	Liberal
Annual incidental fee.....	\$55.00	\$55.00	\$55.00
Deposit fee .....	5.00	5.00	5.00
Minnesota Union fee.....	2.00	2.00	2.00
Military uniform .....	*18.00	20.00	24.00
Books and instruments .....	19.00	22.00	22.00
Laundry .....	14.40	20.00	35.00
Room rent .....	40.00	70.00	108.00
Board .....	126.00	153.00	180.00
Incidentals .....	36.00	144.00	216.00
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	\$315.40	\$491.00	\$647.00

Necessary for immediate expenses upon entering this College: minimum, \$72.25; average, \$80.00.

## SCHOOL OF CHEMISTRY

	Minimum	Average	Liberal
Annual incidental fee.....	\$55.00	\$55.00	\$55.00
Deposit fee .....	5.00	5.00	5.00
Minnesota Union fee.....	2.00	2.00	2.00
Gymnasium suit .....	4.50	4.50	4.50
Military uniform .....	*18.00	20.00	24.00
Books and instruments.....	13.00	15.00	17.00
Laundry .....	14.40	20.00	35.00
Room rent .....	40.00	70.00	108.00
Board .....	126.00	153.00	180.00
Incidentals .....	36.00	144.00	216.00
	<hr/>	<hr/>	<hr/>
	\$313.90	\$488.50	\$646.50

\* Subject to change, depending upon cost of material.

Necessary for immediate expenses upon entering this School; minimum, \$75.00; average, \$85.00.

## 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. 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 making all of their college expenses. Some are able to earn 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 man 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 \$100 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 as clerks, bookkeepers, stenographers, salesmen, solicitors, telegraph operators, mechanics, assistants, musicians, waiters, laborers, janitors, telegraph 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 man 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 would do well to 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 would 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. Students who can meet the usual requirements for college entrance are allowed university credit for 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 1916-17. 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 \$300 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 Assistants
Astronomy .....	1	Scholar
Botany .....	3	Assistants
Chemistry .....	7	Assistants
Comparative Philology .....	1	Scholar
Economics .....	}	2 Assistants
		2 Scholars
Education .....	2	Scholars
English .....	}	1 Assistant
		2 Scholars
Geology and Mineralogy.....	}	1 Teaching Fellow
		2 Scholars
German .....	}	1 Teaching Fellow
		2 Scholars
	}	2 Teaching Fellows
History .....		1 Assistant
	}	4 Scholars
Mathematics .....		1 Assistant
	}	1 Scholar
Medical School.....		6 Teaching Fellows*
	}	36 Mayo Fellows
		5 Scholars
		10 Assistants
Philosophy and Psychology.....	2	Scholars
Physics .....	2	Scholars
Political Science .....	2	Scholars
Rhetoric and Public Speaking..	7	Scholars
Romance Languages .....	}	2 Teaching Fellows
		1 Scholar
Scandinavian .....	1	Scholar
Sociology and Anthropology....	2	Scholars

\* Special Requirements. Address inquiries to Dean of the Medical School.

*The Albert Howard Scholarship Fund*

This scholarship, amounting to \$240 a year, is awarded to graduate students in the College of Science, Literature, and the Arts.

*Class of 1890 Scholarship*

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 who has shown distinguished ability and initiative as a student and who desires to make further preparation for public service.

## UNDERGRADUATE SCHOLARSHIPS

*Free and Service Scholarships*

The following scholarships, open to residents of Minnesota who have been in attendance at the University for at least one semester, will be available after August 1, 1916:

100 semester free scholarships of \$20 each

50 semester service scholarships of \$20 each requiring of the holder eighty hours' service in some division of the University.

Students interested may secure application blanks upon inquiry at the Registrar's office.

*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 Minneapolis College Woman's Club Scholarship*

For the year 1917-18 this scholarship amounts to \$150. In awarding it the preference will be given to students in the junior and senior classes and to graduate students. Applications for this scholarship may be made to the Dean of Women.

*The St. Paul College Woman's Club Scholarship*

For the year 1917-18 two scholarships of \$100 each are available. In awarding them, the character, the scholarship, and the need of the applicants will be considered. Altho open to all women in the junior and senior classes and to graduate students, preference will be given to young women from St. Paul. Applications for it may be made to the Dean of Women.

*The W. S. G. A. Scholarship*

The W. S. G. A. has raised \$100 for a scholarship, said scholarship to be for the use of a Junior or Senior for 1917-18, and is to be a gift outright. Application should be made not later than May 10 to the Acting Dean of Women. This fund is to be administered by the W. S. G. A.

*Minneapolis Women's Scholarships*

Five scholarships of \$100 each are offered by the following women for the College year 1917-18: Mrs. George H. Partridge, Mrs. Elbert L. Carpenter, Mrs. George C. Christian, Mrs. Fred B. Snyder, Mrs. Sumner T. McKnight. The administering of this fund is to be in the hands of Mrs. Jessie S. Ladd of Shevlin Hall.

## 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.

*The Puritan Colony Scholarship Loan*

For the year 1917-18 this scholarship loan amounts to \$100. It is available for women students of New England birth or ancestry. In awarding it the preference will be given to young women in the junior and senior classes. Application for it may be made to the Dean of Women.

*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 Dean.



*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.

*Loan Fund for Women Students*

This fund is to be used for emergency loans to women students whose character and scholarship recommend them for assistance. Application may be made to the Dean of Women.

*Home Economics Self-Government 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.

## 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 member 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 \$25 each year is given for the best thesis in history, written from the sources, by a member of the graduating class.

*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 broadminded, unselfish, industrious, and willing to work courteously and enthusiastically with others so as to serve the highest interests of debate and oratory 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 one dollar a semester, payable at the time of registration. The Legislature gave the Chemistry Building for the use of the Union and \$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 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 Home Economics Self-Government Association.*—The women in the College of Agriculture, altho nominally members of the Women's Self-Government Association, have an independent organization, the Home Economics Self-Government Association, which is open to all women in the College of Agriculture. The form of organization and the purpose of the Association are similar to those of the Women's Self-Government Association, but adapted to the needs of the students in the College of Agriculture.

*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 of which will be sent upon request.

## PUBLICATIONS

*The Bulletin of the University of Minnesota* includes the *Catalog Series* and the *General Series*. The *Catalog Series* contains 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, etc. The *General Series* contains announcements of departments of instruction, reports of University officers, etc.

*Research Publications of the University of Minnesota* were begun in 1912 with the support of a special appropriation by the Legislature. They 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 Series* contains 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 *Surface Formations and Agricultural Conditions of Northwestern Minnesota*, and *Preliminary Report on the Clays and Shales of Minnesota*.

List with prices of preceding four groups of 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. It is sent principally to teachers of agriculture, superintendents of schools, and to students of education in the College of Agriculture.

*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.

*The Minnesota Magazine* is a monthly magazine devoted to the cultivation of literary taste and effort among the students of the University. It is managed by a board of editors chosen from the senior class.

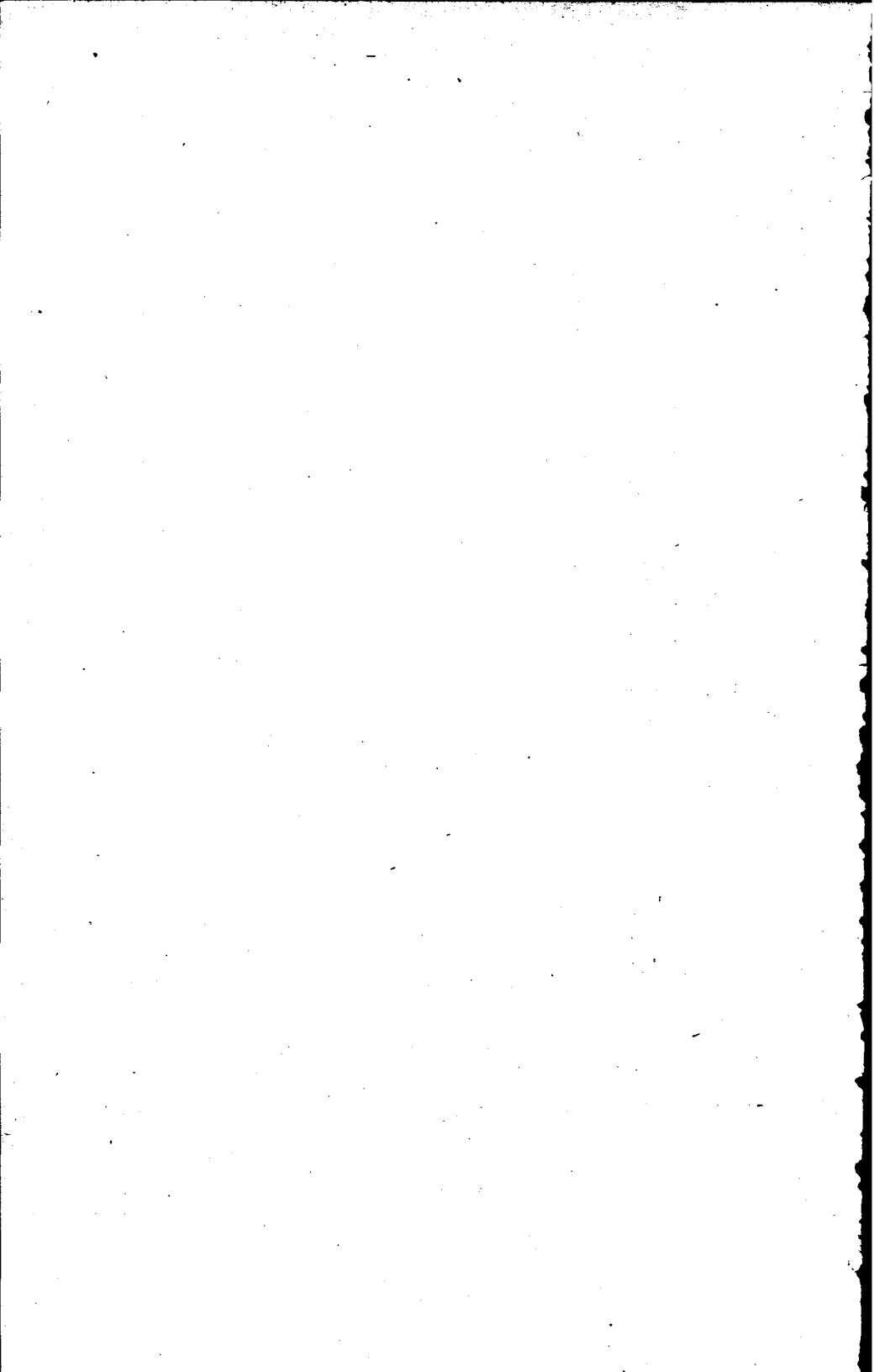
*The Minnesota Farm Review* is a weekly owned by the alumni of the School of Agriculture, but operated under the direction of a committee representing the faculty, the alumni, and the students of the School and College of Agriculture, and edited by the Division of Publications and Journalism, as a laboratory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

*The Junior Annual*, called "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 Engineer of the Society of Engineers* is issued quarterly. It is devoted to the publication of articles upon engineering subjects.

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



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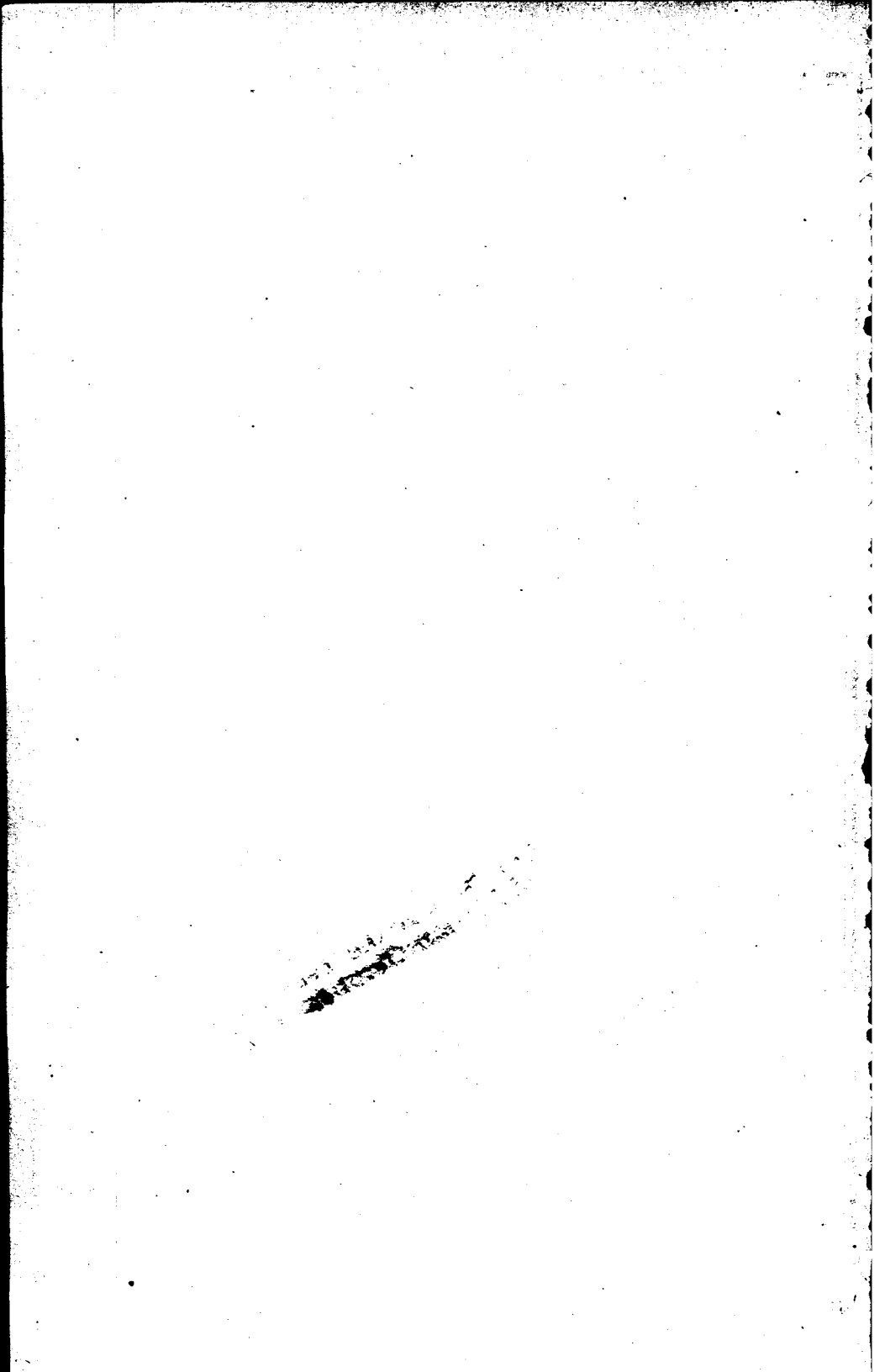
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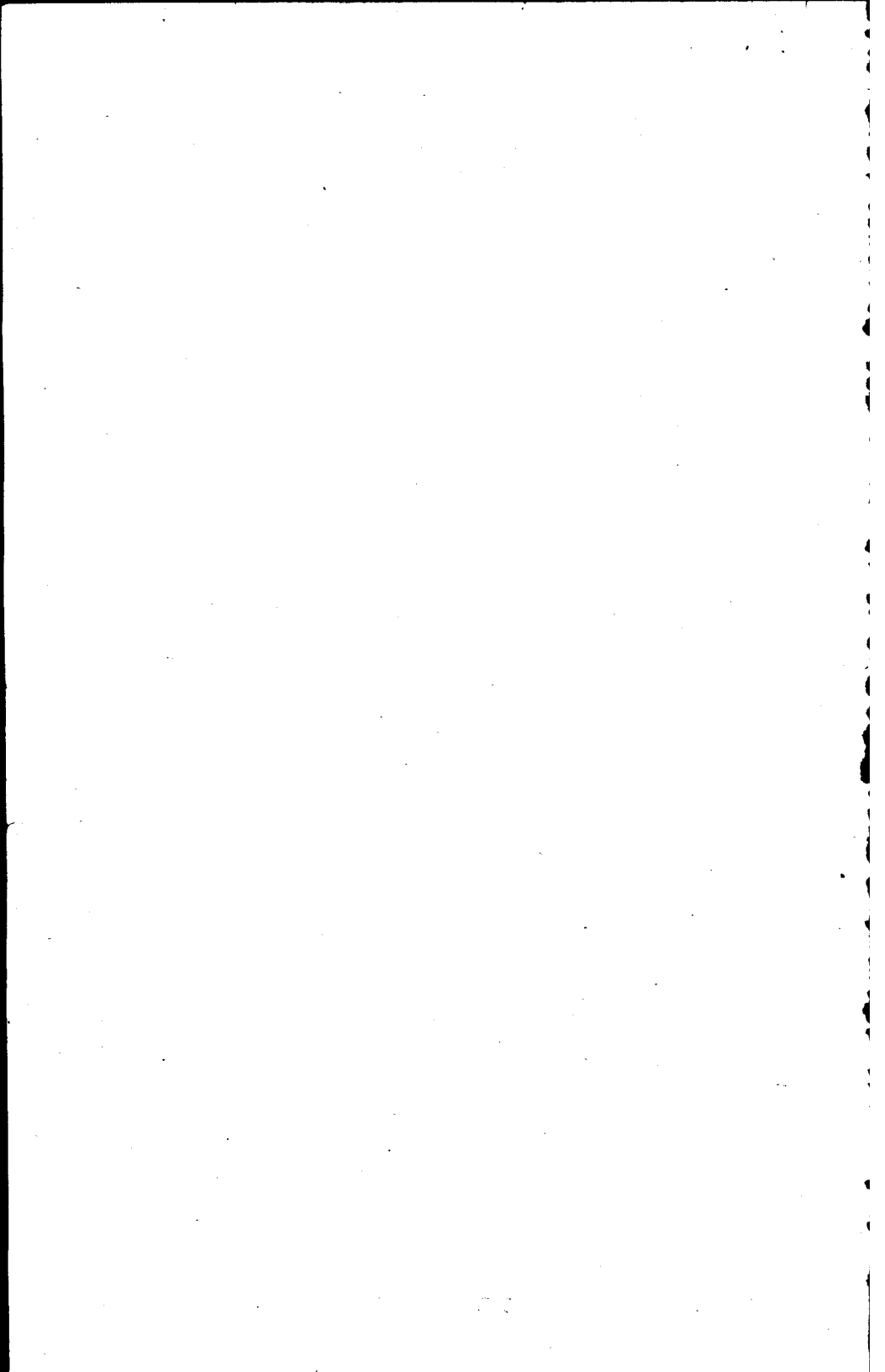
*The Bulletin*  
*of the University of*  
**Minnesota**

*The College of Science, Literature,*  
*and the Arts*  
**1917-1918**



*Catalog Series No. 4 Part I*  
**Vol. XX No. 28 July 22 1917**

*Entered at the post-office*  
*in Minneapolis as second-class matter*  
*Minneapolis, Minnesota*



## NOTE

This bulletin is intended as a record of the Faculty and of the work offered in the College during the academic year 1916-17. It will be followed by a second bulletin which will give the program and regulations of each department and of the College for the year 1917-18. Changes in requirements, courses, credits, and prerequisites and all information necessary for registration and planning of work during next year must be looked for in that program bulletin. It will be ready for distribution about August 1.

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2	3	4	5	6	7	8	2	3	4	5	6	7	8	8	9	10	11	12	13	14
9	10	11	12	13	14	15	9	10	11	12	13	14	15	15	16	17	18	19	20	21
16	17	18	19	20	21	22	16	17	18	19	20	21	22	22	23	24	25	26	27	28
23	24	25	26	27	28	29	23	24	25	26	27	28	29	29	30	31	..	..	..	..
30	31	..	..	..	..	..	30	..	..	..	..	..	..	..	..	..	..	..	..	..

# UNIVERSITY CALENDAR

1917-1918

September	26	Wednesday	Registration closes for all students
September	26	Week	Fees payable for all students
October	31	Monday	First semester evening extension classes begin
October	2-9	Week	Examinations for removal of conditions (except for Colleges of Agriculture and Forestry), and entrance examinations
October	10	Wednesday	First semester begins
October	15	Monday	Agricultural College, farm experience examinations
October	18	Thursday	Senate meeting, 4:00 p.m.
October	29	Monday	School of Agriculture, first term begins
November	5	Monday	Dairy School opens
November	28	Wednesday	Thanksgiving recess begins 9:00 p.m.
December	1	Saturday	Dairy School closes
December	3	Monday	Thanksgiving recess ends 8:00 a.m.
December	3-8	Week	Second semester condition examinations, Colleges of Agriculture and Forestry
December	3-8	Week	Short course for ice-cream makers
December	5	Wednesday	Medical School second quarter begins
December	20	Thursday	Senate meeting, 4:00 p.m.
December	21	Friday	School of Agriculture, first term closes
December	21	Friday	Christmas vacation begins 9:00 p.m.
1918			
December	31	Week	Farmers' and Home Makers' Week
January	5	Week	Short Course
January	2	Wednesday	Christmas vacation ends 8:00 a.m.
January	2	Wednesday	School of Embalming begins, eight weeks' session
January	8	Tuesday	School of Agriculture, second term begins
January	25	Friday	First semester evening extension classes close
February	4	Monday	Second semester registration closes
February	4	Monday	Second semester evening extension classes begin
February	4-9	Week	Merchants' Short Course
February	11	Monday	Final examinations begin
February	11	Monday	Payment of fees for second semester closes

February	12	Tuesday	Lincoln's Birthday; a holiday
February	18	Monday	Second semester begins
February	18	Monday	Second semester evening classes begin
February	21	Thursday	Senate meeting, 4:00 p.m.
February	22	Friday	Washington's Birthday; a holiday
March	27	Wednesday	School of Agriculture closes
March	28	Thursday	Easter recess begins 9:00 p.m.
April	1	Monday	Easter recess ends 8:00 a.m.
April	1-6	Week	Boys' and Girls' Week
April	1-6	Week	Condition examinations in certain colleges
April	15	Monday	Medical School fourth quarter begins
April	30	Tuesday	Traction Engineering Short Course begins
May	16	Thursday	Senate meeting, 4:00 p.m.
May	24	Friday	Second semester evening extension classes close
May	30	Thursday	Memorial Day; a holiday
May	31	Friday	Traction Engineering Short Course closes
June	8	Saturday	Final examinations begin 2:00 p.m.
June	15	Saturday	Second semester closes
June	16	Sunday	Baccalaureate service
June	17	Monday	Senior Class Day exercises
June	19	Wednesday	Alumni Day
June	20	Thursday	Forty-sixth Annual Commencement
June	21	Friday	Summer vacation begins
June	24	Monday	Summer Session begins

The University year for 1918-19 probably will begin Tuesday, September 17. Classes will begin September 25.

*Program of Entrance Examinations 1917-1918*

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,	Oct. 2	9 a.m.	Business Subjects, Elementary Algebra, Plane Geometry
		2 p.m.	Manual Subjects, Domestic Art and Science, Agriculture, Higher Algebra, Solid Geometry
Wednesday,	Oct. 3	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,	Oct. 4	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 to 12 to give information and advice.

#### *Condition Examinations*

Examinations for the removal of conditions are given at no other times than (1) the week following the Easter recess, (2) the registration week in October, and (3) the week following the Thanksgiving recess, for students in the Colleges of Agriculture and Forestry.

The examinations in second-semester courses are given in the October period and those in first-semester courses are given after the Easter recess or in October, or at both times, as each school or college may determine. No student may take more than one examination to remove a condition.

Examination schedules for the respective schools and colleges may be secured at the Registrar's office.

# COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

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\* Absent on leave, 1916-17.

† Absent on leave second semester, 1916-17.

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- ETHEL L. PHELPS, B.S., Instructor in Textiles and Clothing  
1160 Raymond Ave., St. Paul
- WILLIS J. PLUMMER, Sobresaliente in Spanish Language and Literature,  
Instructor in Spanish 1329 6th St. S. E.
- TERENCE T. QUIRKE, E.M., Ph.D., Instructor in Geology  
315 11th Ave. S. E.
- WILLIAM D. REEVE, B.S., Instructor in Mathematics, University High  
School 820 University Ave. S. E.
- GERTRUDE REEVES, Instructor in Pianoforte 5526 Pillsbury Ave.
- BERT A. ROSE, Instructor in Band Music 710 S. E. 7th St.
- MARTIN B. RUUD, Ph.D., Instructor in Rhetoric 220 S. E. Harvard St.
- SANDFORD M. SALYER, M.A., Instructor in Rhetoric 1318 S. E. 7th St.
- CARL L. SCHUMANN, Ph.D., Instructor in Chemistry 317 17th Ave. S. E.
- EDWARD H. SIRICH, Ph.D., Instructor in French 321 14th Ave. S. E.
- FRANK SMOYER, B.A., Instructor in Rhetoric 2021 Girard Ave. S.
- HAROLD W. SOULE, M.A., Instructor in German 1208 S. E. 4th St.
- J. WARREN STEHMAN, M.A., Instructor in Economics 306 10th Ave. S. E.
- WOLDEMAR M. STERNBERG, B.S., in Chem. Eng., Instructor in Chemistry  
510 S. E. Ontario St.
- WAYNE E. STEVENS, Ph.D., Instructor in History 428 S. E. Walnut St.
- CHARLES C. STILLMAN, B.A., Lecturer in Sociology  
809 Laurel Ave., St. Paul
- EARLE K. STRACHAN, Ph.D., Instructor in Chemistry 941 14th Ave. S. E.
- JOHN T. TATE, Ph.D., Instructor in Physics 1316 S. E. 4th St.

- STERLING TEMPLE, Ph.D., Instructor in Chemistry 1758 Blair St., St. Paul  
 ALICE L. THOMAS, M.A., Instructor in Foods and Cookery  
 2134 Knapp St., St. Paul  
 ARTHUR J. TIEJE, Ph.D., Instructor in Rhetoric 1028 S. E. 6th St.  
 ALICE HOPKINS TOLG, M.D., Instructor in Physical Education for Women  
 1200 W. 25th St.  
 ELIZABETH VERMILYE, B.A., Instructor in Foods and Cookery  
 2116 Knapp St., St. Paul  
 HOWARD T. VIETS, M.A., Instructor in Rhetoric 512 S. E. Delaware St.  
 H. LEE WARD, Ph.D., Instructor in Chemistry 425 S. E. Walnut St.  
 JOHN G. WEST, Jr., B.S., Instructor in Physical Education for Men  
 411 17th Ave. S. E.  
 RICHARD WISCHKAEMPER, M.A., Instructor in German  
 977 14th Ave. S. E.  
 EDWIN H. ZEYDEL, M.A., Instructor in German 1312 S. E. 7th St.

## ASSISTANTS AND SCHOLARS

1916-1917

## ANIMAL BIOLOGY

- EDNA G. DYAR, B.S., Assistant  
 WALTER W. MARSHALL, M.A., Assistant  
 ADOLPH RINGOEN, M.A., Assistant  
 HELEN A. SANBORN, B.A., Assistant  
 FAUS PETER SILVERNALE, Ph.B., Laboratory Assistant  
 EARL L. ABRAMSON, B.A., Teaching Fellow  
 ROYAL N. CHAPMAN, B.S., Teaching Fellow  
 GEORGE H. CHILDS, M.A., Scholar  
 EMILY PAYNE, B.A., Scholar  
 GEORGE A. THIEL, Helper

## ·ASTRONOMY

- RALPH SYLVESTER UNDERWOOD, B.A., Scholar

## BOTANY

- DONALD FOLSOM, B.A., Assistant  
 FRANCES L. LONG, B.A., Assistant  
 VINNIE A. PEASE, B.A., Assistant  
 HARVEY L. STALLARD, Ph.B., Assistant  
 ARTHUR M. JOHNSON, B.A., Teaching Fellow

## COMPARATIVE PHILOLOGY

- RALPH HAEFNER, B.A., Scholar

## ECONOMICS

- JOSEPH E. CUMMINGS, B.A., Assistant  
 JACKSON B. DENNISON, M.A., Scholar



HOWARD L. HALL, B.A., Scholar  
 HERBERT GLENN KENAGY, B.A., Scholar  
 WALTER J. MATHERLY, M.A., Scholar  
 JOHN J. WAGNER, B.A., Scholar  
 EUGENE J. ACKERSON, Student Helper  
 OLIVER S. POWELL, Student Helper

## ENGLISH

MARIE C. LYLE, M.A., Assistant  
 MARGARET ALTERTON, B.A., Scholar  
 ALDENA CARLSON, B.A., Scholar  
 RALPH COLBY, B.A., Scholar

## GEOLOGY AND MINERALOGY

MYRON A. DRESSER, B.A., Scholar  
 A. IRVING LEVORSEN, Student Helper

## GERMAN

LOUISE G. FRARY, M.A., Teaching Fellow  
 ARNOLD W. SHUTTER, M.A., Teaching Fellow  
 DOROTHY J. SCHAFFNIT, B.A., Scholar  
 ROSE M. TSCHIDA, B.A., Scholar

## HISTORY

\*WILSON P. SHORTRIDGE, B.A., Assistant  
 GLADYS CAMPBELL, M.A., Teaching Fellow  
 CHARLES B. KUHLMAN, B.A., Teaching Fellow  
 RUTH ELIZABETH MARSHALL, M.A., Teaching Fellow  
 ALICE M. CARR, B.A., Scholar  
 MARK M. HEALD, B.A., Scholar  
 DOROTHY HEINEMANN, B.A., Scholar  
 KARL H. TROUT, B.A., Scholar  
 HOLLIS A. CROSS, Student Helper  
 FAITH THOMPSON, Student Helper

## MATHEMATICS

KARL HOLZINGER, B.A., Assistant  
 ELLA THORP, B.A., Assistant  
 VERA WRIGHT, M.A., Assistant  
 ORVILLE A. GEORGE, B.A., Scholar

## MUSIC

THERESA MAIER, B.A. in Music, Scholar

## PHILOSOPHY AND PSYCHOLOGY

FRANCES LOWELL, B.A., Assistant  
 \*CLARE TOOMEY, Student Helper

\* Second semester only.

## PHYSICAL TRAINING FOR MEN

BOTTOLF M. OHNSTAD, Assistant  
 HUBERT FOURNIER, Attendant  
 MORRIS H. LITMAN, Student Helper

## PHYSICAL TRAINING FOR WOMEN

LILLIAN HANSEN, Assistant

## PHYSICS

FRITJOF VIK, B.A., Scholar  
 OSWALD ROGNLEY, B.A., Scholar

## POLITICAL SCIENCE

PERCIVAL VIESSELMAN, M.A., LL.B., Assistant  
 MAX P. RAPACZ, B.A., Scholar  
 JOSEPH D. SULLIVAN, B.A., Scholar

## RHETORIC AND PUBLIC SPEAKING

RAY M. WILCOX, Assistant  
 MARJORIE MORTLAND, B.A., Theme Clerk

## ROMANCE LANGUAGES

ENRIQUE JIMÉNEZ, Bachiller en Ciencias y Letras, Abogado, Teaching Fellow  
 GUSTAAF VAN ROOSBROECK, B.A., Teaching Fellow  
 MARIAN WOODWARD, B.A., Scholar

## SCANDINAVIAN

DAGNY E. NISSEN, B.A., Scholar  
 VERNIE LARSON, Student Helper

## SOCIOLOGY AND ANTHROPOLOGY

CLYDE RAY CHAMBERS, B.A., Scholar  
 GLADYS REKER, B.A., Scholar

## FACULTY COMMITTEES

*Advisory Committee*

CEPHAS D. ALLIN  
 WILLIAM H. BUSSEY  
 WILLIAM H. EMMONS  
 AUGUST C. KREY  
 GEORGE N. NORTHROP  
 JOSEPH B. PIKE  
 COLBERT SEARLES  
 CHARLES P. SIGERFOOS

*Administrative Board*

EDWARD E. NICHOLSON, Assistant Dean  
 LOTUS D. COFFMAN, Dean of the College of Education  
 ROYAL R. SHUMWAY  
 ALFRED E. KOENIG

## 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 vocational subjects.

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

### CLASS ROUTINE AND SCHOLASTIC REQUIREMENTS

Classes are held every week day except Saturday afternoon. Recitation periods are fifty minutes long and begin at eight, nine, ten, eleven, one, two, three, four, and five o'clock. A general assembly of faculty and students is held at noon on days to be announced.

Most of the courses of instruction are given in three periods a week on alternate days. Students are advised to arrange their programs so as to secure as even a distribution of classes as possible.

Examinations are held at the close of each semester. 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 finished is marked I (incomplete). An "incomplete" must be removed within one month after the opening of the following semester; otherwise it becomes a "condition." A "condition," if not removed before the opening of the corresponding semester of the following year becomes a "failure." A "failure" in a required subject must be removed by pursuing the work again in class the next time the course is offered.

Requirements for graduation are expressed in credit hours, indicating amount of work; and in honor points, indicating grade of work. Each credit hour 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 hour with the grade of A carries three honor points; each credit hour with the grade of B, two honor points; each credit hour with the grade of C, one honor point.

## 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:*

A general course leading to the degree of Bachelor of Arts.

An intensive course leading to the degree of Bachelor of Arts with Honors.

A four-year course leading to the degree of Bachelor of Arts in Music.

A four-year course in Business Education leading to the degree of Bachelor of Arts.

A five-year course in Training for Social and Civic Work, leading to the degree of Bachelor of Arts at the end of the fourth year, and a special certificate at the end of the fifth year. To be offered in 1917-18.

*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 four-year course for Military Training.

### REGULATIONS APPLYING TO ALL COURSES

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

Rhetoric 1-2 is required of all freshmen.

No student may elect work during any semester in more than five departments.

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

Students may ordinarily elect not more than seventeen credit hours. After the freshman year a student who has, during the preceding semester or two semesters, earned an average of one and one-half honor points for each credit hour taken and who has had no condition or failure the preceding semester, may elect eighteen hours.

## DEPARTMENTAL STATEMENTS

### EXPLANATION OF COURSE NUMBERS

Odd numbers indicate first-semester courses; even numbers, second-semester courses. A combination of the two (e.g., 5-6) indicates courses continuing through the year. The suffixes *a* and *b* apply to one-semester courses offered both semesters, *a* indicating the first semester and *b* the second semester (e.g., 3a,b; 4a,b). Courses marked with a *t* are given at hours convenient for teachers.

All undergraduate courses are numbered from 1 to 100. All courses open to undergraduates and graduates are numbered from 101 to 200. Strictly graduate courses are numbered from 201 up.

### STARRED COURSES

Courses marked with an asterisk (\*), called starred courses, are courses which are open only to juniors, seniors, and graduate students, and which have at least nine prerequisite credits if the department offers work in the freshman year, and at least six prerequisite credits if the department offers no work in the freshman year. It is provided, however, that courses in foreign languages for which there is a prerequisite of five years in secondary school and college, at least one year of which is in college, shall be starred courses.

*For graduation a student must secure during the junior and senior years thirty credits in starred courses.*

### ANIMAL BIOLOGY

Professors HENRY FRANCIS NACHTRIEB, JOHN B. JOHNSTON, THOMAS S. ROBERTS, CHARLES P. SIGERFOOS; Associate Professor HAL DOWNEY; Assistant Professors ELMER J. LUND, OSCAR W. OESTLUND; Instructors GEORGE DELVIN ALLEN, CHARLES E. JOHNSON; Assistants WALTER W. MARSHALL, ADOLPH RINGOEN, HELEN SANBORN; Teaching Fellows EARL L. ABRAMSON, ROYAL N. CHAPMAN.

### JOURNAL CLUB

The professors, instructors, and advanced students of the department meet once a week to review and discuss current zoological literature and to listen to reports from those carrying on investigations.

### INTRODUCTORY COURSES

1-2. GENERAL ZOOLOGY. A survey of the animal kingdom, emphasizing the principles of structure, physiology, embryology, classification, and evolution of animals. Textbook, lectures, and quizzes. Six credits. SIGERFOOS, LUND, ALLEN, RINGOEN, SANBORN.

- 7-8. 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. Six credits. DOWNEY and Assistant.
- 15-16. GENERAL PHYSIOLOGY. Characteristic properties of living substance shown by preparation and properties of biological compounds, colloids, enzyme action, growth, inanition; production of movement, heat, etc. Mechanism and conditions of excitation and response. Laboratory, lecture, readings, quizzes. Six credits. LUND.
- 19-20. COMPARATIVE GROSS ANATOMY OF VERTEBRATES. (a) Dissection and study of selected types, cyclostomes to reptiles or birds inclusive; special consideration of history of organ systems. (b) Mammalian anatomy. An intensive study of the cat. Textbook, laboratory guide. Laboratory, lectures, quizzes. Six credits. JOHNSON and Assistants.
- 23-24. ENTOMOLOGY. Elements of entomology leading up to discussion of the principles of taxonomy and their application to the classification of insects. Textbook, lectures, quizzes, and laboratory work. Six credits. OESTLUND and Assistant.
28. ORNITHOLOGY. Study of 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, and quizzes. Limited to ten. Three credits. ROBERTS.
30. ELEMENTS OF NEUROLOGY. A brief study of the nervous system; intended for students in psychology and the social sciences. Three credits. Not given in 1916-17. JOHNSTON.
- \*31-32. NATURE STUDY. Discussions, reference, field and laboratory work, through the year once a week and, in addition, field trips Saturday afternoons during the autumn and spring months. Especially for the fitting of teachers in secondary schools. Three credits. SIGERFOOS.
- \*51. PROTOZOLOGY. Lectures, reference, and laboratory work on the structure and life-histories of Protozoa. Special reference is paid to the relations of the Protozoa to diseases of animals. Three credits. SIGERFOOS.
- \*56. MORPHOLOGY OF INVERTEBRATES. An intensive study of the Crustacea and some of the smaller phyla of the animal kingdom. Mainly reference and laboratory work. Three credits. SIGERFOOS.

#### ADVANCED AND GRADUATE COURSES

- \*101-102. ADVANCED ENTOMOLOGY. Advanced work in the lines of morphology and histology; or classification of insects with lectures on the history of entomology. Lectures and laboratory. Six credits. OESTLUND, CHAPMAN.

- \*107-108. GENERAL ECOLOGY OF INSECTS. General ecology with special reference to the insects of Minnesota. Frequent field trips made whenever the weather allows. Lectures, laboratory, and field work. Six credits. OESTLUND, CHAPMAN.
- \*115-116. MAMMALOLOGY. Structure and classification of North American mammals. The mammalian skeleton; its modifications; consideration of our domestic animals; dissection of a typical mammal. Classification, natural history and geographic distribution with special reference to Minnesota mammals. Six credits. JOHNSON.
- \*119-120. VERTEBRATE HISTOLOGY. Primarily advanced work on vertebrate tissues. Conference, reference, and laboratory work. Six credits. DOWNEY.
- \*123-124. BLOOD OF VERTEBRATES. A comparative study of blood and blood-forming organs of vertebrates. A portion of time to be devoted to research. Six credits. DOWNEY.
- \*131-132. EMBRYOLOGY. A brief survey of general embryology, and the organogeny of the vertebrates with special reference to the circulatory system. Conference, reference, and laboratory work with Kellicott's *General Embryology* and *Outlines of Chordate Development* as texts. Six credits. Not given in 1916-17. NACHTRIEB.
- \*143-144. GENETICS AND EUGENICS. Facts and theories of heredity and the application of the laws governing natural inheritances for the improvement of a race. Lectures, reference, conference, and laboratory work. Six credits. Not given in 1916-17. NACHTRIEB.
- \*161-162. PROBLEMS. Advanced work in some special line. Six or twelve credits. DOWNEY, JOHNSON, JOHNSTON, LUND, NACHTRIEB, OESTLUND, SIGERFOOS.

## ECONOMIC ZOOLOGY

## COLLEGE OF AGRICULTURE

Professor FREDERICK L. WASHBURN; Associate Professor ARTHUR G. RUGGLES; Assistant Professors CHARLES W. HOWARD, WILLIAM MOORE.

## INTRODUCTORY COURSES

3. ECONOMIC ENTOMOLOGY. A consideration of the most important insect pests; methods of control; insecticides and insecticidal apparatus; beneficial insects. All students entering this course make a collection of insects. Three credits. WASHBURN, RUGGLES, HOWARD, MOORE.
4. ECONOMIC VERTEBRATE ZOOLOGY. The relation of birds and four-footed wild animals to agriculture. Laboratory and field work. Identification of Minnesota birds affecting the horticulturist and agriculturist;

also of vertebrate farm pests, study of habits, methods of combating, etc. Two credits. WASHBURN.

14. INSECTS AND PUBLIC HEALTH. A consideration of the agency of insect-like animals in the transmission of disease, as well as general household insects; also methods of sanitation, etc., related to their control and disease transmission. Two credits. HOWARD.
18. CONTROL OF INSECT PESTS. The principal insects of the orchard and garden are studied in detail. The last part of the course deals with spray materials and their method of application. Three credits. RUGGLES, MOORE.

#### ADVANCED AND GRADUATE COURSES

104. METHODS IN ECONOMIC ENTOMOLOGY. Methods of breeding insects; identification of insects in various stages; photography of insects; general field work, etc. Three credits. MOORE.
- 105-106. SPECIAL PROBLEMS. Investigations of special problems for those intending to specialize in entomology or economic zoology. Problems may be chosen in any section of the Division. Students are expected to be in attendance during the Summer Session. Six credits. WASHBURN, RUGGLES, HOWARD, MOORE.
- 107-108. IMMATURE STAGES OF INSECTS. A study of immature forms of economic insects. Laboratory work. Three or six credits. RUGGLES.
- 109-110. ACTION OF INSECTICIDES. A study of the common insecticides and their action on insects and their hosts. Laboratory and conference work. Three or six credits. MOORE.

#### ASTRONOMY

Professor FRANCIS P. LEAVENWORTH; Assistant Astronomer WILLIAM O. BEAL.

#### ASTRONOMICAL OBSERVATORY

The Astronomical Observatory contains a ten and one-half-inch refracting telescope furnished with a third lens for converting it into a photographic telescope; a five-inch star camera; a filar micrometer; a spectroscope by Brashear; a meridian circle and zenith telescope; a Repsold photographic measuring machine; a chronograph, and astronomical clocks.

- 9-10. DESCRIPTIVE ASTRONOMY. Same as Course II. One evening session each week, one and one-half hours long, throughout the year. Three credits. BEAL.
- 11a,b. DESCRIPTIVE ASTRONOMY. Lectures on the elements of Astronomy, illustrated by lantern slides. Three credits. LEAVENWORTH, BEAL.
- 13-14. DESCRIPTIVE ASTRONOMY AND OBSERVATORY PRACTICE. Lectures and



recitations on the elements of Astronomy; lectures illustrated by lantern slides. Laboratory exercises, problems, and telescopic observations. No credit is given until both semesters are completed. Six credits. BEAL.

\*51-52. GENERAL ASTRONOMY. A thoro study of the general principles of Astronomy, illustrated by lantern slides and telescopic observations. No credit is given until both semesters are completed. Six credits. LEAVENWORTH.

62a,b. ELEMENTS OF PRACTICAL ASTRONOMY. Theory and use of astronomical instruments in determining time, latitude, longitude, and positions of heavenly bodies. Three credits. BEAL.

\*101-102. PRACTICAL ASTRONOMY. Theory and use of astronomical instruments in determining time, latitude, longitude, positions of heavenly bodies; astronomical photography, with measures of plates; study of the method of least squares. Six or twelve credits. LEAVENWORTH.

\*140. METHOD OF LEAST SQUARES. The combination and adjustment of observations and the discussion of their precision as applied especially to Engineering, Physics, and Astronomy. Two credits. LEAVENWORTH.

### BACTERIOLOGY

Associate Professor WINFORD P. LARSON; Instructors ARTHUR T. HENRICI, ANNE BENTON.

58a or 58b. GENERAL BACTERIOLOGY. Preparation of culture media. The morphology of bacteria. Methods of staining and of identification. Anaerobic bacteria. Principles of sterilization and disinfection. Examination of air, water, milk. Relation of bacteriology to the industries. Four credits. LARSON, BENTON, HENRICI.

\*59. SPECIAL BACTERIOLOGY. Study of pathogenic bacteria. Bacteriological methods in clinical diagnosis. Principles of infection and immunity with practical application of serum reactions. Three credits. LARSON, BENTON.

\*104. SPECIAL BACTERIOLOGIC TECHNIQUE. An advanced course offering an opportunity for additional work in bacteriology and affording the opportunity of working out special problems. Limited to ten students. Three credits. LARSON.

### BOTANY

Professors FREDERIC E. CLEMENTS, CARL OTTO ROSENDAHL, JOSEPHINE E. TILDEN; Assistant Professors HERBERT F. BERGMAN, \*FREDERIC K. BUTTERS, NED L. HUFF; Instructor WILLIAM S. COOPER; Assistants DONALD FOLSOM, FRANCES L. LONG, HARVEY STALLARD, VINNIE A. PEASE; Teaching Fellow ARTHUR M. JOHNSON.

\* Absent on leave, 1916-17.

## INTRODUCTORY COURSES

- 1a,b. GENERAL BOTANY. A study of the external form and organs of flowering plants, root, stem, leaf, fruit and seed, and of their relations to each other, together with simple greenhouse experiments to illustrate the various functions. Three credits. CLEMENTS, HUFF, BERGMAN, COOPER, FOLSOM, LONG, STALLARD, JOHNSON.
- 2a,b. STRUCTURAL BOTANY. A study of the microscopic structure of flowering plants, the cell, tissues and tissue systems, as seen in the root, stem, leaf, etc. Three credits. HUFF, JOHNSON.
- 3a,b. EVOLUTION OF PLANTS. A comparative microscopic study of selected types of plants, illustrating the evolution of land plants from the simplest forms. Three credits. HUFF.
4. FIELD AND GARDEN BOTANY. Greenhouse, garden, and field study of the form, behavior, naming, and relationships of flowering plants, together with individual problems in the pollination, reproduction and propagation of common lower types. Three credits. CLEMENTS, BERGMAN, COOPER, FOLSOM, LONG, STALLARD.

## INTERMEDIATE COURSES

- 5-6. PLANT MORPHOLOGY. A comparative study of the form, structure, and life history of typical algae, fungi, liverworts, mosses, ferns, and seed plants. Course 6 (but not 5) open to those who have taken Course 3. Six credits. HUFF.
- 7-8. TAXONOMY. 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. Six credits. ROSENDAHL.
- 9-10. PLANT PHYSIOLOGY AND ECOLOGY. Greenhouse study of the growth and behavior of plants, and field study of plant communities and their environment in fall and spring. Six credits. CLEMENTS, COOPER.
- 11-12. INDUSTRIAL BOTANY. Laboratory study of the plants useful to man, including those which furnish food, shelter, fuel, clothing, etc. Six credits. TILDEN.
- 13-14. MYCOLOGY. The classification and life history of the various groups of fungi, based on identification, field work, and cultures. Six credits. Not offered in 1916-17. CLEMENTS.

## ADVANCED COURSES

- \*103. PLANT FOODSTUFFS AND TEXTILES. A special study of the botany of foods, textile fibers and fabrics, together with an inquiry into the relation of plants to household processes and problems. For young women. Three credits. TILDEN.

- \*105-106. ALGAE. A detailed comparative study of the structure and classification of the algae, including an examination of blue-green and green freshwater forms and the more important brown and red marine species. Six credits. TILDEN.
- \*107-108. COMPARATIVE MORPHOLOGY OF MOSSES AND FERNS. Designed for students who wish to pay special attention to the morphology and taxonomy of liverworts, mosses, and ferns. Lecture, laboratory, and field work. Six credits. Not given in 1916-17. BUTTERS.
- \*110. MORPHOLOGY AND TAXONOMY OF GYMNOSPERMS. A comparative 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. Six credits. Not given in 1916-17. BUTTERS.
- \*111-112. 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. Six credits. Not given in 1916-17. ROSENDAHL.
- \*113-114. ADVANCED ECOLOGY. Critical quantitative study of adaptations produced by water and light (autecology), in 1916-17; an examination of plant formations (synecology), in 1917-18. Discussion, quizzes, field or greenhouse work. Six credits. CLEMENTS, COOPER.
- \*115-116. ADVANCED PLANT PHYSIOLOGY. The interrelations of factor, function, and structure with special reference to the food cycle (photosynthesis, respiration, and growth) in 1916-17, and to the water cycle (absorption, transport, and transpiration) in 1917-18. Discussions, quizzes, and greenhouse work. Six credits. CLEMENTS, BERGMAN.
- \*117-118. 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. Six credits. ROSENDAHL.
- \*119-120. ADVANCED INDUSTRIAL BOTANY. A study of the origin, distribution, and cultivation of plants yielding products of economic value; the nature and uses of these products and the processes by which they are obtained from the plants. Six credits. TILDEN.
- \*121-122. PLANT STUDIES AND METHODS. The subjects of nature-study and high-school botany presented as they are to be taught; the material considered in detail in proper sequence, and training in method afforded by practice in the University and Minneapolis High Schools. Six credits. CLEMENTS.

## CHEMISTRY

## THE SCHOOL OF CHEMISTRY

Professors GEORGE B. FRANKFORTER, CHARLES F. SIDENER; Associate Professors EVERHART P. HARDING, WILLIAM H. HUNTER; Assistant Professors IRA H. DERBY, EDWARD E. NICHOLSON; Instructors ROSS A. BAKER, FRANK W. BLISS, LILLIAN COHEN, J. GERHARD DIETRICHSON, ISAAC W. GEIGER, LAWRENCE M. HENDERSON, FRANK H. MACDOUGALL, EDWARD B. PECK, CARL L. SCHUMANN, WOLDEMAR STERNBERG, STERLING TEMPLE, H. LEE WARD; Assistants ARTHUR R. CADE, ROSCOE H. CARTER, DONALD C. FARLEY, ALLAN S. HUMPHREYS, FLOYD E. JOYCE, VAMAN R. KOKATNUR, WALTER M. LAUER, ALLEN T. NEWMAN, CHARLES R. PARK, ANNA C. PETERSON, S. JOSEPH REICHERT, HUGO RINGSTROM, J. GORDON SWEENEY.

## DIVISION OF GENERAL AND INORGANIC CHEMISTRY

- 1-2. GENERAL CHEMISTRY. A study of the metallic and non-metallic elements, and the underlying laws and theories of chemistry. Six credits. COHEN and Assistants.
- 3-4. ADVANCED GENERAL CHEMISTRY AND QUALITATIVE ANALYSIS. This course includes a study of the chemical elements and their more important compounds, the acid and basic qualitative analysis, and a consideration of the important laws and theories of chemistry. Six credits. FRANKFORTER, DIETRICHSON, and Assistants.
- 7-8. QUALITATIVE ANALYSIS. The general reactions of the metals and acids with their qualitative separation. The ionic theory and the law of mass action with special reference to common qualitative reactions. Six credits. NICHOLSON, BLISS, and Assistants.
10. GLASS BLOWING. Demonstration of glass manipulation. The construction and repair of simple glass apparatus. Open only to those who have taken or are taking practice teaching in chemistry. Three hours laboratory practice per week. One credit. BAKER.
17. COLLOQUIUM IN INORGANIC CHEMISTRY. A systematic review. Two credits. BAKER.
20. TEACHERS' COURSE. For those who expect to teach Chemistry. Two credits. WARD.
- 21-22. INORGANIC AND QUALITATIVE CHEMISTRY. This includes a study of the non-metals, metals, and qualitative analysis, together with a discussion of the fundamental laws and theories of chemistry. Ten credits. COHEN.
- \*167-168. ADVANCED INORGANIC CHEMISTRY. Designed to systematize and broaden the student's knowledge of inorganic chemistry. Based largely on the periodic system. Important types of chemical reactions studied with reference to their analytical and industrial significance. Lectures, recitations, assigned reading. Four credits. BAKER.

- \*169-170. CHEMISTRY OF THE RARE ELEMENTS. The descriptive chemistry of the rare elements and their analytical separation. Four credits. NICHOLSON.

## DIVISION OF ANALYTICAL CHEMISTRY

- \*11-12. QUANTITATIVE ANALYSIS. First semester: A general discussion of quantitative methods, with laboratory work in gravimetric analysis. Second semester: A discussion of standard solutions and the necessary stoichiometric calculations with laboratory work in volumetric analysis. Prerequisite, one year of chemistry, and one year of physics or of mathematics. Eight credits. SIDENER, STERNBERG, GEIGER.
- \*107-108. ADVANCED QUANTITATIVE ANALYSIS. The work in this course will be adapted as far as possible to the needs and desires of the individual students. Four or six credits. SIDENER.

## DIVISION OF ORGANIC CHEMISTRY

- 13-14. MEDICAL ORGANIC CHEMISTRY. The chemistry of carbon, including the preparation of some of the important organic compounds. Emphasis laid on the parts of organic chemistry most important in medicine. Open only to students in Arts and Medicine Course. Six credits. HUNTER, SCHUMANN, and Assistants.
18. COLLOQUIUM IN ORGANIC CHEMISTRY. A thoro quiz in general organic chemistry. Two credits. FRANKFORTER.
- \*35-36. ORGANIC CHEMISTRY. The aliphatic and the aromatic series with the preparation of the more important compounds. Prerequisite, one year of chemistry, and one year of biological science. Eight credits. FRANKFORTER, SCHUMANN, and Assistants.
- \*115. ADVANCED ORGANIC CHEMISTRY. Selected topics: constitution work, quinones, etc.; the study of organic reactions. Two credits. HUNTER.
- \*116. THEORETICAL ORGANIC CHEMISTRY. A consideration of theories that apply especially to carbon compounds, such as relation of properties to constitution, the carbon valence theory. Two credits. HUNTER.

## DIVISION OF PHYSICAL CHEMISTRY

- \*121-122. PHYSICAL CHEMISTRY. A consideration of the theories and laws, phenomena, and processes which form the basis of chemical science. Charts, models, and experiments employed to supplement and illustrate the discussions. Four credits. MACDOUGALL.
- \*123-124. PHYSICO-CHEMICAL LABORATORY PRACTICE. Physico-chemical methods and measurements. Open only to students pursuing Course 121-122, or who have had it or its equivalent. Two credits. MACDOUGALL.
- \*125-126. ADVANCED PHYSICAL CHEMISTRY. The theories of chemistry treated systematically from the standpoint of thermodynamics and

the molecular theory. Suited to the needs of candidates for the higher degrees and all others interested in the advances of modern physical chemistry. Six credits. DERBY.

- \*127. RADIOCHEMISTRY. The occurrence, methods of isolation, and physico-chemical properties of the radioactive substances, together with a brief consideration of the chemical, geological, and biological bearing of the subject. Two credits. Not given in 1916-17. HENDERSON.
- \*128. LABORATORY COURSE IN RADIOACTIVITY. To accompany or follow Course 127. Two credits. Not offered in 1916-17. HENDERSON.

#### DIVISION OF TECHNOLOGICAL CHEMISTRY

- 27-28. CHEMISTRY OF EVERY-DAY LIFE. A discussion of the inorganic and organic substances used in every-day life. Four credits. FRANK-FORTER, GEIGER.

#### DIVISION OF INDUSTRIAL CHEMISTRY

15. PHOTOCHEMISTRY. A discussion of the general principles of photochemistry and their application to dry-plate photography and the ordinary printing processes. Two credits. PECK.
16. COLOR PHOTOGRAPHY. Theory and practice in the preparation and use of orthochromatic and panchromatic plates; photography in natural colors. Two credits. Not given in 1916-17. PECK.

#### COMPARATIVE PHILOLOGY

Professor FREDERICK KLAEBER.

- \*101. GENERAL INTRODUCTION TO THE SCIENCE OF LANGUAGE. Sufficiently general to be of use to all students who wish to obtain an insight into the life of language. Prerequisites: (1) five years of foreign language, one necessarily in college; (2) two years of foreign language in college; (3) six credits in Old English; (4) Courses 3 and 5 in English. Two credits. KLAEBER.
- \*102. SCIENCE OF LANGUAGE (Advanced Course). Investigation of linguistic problems. Study of standard works. Reports on recent publications. Alternates with Course 106. Two credits. Not given in 1916-17. KLAEBER.
- \*104. INTRODUCTION TO GERMAN PHILOLOGY. Two credits. Not given in 1916-17. KLAEBER.
- \*105. THE UNIVERSAL LANGUAGE. Comparison of the principal families of languages in grammatical and lexical respects. History of the movement for the creation of an international language. Consideration of Volapük, Esperanto, Ido, and other artificial languages. One credit. KLAEBER.

- \*106. THE LIFE OF WORDS. Etymology and semasiology. Growth of vocabulary; change of words in form and meaning. Lectures and exercises with special reference to English and other Germanic languages. Alternates with Course 102. Two credits. KLAEBER.
- \*109-110. HISTORY OF THE GERMAN LANGUAGE. Lectures, discussions, assigned readings. Course may be conducted in German. Alternates with Course 141-142. Identical with German 109-110. Four credits. Not given in 1916-17. KLAEBER.
- \*141-142. HISTORICAL GRAMMAR OF THE ENGLISH LANGUAGE. (1) Sounds and Spelling. (2) Accidence and Syntax. Alternates with Course 109-110. Identical with English 141-142. Four credits. KLAEBER.

## DRAWING AND DESCRIPTIVE GEOMETRY

Professor WILLIAM H. KIRCHNER; Instructor LAWRENCE J. MORTENSON.

21-22. TECHNICAL DRAWING. Theoretical and practical graphics, the reading and making of working plans. Projection, sketching, lettering, conventions, renderings, and translations. Four credits. KIRCHNER, MORTENSON.

## ECONOMICS

Professors †JOHN H. GRAY, E. DANA DURAND; Assistant Professors ROY G. BLAKEY, J. FRANKLIN EBERSOLE, \*THOMAS WARNER MITCHELL; Instructors LLOYD M. CROSGRAVE, WILLIAM W. CUMBERLAND, ALBERT C. HODGE, ALBERT C. JAMES, ROBERT J. MCFALL, WILLIAM A. PATON, J. WARREN STEHMAN; Assistant JOSEPH A. CUMMINGS; in the General Extension Division, Associate Professor CLARE L. ROTZEL; Assistant Professors CHARLES H. PRESTON, \*GERHARD A. GESELL; Instructor RAYMOND V. PHELAN.

## SUGGESTIONS AS TO COURSES IN THE DEPARTMENT

In order to aid students who have some idea as to their intended profession or calling to make a wise choice of courses, the accompanying tabular statement has been prepared.

These recommendations are merely suggestive and more courses are sometimes recommended than suffice to make up a technical major in order that students may choose those courses which interest them the most.

Course 3-4 is not included in these recommendations, as it should, in any case, precede the advanced courses, and is required of all taking a major in Economics.

Students desiring merely a general acquaintance with Economics as part of a liberal education and as a preparation for citizenship are recommended to take the general courses and such others, amounting at least to a minor, as their interests may indicate.

\* Absent on leave, 1916-17.

† Absent on leave second semester, 1916-17.

## ECONOMICS

In preparation for	Courses most essential	Additional courses desirable
Law .....	76, 145, 146, 191	43, 104, 143, 174
Public Service .....	2, 145, 146, 191	35-6, 101, 164
Consular and Diplomatic Service .....	2, 13, 72, 76, 101	34, 43, 143
Journalism .....	2, 43, 145, 146, 173, 191	101, 104, 143, 161, 164
Engineering or Railway Service .....	47, 145, 146, 173	34, 35-6, 142, 161, 174
Chemistry or Manufactures..	2, 15, 76, 145, 161	34, 35-6, 101, 131
Mining .....	2, 72, 143, 145, 161	13, 142
Banking and Finance.....	43, 46, 101, 143, 145	35-6, 41, 139, 142, 144, 255-56
General Business .....	2, 13, 43, 76, 143	34, 35-6, 142, 145
Forestry or Agriculture....	13, 15, 18, 22	35-6, 43, 143, 173, 251-2
Teaching Business Subjects.	2, 13, 43, 104	34, 35-6, 41
Medicine .....	2, 43, 164	34, 35-6, 142
Social Service Work.....	2, 101, 161	104, 164, 261-62
The Ministry .....	2, 161	104
Public Accountancy .....	34, 35-6, 132	43, 46, 49, 101, 131, 142, 145, 146, 253-54
Insurance .....	34, 35-6, 46, 47	142, 145, 146

## GENERAL COURSES

- 3a,b-4. 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 monopoly problems. Not open to students in vocational curriculum. Six credits. BLAKEY, JAMES, STEHMAN, CUMBERLAND, CROSGRAVE, PATON.
5. ECONOMIC DEVELOPMENT PRIOR TO 1750. Development of commerce and commercial policies in Europe prior to the Industrial Revolution, as a preparation for the study of modern economic conditions and theories. Textbook, supplemented by lectures and assigned readings. Three credits. Not given in 1916-17. BLAKEY.
7. PRINCIPLES OF ECONOMICS. A study in the principles that underlie the present industrial order. Open only to students in the vocational curriculum. Three credits. Not given in 1916-17. BLAKEY and others.
- 8a. ECONOMIC PROBLEMS. A survey of the fundamentals in the problems of labor, social insurance, socialism, government ownership, corporations, trusts, monopolies, transportation, banking, protection, free trade, public revenues and expenditures. Open only to students in the vocational curriculum. Three credits. BLAKEY and others.
9. INDUSTRIAL HISTORY SINCE 1750. Economic effects of inventions, wars, political changes, increased supply of precious metals, improved transportation, and modification of business organization; chief emphasis on Great Britain. Six credits. GRAY.
- \*101. THEORY AND PRACTICE OF STATISTICS. Principles of collection, tabulation, and interpretation of statistical material, illustrated by pres-



ent-day statistical data. Lectures, assigned readings, and special investigations by individual members of the class. Three credits. DURAND.

- \*103. DISTRIBUTION OF WEALTH. An advanced course in economic theory devoted chiefly to a study of recent theories of distribution. Assigned readings, reports, and discussions. Three credits. PATON.
- \*104. 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. Three credits. PATON.
- \*105-106. ECONOMIC CONFERENCE. Monthly meetings of the instructional staff, and advanced students in Economics. Lectures on bibliography by Mr. Gerould; papers prepared for advanced courses presented for criticism; reports on current economic events and literature. No credit.

#### PRODUCTION, TRANSPORTATION, AND COMMERCE

- 2a. INDUSTRIES AND COMMERCE OF THE UNITED STATES. Same as 2b, but given at the College of Agriculture. Three credits. MCFALL.
- 2b. INDUSTRIES AND COMMERCE OF THE UNITED STATES. Agricultural, mining, and manufacturing industries and internal and foreign commerce. Leading individual industries—geographical distribution, methods of organization, production and marketing, and relationships to one another. Textbook, lectures, and assigned readings. Three credits. MCFALL, CUMBERLAND.
- 13. ECONOMIC GEOGRAPHY OF FOREIGN COUNTRIES. Economic basis of modern civilization; localization of industries; principal extractive, manufacturing, and distributive industries of leading foreign countries, especially markets for American products. Textbook with lectures and special reports. Three credits. MCFALL.
- 15. FOREST ECONOMICS AND CONSERVATION. Development of forest policies; relation of forests to other industries; effects of transportation rates and taxation; general problem of the conservation of natural resources. Lectures, assigned readings, and reports. Three credits. Not given in 1916-17. MCFALL.
- 18. PROBLEMS IN AGRICULTURAL ECONOMICS. The practical economic problems which confront the farmer as a producer, consumer, and citizen; land settlement and development; size of farms; intensity of cultivation; tenancy, credit; marketing; coöperation; taxation, protective duties; foreign markets; transportation. Three credits. DURAND.

#### FINANCE

- 41. FINANCIAL HISTORY OF THE UNITED STATES. American monetary and fiscal 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. Three credits. BLAKEY.
- 43a,b. PRINCIPLES AND PRACTICE OF 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. Three credits. EBERSOLE, STEHMAN.
46. PERSONAL INSURANCE. Life insurance companies; types of policies and their uses; premium, reserve, surrender values, dividends, and rights and obligations of policy holders. Analysis of accident and liability insurance contracts and methods. Public regulation. Three credits. JAMES.
47. PROPERTY INSURANCE. Basic theory and critical examination of policy contracts, of fire, marine, other casualty title and credit insurance. Textbook, lectures, and assigned readings. Three credits. JAMES.
- \*142. INVESTMENT AND SPECULATION. 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. Three credits. EBERSOLE.
- \*143. MONEY AND PRICES. The functions of money; the nature of credit; changes in general prices, their causes and effects; international movements of gold; monetary standards and currency systems; the problem of securing an ideal money. Three credits. EBERSOLE.
- \*144. 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 examination of all the available business barometers designed to forecast similar conditions. Three credits. EBERSOLE.
- \*145. THE MODERN BUSINESS CORPORATION. The organizing, financing, and managing of corporations; the corporation before the law; methods of accounting; the relation of the government to the corporation; the question of trusts in its various phases. Three credits. GRAY.
- \*146. 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. Three credits. DURAND.
- \*191. PUBLIC FINANCE. Public expenditures; public debt; budgetary legislation; tax systems. Three credits. BLAKEY.
- \*192. STATE AND LOCAL TAXATION. Problems of state and local taxation. Historic survey of various taxes and examination of present pro-

cedure in taxing different kinds of property; tax reforms. Particular attention given to conditions in Minnesota. Three credits. BLAKEY.

- \*72. **ECONOMICS OF COLONIZATION.** Economic causes of human migration; historical survey of colonization with reference to economic bases; colonial commerce in relation to modern commercial and foreign policies; preferential tariffs and imperial federation. Lectures, readings. Three credits. Not given in 1916-17. MCFALL.
- \*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. Three credits. BLAKEY.
- \*173. **RAILWAY PROBLEMS.** Survey of railways and railway policy of the United States and representative foreign countries. Railway organization and finance. Railway discriminations, competition, pooling, combination, and associations. Canal and ocean transportation. Transportation and labor. Three credits. MCFALL.
- \*174. **RAILWAY RATE REGULATION.** Rate-making, federal and state legislation, cost and value of service, earnings, valuation, the regulation of particular rates and of entire rate schedules, complications from state and interstate jurisdiction, classification, and representative decisions. Three credits. MCFALL.

#### BUSINESS ADMINISTRATION

34. **BUSINESS MANAGEMENT.** The principles of efficiency in business operation and forms of organization to apply them; the typical departments of a business; their functions, office organization and administration. Textbook, assigned readings, and lectures. Three credits. HODGE.
- 35-36. **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. Six credits. HODGE, PATON.
37. **MARKETING OF PRODUCTS.** Foreign and domestic merchandising methods of manufacturers. Problems of wholesalers and commission men; distributing system and market organization; price policies. Problems of the credit department. Three credits. JAMES.
39. **ADVERTISING AND SALESMANSHIP.** Functions and principles of advertising; advertising media; planning and executing an advertising campaign. Copy. Sales management and personal salesmanship. Three credits. JAMES.

- \*88. **RETAIL MERCHANDISING.** 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. Three credits. JAMES.
- \*131. **COST ACCOUNTING.** Analysis of production cost; methods of recording 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. Three credits. PRESTON.
- \*132. **ACCOUNTING PROBLEMS.** A selection from C.P.A. examinations and other sources of difficult problems that confront the public accountant. Three credits. Not given in 1916-17. MITCHELL.
- \*133. **ACCOUNTING SYSTEMS.** The special accounting problems of building societies, banks, department stores, insurance companies, railroad companies, and other types with a description of their accounting systems. Three credits. Not given in 1916-17. MITCHELL.
- \*134. **AUDITING.** Preparation for, and conduct of, an audit; the auditor's report and certification, and legal responsibilities. Textbook, assigned readings, class discussions, and lectures. Three credits. Not given in 1916-17. MITCHELL.
- \*139. **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. Three credits. EBERSOLE.

#### ECONOMIC REFORMS

- \*161. **LABOR PROBLEMS.** Modern labor problems: woman and child labor, industrial education, unemployment, poverty, industrial hygiene, welfare work, profit-sharing, coöperation, labor unions, strikes, boycotts, conciliation, and arbitration; economic causes and effects of immigration. Three credits. CROSGRAVE.
- \*163. **ECONOMIC CONDITIONS IN AMERICAN CITIES.** The causes of economic dependence in American cities; the standard of living; the constructive agencies for economic betterment. Lectures, assigned readings, and visits of inspection in the Twin Cities. Three credits. Not given in 1916-17. CROSGRAVE.
- \*164. **THE ECONOMIC FUNCTIONS OF THE STATE.** The proper limits of state interference with private property, freedom of contract and individual liberty. Police powers of the state. Legislation concerning factories, female and child labor, minimum wage, social insurance, etc. Three credits. CROSGRAVE.

- \*165. HISTORY AND THEORY OF SOCIALISM. Economic utopias from Plato to Proudhon. Special attention to the theory, history, and practical significance of modern socialism. Lectures, assigned readings, and discussions. Three credits. CROSGRAVE.
- \*166. TRADE UNIONISM AND ALLIED PROBLEMS. Development and activities of American trade unions. Economic and legal aspects of collective bargaining, closed shops, strikes, and boycotts. Employer's associations. Conciliation and arbitration. Social significance and probable future of trade unionism. Not given in 1916-17. Three credits. Not given in 1916-17. CROSGRAVE.
- \*168. WAGES. The history of real and money wages during the last four centuries. Theories of wages from Adam Smith to the present. Wage statistics. Wage regulation with intensive study of minimum wage laws. Three credits. Not given in 1916-17. CROSGRAVE.

## EDUCATION

## THE COLLEGE OF EDUCATION

Professors LOTUS D. COFFMAN, MELVIN E. HAGGERTY, ALBERT W. RANKIN, FLETCHER H. SWIFT; Assistant Professor WILFORD S. MILLER; Instructors JEAN ALEXANDER, CHARLES L. HARLAN, ELLSWORTH LOWRY.

- 1a,b. 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. Three credits. SWIFT, ALEXANDER.
- 3a,b. 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. Three credits. RANKIN, HARLAN, LOWRY.
- 3bt. SAME AS ABOVE FOR TEACHERS. RANKIN.
- 11a,b. 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. Three credits. HARLAN, MILLER.
- \*101. FOUNDATIONS OF MODERN EDUCATION. Interpretative historical study of those elements in modern education derived from the Hebrews, Greeks, Romans, Middle Ages, and Renaissance. Emphasis upon secondary and higher education and the origin and results of the monopoly of the cultural conception of education and cultural studies. Three credits. SWIFT.
- \*102. HISTORY OF EDUCATION FROM THE REFORMATION TO THE PRESENT

TIME. Modern educational institutions, theories, and problems in the light of their history. Special emphasis upon elementary education. Three credits. SWIFT.

- \*103. EDUCATIONAL CLASSICS. An intensive study of selected writings of educational leaders, ancient, medieval, and Renaissance. Two credits. SWIFT.
- \*104. EDUCATIONAL CLASSICS. An intensive study of selected writings of educational leaders from Locke to the present time. Two credits. SWIFT.
- \*105. EDUCATIONAL PSYCHOLOGY. Advanced work in genetic psychology, the origin and nature of the human organism, the origin, development and control of instincts, the relation of instincts to the formation of habits, introductory to the psychology of learning. Three credits. HAGGERTY.
- \*106. 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. Three credits. HAGGERTY.
- \*109. 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. Two credits. HAGGERTY.
- \*115a,b. 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. Three credits. MILLER.
- \*119. 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 community needs. Three credits. RANKIN.
- 119t. SCHOOL CURRICULA. For teachers. RANKIN.
- \*121a,b. 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. Three credits. RANKIN.
- \*123. 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; the time allotment of studies. Three credits. COFFMAN, .....

- \*124. EDUCATIONAL ADMINISTRATION. The interpretation of present tendencies in the administration of state and city school systems. Three credits. COFFMAN, .....
- \*125. METHODS IN 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. Two credits. COFFMAN.
- \*131. GERMAN SCHOOLS. Study of the existing school systems of Germany with emphasis upon present conditions and problems. Three credits. ALEXANDER.
- \*132. FRENCH SCHOOLS. A study of the existing school systems of France with emphasis upon present conditions and problems. Three credits. ALEXANDER.
- \*134. MENTAL DIAGNOSIS OF SCHOOL CHILDREN. A study of mental variation in children, its nature, degree, causes and effects and a discussion of methods of treating superior and subnormal individuals in the schools. Two credits. HAGGERTY.
- \*136. MENTAL TESTS. Study of individual differences by means of mental tests. Laboratory work in giving and taking tests introductory to the use of group tests for the measurement of age-level, etc. Three credits. HAGGERTY.
- \*141. 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. Three credits. RANKIN.
- \*142. INDUSTRIAL EDUCATION. Existing types of industrial and vocational schools and systems of training. Comparison of conditions in American and foreign countries. Organization of course of study. Three credits. RANKIN.
- 142t. INDUSTRIAL EDUCATION. For teachers. RANKIN.
- \*146. HISTORY AND PRINCIPLES OF RELIGIOUS EDUCATION. Part I: The influence of religion and religious education as social and spiritual forces among certain selected types. Part II: Principles of education as applied to religious instruction and training. Three credits. SWIFT.

## ENGLISH

Professors RICHARD BURTON, HARDIN CRAIG, FREDERICK KLAEBER, \*ELMER E. STOLL, CARLETON BROWN; Associate Professor OSCAR W. FIRKINS; Assistant Professors JOSEPH W. BEACH, GEORGE N. NORTHROP.

I-2. GENERAL SURVEY OF ENGLISH LITERATURE from the beginning to

\* Absent on leave, 1916-17.

- Swinburne. Lectures, recitations, and assigned readings. Designed to prepare for more minute study of special periods. These courses may be taken in either order and credited independently of each other. Six credits. CRAIG, BROWN, BEACH, NORTHP, and PATTISON, HERRICK, KUHL, of the Department of Rhetoric.
3. OLD ENGLISH. The language, with reading of representative selections of Old English prose and poetry. The relation to modern English is particularly emphasized. Three credits. KLAEBER, FIRKINS.
  4. ADVANCED OLD ENGLISH. A continuation of the preceding course. Three credits. KLAEBER.
  - 5a,b. CHAUCER. The grammar and literary forms of fourteenth century English, with selected readings from Chaucer's works. Special attention to *The Canterbury Tales*. Open to students who have taken or are taking Course 1-2. Three credits. First semester, BROWN; second semester, FIRKINS.
  6. 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*. Open to students who have taken or are taking Course 1-2. Three credits. FIRKINS.
  8. HISTORY OF THE ENGLISH LANGUAGE. Outlines of the history of the language. Lectures and assigned readings. One credit. KLAEBER.
  - \*55a,b. SHAKESPEARE. An introductory study of Shakespeare's development as a poet and dramatist up to *King Lear*, with reading of representative plays. Three credits. First semester, NORTHP; second semester, BROWN.
  - \*59. MODERN DRAMA. Contemporary drama from 1870 to the present; the new impulse in dramatic literature under the stimulus of latter-day thought. Three credits. BURTON.
  - \*60. ADVANCED MODERN DRAMA. A continuation of the preceding course treating in greater detail contemporary problems in stagecraft and dramaturgy. Limited to twenty students who have completed Course 59 with distinction. Three credits. BURTON.
  - \*62. MILTON. The principal poets of the time of Charles I and the Protectorate with special emphasis upon Milton. Not offered in 1916-17. Three credits. NORTHP.
  - \*66. 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. Three credits. BURTON, and PATTISON and HERRICK of the Department of Rhetoric.
  - \*67. THE ENGLISH NOVEL. Principles and personalities in the evolution



- of the English novel. Written reports on selected novels. Three credits. BURTON, and PATTISON and HERRICK of the Department of Rhetoric.
- \*75. RECENT ENGLISH POETRY. Poetry in England and America since 1870. The main poetic traditions and tendencies now prevailing. Two credits. Not given in 1916-17. BEACH.
- \*80a,b. TEACHERS' COURSE. Methods of teaching English in high schools. Course of study, textbooks, and equipment; visits to Minneapolis and St. Paul high schools; theme-correcting. Open to juniors, seniors, and graduates qualifying for a major recommendation in English. Credit only in Education. INGLIS.
- \*101. INTRODUCTION TO MIDDLE ENGLISH. An outline of Middle English grammar, including the interpretation of selected texts. Alternates with Course 103. Two credits. Not given in 1916-17. KLAEBER.
- \*103. PIERS THE PLOWMAN. A critical study of *Piers the Plowman*. Alternates with Course 101. Two credits. Not given in 1916-17. KLAEBER.
- \*105. EIGHTEENTH CENTURY POETRY. The Rise of Naturalism and Romanticism. Eighteenth century English poetry from Pope to Burns, with special reference to the rise and growth of naturalism and romanticism. Three credits. CRAIG.
- \*107. 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. Three credits. Not given in 1916-17. CRAIG.
- \*108. THE ROMANTIC MOVEMENT. The Romantic School of poets from Wordsworth to Keats and the influence of the revolution in France. Three credits. CRAIG.
- \*109-110. ENGLISH HUMORISTS. Manifestations of the comic spirit in modern English literature; humor, wit, comedy, and satire, with special reference to their use in a criticism of life; illustrations from dramatists, novelists, essayists, poets. Six credits. Not given in 1916-17. BEACH.
- \*112. SEVENTEENTH CENTURY PROSE. General survey of the prose of the century to 1660. Second semester. Course 3-4 in History is a desirable prerequisite. Three credits. NORTHROP.
- \*113-114. THE DRAMA: STRUCTURE AND EVOLUTION. First semester: theory of the drama, and history up to the nineteenth century. Second semester: recent drama, continental, English; open only to those who have completed first semester. Six credits. FIRKINS.
- \*115. ENGLISH IDIOM. A discussion of current idiom with the purpose of relating it to the underlying principles of historic development. Two credits. BURTON.

- \*118. THE BIBLE AS LITERATURE. A literary study of the Old Testament with special attention to forms and the critical study of selected readings. Two credits. Not given in 1916-17. BURTON.
- \*119-120. PRINCIPLES OF LITERARY CRITICISM. A brief treatment of elements or forces in literature; an exposition of literary types in relation to the standards and methods of judging each. Instructor's permission to take the course must be obtained before registration. Six credits. FIRKINS.
- \*122. AMERICAN LITERATURE. Lectures on American literature, with extensive readings from the principal poets and prose writers of the United States. Three credits. Not given in 1916-17. CRAIG.
- \*123-124. SEMINAR IN NOVELISTS. Detailed study of selected novelists. In 1916-17, George Meredith; in 1917-18, Thomas Hardy first semester, Henry James second semester. Open upon approval of instructor to graduate students and seniors who have completed twelve credits in English. Four credits. BEACH.
- \*125-126. BIOGRAPHY. The rise and development of English biography, with attention to journals, memoirs, and letters. Open to graduates with a major in English or History and, upon approval of the instructor, to seniors with twelve credits in English. Four credits. NORTHROP.
- \*128. SEVENTEENTH CENTURY DRAMA. The drama from the Restoration to the rise of sentimental comedy, special attention being given to the Comedy of Manners, from Etherege to Farquhar. Three credits. Not given in 1916-17. STOLL.
- \*131. ELIZABETHAN DRAMA. A study of Elizabethan and Jacobean dramatists (Shakespeare not included) from Lyly to Shirley. Three credits. Not given in 1916-17. STOLL.
- \*133. THE ENGLISH AND SCOTTISH POPULAR BALLADS. A study of a large number of traditional ballads, English and foreign, and an examination of ballad style and origins. Two credits. BROWN.
- \*136. ADVANCED SHAKESPEARE. Shakespeare's development traced to the end. A careful analysis of a number of the later plays. Problems in the interpretation of Shakespeare's dramatic methods. Three credits. BURTON.
- \*138. HISTORY OF CRITICISM. This course traces the rise, growth and present status of principles of English literary criticism. Open upon approval of instructor to graduate students and seniors who have completed twelve credits in English. Two credits. Not given in 1916-17. BURTON.
- \*140. ADVANCED STUDY OF CHAUCER. Further study of *The Canterbury Tales* and of the Minor Poems. Open upon approval of instructor

to juniors, seniors, and graduate students who have completed 5a or 5b. Two credits. BROWN.

\*141. HISTORICAL GRAMMAR OF THE ENGLISH LANGUAGE, I. Sounds and spelling. This course is identical with Comparative Philology 141. Two credits.

\*142. HISTORICAL GRAMMAR OF THE ENGLISH LANGUAGE, II. Accidence and Syntax. This course is identical with Comparative Philology 142. Two credits.

### GEOLOGY AND MINERALOGY

Professor WILLIAM H. EMMONS; Associate Professor CLINTON R. STAUFFER; Assistant Professors FRANK F. GROUT, CHESLEY J. POSEY; Instructors THOMAS M. BRODERICK, A. WALFRED JOHNSTON, TERENCE T. QUIRKE; in the General Extension Division, Assistant Professor \*EDWARD M. LEHNERTS.

1. 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. Three credits. EMMONS, JOHNSTON.
3. LABORATORY WORK. Supplements Course 1 with study of rocks and ores, topographic and geologic maps, and reference reading. One credit. JOHNSTON and Assistants.
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. Three credits. JOHNSTON.
- \*5. 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. Three credits. QUIRKE.
6. HISTORICAL GEOLOGY. The geological history of the North American continent; the more important types of fossils and their relations. Three credits. EMMONS, QUIRKE, JOHNSTON.
8. HISTORICAL GEOLOGY LABORATORY WORK. The interpretation of geologic maps and sections; structural relations; study of fossils and rock specimens. One credit. JOHNSTON.
10. ELEMENTS OF PALEONTOLOGY. An introduction to the study of fossil organisms. Lectures supplemented by field excursions. This course may be taken with Course 6. Three credits. STAUFFER.
11. PALEONTOLOGY. Index fossils of North America; a study of fossils

\* Absent on leave, 1916-17.

- and their uses in correlation. A course intended primarily for mining geologists. Three credits. STAUFFER.
12. PALEONTOLOGY. A continuation of Course 11. Three credits.
  14. 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. Three credits. QUIRKE.
  - 15a or 15b. MINERALS AND ROCKS. An outline study of general principles of petrography; classification of minerals and rocks and practice in their identification. One credit. GROUT, BRODERICK.
  21. ELEMENTS OF MINERALOGY. 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. Open to students who have taken or are taking Chemistry. Three credits. BRODERICK, GROUT.
  22. DESCRIPTIVE MINERALOGY. Continues Course 21. Special attention given to metalliferous and rock-forming minerals. Laboratory determinations and sight identification. The use of the goniometer and microscope. Laboratory work, reference reading, and field excursions. Three credits. BRODERICK, GROUT.
  - 27a,b. OUTLINES OF MINERALOGY. A course designed especially for teachers. Methods of identification of minerals, laboratory practice, conferences, reference reading. One credit. GROUT, BRODERICK.
  29. GENERAL PHYSIOGRAPHY. Principles of earth sculpture; physiographic changes in progress, and agencies causing them; hydrography and oceanography; planetary relations; climatology; field excursions. Three credits. 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. Three credits. POSEY.
  35. LABORATORY WORK. A course in the interpretation of topographic maps. Supplements and should accompany Courses 29 and 31, tho not required in connection with them. Should be taken by those who are preparing to teach Physiography. One credit. 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. May be taken as a continuation of Course 29. Three credits. POSEY.

37. PHYSICAL AND COMMERCIAL GEOGRAPHY. A study of the origin of the earth's physical features, of the distribution of natural resources, and of the geographic factors influencing the production and exchange of commodities. Required of commerce students. Three credits. POSEY.
39. GEOGRAPHICAL INFLUENCES IN THE DISCOVERY AND DEVELOPMENT OF AMERICA. A study of the influence of geographic factors of location, topography, climate, and natural resources upon the economic, social, and political development of America. Given in alternate years. Not given in 1916-17. Prerequisites: Geology I or 29 or 31, and History 5 or its equivalent. Three credits. POSEY.
- \*55. TEACHERS' COURSE IN GEOGRAPHY. A critical study of the materials and methods of teaching secondary school geography. The relation of human activities to environment will be emphasized. Prerequisites: Geology I or 29, and 36 or 116 or 118. Two credits. POSEY.
- \*57. PALEONTOLOGY. A study of fossil forms with special reference to those of geological importance. Three credits. STAUFFER.
- \*58. PALEONTOLOGY. Faunas and their correlation. A continuation of Course 57. Three credits. 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. Three credits. BRODERICK.
- \*65. MORPHOLOGY OF MINERALS. Crystallography, embracing projection and the 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 calculation. Three credits. GROUT.
- \*105. ELEMENTS OF ROCK STUDY. The occurrence and genesis of igneous, sedimentary, and metamorphic rocks; their mineral and chemical composition, structure, texture, and alteration. Classification and methods of identification and description of rocks. Open to students who have had Course I and who have taken or are taking Course 22. Three credits. GROUT, BRODERICK.
- \*106. PETROLOGY. 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. Laboratory work, lectures, and reference reading. Three credits. GROUT, BRODERICK.
- \*108. 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. Largely individual work. Three credits. STAUFFER.

- \*109. **ADVANCED PALEONTOLOGY.** A systematic study of fossil organisms accompanied by an analytical study of faunas. Lectures and laboratory work. Three credits. STAUFFER.
- \*110. **ADVANCED PALEONTOLOGY.** A continuation of Course 109. Three credits.
- \*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. Four credits. EMMONS.
- \*112. **PROBLEMS IN ORE DEPOSITS.** Field excursions, map work, lectures on field and laboratory methods. Four credits. EMMONS.
- \*116. **GEOGRAPHY OF LATIN AMERICA.** Regional geography of the Latin-American countries; their geology, topography, climate, natural resources, people. Trade relations between Latin-American countries and the United States given special attention. Alternates with Course 118. Three credits. Not given in 1916-17. POSEY.
- \*118. **GEOGRAPHY OF EURASIA.** Regional geography of Eurasia; the geology, topography, climate, natural resources, people, industries, and trade of these countries. The attitude of the major European countries to the "new" lands of Asia. Alternates with Course 116. Three credits. POSEY.
- \*124. **STRUCTURAL AND METAMORPHIC GEOLOGY.** The conditions, processes, and results of metamorphism; structural features resulting from deformation under varying conditions of load. Three credits. JOHNSTON.
- \*131-\*132. **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. Six credits. GROUT.
- \*137. **TESTING ECONOMIC MINERALS.** Methods of determining quality of mineral deposits, described and illustrated by laboratory tests of coals, oil, building stone, and metallic ores. Three credits. GROUT.
- \*140. **APPLIED PETROLOGY.** To follow or accompany Course 132. Determination of transparent and opaque ores and gangue minerals. Microscopic studies of paragenesis of ores and other mineral associations by means of reflecting light. Practical petrographic problems. Three credits. GROUT.
- \*144. **CONSTRUCTION OF GEOLOGIC MAPS.** Methods of geological examination; study and problems in construction and interpretation of geologic maps. Three credits. QUIRKE.
- \*151. **ADVANCED GENERAL GEOLOGY.** Geologic processes and their results;

development of the North American continent. Three credits. STAUFFER.

- \*152. ADVANCED GENERAL GEOLOGY. A continuation of Course 151. Three credits.
- \*160. FIELD GEOLOGY. Two weeks in the field in the summer vacation period. Fields for 1916, the Mesabi and Vermilion ranges. Credits given only on completion of satisfactory report. Six credits. JOHNSTON.
- \*188. FIELD WORK IN GEOGRAPHY. A six weeks' course during the summer months. Systematic study in the field of the physical and industrial geography of selected areas in one or more western states. Arrangements made upon application to the department. Six credits. LEHNERTS.

### GERMAN

Professor CARL SCHLENKER; Assistant Professors OSCAR C. BURKHARD, SAMUEL KROESCH, WALTER R. MYERS; Instructors JAMES DAVIES, LYNWOOD G. DOWNS, J. THEODORE GEISSENDOERFER, ARTHUR R. GRAVES, ALFRED E. KOENIG, HAROLD W. SOULE, RICHARD WISCHKAEMPER, EDWIN H. ZEYDEL; Teaching Fellows LOUISE FRARY, ARNOLD W. SHUTTER.

- a. Only students who are taking or who have taken Course 5-6 or Course 21-22 may elect the supplementary courses 25-26 and 27-28, either one or both together. But students electing Course 11-12 may take Course 25-26. No credit will be granted to students who are taking or have taken a course numbered above 50.
- b. Only students who are taking or who have taken Course 7-8 or Course 9-10 or Course 11-12 or Course 23-24 may elect the supplementary courses 29-30 and 31-32, either one or both together. Students electing Course 11-2 should take 31-32 only after consultation with the instructor in charge.
- c. Credit will be granted for either Course 5-6 or Course 21-22 but not for both.
- d. Credit for only one of the following courses will be granted: Courses 7-8, 9-10, 11-12, 23-24.
- 1a,b. BEGINNING. Double course. Pronunciation, grammar, conversation, and composition; selected readings in easy prose and verse. Six credits. KROESCH, MYERS, DAVIES, DOWNS, GRAVES, KOENIG, SOULE, ZEYDEL, SHUTTER.
- 3a,b. INTERMEDIATE. Double course. Selected texts in modern narrative and descriptive prose; selected lyrics and ballads. Assigned read-

- ing of texts outside of class. Six credits. KROESCH, MYERS, DAVIES, DOWNS, GRAVES, KOENIG, SOULE, ZEYDEL, SHUTTER.
- 5a-6b or 5b-6a. PROSE AND POETRY. See Notes *a* and *c* above. Six credits. BURKHARD, DOWNS, GEISSENDOERFER, GRAVES, WISCHKAEMPER, ZEYDEL, FRARY.
- 7-8. DRAMA. First semester: classic drama; plays of Lessing, Goethe, Schiller. Second semester: modern drama; plays of Hebbel, Hauptmann, Sudermann, and others. Assigned readings and reports throughout the year. See Notes *b* and *d* above. Six credits. SCHLECKER, BURKHARD, KROESCH, DAVIES.
- 9-10. HISTORICAL PROSE. Rapid reading course for students of history and the other social sciences. See Notes *b* and *d* above. Six credits. GEISSENDOERFER.
- 11-12. RAPID READING. First semester: narrative prose; Hauff, Storm, Sudermann, Goethe's *Hermann und Dorothea*. Second semester: plays of Lessing, Goethe, Schiller, Hebbel. Assigned readings and reports. See Notes *a*, *b*, and *d* above. Six credits. DAVIES, GRAVES, KOENIG, SOULE.
- 21-22. SCIENTIFIC INTERMEDIATE. This course aims to give students a reading knowledge of German for use in scientific studies. See Notes *a* and *b* above. Six credits. GEISSENDOERFER, GRAVES, WISCHKAEMPER.
- 23-24. SCIENTIFIC ADVANCED. Reading of monographs and periodicals. See Notes *b* and *d* above. WISCHKAEMPER.
- 25-26. ELEMENTARY COMPOSITION. Translation of easy English selections; essays on assigned subjects. See Note *a* above. Two credits. DOWNS, SOULE, WISCHKAEMPER, ZEYDEL.
- 27-28. ELEMENTARY CONVERSATION. Conversation on topics of every-day life, aiming at fluency in the use of idiom. Not a course in composition. Organized on the laboratory basis—one hour credit with two hours recitation and at least one hour of outside reading. See Note *a* above. Two credits. DOWNS, SOULE, WISCHKAEMPER, ZEYDEL.
- 29-30. ADVANCED CONVERSATION. Aims to develop ease and correctness of oral expression. Organized on laboratory basis—one hour credit with two hours recitation and at least one hour of outside reading. See Note *b* above. Two credits. KOENIG, SOULE, ZEYDEL.
- 31-32. INTERMEDIATE COMPOSITION. Translation of English selections; essays on assigned subjects; the elements of German style. See Note *b* above. Two credits. KOENIG, WISCHKAEMPER, ZEYDEL.
- \*51. GOETHE'S FAUST, PART I. Reading and interpretation of the text; study of its genesis; the Faust legends and the early Faust books;



- Marlow's *Faustus*; the most important criticisms of the work. Two credits. SCHLENKER.
- \*52. GOETHE'S FAUST, PART II. Reading and interpreting of the text; study of its genesis; the most important criticisms of the work; the treatment of the Faust legend in European literature before and since Goethe. Two credits. SCHLENKER.
- \*53. SURVEY OF GERMAN LITERATURE THROUGH THE CLASSIC PERIOD. Lectures, assigned readings, reports. Three credits. BURKHARD, MYERS.
- \*54. SURVEY OF GERMAN LITERATURE SINCE THE CLASSIC PERIOD. Lectures, assigned readings, reports. Three credits. BURKHARD, MYERS.
- \*55-56. ADVANCED COMPOSITION. A discussion of the principles of structure and style; criticism of essays on assigned subjects. Two credits. KROESCH, MYERS.
- \*57-58. ORAL DICTION. Oral exercises based upon studies in German cultural life; critical analysis of various works of German literature, argumentation and debate. Prerequisites: Courses 29-30 and 31-32, and consultation with the instructor. Four credits. KOENIG.
- \*59-60. TEACHERS' COURSE. Lectures, readings, and reports; observation of classes. Two credits. SCHLENKER.
- \*61. THE ROMANTIC SCHOOL. Assigned readings, reports; occasional lectures. Two credits. SCHLENKER.
- \*62. DRAMA OF THE LAST THIRTY YEARS. Assigned readings, reports, occasional lectures. Two credits. SCHLENKER.
- \*63. POETRY OF THE CLASSIC PERIOD. Schiller's poems. Study of metrics and form. Two credits. WISCHKAEMPER.
- \*64. POETRY OF THE CLASSIC PERIOD. Goethe's poems. Two credits. WISCHKAEMPER.
- \*107-108. BEGINNING MIDDLE HIGH GERMAN. Phonology, morphology, and syntax. Translation into the modern German. *Der Arme Heinrich, Nibelungenlied*, selected poems of Walther. Four credits. KROESCH.
- \*109-110. HISTORY OF THE GERMAN LANGUAGE. Its development, with special reference to modern German. Based on Behagel's *Deutsche Sprache*. Etymology, word formation, syntax, comparison of English and German, etc. Arranged to meet the needs of teachers. Four credits. Not given in 1916-17. KLAEBER.
- \*119-120. THE DRAMA OF SCHILLER. The plays considered with reference to the development of the dramatic idea, from the expression of the Storm and Stress movement in the early plays to the classic form of his last works. Four credits. MYERS.
- \*127-128. LYRIC POETRY OF THE EIGHTEENTH AND NINETEENTH CENTURIES.

Historical review of the best lyric poetry and the chief writers. Four credits. DAVIES.

- \*129-130. DER DEUTSCHE ROMAN. A study of the social forces and the foreign influences manifesting themselves in the German novel. Four credits. Not given in 1916-17. GEISSENDOERFER.
- \*131-132. DIE NOVELLE. A study of the technique and development. Assigned readings and reports. Four credits. BURKHARD.
- \*133-134. ENGLISH INFLUENCES IN GERMAN LITERATURE. A study of the literary relations between England and Germany with special reference to the effect upon German Literature. First semester: Milton, Pope, Richardson, and Fielding; second semester: Shakespeare. Four credits. Not given in 1916-17. MYERS.
- \*137-138. GRILLPARZER AND THE AUSTRIAN WRITERS. Assigned readings and reports. Four credits. GEISSENDOERFER.
- \*143-144. HEINE. His life and works. Assigned readings and reports. Four credits. Not given in 1916-17. GRAVES.

### GREEK

Professors JOHN CORRIN HUTCHINSON, CHARLES ALBERT SAVAGE.

- 1-2. FIRST YEAR GREEK. General principles, inflections, word-formation, syntax, elementary readings, composition. Ten credits. HUTCHINSON, SAVAGE.
- 3-4. HISTORY AND EPIC POETRY. Selections from Xenophon's *Anabasis*, and from Homer's *Iliad*. Six credits. SAVAGE.
- 7. DRAMATIC POETRY. Euripides' *Alcestis*. Introductory course in the drama. Three credits. Not given in 1916-17. SAVAGE.
- \*51. PHILOSOPHY. Plato's *Apology*, and selections from other dialogues of Plato. Three credits. HUTCHINSON.
- \*52. ORATORY. Selections from Lysias, Demosthenes, and Isocrates; lectures on Greek oratory. Three credits. HUTCHINSON.
- \*53-54. COMPOSITION. An advanced course in syntax and style, chiefly for those who expect to teach Greek. Two credits. Not given in 1916-17. HUTCHINSON.
- \*101. LYRIC POETRY. Selections from the elegiac, iambic, lyric, and bucolic poets. Three credits. Not given in 1916-17. HUTCHINSON.
- \*102. TRAGEDY. Aeschylus or Sophocles. Special attention given to the development of the drama, and to the literary form and dramatic representation of the plays read. Three credits. SAVAGE.
- \*103. THE SEPTUAGINT. Especially intended for those who are preparing for the ministry. Three credits. HUTCHINSON.

- \*104. THE NEW TESTAMENT. Especially intended for those who are preparing for the ministry, or for some other form of religious work. Three credits. HUTCHINSON.
- 59-60. GREEK ARCHAEOLOGY. A study of the Greek spirit as manifested in architecture and sculpture. First semester, architecture; second semester, sculpture. Two credits. HUTCHINSON.
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 lectures. Students taking this course may not receive credit for Course 62. Two credits. SAVAGE.
62. GREEK LITERATURE AND LIFE. Lectures, text-book, illustrative and assigned readings; special lectures illustrated by stereopticon views. Recommended to those who intend to teach Greek, Latin, English, or ancient history. Two credits. SAVAGE.
- 63-64. GREEK MYTHOLOGY. Lectures, textbook, and assigned readings, supplemented by occasional stereopticon illustrations. Recommended to those specializing in languages or philosophy. One or two credits. SAVAGE.

## HISTORY

Professors GUY STANTON FORD, CARL LOTUS BECKER, WILLIAM STEARNS DAVIS, ALBERT BEEBE WHITE; Associate Professor WALLACE NOTESTEIN; Assistant Professors SOLON JUSTUS BUCK, AUGUST CHARLES KREY; Instructor WAYNE E. STEVENS; Teaching Fellows CHARLES BYRON KUHLMANN, GLADYS M. CAMPBELL, WILSON P. SHORTRIDGE.

- 1-2. MEDIEVAL AND MODERN HISTORY. The development of Europe from 800 A.D. to the French Revolution. Designed as a background for later work in the history, literature, and politics of continental Europe. Six credits. FORD, KREY, STEVENS, KUHLMANN.
- 1b. MEDIEVAL HISTORY TO THE REFORMATION. Repetition of first semester of History 1-2. Three credits.
- 2a. HISTORY OF MODERN EUROPE. Covers the work of the second semester of History 1-2. Open to those who have taken History 1 or 1b. Three credits. KREY.
- 3-4. ENGLISH HISTORY TO 1783. General political history of England from the earliest times to close of the American Revolution, with special reference to development of governmental institutions. Serves as introduction to further work in English history, literature, and politics. Six credits. WHITE, NOTESTEIN, STEVENS.

## GENERAL COURSES

- 5-6. AMERICAN HISTORY. A general survey of American history to the

- present time. Chief emphasis upon the National period. If possible, Political Science I should accompany or follow this course. Six credits. BECKER, BUCK, STEVENS.
7. ENGLISH HISTORY 1750-1915. Textbooks, assigned readings and lectures. Emphasis placed upon the industrial revolution, franchise reforms, relations with the United States and very recent history. Three credits. NOTESTEIN.
  9. NATIONAL MOVEMENTS. A study of European history in the age of Bismarck, with special reference to the national movements between 1848 and 1870 and to Germany since 1870. Three credits. FORD.
  10. EUROPE IN THE NINETEENTH CENTURY. The national movements of the nineteenth century and those European conditions which form the basis of modern world politics. Three credits. Not given in 1916-17. FORD.
  13. MEDIEVAL CIVILIZATION. A study of the social and intellectual development of Europe from the period of the German migration to the end of the thirteenth century. Three credits. Not given in 1916-17. KREY.
  14. THE RENAISSANCE AND REFORMATION. The Renaissance and Reformation as general European movements with especial emphasis upon the work of individual men and upon ideas rather than upon politics and institutions; how the medieval world became the modern world. Three credits. KREY.
  - \*21. SELECTED TOPICS IN GREEK HISTORY. Open to juniors and seniors eligible for Course 121-122, but desiring a shorter course. Alternates with Course 121-122. Three credits. Not given in 1916-17. DAVIS.
  - \*23. ROMAN HISTORY (Short Course). Open to students eligible for Course 123-124, but desiring a shorter course. To alternate with Course 123-124. Three credits. Not given in 1916-17. DAVIS.
  - \*56-57. THE TEACHING OF HISTORY AND GOVERNMENT. Open only to students who have eighteen credits in History, including a starred course. Deals chiefly with the practical problems of teaching history and government in the secondary schools. Students planning to teach government must have 9 credits in Political Science. Three credits. KREY et al.
  - \*101. THE FRENCH REVOLUTION. A study of the conditions in France at the opening of the Revolution, and of the revolutionary movement from 1789 to 1799. Three credits. BECKER.
  - \*104. THE NEAR EAST. Turkey, the Balkan States, and European diplomacy in the East since 1453, with special reference to causes of the war of 1914. Three credits. DAVIS.
  - \*121-122. HISTORY OF GREECE. Political and social development of the Greek states up to their incorporation into the Roman Empire. Per-

- manent influence of Greek civilization. Prerequisites nine credits in History, or six credits in History and a major in Greek. Not open to those having taken History 21. Alternates with Course 22. Six credits. Not given in 1916-17. DAVIS.
- \*123-124. HISTORY OF ROME. Social and political development with considerable attention to cultural subjects. Prerequisites, nine credits in History, or six credits and a major in Latin. Alternates with Course 24. Six credits. DAVIS.
- \*125. HISTORY OF THE 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. Alternates with Course 104. Three credits. DAVIS.
- \*133-134. ANCIENT CIVILIZATION. First semester, Greece, second semester, Rome. Social and intellectual life of antiquity, with special reference to those factors which have persisted to the present day. A working knowledge of the political history assumed. Prerequisites, twelve credits in History, or a major in Greek or Latin and six credits in History. Six credits. DAVIS.
- \*136. OUTLINES OF PRUSSIAN HISTORY TO THE DEATH OF FREDERICK THE GREAT. Three credits. FORD.
- \*137. ENGLISH CONSTITUTIONAL HISTORY. Origin and early development of the English government, with emphasis upon judicial institutions. Three credits. WHITE.
- \*141. THE WEST IN AMERICAN HISTORY TO 1815. The westward movement of population and civilization; its political, economic, and social aspects; and the results upon national development. Three credits. BUCK.
- \*144. HISTORY OF MINNESOTA SINCE 1815. The settlement and development—political, economic, and social—of a typical American commonwealth. Three credits. BUCK.

## ADVANCED OR INTENSIVE COURSES

- \*154. THE AMERICAN REVOLUTION. A study of the conditions in the American colonies and in England that led to the Revolutionary War, and of the political, military, and diplomatic events of the war itself. Three credits. BECKER.
- \*162. THE BEGINNINGS OF PARLIAMENT. Parliamentary beginnings from the Norman Conquest to reign of Edward I, based wholly on original sources. Prerequisites, twelve credits in history, including Course 3-4, and permission of the instructor; knowledge of at least high-school Latin. Three credits. WHITE.
- \*163. ORIGIN OF THE ENGLISH JUDICIAL SYSTEM. The origin and early

- development of the most distinctive features in England's present-day courts and procedure. Prerequisites, same as Course 161. Three credits. Not given in 1916-17. WHITE.
- \*171-172. GERMAN HISTORY. A general survey with special reference to the rise of Brandenburg-Prussia since 1640. Prerequisites, the permission of the instructor; twelve credits in History, or History 1-2 and a major in German. Six credits. Not given in 1916-17. FORD.
- \*181. ENGLISH BACKGROUNDS OF AMERICAN HISTORY. A survey of the political and social institutions of England in the reign of Charles I, with special emphasis upon the local institutions. Three credits. NOTESTEIN.
- \*182. ENGLISH COLONIZATION IN AMERICA. Alternates with Course 184. A study of institutions in New England and Virginia. Three credits. NOTESTEIN.
- \*184. STUART PERIOD. English 111-112 is strongly recommended as a desirable reinforcing subject. Alternates with Course 182. Three credits. Not given in 1916-17. NOTESTEIN.
- \*191. SOCIAL AND ECONOMIC EUROPE IN THE AGE OF THE CRUSADES. A study of Europe and the Latin East during the twelfth and thirteenth centuries. Prerequisites: twelve credits in History; a reading knowledge of two of the following languages: French, German, Latin. Three credits. KREY.

## HOME ECONOMICS

### THE COLLEGE OF AGRICULTURE

Professor JOSEPHINE T. BERRY; Assistant Professors HARRIETT GOLDSTEIN, MABEL B. TRILLING, MARION WELLER, GRACE I. WILLIAMS; Instructors ANNA E. BAYHA, BESSIE E. BEMIS, VETTA GOLDSTEIN, AMY P. MORSE, ETHEL L. PHELPS, ALICE L. THOMAS, ELIZABETH VERMILYE; Lecturer MARTHA B. MOORHEAD.

- 1a,b. TEXTILES. A study of the textile fibers and fabrics as to structure and properties, with application to the art and economic considerations involved in selection and purchase of fabrics for clothing and household furnishing. Two credits. WELLER, TRILLING, PHELPS.
- 11a,b. 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. Three credits. PHELPS, BAYHA.
- 13a,b. DRESSMAKING. Careful consideration of factors of quality, suitability, cost in selection of dress fabrics employed; analysis and adaptation of simple dress designs; instruction and practice in cut-

- ting, fitting, draping, methods of construction involved in tailored dresses. Three credits. TRILLING, BAYHA.
- 21a,b. 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. Three credits. WILLIAMS, BEMIS, THOMAS.
- 22a,b. 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. Three credits. WILLIAMS, BEMIS, VERMILYE, THOMAS.
- 23a or 23b. FOODS AND COOKERY. This course follows the same outline as 21a or 21b, with a more detailed treatment of each topic. Five credits. WILLIAMS, BEMIS, VERMILYE.
33. 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. One credit. MOORHEAD, .....
- 51a,b. DRAWING AND DESIGN. Composition, perspective, color theory, and color harmonies applied to costume design and interiors; harmony, balance, rhythm, in line and area design. Three credits. GOLDSTEIN.
- 53a,b. HISTORIC ORNAMENT AND ADVANCED DESIGN. Historic styles in art and architecture; pure design and applied design. Three credits. GOLDSTEIN, MORSE.

## HUMAN ANATOMY

### THE MEDICAL SCHOOL

Professors CLARENCE M. JACKSON, JOHN B. JOHNSTON, THOMAS G. LEE, RICHARD E. SCAMMON; Associate Professor CHARLES A. ERDMANN; Instructors JAY A. MYERS, ANDREW T. RASMUSSEN, CHESTER A. STEWART.

NOTE: Since the number of students in anatomy courses Nos. 3-4, 101 and 102 is limited, students will not be permitted to register for these courses without written permission by the head of the department.

- 3-4. GROSS HUMAN ANATOMY. Dissection, including osteology. Laboratory work, with lectures and quizzes. Ten credits. JACKSON, ERDMANN, MYERS.
- \*101. HUMAN HISTOLOGY. Microscopic study of the various tissues and organs. Laboratory work, with lectures and quizzes. Five credits. SCAMMON, STEWART.
- \*102. HUMAN EMBRYOLOGY. The development of the human body. Lab-

- oratory work, with lectures and quizzes. Three credits. LEE, SCAMMON.
- \*103. HUMAN NEUROLOGY. A study of the central nervous system and sense organs. Lectures, recitations, and laboratory work. Three credits. JOHNSTON, RASMUSSEN.
- 111a,b. ANATOMICAL TECHNIQUE. Microtechnique, reconstruction, and museum methods, etc. Laboratory work and occasional lectures. Limited to sixteen students. Three credits. LEE.
- \*114. TOPOGRAPHIC ANATOMY. A study of the position and relations of the various organs, based upon serial cross-sections of the human body. Laboratory work, with lectures and quizzes. Three credits. JACKSON.
- \*115. FETAL ANATOMY. Dissection of the human fetus, with comparison of earlier embryonic and later postnatal structure. Laboratory work, largely individual in character, with conferences and written reports. Three credits. SCAMMON.

## HUMAN PHYSIOLOGY

### THE MEDICAL SCHOOL

Professor ELIAS P. LYON; Associate Professors RICHARD OLDING BEARD, FREDERICK H. SCOTT; Assistant Professors JOHN F. McCLENDON, M. RUSSELL WILCOX; Instructors FRANCIS B. KINGSBURY, CHAUNCEY J. V. PETTIBONE; Assistants EDWARD D. ANDERSON, ALBERT M. SNELL, EDWARD F. SLATER.

### INTRODUCTORY COURSES

- 3a,b. ELEMENTARY HUMAN PHYSIOLOGY. School for Nurses, Home Economics students and others. Three credits. BEARD, LYON, and Assistants.
4. ELEMENTARY PHYSIOLOGY. Sophomore dental students and others. Three credits. LYON, BEARD, SCOTT, and Assistants.
6. ELEMENTARY PHYSIOLOGIC CHEMISTRY. Sophomore dental students and others. Two credits. PETTIBONE, KINGSBURY, and Assistants.

### ADVANCED COURSES

- \*102. PHYSIOLOGIC CHEMISTRY. The components of the animal body; foods, digestion, the excreta and metabolism. Five credits. PETTIBONE, KINGSBURY, ANDERSON.
- \*103. PHYSIOLOGY OF MUSCLE, NERVE, BLOOD, CIRCULATION, AND DIGESTION. Four credits. SCOTT, LYON, BEARD, McCLENDON, and Assistants.
- \*104. PHYSIOLOGY OF THE NERVOUS SYSTEM AND SPECIAL SENSES; RESPIRATION, METABOLISM, NUTRITION, AND EXCRETION. Four credits. LYON, BEARD, SCOTT, McCLENDON, and Assistants.



- \*111. PHYSICAL CHEMISTRY OF CELLS. Osmotic pressure, surface tension, and electric conductivity of blood and urine; colloids; permeability of cells and tissues and changes in permeability produced by electrolytes. Three credits. McCLENDON.
- \*112. ELECTRO-PHYSIOLOGY. The bio-electric currents and the theory of stimulation and narcosis. Hydrogen ion concentration and its relation to enzyme activity and irritability. Three credits. McCLENDON.
- \*113-114. PROBLEMS IN PHYSIOLOGY. Course arranged by instructors with qualified students. Each student will be assigned a topic for special laboratory study, leading in some cases to original investigation. Three credits. LYON, SCOTT, McCLENDON.
- \*115-116. CONFERENCE COURSE IN PRINCIPLES OF PHYSIOLOGY; STUDENT SEMINAR. Bayliss' text-book will be made the basis of the course. Informal lectures and library study. One and one-half or three credits. LYON, SCOTT, McCLENDON.
- \*137a,b. FOODS AND PRACTICAL DIETETICS. A study of human foods and food values; of the principles of food selection; of caloric indices and balanced dietaries. Exercises in the practical preparation of foods. Second quarter; repeated fourth quarter. Limited to twelve students. Two credits. BEARD, assisted by MISS THOMAS, Dietitian to the University Hospital.
- \*138. PHYSIOLOGY OF DEVELOPMENT. The physiology of the ovum, the embryo, the fetus; the functions of menstruation, ovulation, pregnancy, parturition, and lactation; the functional characteristics of birth, infancy, childhood, adolescence, maturity, and old age. Two credits. BEARD.
- \*151-152. PHYSIOLOGIC CHEMISTRY. The components of the body, foods, digestion, and metabolism. Six credits. KINGSBURY.
- \*153-154. ADVANCED PHYSIOLOGIC CHEMISTRY. Course arranged by instructors with qualified students for special work. Six credits. PETTIBONE, KINGSBURY.
- \*161. URINALYSIS. Advanced methods. First quarter. One and one-half credits. PETTIBONE.
- \*163. METABOLISM. Special phases of metabolism. Lectures may be taken alone; number of students unlimited. Laboratory course limited to ten students. One and one-half credits. PETTIBONE.
- \*164. QUANTITATIVE METHODS. The estimation of certain important substances in the urine, blood, and other body fluids. Three credits. KINGSBURY.

## LATIN

Professors JOSEPH B. PIKE, JOHN E. GRANRUD.

1. SELECTIONS FROM LATIN AUTHORS. An effort will be made to give a general view of Roman life and literature. (Students entering at mid-year with two or three years' preparation in Latin may take Course 2). Three credits. GRANRUD.
2. SELECTIONS FROM LATIN AUTHORS. A continuation of Course 1. Three credits. GRANRUD.
5. LIVY. Selections. Review of principles of Latin Syntax. Three credits. PIKE, GRANRUD.
6. PLAUTUS AND TERENCE. Translation of selected plays, with study of the beginnings of the Roman drama. (Students entering at mid-year with four years of Latin may enter Course 6.) Three credits. PIKE, GRANRUD.
9. ROMAN ARCHITECTURE AND LIFE. National characteristics, the Forum and its activities, the forums and palaces of the Caesars, Roman houses and furniture, theaters, amphitheaters, circuses, thermae, and triumphal arches. Illustrated lectures and quizzes. One credit. GRANRUD.
10. ROMAN AND ITALIAN ART. Roman portrait sculpture and historical reliefs. Pompeian wall decoration and painting. Italian scenery and typical cathedrals, select masterpieces of Raphael and Michael Angelo. Illustrated lectures and quizzes. One credit. GRANRUD.
- \*57. HORACE. Selections from the odes, epodes, satires, and epistles, with a study of the life and literary art of Horace. Three credits. PIKE.
- \*58. PLINY. Selected letters of Pliny the Younger. Three credits. PIKE.
- \*101. ADVANCED COURSE IN CAESAR. (Teachers' Course.) Selections from books five to seven of the Gallic War; the principles of indirect discourse; intermediate Latin composition; class drill and discussion of various problems connected with secondary school work in Latin. Three credits. PIKE.
- \*102. ADVANCED COURSE IN VERGIL. An interpretation of selections from books seven to twelve of the Aeneid; review of portions of books one to six; the quantitative method of pronouncing Latin verse; metrical rendering of selected passages. Three credits. PIKE.
- \*104. LATIN WRITING. Study of Latin prose style. Alternates with Course 106. Two credits. Not given in 1916-17. PIKE.
- \*105. ROMAN ELEGY. Selections from Catullus, Tibullus, Propertius, and Ovid. The origin, development, and technique of Roman Elegy. Three credits. Not given in 1916-17. GRANRUD.

- \*106. THE ROMAN NOVEL. The *Cupid and Psyche* of Apuleius and *Trimalchio's Dinner* of Petronius. A study of the ancient novel. Three credits. Not offered in 1916-17. PIKE.
- \*107. LETTERS OF CICERO. Selections from his correspondence. A study of his life and times, his literary art and methods. Alternates with Course 105. Three credits. GRANRUD.
- \*108. TACITUS. Selections from his works. A study of the development of Roman historical literature, and of the sources, methods, and literary characteristics of Tacitus. Three credits. Not offered in 1916-17. GRANRUD.
- \*110. ROMAN SATIRE. Selections from Juvenal. The beginnings, evolution, and distinctive qualities of Roman Satire; Juvenal as a literary artist and a moralist. Alternates with Course 108. Three credits. GRANRUD.
- \*201-202. LUCRETIUS. (Graduate seminar but open to students who register for honors in Latin.) Interpretation of the text of Lucretius, with a study of his philosophy and its sources. Six credits. Not given in 1916-17. PIKE.
- \*203-204. SENECA. (Graduate seminar but open to students who register for honors in Latin.) Selections from the letters and essays of Seneca the philosopher. A study of Roman Stoicism. Alternates with Courses 201-202. Six credits. PIKE.
- \*205-206. CICERO. (Graduate seminar but open to students who register for honors in Latin.) Selections from the rhetorical works of Cicero. Cicero's theory of an artistic style. Six credits. GRANRUD.

## MATHEMATICS

Professors GEORGE N. BAUER, FRANCIS P. LEAVENWORTH; Associate Professor WILLIAM H. BUSSEY; Assistant Professors ROYAL R. SHUMWAY, HERMON L. SLOBIN, ANTHONY L. UNDERHILL, WILLIAM D. REEVE; Instructors RALPH M. BARTON, CLARENCE McCORMICK; Assistants KARL HOLZINGER, ELLA THORP, VERA WRIGHT.

- 1a,b. HIGHER ALGEBRA, PART I. Rapid review of factoring, fractions and fractional equations, simultaneous linear equations with graphs, involution, evolution, theory of exponents, radicals, radical equations, quadratic equations, simultaneous quadratics with graphs. Five credits. McCORMICK, HOLZINGER, WRIGHT, THORP.
- 2a,b. ALGEBRA CONTINUED THROUGH LOGARITHMS AND PLANE TRIGONOMETRY. Progressions, mathematical induction, permutations and combinations, determinants, theory of equations, logarithms, trigonometry. Those who intend to specialize in Mathematics should take this course rather than Course 3. Five credits. SLOBIN, UNDERHILL, BARTON, McCORMICK, HOLZINGER, WRIGHT, THORP.

- 3a,b. HIGHER ALGEBRA, PART II. Rapid review of quadratics, equations in quadratic form, graphical solution of quadratics, simultaneous quadratics with graphs, progressions, mathematical induction, binomial theorem, permutations and combinations, determinants, theory of equations. Three credits. BUSSEY, SLOBIN, UNDERHILL, BARTON, McCORMICK.
- 4a,b. LOGARITHMS AND TRIGONOMETRY. Text, tables, and numerous problems. Three credits. BAUER, SLOBIN, BARTON, McCORMICK.
6. SOLID SPHERICAL GEOMETRY. This course is intended primarily for those who are preparing for high school teaching and who did not present Solid Geometry for entrance. Text and lectures. Two credits. Not offered in 1916-17. BUSSEY.
7. PLANE ANALYTICAL GEOMETRY. Rectilinear and polar coordinates, loci and their equations, transformation of coordinates, the straight line, conic sections, higher plane curves. Three credits. BUSSEY.
- 9a,b. PLANE AND SOLID ANALYTICAL GEOMETRY. A more extended course in Plane Analytical Geometry than Course 7, and an introduction to Solid Analytical Geometry. For those who intend to specialize in Mathematics. Not open to those who have taken Course 7. Five credits. BAUER, SLOBIN, UNDERHILL, BARTON.
- 11a,b. DIFFERENTIAL CALCULUS. Differentiation of algebraic and transcendental functions, development of functions, indeterminate forms, maxima and minima, treatment of tangents, subtangents, normals, subnormals, asymptotes, direction and rate of curvature, evolutes, envelopes, and singular points. Three credits. BAUER, BUSSEY, SLOBIN, UNDERHILL, BARTON.
- 51a,b. INTEGRAL CALCULUS. Integration of the various forms, integration as summation, rectification of curves, quadrature of plane and curved surfaces, cubature of volumes, equations of loci, successive integration with applications to moment of inertia, areas and volumes. Three credits. BAUER, UNDERHILL.
- 54a,b. TEACHERS' COURSE. For students preparing to become teachers of secondary school mathematics. Lectures, readings, discussion. Methods of presentation, assignment, lesson plans, examinations, with definite plans for beginning courses in Elementary Algebra and plane Geometry. The aims and outcomes of education. Two credits. REEVE.
- \*62. THEORY OF EQUATIONS. Algebraic solution of cubic and quartic equations, properties of roots of an equation, symmetric functions, isolation of real roots, solution of numerical equations, complex numbers, fundamental theorem of algebra, determinants, discriminants, resultants. Text and lectures. Three credits. SHUMWAY.

- \*71. SOLID ANALYTICAL GEOMETRY. Elementary theorems of projection, coördinates, the plane, the line in space, quadric surfaces, transformation of coördinates, tangents, poles and polars, the general equation of the second degree. Numerous examples assigned to illustrate the theory. Three credits. BUSSEY.
- \*102. ADVANCED COURSE IN PLANE ANALYTICAL GEOMETRY. Supplements Courses 7 and 9, treating more fully of the subjects of those courses, and taking up additional topics. Three credits. Not given in 1916-17. BUSSEY.
- \*104. MODERN SYNTHETIC GEOMETRY. Based upon the method of central projection without the use of coördinates. Three credits. BUSSEY.
- \*106a,b. DIFFERENTIAL EQUATIONS. Text and lectures. Three credits. SLOBIN.
- \*107. ADVANCED DIFFERENTIAL CALCULUS. Infinitesimals of different orders, partial and total derivatives, introduction to infinite series, Taylor's and Maclaurin's expansions with applications of the calculus to plane curves. Three credits. UNDERHILL.
- \*108. ADVANCED INTEGRAL CALCULUS. Deals with the definite integral as the limit of a sum, improper integrals, the Beta and Gamma functions, elliptic integrals, differentiation and integration under the sign of integration; numerous applications to geometry and mechanics. Three credits. Not given in 1916-17. BAUER.
- \*119a,b. MODERN HIGHER ALGEBRA. Three credits. Not given in 1916-17. SHUMWAY.
- \*125-126. DIFFERENTIAL GEOMETRY. Six credits. Not given in 1916-17. UNDERHILL.
- \*127a,b. INFINITE SERIES. Three credits. Not given in 1916-17. BAUER.
- \*140. METHOD OF LEAST SQUARES. The combination and adjustment of observations and the discussion of their precision as applied especially to Engineering, Physics, and Astronomy. Two credits. LEAVENWORTH.

#### MILITARY SCIENCE AND TACTICS

Major GEORGE W. MOSES, U. S. Cavalry, Professor of Military Science and Tactics, Head of the Department.

Assistants, Captain THEODORE B. TAYLOR, U. S. Cavalry, Professor of Military Science and Tactics; Captain JAMES B. WOOLNOUGH, U. S. Infantry, Professor of Military Science and Tactics; First Lieutenant OWEN R. MEREDITH, U. S. Infantry, Professor of Military Science and Tactics.

University Staff, WALTER F. RHINOW, Brigade Adjutant; BERT A. ROSE, Band 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 juniors and seniors who have completed two years of drill 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. Any student who for satisfactory reasons is permitted to withdraw from this course must reimburse the War Department for all moneys received.

Juniors and seniors who take the course required by General Orders No. 49, which includes two camps of four weeks each, will receive an allowance of thirty cents per 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 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 drill and three of study 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 College of Science, Literature, and the Arts. 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.

## MUSIC

Professor CARLYLE SCOTT; Assistant Professor DONALD FERGUSON; Instructor GERTRUDE REEVES; Special Instructors MAXIMILIAN DICK, THADDEUS GIDDINGS, GERTRUDE HULL.

I-2. HARMONY. The study of chords, their construction, relations, and

progressions. Written exercises on basses, the harmonization of given melodies. Six credits. SCOTT.

3-4. COUNTERPOINT. First semester: strict counterpoint up to eight parts. Second semester: free contrapuntal harmonization of chorales and composition of smaller contrapuntal forms such as inventions. Four credits. FERGUSON.

5-6. MUSICAL FORM AND FREE COMPOSITION. For those specializing in Music and can be taken only with the consent of the instructor. At the close of the year a program of original compositions will be given. Four credits. FERGUSON.

7-8. 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. Two credits. SCOTT.

9-10. 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. Six credits. FERGUSON.

11-12. APPRECIATION OF MUSIC. A non-technical course. No prerequisite. One credit. REEVES.

13-14. First semester: Bach and Beethoven. Second semester: Wagner and Brahms. Critical study of selection from master works of the four greatest composers. Biographical readings, topics and analyses, giving historical and literary background to culminative periods in composition. Four credits. FERGUSON.

15-16, 17-18. 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. Four or eight credits. SCOTT, FERGUSON, REEVES.

19-20. VIOLIN. Candidate must be able to play the first ten of Kreutzer's forty etudes, and the easier Handel and Mozart sonatas. Four or eight credits. DICK.

21-22. VOICE CULTURE. Thoro training in relaxation and breath control, the foundations of tone production. Great advantages are also offered to the advanced singer, in the study of the best in vocal literature, songs, oratorio, and opera. Fee, forty dollars per semester. Four credits. HULL.

23-24. VIOLONCELLO. Four or eight credits. Instructor provided if the work is called for.

25-26. OTHER ORCHESTRAL INSTRUMENTS.

27-28. PUBLIC SCHOOL MUSIC. Preparation for teachers and supervisors

- of music in the grades. Piano-playing, singing, and ready reading prerequisite. Four hours in class and one half day weekly in public school visiting. Practice teaching demanded. Six credits. GIDDINGS.
- 29-30. **NORMAL PIANO.** Special course offered to students desiring to teach pianoforte as a profession. Four credits. REEVES.
- 31-32. **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. Four credits. DICK.
- 33-34. **EAR TRAINING.** A non-technical course. Required of all music students. No prerequisite. Two credits. REEVES.
- 35-36. **ORCHESTRA.** Practical study of orchestral literature: standard symphonies, overtures, concertos, etc., with public performance as frequently as practicable. May be taken a second year with credit. Two credits. FERGUSON.
- 37-38. **ADVANCED NORMAL PIANO.** Practice teaching. Prerequisite: Normal Piano 29-30. Six credits. REEVES.
- 39-40. **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 required. Prerequisite: Public School Music 27-28. Six credits. GIDDINGS.

### PHILOSOPHY AND PSYCHOLOGY

Professors **NORMAN WILDE**, **MELVIN E. HAGGERTY**; Associate Professor **DAVID F. SWENSON**; Assistant Professors **HERBERT WOODROW**, **JOSEPH PETERSON**, **RUPERT C. LODGE**; Instructors **HAROLD R. CROSLAND**, **JOHN F. DASHIELL**, **JACOB KANTOR**.

- 1-2. **GENERAL PSYCHOLOGY.** The aims and methods of psychology; the facts, laws and functions of mental life; development and learning in relation to training and instinct. Required for a teacher's certificate. Six credits. HAGGERTY, PETERSON, DASHIELL, KANTOR, CROSLAND.
- 5a or 5b. **ELEMENTS OF PSYCHOLOGY.** A brief outline for those who do not intend to take further work in psychology. Together with Course 9 a satisfactory introduction to the philosophical courses of the junior year. Three credits. SWENSON, LODGE.
- 9a or 9b. **LOGIC.** The nature of knowledge, the laws of reasoning, the principles and methods of scientific proof. Together with Course 5 a satisfactory introduction to the philosophical courses of the junior year. Three credits. SWENSON, LODGE.
13. **INTRODUCTION TO PHILOSOPHY.** The aim, method, and chief problems of philosophy. Three credits. Not given in 1916-17.



17. **METHODS OF STUDY.** Some results of modern psychology in their application to the problems of the learner; ways of avoiding and overcoming obstacles in study. Three credits. Not given in 1916-17.
18. **CHILD DEVELOPMENT.** A study of the stages of development from infancy through adolescence for those interested in parenthood and education. Three credits. DASHIELL.
20. **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. Three credits. WILDE.
- \*51a. **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. Three credits. WILDE.
- \*55. **ABNORMAL PSYCHOLOGY.** Unusual and pathological phenomena; the subconscious, dreams, suggestibility, hypnotism, mental disorders, secondary personalities. Three credits. CROSLAND.
- \*56. **ESTHETICS.** An introduction to the history and theory of esthetics, psychological analysis of beauty, and a discussion of the arts. Three credits. SWENSON.
- \*65. **DEVELOPMENT OF RELIGION.** The development of religious ideas and practices; a summary of the typical historical religions; the chief methods of modern psychological investigation. Three credits. SWENSON.
- \*66. **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. Three credits. SWENSON.
- \*101a,b. **EXPERIMENTAL PSYCHOLOGY.** Laboratory experiments designed to demonstrate the fundamental facts and laws of mental life. Three credits. WOODROW, CROSLAND.
- \*105. **MENTAL RETARDATION.** The nature and causes of retarded and perverted development in children; tests for the detection of mental defects; remedial measures. Three credits. WOODROW.
- \*107. **SOCIAL PSYCHOLOGY.** The instinctive and acquired factors in the behavior of the individual toward society in its various forms and groupings, and in the growth of ideas of self and of social attitudes. Three credits. PETERSON.
- \*108. **COMPARATIVE PSYCHOLOGY.** The development of the problems and methods of animal psychology; current experimental methods and results; relations of animal and human behavior. Three credits. PETERSON.

- \*109. **PSYCHOLOGICAL PRINCIPLES.** Detailed study of the more general problems in psychology. Three credits. KANTOR.
- \*115-116. **SEMINAR IN PSYCHOLOGY.** Major or minor research in experimental, analytical, genetic, or comparative psychology. Six credits. WOODROW.
- \*118. **ADVANCED ETHICS.** A study of the main types of ethical theory. Three credits. WILDE.
- \*121. **ANCIENT AND MEDIEVAL PHILOSOPHY.** Such an outline of the history of thought as is desirable in a general education. Emphasis placed upon the human significance of philosophy rather than upon its purely technical aspect. Three credits. WILDE.
- \*122. **MODERN PHILOSOPHY.** Continues Course 121. Lectures on the representative systems of modern philosophy from the Renaissance to the beginning of the nineteenth century; to prepare the student to understand the philosophical tendencies of the present. Three credits. WILDE.
- \*123. **SCANDINAVIAN PHILOSOPHY.** Philosophic thought of the 19th century, including a comparative study of Boström and Kierkegaard. Reading knowledge of Scandinavian required. Three credits. SWENSON.
- \*124. **NINETEENTH CENTURY PHILOSOPHY.** Continues Course 122. Modern currents of thought from the idealism of Fichte and Hegel, to the philosophy of evolution, pragmatism, and the new realism. Three credits. Not given in 1916-17. LODGE.
- \*126. **LOGIC OF SCIENCE.** An introduction to philosophy through the medium of the special sciences, its aim being to suggest a system of the sciences through a discussion of the nature and relation of their fundamental principles. Three credits. Not given in 1916-17.
- \*127. **METAPHYSICS.** A critical and constructive study of the theories of knowledge and reality. Three credits. Not given in 1916-17.
- \*129-130. **SEMINAR IN PHILOSOPHY.** Individual investigation in the field of philosophy. The character of the work and the general topic for the year can be ascertained by consultation with the department. Six credits. WILDE, LODGE.
- \*135. **THE PHILOSOPHY OF PLATO.** Three credits. LODGE.

## PHYSICAL EDUCATION

### FOR MEN

Director LOUIS J. COOKE; Assistant Director WILLIAM K. FOSTER; Instructor JOHN C. WEST; Assistant BOTTLF M. OHNSTAD.

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 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.

1. PERSONAL HYGIENE. Two hours per week; first six weeks of first semester. Examination at close of course. No credit. COOKE.

*A special lecture* on sex hygiene is given sometime during the first ten days of the autumn semester, with required attendance on the part of all freshmen.

3-4. GYMNASTICS. Two hours a week, from November 1 to end of second semester. Required qualifications in swimming, life-saving, bar-vaulting, jumping, sprinting, running, and on heavy apparatus. No credit. FOSTER, WEST.

5-6. INTERMEDIATE GYMNASTICS. Elective for freshmen showing exceptional ability in elementary apparatus work. No credit. FOSTER, WEST.

7-8. CLASS LEADERS (ADVANCED). Three hours a week. (No student may receive more than a total of six credits for elective work in both Physical Education and Military Drill.) Two credits. FOSTER, WEST.

9-10. CORRECTIVE GYMNASTICS. Three hours a week. Special individual courses for students physically defective. No credit. OHNSTAD.

11-12. WRESTLING. Course in competitive wrestling. Most promising candidates chosen to represent Minnesota at the Western Intercollegiate Gymnastic and Wrestling Meet. (Optional.) No credit. FOSTER, OHNSTAD.

13-14. ADVANCED GYMNASTICS. Same as Course 11 and 12 except that it is in gymnastics instead of wrestling. Includes course in ground tumbling, horizontal bar, parallel bars, side horse, and flying rings. No credit. FOSTER, WEST.

15-16, 17-18. SWIMMING, INTERMEDIATE AND ADVANCED. Life saving, efficiency swimming, and fancy diving. Instruction is given in rescuing and restoring the apparently drowned and other useful swimming accomplishments. No credit. FOSTER, OHNSTAD.

## PHYSICAL EDUCATION

### FOR WOMEN

Assistant Professor J. ANNA NORRIS; Instructors MAY S. KISSOCK, VALERIA G. LADD, ALICE H. TOLG.

This department aims 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; and investigates cases of illness which come to its attention.

Work in this department is required of all newly entering students (see Courses 1-2 and 11), 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 work-without credit arranged in social dancing, gymnastic dancing, swimming, fencing, basket ball, baseball, and other activities.

A professional course 15-16 for those who desire to teach will be offered for the first time in 1916-17. All senior students who desire a recommendation for teaching must also take Course 5-6 in 1916-17 whether or not it has been previously taken.

- 1-2. ELEMENTARY PHYSICAL TRAINING. Lighter forms of gymnastics; gymnastic dances; indoor and outdoor games; swimming. Study of daily habits of living. Ten-week swimming courses. Freshmen graded *Incomplete* required to repeat as sophomores. Shower bath fee, \$1.50 per semester. No credit. KISSOCK, LADD, TOLG.
- 3-4. INTERMEDIATE PHYSICAL TRAINING. Gymnastics, dances, and organized team games. Includes a study of daily habits of living and a written abstract of one book each semester. If taken for no credit, no reading or written work will be required. Shower bath fee, \$1.50 per semester. Three credits. KISSOCK.
- 5-6. ADVANCED PHYSICAL TRAINING. Gymnastics and an election of dancing, fencing, or a sport. Written abstract of one book a semester. If taken without credit, no written work or reading will be required. Shower bath fee, \$1.50 per semester. Three credits. LADD.

11. PRELIMINARY HYGIENE. Twelve lectures. The most essential aspects of the care of the body. No credit. NORRIS.
13. PERSONAL HYGIENE. The essential knowledge of the care of the body, including a brief consideration of its anatomy and a study of its physiology, the prevention of contagious diseases, and first aid to the injured. Three credits. NORRIS.
14. HYGIENE OF THE FAMILY. A study of maternity and infancy and the essentials of home nursing. Three credits. NORRIS.
- 15-16. PRINCIPLES OF PHYSICAL EDUCATION. A study of the character, purpose, arrangement, and progression of developmental and corrective gymnastics, games, and dancing; physical examinations and first aid. Includes practice teaching within the class group. Six credits. KISSOCK, LADD, TOLG.
- 21-22. ELEMENTARY ESTHETIC DANCING. Two hours a week. No credit. LADD.
- 31-32. FOLK DANCING AND ORGANIZED GAMES. Graded games for the school and playground. Two hours a week. No credit. KISSOCK.

### PHYSICS

Professors HENRY A. ERIKSON, ANTHONY ZELENY; Assistant Professor LOUIS W. MCKEEHAN; Instructors ARTHUR H. COMPTON, ERNEST O. DIETERICH, PAUL D. FOOTE, PAUL E. KLOPSTEG, JOHN T. TATE.

1. GENERAL PHYSICS. Mechanics of solids, fluids, sound, and heat. Treatment experimental rather than mathematical; fundamental principles. First part of general course 1-2. Preferably taken with Course 3, may be taken separately. One lecture, two recitations per week. Three credits. ZELENY, DIETERICH, KLOPSTEG.
2. GENERAL PHYSICS. Electricity, magnetism, and light. Treatment experimental; fundamental principles, including those of radioactivity, ionization, X-radiation. Second part of general course 1-2. Preferably taken with Course 4, may be taken separately. One lecture, two recitations per week. Three credits. ZELENY, DIETERICH, KLOPSTEG.
3. GENERAL LABORATORY PRACTICE. Physical measurements in the mechanics of solids and fluids, sound, and heat, giving the student a knowledge of experimental methods, and an acquaintance with the fundamental facts of the subject. One credit. MCKEEHAN, DIETERICH, TATE.
4. GENERAL LABORATORY PRACTICE. Physical measurements in electricity, magnetism, and light. Open to all who have completed or are taking Course 2, and have attended Courses 3 or 9. One credit. MCKEEHAN, DIETERICH, TATE.

7. GENERAL PHYSICS. Mechanics of solids and fluids, sound, and heat; numerous problems to illustrate the principles. Must be taken in conjunction with Course 9. The first part of a general course 7-8, 9-10. One lecture, three recitations per week. Four credits. ERIKSON, COMPTON, FOOTE, TATE.
8. GENERAL PHYSICS. Electricity, magnetism, and light. Must be taken in conjunction with Course 10. The second part of a general course 7-8, 9-10. One lecture, three recitations per week. Four credits. ERIKSON, COMPTON, FOOTE, TATE.
9. GENERAL LABORATORY PRACTICE. Physical measurements in the mechanics of solids and fluids, sound, and heat. Must be taken in conjunction with Course 7. One credit. MCKEEHAN, COMPTON, FOOTE, TATE.
10. GENERAL LABORATORY PRACTICE. Physical measurements in electricity, magnetism, and light. Must be taken in conjunction with Course 8. One credit. MCKEEHAN, COMPTON, FOOTE, TATE.
21. ELEMENTS OF MECHANICS. The mechanics of solids treated from an historical and experimental standpoint. Two recitations and one two-hour session in the laboratory per week. Three credits. TATE.
22. ELEMENTS OF MECHANICS. The mechanics of liquids and gases, and wave motion, treated from an experimental standpoint. Two recitations and one two-hour session in the laboratory per week. Three credits. TATE.
31. ACOUSTICS. Study of fundamental principles of sound. A course designed primarily for the students in the Department of Music. Open also to academic students who have completed 22 or a general course in Physics. Three credits. ERIKSON.
42. HEAT. A study of the fundamental principles of heat. One lecture, two recitations per week. Three credits. Not given in 1916-17. FOOTE.
44. HEAT MEASUREMENTS. A laboratory course in heat supplementary to Course 42. One credit. Not given in 1916-17. FOOTE.
52. LIGHT. A study of the fundamental principles of light. One lecture, two recitations per week. Three credits. Not given in 1916-17. ERIKSON.
54. LIGHT MEASUREMENTS. A laboratory course in light supplementary to Course 52. One credit. Not given in 1916-17. ERIKSON.
81. PHYSICAL MANIPULATION AND LABORATORY TECHNIQUE. A practical study of the processes essential in the upkeep of a physical laboratory. Selection, preparation, and purification or cleansing of materials; glass blowing; construction and repair of simple apparatus. Two credits. MCKEEHAN.
82. PHYSICAL INSTRUMENTS OF PRECISION. A practical study of instru-

- ments of precision. The physical principles and mechanical devices employed in their construction. Methods of adjustment and standardization. Two credits. MCKEEHAN.
- \*90. TEACHERS' COURSE. Methods of presentation; selection of lecture and laboratory experiments; laboratory management. Two credits. KLOPSTEG.
- \*121-122. DYNAMICS. Some problems essential in advanced physics. Six credits. TATE.
- \*125-126. CHEMICAL DYNAMICS. Designed primarily to meet the needs of students in the School of Chemistry. Open also to academic students. Six credits. MCKEEHAN.
- \*155. SPECTROMETRY. Measurements involving the use of prism spectrometers, plane transmission, and reflection gratings, concave grating, and the interferometers. Three credits. ERIKSON.
- \*161. ELECTRICITY AND MAGNETISM. The phenomena accompanying the passage of electricity through solids, liquids, and gases. One lecture, one recitation, and one two-hour laboratory period a week. Four credits. Not given in 1916-17. ZELENY.
- \*162a,b. ELECTRICAL MEASUREMENTS. Devoted mainly to the study of capacity, inductance, and magnetic flux. Three credits. ZELENY.
- \*166. ELECTRICAL MEASUREMENTS OF PRECISION. Precision measurements of electromotive force, current, resistance, capacity, inductance, and magnetic flux. Use of apparatus of highest precision. Special problems. Three two-hour laboratory periods a week. Three credits. ZELENY.
- \*177. RADIOACTIVITY. Lectures, experimental and descriptive; the various theories and methods of investigation. Detailed study of the radioactive elements. Three credits. MCKEEHAN.
- \*178. RADIOACTIVITY MEASUREMENTS. Laboratory technique in radioactivity. Three credits. MCKEEHAN.
- \*181. ADVANCED PHYSICAL MEASUREMENTS. Individual work in the laboratory on topics specially chosen to serve best the needs and capacity of each student; intended to introduce him to some of the more intricate physical measurements. Three credits. ERIKSON, ZELENY, MCKEEHAN.
- \*182. ADVANCED PHYSICAL MEASUREMENTS. Continuation of Course 181.
- \*191a,b. ELEMENTARY PHYSICAL INVESTIGATION. The experimental or theoretical study of physical phenomena, the nature or laws of which are not yet understood. Three credits. ERIKSON, ZELENY, MCKEEHAN.
- \*192a,b. ELEMENTARY PHYSICAL INVESTIGATION. Continuation of Course 191. Three credits.

## POLITICAL SCIENCE

Professors WILLIAM A. SCHAPER, CEPHAS D. ALLIN, \*JEREMIAH S. YOUNG;  
Instructors WILLIAM ANDERSON, BEN A. ARNESON; Assistant PERCIVAL  
W. VIESSELMAN.

- 1a,b. AMERICAN GOVERNMENT. Organization and actual workings of the national government; nature and origin of the American governmental system. If possible, History 5-6 should accompany or follow this course. Three credits. SCHAPER, ALLIN, ANDERSON, ARNESON, VIESSELMAN.
3. COMPARATIVE GOVERNMENT. The organization and working of the governments of the great European powers of today. Three credits. ALLIN.
5. EUROPEAN MUNICIPAL ADMINISTRATION. A study of French, German, Austrian, and English cities; the forms of government, parties and elections; achievements in finance, police, sanitation, city planning and other public services undertaken. Three credits. SCHAPER.
6. AMERICAN MUNICIPAL ADMINISTRATION. 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. Three credits. SCHAPER.
- 7a,b. STATE AND LOCAL GOVERNMENT. Typical American state governments, special attention to Minnesota; relation of states to the United States and to local units; recent experiments such as the initiative and referendum, the recall, and primaries; social and economic legislation. Three credits. ANDERSON, ARNESON, VIESSELMAN.
9. COLONIAL ADMINISTRATION. Not given in 1916-17.
25. AMERICAN GOVERNMENT (Engineers). VIESSELMAN.
26. BUSINESS LAW (Engineers). VIESSELMAN.
28. BUSINESS LAW (Agricultural). VIESSELMAN.
- \*51. BUSINESS LAW, PART I. Principles of law governing ordinary business transactions. So much of the law taught as an educated man ought to know for guidance in every-day business affairs. General law of contracts, sales, mortgages, bankruptcy, and agency. Three credits. VIESSELMAN.
- \*52. BUSINESS LAW, PART II. The law of partnerships, corporations, and negotiable instruments. Three credits. VIESSELMAN.
- \*54. LATIN-AMERICAN RELATIONS. A survey of the relations of the United

\* Absent on leave, 1916-17.



- States with the Latin-American nations; a comparative study of the constitutions, governments and recent progress of the leading Latin-American Republics. Three credits. SCHAPER.
- \*56-57. TEACHERS' COURSE. Lectures on teaching Government in the secondary schools, given in coöperation with the Department of History and credited as part of History 56-57. Three credits. SCHAPER.
- \*58. AMERICAN DIPLOMATIC PROBLEMS. Our foreign policy; the making and enforcing of treaties under the Constitution; the policy of isolation; the doctrine of neutrality; territorial expansion and boundary disputes; freedom of the seas; our relations with the Far East; arbitration. Three credits. ANDERSON.
- \*59. MUNICIPAL CORPORATIONS. The legal basis of municipal government; the relation of the city to the state from the legal point of view; home rule; the city as a legal entity; municipal liability for torts; and kindred topics. Three credits. ANDERSON.
- \*101. CONSTITUTIONAL LAW. Constitutional law, its origin and nature; American constitutions, how made and amended; the courts and the development of the Constitution; Federal and State relations; the Territories, their acquisition and government; citizenship. Three credits. SCHAPER.
- \*102. MODERN POLITICAL THOUGHT. Nature and purpose of the modern state; sovereignty; the growth of democracy; the decline of individualism; increase of governmental activities; the great contributions to political thought from Hobbes, Locke, and Rousseau to the present time. Three credits. SCHAPER.
- \*104. POLITICAL PARTIES. Not offered in 1916-17.
- \*105. COMPARATIVE ADMINISTRATION. Administration as a science; origin and development; 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. Three credits. ARNISON.
- \*106. LEGISLATIVE POWER AND METHODS. Source and scope of the legislative power; methods used by legislative bodies; current public questions; formulation and defense of legislative bills. Three credits. ARNISON.
- \*108. THE POLICE POWER. Not offered in 1916-17.
- \*109. DIPLOMACY. The growth of international relations; the mode of conducting foreign affairs; diplomatic and consular service; the framing, interpretation, and termination of treaties and compacts. Three credits. ALLIN.
- \*110. INTERNATIONAL LAW. Nature, sources, and sanction of international

law; the status of nations, the rules of peace, neutrality, and war, and the arbitration movement. Three credits. ALLIN.

\*112. 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. Three credits. ALLIN.

\*114. THE GOVERNMENT AND POLICIES OF THE BRITISH EMPIRE. The origin, nature and operation of the British constitution, political parties and principles in Great Britain and the Colonies. Three credits. ALLIN.

### RHETORIC AND PUBLIC SPEAKING

Professors JOSEPH M. THOMAS, \*MARGARET SWEENEY; Assistant Professors \*DANIEL FORD, HALDOR GISLASON, CHARLES W. NICHOLS, SIDNEY F. PATTISON, ANNA H. PHELAN, FRANK M. RARIG, CHARLES E. SKINNER, HELEN A. WHITNEY; Instructors CECIL C. BEAN, ELBRIDGE COLBY, ELIZABETH HAWTHORN, GEORGE E. HEDGER, CYRIL A. HERRICK, JAMES T. HILLHOUSE, ELIZABETH JACKSON, ERNEST P. KUHL, MARTIN B. RUUD, SANDFORD M. SALYER, FRANK SMOYER, ARTHUR J. TIEJE, HOWARD T. VIETS; Assistant RAY M. WILCOX.

†1-2. COMPOSITION AND RHETORIC. Practical training in the art of writing; the principles of structure and analysis of specimens of good prose. Six credits. THOMAS, PATTISON, PHELAN, SKINNER, WHITNEY, BEAN, COLBY, HAWTHORNE, HEDGER, HERRICK, HILLHOUSE, KUHL, JACKSON, RUUD, SALYER, SMOYER, TIEJE.

†1b. COMPOSITION AND RHETORIC. Same as Course 1. Three credits.

2a. COMPOSITION AND RHETORIC. Same as Course 2. Three credits.

3-4. COMPOSITION FOR ENGINEERS. In the College of Engineering. Six credits. NICHOLS, VIETS.

11-12. EXPOSITION, DESCRIPTION, AND NARRATION. Analysis of specimens; short themes and fortnightly essays, with emphasis on planning and amplification; informal exposition during the first half of the first semester, followed by description and narration. Number in each section limited to twenty. Six credits. COLBY, HILLHOUSE, PHELAN, RUUD, SKINNER.

\* Absent on leave, 1916-17.

† All students taking Rhetoric 1-2 shall be regarded as on probation during the first four weeks of the course. At the end of that period those who have shown their inability to do satisfactory work because of *lack of preparation* shall be dropped from the course with a record of *failed*. To be eligible to enter the course again the next semester, such students must make up their deficiency in preparation by devoting at least three hours each week to regular instruction in this subject outside the college and must pass an examination given by the department. Until this examination is passed such students will not be permitted to carry more than fourteen hours of college work.

- 15-16. EXPOSITION AND ARGUMENT. Exposition during the first half of the first semester, 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. Six credits. SALYER, TIEJE.
- 31-32. TECHNICAL WRITING. In the College of Engineering. Four credits. NICHOLS.
- 80a,b. TEACHERS' COURSE. Methods of teaching English in high schools. Course of study, textbooks, and equipment; visits to Minneapolis and St. Paul high schools; theme-correcting. Open to juniors, seniors, and graduates, qualifying for practice teaching. Credit only in Education. Three credits. INGLIS.
- \*102. 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. Three credits. NICHOLS.
- \*103-104. 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. Six credits. WHITNEY.
- \*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. Three credits. THOMAS.
- \*110. SHORT-STORY WRITING. The technique of the short story accompanied by constructive work in story writing. Three credits. THOMAS.
- \*111-112. 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. Six credits. PATTISON.
- \*115-116. DRAMATIC TECHNIQUE. Principles of plotting, characterization, climax, dialog, and scenario-making. Writing of three plays—two original, one dramatized short story. Required readings, laboratory work, criticisms of local productions. Prerequisites: Courses 11-12 and 59-60 or 113-114 in English. Six credits. SKINNER.
- \*119-120. 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. Open to seniors and graduates. Prerequisites: Courses

1-2, 11-12, and at least one other course. Required of Honor Course students. Four credits. THOMAS.

\*201-202. GRADUATE SEMINAR. (Open to seniors taking the Honors Course.) Lectures, discussions and reports. For 1916-17: study of critical theory beginning with Plato and Aristotle and emphasizing more important English and French writers. Prerequisites, Courses 1-2, 11-12, or 15-16, and at least one other course. Six credits. THOMAS.

#### 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 inter-society debate; (3) have represented the University in an intercollegiate debate, or won a place in the Pillsbury oratorical contest.

41-42. 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 compositions. Each section limited to twenty-five. Six credits. RARIG, GISLASON, WILCOX.

45-46. 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. Six credits. GISLASON.

47. INTERCOLLEGIATE DEBATE AND ORATORY. The question for intercollegiate debate studied and briefed, and frequent practice debates held. Open to juniors and seniors who are awarded places on the intercollegiate debating squad. Three credits. GISLASON, RARIG.

\*81-82. 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. The aim is intelligent and sympathetic reading. Six credits. RARIG.

\*83-84. 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. Six credits. RARIG.

## ROMANCE LANGUAGES

Professors EVERETT W. OLMSTED, COLBERT SEARLES; Assistant Professors JULES FRELIN, RUTH S. PHELPS; Professorial Lecturers BALBINO DÁVALOS, PAUL D'EQUILLY MORIN, PEDRO HENRÍQUEZ UREÑA; Instructors HARRY E. ATWOOD, GEORGE S. BARNUM, FRANCIS B. BARTON, NELSON F. COBURN, WILLIS J. PLUMMER, EDWARD H. SIRICH; Teaching Fellows ENRIQUE JIMÉNEZ, GUSTAAF VAN ROOSBROECK.

## INTRODUCTORY COURSES

*French*

- 1a,b. BEGINNING FRENCH. Double course. This course will complete in one semester the work heretofore done in two. Pronunciation, grammar, oral exercises, and translation. Six credits. ATWOOD, BARTON, COBURN, FRELIN, SEARLES, SIRICH.
- 2a. BEGINNING FRENCH. Second half of Course 1a. Open to students who have had one year of high school French or beginning French in Summer Session. Three credits. BARTON.
- 3a,b. INTERMEDIATE FRENCH. Double course. This course will complete in one semester the work heretofore done in two. Review of grammar, composition, conversation, and reading of representative authors. Six credits. ATWOOD, FRELIN, BARNUM.
4. SURVEY OF FRENCH LITERATURE. Same as 5-6, except that it is a second semester six-hour course. Six credits. BARTON.
- 5-6. SURVEY OF FRENCH LITERATURE. This course will cover the whole period in historical outline and is a prerequisite for the courses devoted to special periods. Six credits. ATWOOD, MORIN, PHELPS, SIRICH.
- 7-8. ELEMENTARY FRENCH CONVERSATION. A small amount of outside preparation will be required. The section meeting at nine o'clock on Monday and Wednesday is limited to students taking Course 5-6 and is based on the work of that course. Two credits. BARTON, FRELIN, MORIN.
- 9-10. ELEMENTARY FRENCH COMPOSITION. Two credits. BARTON, FRELIN, MORIN.
- 61-62. ADVANCED FRENCH CONVERSATION. The life and custom of Modern France accompanied by illustrative material. Two credits. MORIN.
- 63-64. ADVANCED FRENCH COMPOSITION. Two credits. MORIN.
- 75-76. FRENCH LITERATURE: NINETEENTH CENTURY. Discussions based on texts and collateral reading. Six credits. BARTON.

*Spanish*

- 31a,b. BEGINNING SPANISH. Double course. This course will complete in

- one semester the work heretofore done in two. Pronunciation, grammar, oral exercises, and translation. Six credits. PLUMMER, HENRÍQUEZ.
- 33-34. BEGINNING SPANISH. This course is the same as Course 31a except that it is a year course meeting three times a week. Six credits. BARNUM, COBURN, OLMSTED, PLUMMER.
- 35a,b. INTERMEDIATE SPANISH. Double course. This course will complete in one semester the work heretofore done in two. Review of grammar, composition, conversation, and reading. Six credits. PLUMMER, HENRÍQUEZ.
- 37-38. INTERMEDIATE SPANISH. This course is the same as Course 35a except that it is a year course meeting three times a week. Six credits. COBURN, HENRÍQUEZ.
- 39-40. SPANISH LITERATURE OF THE NINETEENTH CENTURY. Discussions based upon texts and collateral reading. Six credits. HENRÍQUEZ.
- 41-42. ELEMENTARY SPANISH CONVERSATION. A small amount of outside preparation will be required. Two credits. PLUMMER.
- 43-44. ELEMENTARY SPANISH COMPOSITION. Special attention is given to social and commercial correspondence. Two credits. PLUMMER.

#### *Italian*

- 51-52. BEGINNING ITALIAN. Pronunciation, grammar, oral exercises, and translation. Six credits. PHELPS.
- 53-54. REPRESENTATIVE ITALIAN AUTHORS. Ariosto, Tasso, Goldoni, Manzoni, Leopardi, Carducci. Six credits. PHELPS.

#### ADVANCED COURSES

#### *French*

- \*101-102. FRENCH LITERATURE: EIGHTEENTH CENTURY. Discussions based upon texts and collateral reading. Six credits. SEARLES.
- \*103-104. FRENCH LITERATURE: SEVENTEENTH CENTURY. Discussions based upon texts and collateral reading. Six credits. OLMSTED.
- \*105-106. FRENCH LITERATURE: SIXTEENTH CENTURY. Discussions based upon texts and collateral reading. Six credits. SIRICH.
- \*107-108. FRENCH ORAL DICTION. Dissertations orales sur des sujets variés. Four credits. MORIN.
- \*109-110. FRENCH SYNTAX AND COMPOSITION. Special studies in characteristic problems of French Syntax. Two credits. MORIN.
- \*111-112. LECTURES IN FRENCH. L'Exotisme dans la Littérature française. Four credits. MORIN.

- \*113-114. FRENCH LITERATURE: CLASSICISM. Four credits. Not given in 1916-17.
- \*115-116. FRENCH LYRIC POETRY. Pro-seminar work. Four credits. SEARLES.
- \*117-118. FRENCH DRAMATIC LITERATURE. Pro-seminar work. Four credits. Not given in 1916-17. OLMSTED.

*Spanish*

- \*131-132. ADVANCED SPANISH COMPOSITION. Life and customs of Spain and Spanish America. Four credits. HENRÍQUEZ.
- \*133-134. LECTURES IN SPANISH. La Civilización española e hispanoamericana. Four credits. HENRÍQUEZ.
- \*135-136. SPANISH NOVEL. Two credits. Not given in 1916-17.

*Italian*

- \*151-152. DANTE, PETRARCH, AND BOCCACCIO. An introduction to the works of these authors. Reading in class, reports, and collateral reading. Four credits. PHELPS.
- \*153-154. DANTE, PETRARCH, AND BOCCACCIO. Lectures and readings in English. Must be taken by those registered in 151-152; may be taken separately by other students. Two credits. PHELPS.
- \*161-162. TEACHERS' COURSE. Lectures and discussions on methods, textbooks, etc. Two credits. OLMSTED, et al.

## SCANDINAVIAN

Professors GISLE BOTHNE, ANDREW A. STOMBERG.

1. BEGINNING NORWEGIAN. Grammar, composition, select readings in easy prose and poetry. Six credits. BOTHNE.
2. INTERMEDIATE NORWEGIAN. Grammar, composition, conversation, elementary history of literature, and select works of modern authors. Six credits. BOTHNE.
- 3-4. ADVANCED NORWEGIAN. Prose and poetry. Six credits. BOTHNE.
5. BEGINNING SWEDISH. Grammar and composition; select readings in easy prose and verse. Six credits. STOMBERG.
6. INTERMEDIATE SWEDISH. Grammar, composition, and conversation; prose texts. An elementary study of the literature of Sweden and reading of Tegner's *Fritiofs Saga*. Six credits. STOMBERG.
- 7-8. ADVANCED SWEDISH. Prose and poetry. Six credits. STOMBERG.
9. BEGINNING NORWEGIAN. Grammar, composition, select readings in easy prose and poetry. Two credits. Not given in 1916-17.

10. **ADVANCED NORWEGIAN.** Grammar, composition, conversation, elementary history of literature, and select works of modern authors. Two credits. Not given in 1916-17.
- 11-12. **NORWEGIAN LITERATURE.** A survey. This course is open to teachers and mature students. Four credits. BOTHNE.
- \*101-102. **MODERN NORWEGIAN LITERATURE.** Norwegian literature from 1814 to the present day. Six credits. BOTHNE.
- \*103. **EARLIER NORWEGIAN LITERATURE.** History of literature. Saga period. Norwegian and Danish folk-songs, Holberg, Oplysningstiden. Three credits. BOTHNE.
- \*104. **IBSEN.** Lectures, reading, and interpretation. Two credits. BOTHNE.
- \*105-106. **HISTORY OF NORTHERN EUROPE.** History of the Scandinavian countries from the earliest period to recent times. Prerequisites: Courses 3-4 or 7-8, or Courses 1-2, 3-4, or 14 in History. Knowledge of Scandinavian languages not required. Six credits. STOMBERG.
- \*107-108. **SWEDISH LITERATURE.** History of Swedish literature from 1710 to the present time. History of the literature and study of modern authors, including Selma Lagerlöf, Geijerstam, Strindberg. Six credits. STOMBERG.
- \*109. **STRINDBERG.** Lectures, reading, and interpretation. Two credits. STOMBERG.
- \*110. **TEACHERS' COURSE IN NORWEGIAN.** For students who expect to teach Norwegian in the high schools. Two credits. BOTHNE.
- \*113-114. **OLD NORSE (ICELANDIC).** Grammar and reading. Gunnlaugs Saga Ormstungu. Four credits. BOTHNE.
- \*116. **TEACHERS' COURSE IN SWEDISH.** For students who expect to teach Swedish in the high schools. Two credits. STOMBERG.

### SOCIOLOGY AND ANTHROPOLOGY

Professors ALBERT ERNEST JENKS, ARTHUR J. TODD; Assistant Professor JOSEPH PETERSON; Instructor PAUL I. NEERGAARD; Lecturers FRANK J. BRUNO, OTTO W. DAVIS, GEORGE EDGAR VINCENT; Superintendents of State Board of Control Institutions.

#### INTRODUCTORY COURSES

- 1a,b. **GENERAL INTRODUCTION.** Elemental activities, institutions, laws, and theories. Especial emphasis placed on descriptive data. Textbook and lectures. Three credits. JENKS,\* NEERGAARD, TODD.\*
4. **CULTURAL ANTHROPOLOGY.** Origin and development of the most im-

\* First semester only.



portant activities and institutions which have had their beginning in primitive society. Textbook, lectures, readings, and essay. Three credits. JENKS.

- 6 MODERN SOCIAL REFORM MOVEMENTS. A survey of the attempts to overcome certain social maladjustments: child labor, the city, the tenement, poverty, degeneracy; movements for public health, old age pensions, social insurance, the protection of infancy and youth, public recreation, etc. Three credits. TODD.

SPECIAL COURSES

7. STUDIES IN SOCIAL PSYCHOLOGY. President George E. Vincent will deliver the following course of five public lectures to the students of the Department:

1. The Individual and the Group
2. Group Conflict and Rivalry
3. Group Coercion
4. Folkways and Mores
5. The Psychology of Leadership.

Not given in 1916-17. VINCENT.

GENERAL COURSES

9. TREATMENT OF DEPENDENTS AND DEFECTIVES. The extent and nature of poverty and mental defectiveness; efforts made for their amelioration and prevention. Three credit. BRUNO.
- \*10. 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. Three credits. BRUNO.
- \*11. 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. Two credits. DAVIS.
- \*12. ETHNOLOGY. The different so-called races of men; their historical classifications; causes of origin and distribution; important ethnic problems. Textbook, lectures, assigned readings, and essay. Three credits. Not given in 1916-17. JENKS.
14. THE RURAL COMMUNITY. A survey of the field of Rural Sociology; description of rural social interests; analysis of fundamental problems of rural life; nature and influence of rural environment; characteristics of rural mind. Three credits. NEERGAARD.
- 21-22. FIELD WORK. Under personal supervision of some member of the Department. Open to properly equipped students. Two credits. Members of the Department.

## ADVANCED COURSES

- \*102. SOCIAL THEORY. The foundations of sociology; the leading American, English, French, and German writers and their methods of approach to the science and the leading results they have secured. Text books, readings, lectures, essay. Three credits. NEERGAARD.
- \*104. 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. Two credits. Not given in 1916-17. TODD, and Experts from the Institutions.
- \*106a. 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. Three credits. TODD.
- \*108. THE PHILIPPINE PEOPLE. Comparative study of the four large ethnic and cultural groups of people in the Philippine Islands; policy of the insular government as it affects American home interests in the Orient. Lectures, readings, and essay. Three credits. JENKS.
- \*110a. PHYSICAL ANTHROPOLOGY. Theory of evolution as applied to natural and cultural man; theory of eugenics and its application. Prerequisites: Courses 1, 4 (or Course 1-2 in Animal Biology), and one other course in Sociology and Anthropology. Lectures, readings, and essay. Three credits. JENKS.
- \*112. THE AMERICAN NEGRO. The negro in Africa; development of the American negro; present characteristics, conditions, developing tendencies, and probable future of the American negro. Lectures, readings, and essay. Three credits. Not given in 1916-17. JENKS.
- \*113. THE AMERICAN PEOPLE. Dominant characteristics of the diverse foreign peoples now in the United States; their modification in America; the importance of these peoples to the American nation. Lectures, readings, and essay. Three credits. JENKS.
- \*114. THE AMERICAN PEOPLE (continued). A continuation of Course 113. Essential and unique historical Americanisms, and their value and virility for the future; facts and forces of amalgamation and assimilation in America; America's ethnic problems. Lectures, readings, and essay. Three credits. JENKS.
- \*117. SOCIAL PSYCHOLOGY. An introduction to the study of reciprocal influence of minds in society. (Same as Course 107 in the Department of Philosophy and Psychology.) Prerequisites: Course 1 and one other course, and Course 1-2 or 5 in Philosophy and Psychology. Three credits. PETERSON.

- \*119. **THE FAMILY.** A study of the historical development of forms of the family, and their relation to other social institutions. The modern family, its functions, and its problems. Three credits. TODD.
- \*120. **SOCIAL PROGRESS.** A critical study of various theories of progress and a review of social institutions and conditions that are supposed to favor or hinder social progress. Prerequisites: three courses including 117 (or philosophy and psychology 13, or education 3a). Not open to students having previously taken Course 119. Three credits. TODD.
- \*121-122. **SEMINAR IN SOCIOLOGY.** An advanced course in method and independent research. Four credits. Not given in 1916-17. TODD.
- \*123-124. **SEMINAR IN ANTHROPOLOGY.** An advanced course in method and independent research. Six credits. JENKS.

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*The Bulletin*  
*of the University of*  
**Minnesota**

*The College of Science, Literature,*  
*and the Arts*  
**1917-1918**



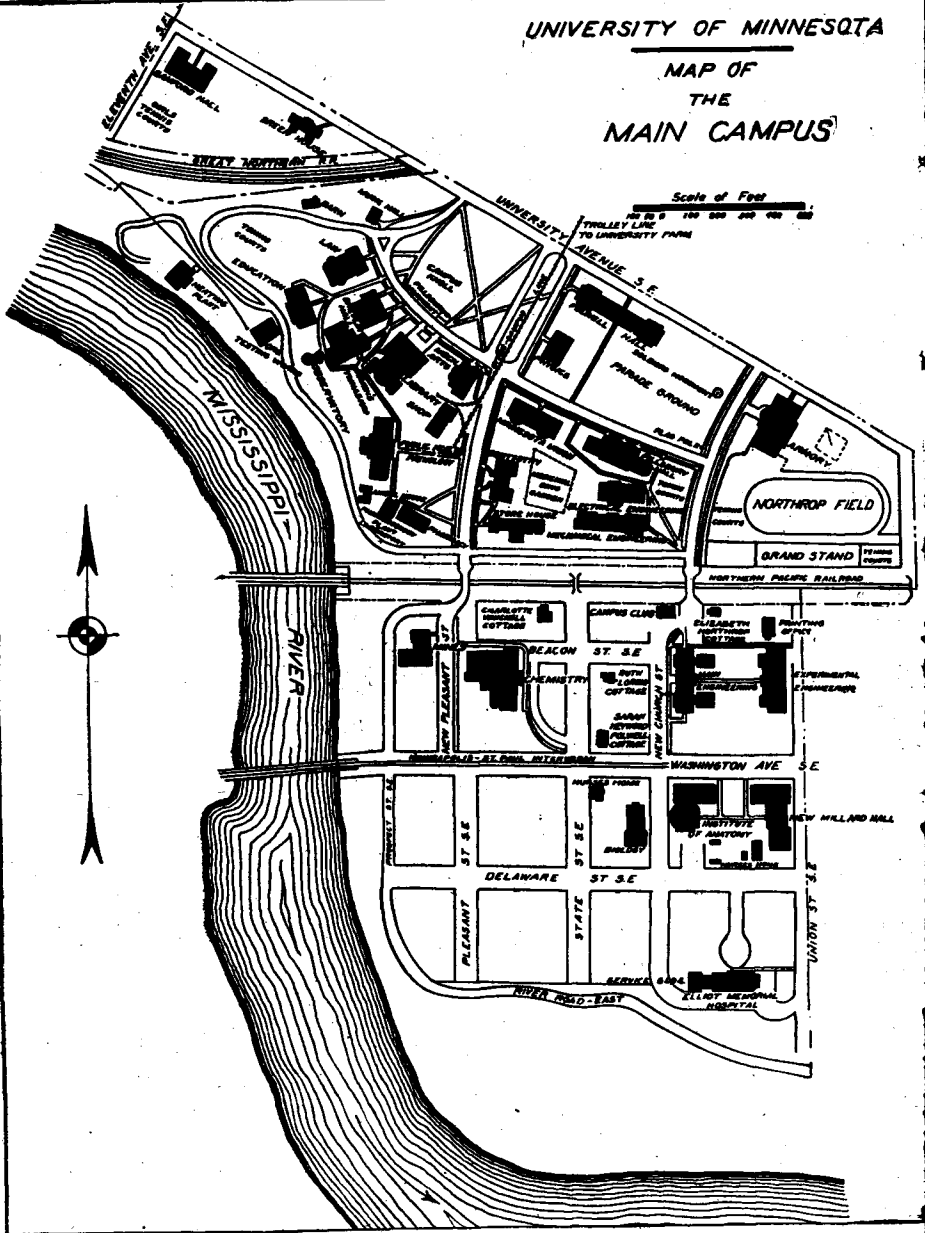
*Catalog Series No. 4 . Part II*  
*Vol. XX No. 36 August 27 1917*

*Entered at the post-office*  
*in Minneapolis as second-class matter*  
*Minneapolis, Minnesota*

UNIVERSITY OF MINNESOTA

MAP OF  
THE  
MAIN CAMPUS

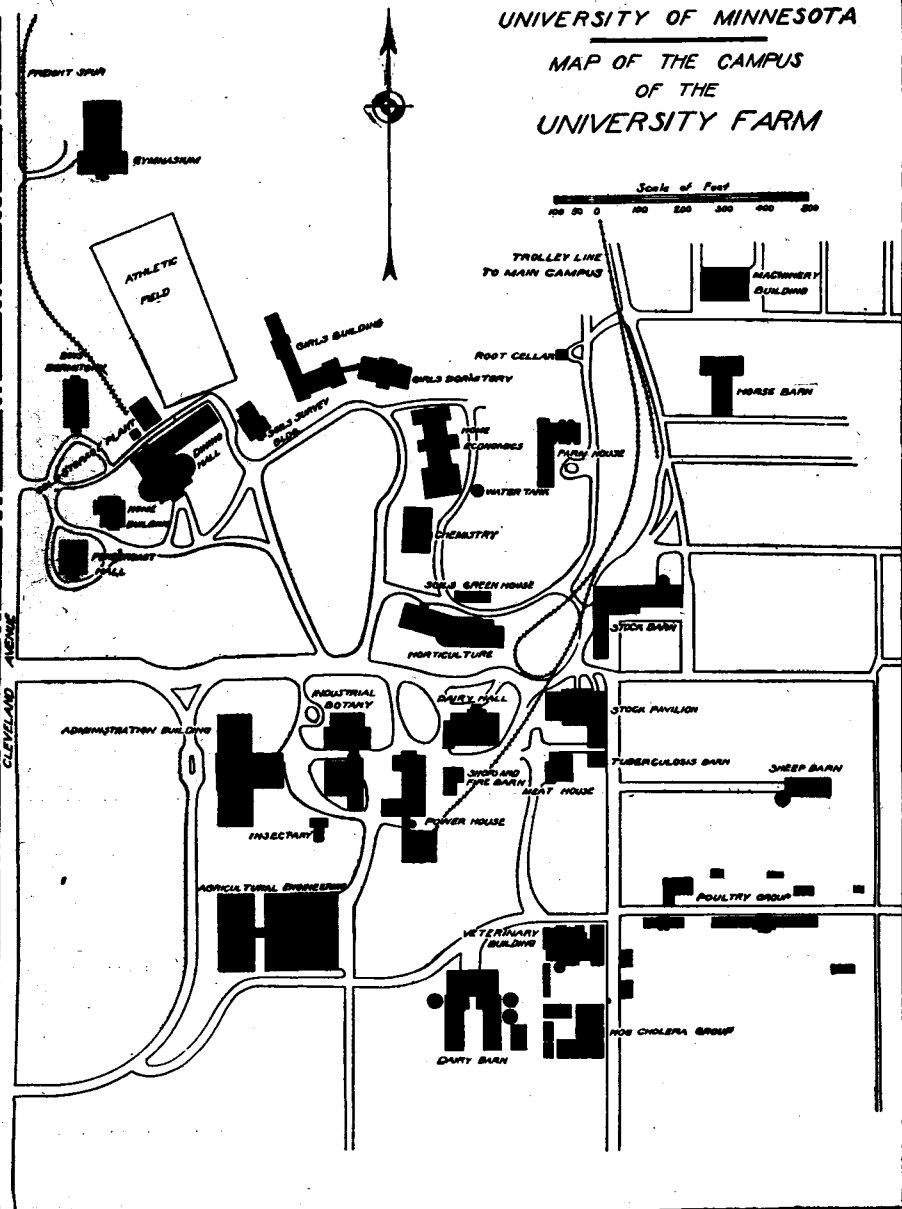
Scale of Feet  
0 50 100 200 400 800



Area of Main Campus, 108.5 acres

UNIVERSITY OF MINNESOTA

MAP OF THE CAMPUS  
OF THE  
UNIVERSITY FARM



Area of University Farm, 422.56 acres

1917							1918													
<b>JULY</b>							<b>JANUARY</b>							<b>JULY</b>						
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	6	7	..	..	1	2	3	4	5	..	1	2	3	4	5	6
8	9	10	11	12	13	14	6	7	8	9	10	11	12	7	8	9	10	11	12	13
15	16	17	18	19	20	21	13	14	15	16	17	18	19	14	15	16	17	18	19	20
22	23	24	25	26	27	28	20	21	22	23	24	25	26	21	22	23	24	25	26	27
29	30	31	..	..	..	..	27	28	29	30	31	..	..	28	29	30	31	..	..	..
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<b>AUGUST</b>							<b>FEBRUARY</b>							<b>AUGUST</b>						
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5	6	7	8	9	10	11	3	4	5	6	7	8	9	4	5	6	7	8	9	10
12	13	14	15	16	17	18	10	11	12	13	14	15	16	11	12	13	14	15	16	17
19	20	21	22	23	24	25	17	18	19	20	21	22	23	18	19	20	21	22	23	24
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<b>SEPTEMBER</b>							<b>MARCH</b>							<b>SEPTEMBER</b>						
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2	3	4	5	6	7	8	3	4	5	6	7	8	9	8	9	10	11	12	13	14
9	10	11	12	13	14	15	10	11	12	13	14	15	16	15	16	17	18	19	20	21
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11	12	13	14	15	16	17	12	13	14	15	16	17	18	10	11	12	13	14	15	16
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<b>DECEMBER</b>							<b>JUNE</b>							<b>DECEMBER</b>						
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9	10	11	12	13	14	15	9	10	11	12	13	14	15	15	16	17	18	19	20	21
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# UNIVERSITY CALENDAR

1917-1918

<b>1917</b>			
September	26	Wednesday	Registration closes for all students
September	26	Week	Fees payable for all students
October	3	Monday	First semester evening extension classes begin
October	1		
October	2-9	Week	Examinations for removal of conditions (except for Colleges of Agriculture and Forestry), and entrance examinations
October	10	Wednesday	First semester begins
October	15	Monday	Agricultural College, farm experience examinations
October	18	Thursday	Senate meeting, 4:00 p.m.
October	29	Monday	School of Agriculture, first term begins
November	5	Monday	Dairy School opens
November	28	Wednesday	Thanksgiving recess begins 9:00 p.m.
December	1	Saturday	Dairy School closes
December	3	Monday	Thanksgiving recess ends 8:00 a.m.
December	3-8	Week	Second semester condition examinations, Colleges of Agriculture and Forestry
December	3-8	Week	Short course for ice-cream makers
December	5	Wednesday	Medical School second quarter begins
December	20	Thursday	Senate meeting, 4:00 p.m.
December	21	Friday	School of Agriculture, first term closes
December	21	Friday	Christmas vacation begins 9:00 p.m.
<b>1918</b>			
December	31	Week	Farmers' and Home Makers' Week
January	5		
January	2	Wednesday	Short Course
January	2	Wednesday	Christmas vacation ends 8:00 a.m.
January	2	Wednesday	School of Embalming begins, eight weeks' session
January	8	Tuesday	School of Agriculture, second term begins
January	25	Friday	First semester evening extension classes close
February	4	Monday	Second semester registration closes
February	4	Monday	Second semester evening extension classes begin
February	4-9	Week	Merchants' Short Course

February	11	Monday	Final examinations begin
February	11	Monday	Payment of fees for second semester closes
February	12	Tuesday	Lincoln's Birthday; a holiday
February	18	Monday	Second semester begins
February	18	Monday	Second semester evening extension classes begin
February	21	Thursday	Senate meeting, 4:00 p.m.
February	22	Friday	Washington's Birthday; a holiday
March	27	Wednesday	School of Agriculture closes
March	28	Thursday	Easter recess begins 9:00 p.m.
April	1	Monday	Easter recess ends 8:00 a.m.
April	1-6	Week	Boys' and Girls' Week
April	1-6	Week	Condition examinations in certain colleges
April	15	Monday	Medical School fourth quarter begins
April	30	Tuesday	Traction Engineering Short Course begins
May	16	Thursday	Senate meeting, 4:00 p.m.
May	24	Friday	Second semester evening extension classes close
May	30	Thursday	Memorial Day; a holiday
May	31	Friday	Traction Engineering Short Course closes
June	8	Saturday	Final examinations begin 2:00 p.m.
June	15	Saturday	Second semester closes
June	16	Sunday	Baccalaureate service
June	17	Monday	Senior Class Day exercises
June	19	Wednesday	Alumni Day
June	20	Thursday	Forty-sixth Annual Commencement
June	21	Friday	Summer vacation begins
June	24	Monday	Summer Session begins

The University year for 1918-19 probably will begin Tuesday, September 17. Classes will begin September 25.

*Program of Entrance Examinations 1917-1918*

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,	Oct. 2	9 a.m.	Business Subjects, Elementary Algebra, Plane Geometry
		2 p.m.	Manual Subjects, Domestic Art and Science, Agriculture, Higher Algebra, Solid Geometry

CALENDAR

7

Wednesday,	Oct. 3	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,	Oct. 4	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 to 12 to give information and advice.

*Condition Examinations*

Examinations for the removal of conditions are given at no other times than (1) the week following the Easter recess, (2) the registration week in October, and (3) the week following the Thanksgiving recess, for students in the Colleges of Agriculture and Forestry.

The examinations in second-semester courses are given in the October period and those in first-semester courses are given after the Easter recess or in October, or at both times, as each school or college may determine. No student may take more than one examination to remove a condition.

Examination schedules for the respective schools and colleges may be secured at the Registrar's office.

## 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 new rule regarding 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 six hours' work 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 hour for all work taken in this college which is to be counted toward a degree.

### CLASS ROUTINE AND SCHOLASTIC REQUIREMENTS

Classes are held every week day except Saturday afternoon. Recitation periods are fifty minutes long and begin at eight, nine, ten, eleven, one, two, three, four, and five o'clock. A general assembly of faculty and students is held at noon on days to be announced.

Most of the courses of instruction are given in three periods a week on alternate days. Students are advised to arrange their programs so as to secure as even a distribution of classes as possible.

Examinations are held at the close of each semester. 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 finished is marked I (incomplete). An "incomplete" must be removed within one month after the opening of the following semester; otherwise it becomes a "condition." A "condition," if not removed before the opening of the corresponding semester of the following year becomes a "failure." A "failure" in a subject required for the given student must be removed by pursuing the work again in class the next time the course is offered.

Requirements for graduation are expressed in credit hours, indicating amount of work; and in honor points, indicating grade of work. Each credit hour 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 hour with the grade of A carries three honor points; each credit hour with the grade of B, two honor points; each credit hour with the grade of C, one honor point.

Continued residence in the college is conditioned on reasonable advance toward graduation. The Administrative Board will 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 re-enter the University until a full semester has elapsed.

The student must secure in any semester credit in at least sixty per cent of the work carried, together with as many honor points as the Administrative Board may prescribe.

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 hour carried. 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.

## 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:*

A general course leading to the degree of Bachelor of Arts.

An intensive course leading to the degree of Bachelor of Arts with Honors.

A four-year course leading to the degree of Bachelor of Arts in Music.

A four-year course in Business Education leading to the degree of Bachelor of Arts.

A five-year course in Training for Social and Civic Work, leading to the degrees of Bachelor of Arts and Master of Arts.

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

### REGULATIONS APPLYING TO ALL COURSES

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

Rhetoric 1-2 is required of all freshmen.

No student may elect work during any semester in more than five departments.

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

Students may ordinarily elect not more than seventeen credit hours. After the freshman year a student who has, during the preceding semester or two semesters, earned an average of one and one-half honor points for each credit hour taken and who has had no condition or failure the preceding semester, may elect eighteen hours.

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 fulfills all the requirements stated below.

AMOUNT AND GRADE OF WORK

1. During his entire course the student must earn one hundred and twenty hours of credit and one hundred and twenty 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 thirty 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.

DISTRIBUTION OF WORK

REQUIREMENTS FOR FRESHMEN AND SOPHOMORES

Rhetoric 1-2 to be taken in the freshman year.

One year-course each year in each of the following groups of subjects. A year-course consists of the continuous study of closely related subject matter through the year. When two courses are designated by a department to serve as a year-course both semesters must be completed to meet this requirement. Either in the freshman or the sophomore year the subject chosen from Group C must be a laboratory science.

GROUP A

GROUP B

GROUP C

OPEN TO FRESHMEN AND SOPHOMORES

Rhetoric and Public  
Speaking  
Foreign Languages

History

Mathematics  
Animal Biology  
Botany  
Chemistry  
\*Physics

ADDITIONAL SUBJECTS OPEN TO SOPHOMORES

English

Economics  
Philosophy  
Political Science  
Psychology  
Sociology and  
Anthropology

Astronomy  
Geology and Mineralogy  
Physics

\* Physics open to a limited number of freshmen under special conditions. See departmental statement.

Subjects for which freshmen register must be continued throughout the year.

#### REQUIREMENTS FOR JUNIORS AND SENIORS

Thirty credits in starred courses of which twelve credits must be in one department.

#### THE JUNIOR AND SENIOR COLLEGES

The work of the Junior College comprises all courses which are open to freshmen and sophomores. The work of the Senior College comprises all courses which are open only to juniors, seniors, or graduates.

Senior College courses are indicated in the bulletin by an asterisk (\*) and are commonly known as *starred courses*. They have as prerequisites courses amounting to six credits when the department concerned 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. In foreign languages it is provided that Senior College courses may be elected by sophomores who have had five years of the language including one year in the college.

#### 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.

#### CHANGES IN THE REQUIREMENTS FOR GRADUATION

Important changes in the curriculum having been made, students previously registered in the college may graduate under the requirements in force when they entered if they so desire. For information regarding major and minor requirements see previous bulletins or consult the departments concerned.

#### THE UNIVERSITY STATE TEACHERS' CERTIFICATE

The University State Teachers' Certificate is granted to graduates of the College of Science, Literature, and the Arts who include the following prescribed work in their course, and who receive the recommendation of at least two departments concerned with high school studies:

- a. General Psychology ..... 6 credits  
(Normally taken during the sophomore year)
- b. Prescribed work in Education

This work must include all of the following courses  
except in the case of honor students

Practice Teaching ..... 3 credits



Teachers' Courses in two subjects, together carrying at least.....	3 credits
Technique of Teaching.....	3 credits
History of Education.....	3 credits
Social Aspects of Education.....	3 credits

Honor students must take Psychology, Practice Teaching, Teachers' Courses, and at least one of the last three subjects named.

Part of this work must be taken in the junior year. The student must inform himself in advance so as to arrange his program properly.

#### SPECIAL COURSES FOR TWIN CITY TEACHERS

Arrangements have been made for offering courses in various departments at times which will make them readily available for teachers in the Twin Cities and environs. These courses will be scheduled to come Saturday mornings or week days after four p.m.

## 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 sixty credits and ninety 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 105 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 all students.

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 (six 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 105 credits. The student is advised to take from twenty-four to thirty hours in his junior year.

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

The requirements for admission are the same as those for admission to the regular freshman class, 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.

Violin: Candidate must be able to play the first ten of Kreutzer's *Forty Etudes*, and the easier Handel and Mozart Sonatas.

Violoncello, organ, and orchestral instruments. Candidate must pass entrance examinations equal to the above grade.

Voice: Candidate must possess good natural equipment, some previous vocal training, be a ready sight reader, and have a reading knowledge of the standard German and English songs.

The number of credits required for the degree in Music is one hundred and twenty, 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 twenty honor points.

The number of credit hours a semester is the same as for the B.A. degree.

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

#### OUTLINE OF COURSE

*Freshman Year* (Sixteen or Seventeen Credits Each Semester).

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)
- Cello (2)
- Voice (2)

- 2. Harmony (3)
- 3. Rhetoric (3)
- 4. Beginning Modern Language (6) or two 3-hour courses if entrance credits are offered in two languages.
- 5. Orchestra (1) elective.

*Sophomore Year* (Sixteen or Seventeen Credits).

## A

- 1. Piano (4)
- Violin (4)
- Cello (4)

## B

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

- 2. Counterpoint (2)
- 3. Acoustics (3) First Semester. Experimental Psychology (3) Second Semester.
- 4. Modern Language (3)
- 5. History (3)
- 6. Ear Training (1)
- 7. Orchestra (1) elective.

*Junior Year* (Seventeen or Eighteen Credits)

## A

- 1. Piano (4)
- Violin (4)
- Cello (4)

## B

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

- 2. English Survey (3)
- 3. History of Music (3)
- 4. Normal Piano (3) or Public School Music (3). The subject elected must be continued through two years.
- 5. Elect four credits from A, including Appreciation of Music (for Public School Music students).

## A

- Ensemble (2)
- Appreciation of Music (1)
- Musical Composition (2)
- Analysis (1)
- 6. Orchestra (1) elective.

Required Subjects for Public  
School Music Students  
Technic of Teaching (3)  
Appreciation of Music (1)

\* Not offered during 1917-18.

*Senior Year* (Twelve or Thirteen Credits)

- | A   | B          |
|---|------------|
| 1. Piano (4)  | Piano (2)  |
| Violin (4)  | Violin (2) |
| Cello (4)   | Cello (2)  |
|   | Voice (2)  |
| 2. Bach and Beethoven (2) First Semester. Brahms and Wagner (2) Second Semester.  |            |
| 3. English Literature (3) or Modern Language (3); for Public School Music Students, Social Education (3) History of Education (3) required. |            |
| 4. Advanced Normal Piano (3) or Advanced Public School Music (3).   |            |
| 5. Orchestra (1) elective.  |            |

## IV. FOUR-YEAR COURSE IN BUSINESS EDUCATION, LEADING TO THE DEGREE OF B.A.

This course differs from the general B.A. course in two ways. The student is able to give a larger part of his time to studies of especial value in preparation for business, and a somewhat higher grade of scholarship is required for advancement and graduation.

The sequence of studies has been determined by the aims of the course. It is the aim in the freshman and sophomore years to give a broad training in those subjects which furnish the foundation for the study of business processes; to acquaint the student with the relations of those processes to the social organization; and to provide the common tools needed in these studies and in the prosecution of business dealings.

It is the aim in the junior and senior years to provide instruction in such branches of economics, political science, law, etc., as give an adequate preparation for general business activities, and to offer in elective courses opportunity either for limited specialization in business lines or for such other work as the student desires.

*Language requirement.* Before beginning the work of the senior year the student must satisfy the language department concerned, by examination, that he can read readily business and economic literature in French, German, or Spanish. This examination, if taken earlier in the course or at the time of entrance, will relieve the student of further required courses in modern languages.

*Scholarship requirement.* In order to enter upon the work of the sophomore year in this course the student must have secured one honor point for each credit hour in the freshman year and have had no conditions or failures, or he must have secured one and one-half honor points for each credit hour. In the sophomore, junior, and senior years the student must secure one and one-half honor points for each credit hour carried.

COURSES OF STUDY

17

FRESHMAN YEAR

	Credits
Rhetoric 1-2 .....	6
Modern Language .....	12 or 6
Laboratory Science or Mathematics.....	0 or 6
History 3-4 (English History).....	6
Physical Geography (Geology 37).....	3
Industries and Commerce (Economics 2).....	3
	<hr style="width: 10%; margin-left: auto; margin-right: 0;"/>
	30

SOPHOMORE YEAR

	Credits
Modern Language (continued for those who begin it in the University) .....	6
Laboratory Science or Mathematics (if not taken in freshman year) .....	6
Principles of Economics (Economics 7-8).....	6
Principles of Accounting (Economics 35-36) .....	6
History (American or Modern Europe).....	6
And the following subjects if the student's program permits:	
Political Science .....	6
Psychology .....	3
Elective .....	3
	<hr style="width: 10%; margin-left: auto; margin-right: 0;"/>
	30

JUNIOR YEAR

	Credits
The above courses in Political Science and Psychology if not taken in the sophomore year.....	9
English or Advanced Composition.....	6
Political Science .....	6
Economics .....	6
Electives .....	3 or 12
	<hr style="width: 10%; margin-left: auto; margin-right: 0;"/>
	30

SENIOR YEAR

	Credits
Political Science .....	6
Economics .....	12
Electives .....	12
	<hr style="width: 10%; margin-left: auto; margin-right: 0;"/>
	30

Attention should be called to the fact that the term "Economics" as used in the above outline includes a wide range of business subjects (Business Management, Accounting, Marketing, Advertising, Insurance, Investment, etc.) which are taught in the Department of Economics. Also,

the term "Electives" indicates that the student is free to spend this part of his time either in these business subjects or in any other work which the College offers.

The National City Bank of New York offers each year to students in this course one or more scholarships for the purpose of training young men in banking and foreign trade. These scholarships provide for expenses during certain periods of practical work and study in the National City Bank.

#### V. FIVE-YEAR COURSE IN SOCIAL AND CIVIC WORK, LEADING TO THE DEGREES OF BACHELOR OF ARTS 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.A. 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's 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.

#### FIRST YEAR STUDIES

##### 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.

## COURSES OF STUDY

19

### SECOND YEAR STUDIES

#### REQUIRED

Modern Language or English, and a year of 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

### 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

#### 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

## (SPECIAL NOTE)

For a fifth year's work consisting of 9 hours class work and 12 hours of supervised field work per week for two semesters 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.

## Courses on Public Health

*Economics*

Principles of Accounting

Public Finance

*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

## OTHER VOCATIONAL COURSES

For information and advice regarding the selection of studies in preparation for various vocations, the student should consult the heads of departments concerned. Young women should consult the Vocational Adviser in the office of the Dean of Women. The studies offered by the college are so varied and the opportunities for election are so great that the student who first forms an intelligent plan can usually find an excellent combination and sequence of courses serving his particular purpose.

## COMBINED ARTS AND PROFESSIONAL COURSES

#### VI. SIX-YEAR COURSE IN ARTS AND LAW, LEADING TO THE DEGREES OF BACHELOR OF ARTS AND BACHELOR OF LAWS

The work of the first three years of this course is done in the College of Science, Literature, and the Arts and is subject to the regulations which govern the work of other Arts students. During these three years the student must secure not less than ninety credits, including fifteen credits in starred courses. The first year of the course in the Law School counts as the equivalent of the fourth year (thirty credits) of the Arts course. During the four years the student must earn one hundred and twenty honor points.



SHORTER PRE-LEGAL COURSES

While the faculty of the Law School strongly recommends the above course, two other courses are open to students who wish the degree of Bachelor of Laws alone. They may take two years' work in the College of Science, Literature, and the Arts, under the regulations which govern other Arts students, or they may take the special pre-legal course outlined below. The student's registration blank must show which course is chosen and that course must be followed without variation. In either case the student must secure at least fifty-eight credits in order to be eligible for admission to the Law School.

In case any student after taking the special pre-legal course shall become a candidate for the B.A. degree, he must satisfy all the regular requirements for that degree.

Students who offer for entrance less than two units of natural science must take one year of natural science.

FRESHMAN YEAR	Credits
Rhetoric 1-2 .....	6
Mathematics or Science .....	6 (or 10)
(1) The student must complete the equivalent of Mathematics 1 and 2, or 3 and 4. If he has had this, he may elect 6 credits in science.	
Language .....	6 (or 12)
(1) The student with two or more units of entrance credits in Latin is strongly advised to take Latin (6 credits).	
(2) The student not taking Latin must take French or German.	
History 3-4 .....	6
Economics 3-4 .....	6
Political Science 1 .....	6
Military Drill and Gymnasium, for men	}
	6-18
	28-36

SOPHOMORE YEAR	
Rhetoric 15-16 .....	6
Language .....	4-6
A continuation of same language taken in freshman year.	
History 5-6	
Economics:	
3-4 (if not previously taken), and not more than three of the following courses: 2, 5, 13, 18, 76, 35-36, 41, 43, 47	}
Political Science:	
Not less than one nor more than four of the following courses: 1 (if not previously taken), 3, 5, 6, 7, 9.	}
Military Drill, for men	}
	6-18
	28-34

VII. FIVE-YEAR COURSE IN ARTS AND CHEMISTRY, LEADING TO THE DEGREES OF BACHELOR OF ARTS AND BACHELOR OF SCIENCE IN CHEMISTRY

During his first three years, the student does his work in the College of Science, Literature, and the Arts subject to the regulations governing other Arts students, and must secure at least ninety credits, including fifteen credits in starred courses. This work must include:

- a. Rhetoric 1-2 and twelve credits in German.
- b. Twelve credits in Group B (see page 11).
- c. The following courses:
  - General Chemistry and Qualitative Analysis, or equivalent.
  - Quantitative Analysis, one year.
  - Technical Drawing 21-22, one year.
  - Geology 21, one semester.
  - Metallurgy 2 (men) or Geology 22 (women), one semester.
  - Biological Science, one year.
  - General Physics with laboratory work, one year.
  - Mathematics, ten credits.
  - Glass Blowing, one credit.

The fourth year of the course is the same as the junior year of the Analytical Course of the School of Chemistry and counts as the equivalent of the fourth year (thirty credits) of the Arts course. During the four years the student must earn one hundred and twenty honor points.

POST-SENIOR YEAR

The student's fifth year is the same as the fourth year of the Analytical Course of the School of Chemistry, and upon its completion he will be entitled to the degree of Bachelor of Science in Chemistry.

During the senior and post-senior years the student, if prepared, has the privilege of specializing for not less than two semesters along one of the following lines: Organic Chemistry, Physical Chemistry, Analytical Chemistry, Applied Chemistry, Photochemistry, Physiological Chemistry, Geochemistry, Bromatology.

### VIII. EIGHT-YEAR COURSE IN ARTS AND MEDICINE, LEADING TO THE DEGREES OF BACHELOR OF ARTS AND DOCTOR OF MEDICINE

During the first three years of this course, the student does his work in the College of Science, Literature, and the Arts subject to the regulations governing other Arts students and must secure ninety credits including fifteen credits in starred courses. The first year of the course in the Medical School counts as the equivalent of the fourth year (thirty credits) of the Arts course. During the four years the student must earn one hundred and twenty honor points.

#### FRESHMAN AND SOPHOMORE YEARS

The following subjects must be included:

Rhetoric 1-2, six credits.

Zoology 1-2, six credits.

Qualitative Analysis and Medical Organic Chemistry with the elementary courses prerequisite to them.

German sufficient to secure a reading knowledge, to be tested by a committee of the Medical faculty.

Physics 1, 2, 3, and 4, (not Physics 21-22), eight credits. This work must be preceded by Mathematics 1 and 2, ten credits, or 3 and 4, six credits.

#### JUNIOR YEAR

The work of the junior year is elective, subject to the requirement of fifteen credits in starred courses.

#### SENIOR YEAR

This year is taken in the Medical School, and is counted toward the B.A. degree.

### IX. SEVEN-YEAR COURSE IN SCIENCE AND MEDICINE, LEADING TO THE DEGREES OF BACHELOR OF SCIENCE AND DOCTOR OF MEDICINE

To be eligible for admission to the Medical School, students in this course must secure in the College of Science, Literature, and the Arts not less than sixty credits including the subjects required during the freshman and sophomore years of the Eight-Year Course in Arts and Medicine.

#### JUNIOR AND SENIOR YEARS

The work during these two years is taken in the Medical School, and is credited toward the B.S. degree. To secure this degree the student

must have one hundred and twenty credits and one hundred and twenty honor points.

Students who have completed elsewhere two or more years of collegiate or university work which includes the required subjects specified above and which is in other respects the full equivalent of the two years of Academic work required in the seven-year combined course, will be awarded the degree of Bachelor of Science on recommendation of the Faculty of the College of Science, Literature, and the Arts, provided they meet the scholarship requirements stated above. The credit value of work done elsewhere shall be determined by the Administrative Board of the College of Science, Literature, and the Arts, but such credits shall not become effective until the student shall have completed, with the required standing, two full years of work in the Medical School of the University of Minnesota.

#### X. SIX-YEAR COURSE IN ARTS AND DENTISTRY, LEADING TO THE DEGREES OF BACHELOR OF ARTS AND DOCTOR OF DENTAL SURGERY

During the first three years of this course the student does his work in the College of Science, Literature, and the Arts, subject to the regulations governing other Arts students and must secure ninety credits, including fifteen credits in starred courses. The final year of the course in the College of Dentistry counts as the equivalent of the fourth year (thirty credits) of the Arts course. During the four years the student must earn one hundred and twenty honor points.

#### XI. 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. 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 juniors and seniors who have completed two years of drill 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. Any student who for satisfactory reasons is permitted to withdraw from this course must reimburse the War Department for all moneys received.

Juniors and seniors who take the course required by General Orders No. 49, which includes two camps of four weeks each, will receive an allowance of thirty 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 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.

The course includes three hours a week of drill and three of study in the Military Department and also includes the following courses of study for students of this college:

(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.

FRESHMAN—YEAR COURSE

Subjects	Credits
Rhetoric .....	3
Modern Language .....	6 or 3
Mathematics .....	3 or 5
History .....	3
Elective .....	0 or 3
Total of .....	15 or 17

SOPHOMORE—YEAR COURSE

Modern Languages .....	3 or 6
Physics .....	4
Drawing (Mechanical) .....	3
Economics or Political Science.....	3
(Industries and Commerce, first or second semester; American Government, first or second semester)	
Elective .....	3
Total of .....	16

JUNIOR—FIRST SEMESTER

Reserve School (required) .....	3
Military History .....	3
Transportation and Supply.....	3
Diplomatic Relations .....	3
Elective .....	3
Total of .....	15

## JUNIOR—SECOND SEMESTER

Subjects	Credits
Reserve School (required) .....	3
Surveying .....	3
International Law .....	3
Elementary Psychology .....	3
Elective .....	3
	<hr/>
Total of .....	15

## SENIOR—YEAR COURSE

Reserve School (required both semesters).....	3
Other subjects elective	

## DEPARTMENTAL STATEMENTS

### EXPLANATION OF COURSE NUMBERS

Odd numbers indicate first-semester courses; even numbers, second-semester courses. A combination of the two (e.g., 5-6) indicates courses continuing through the year. The suffixes *a* and *b* apply to one-semester courses offered both semesters, *a* indicating the first semester and *b* the second semester (e.g., 3a,b; 4a,b). Courses marked with a *t* are given at hours convenient for teachers.

All undergraduate courses are numbered from 1 to 100. All courses open to undergraduates and graduates are numbered from 101 to 200. Strictly graduate courses are numbered from 201 up.

*For graduation a student must secure, during the junior and senior years, thirty credits in starred courses of which twelve credits must be in one department.*

The following abbreviations are used: A, Armory; AB, Animal Biology; Ar indicates that the days, hours, or room are to be arranged (for information, apply to head of the department concerned); C, Chemistry Building; Ed, Education Building; En, Engineering Building, University Farm; F, Folwell Hall; G, Greenhouse; He, Home Economics Building, University Farm; L, Law Building; Lib, Library Building; MA, Mechanic Arts; ME, Main Engineering Building; Mech E, Mechanical Engineering Building; MH, Millard Hall; Mu, Music Building; O, Observatory; P, Pillsbury Hall; PH&P, Institute of Public Health and Pathology; Ph, Physics Building; WGm, Women's Gymnasium.

The symbol ¶ indicates that the instructor is to be assigned.

The symbol § indicates a course not described in previous bulletins. For information students should consult the department.

### ANIMAL BIOLOGY

Professors HENRY FRANCIS NACHTRIEB, HAL DOWNEY, JOHN B. JOHNSTON, THOMAS S. ROBERTS, CHARLES P. SIGERFOOS; Assistant Professors ELMER J. LUND, OSCAR W. OESTLUND; Instructors GEORGE DELWIN ALLEN, ROYAL N. CHAPMAN, CHARLES E. JOHNSON; Assistants EMILY PAYNE, ADOLPH RINGOEN; Teaching Fellow GEORGE A. THIEL; Artist HELEN CHAPMAN.

#### REQUIREMENTS OF THE DEPARTMENT

*For B.A. with Honors*, freshman year, Course 1-2; sophomore year the student may elect from Courses 7-8, 15-16, 19-20, 23-24; during the junior year the student must elect from Courses 31-144, and must include some line of work begun in the sophomore year which he expects to pursue during the senior year under 161-162.

*For a Teacher's Certificate* an average of one and one-half honor points in Courses 1-2, 31-32, and six other credits in Animal Biology and six credits in Botany.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2	6†	General Zoology†† .....	All	None
		Sec. 1. Lab. 8, 9	WF 101AB	¶
		Lect. 10	WF 313AB	¶
		Sec. 2. Lab. 10, 11	WF 101AB	¶
		Lect. 9	WF 313AB	¶
		Sec. 3. Lab. 1, 2	M 101AB	¶
		Lab. 2, 3	W 101AB	¶
		Lect. 1	WF 313AB	¶
		Sec. 4. Lab. 8, 9	ThS 101AB	¶
		Lect. 10	ThS 313AB	¶
		Sec. 5. Lab. 10, 11	ThS 101AB	¶
		Lect. 9	ThS 313AB	¶
		Extra Lab. Classes		
		Sec. 6. Lab. 8, 9	MT 101AB	¶
		Sec. 7. Lab. 10, 11	MT 101AB	¶
7-8	6†	Histology-Embryology ...	Soph., jr., sr. 201, 211	1-2 Downey
12	3	Histological Technique... See Anatomy Schedule	Soph., jr., sr.	1-2 and 7
*15-16	6†	Gen. Physiology .....	Jr., sr.	12 credits in An. Biol. or Zool. 1-2 & Chem. 13-14 or 35-36
		2, 3 MWF	10AB	Lund
19-20	6†	Comp. Gross Anat. of Vert.	Soph., jr., sr. 107-109, 211AB	1-2 Johnson
23-24	6†	Entomology .....	Soph., jr., sr. 208-210AB	1-2 Oestlund
		10, 11 MWF	208-210AB	Oestlund
		8, 9 TThS	208-210AB	Oestlund
28	3	Ornithology .....	Soph., jr., sr. 211, 314AB	1-2 Roberts
*31-32	3†	Nature Study .....	Jr., sr. 213AB	12 credits in An. Biol. Sigerfoos
		2, 3, 4 T	213AB	Sigerfoos
*51	3†	Protozoology .....	Jr., sr. 213AB	9 credits incl. 1-2 Sigerfoos
		8, 9 TThS	213AB	Sigerfoos
*56	3†	Morphology of Invertebr.	Jr., sr. 213AB	9 credits incl. 1-2 Sigerfoos
		8, 9 TThS	213AB	Sigerfoos
*101-102	6	Advanced Entomology ..	Jr., sr., grad. 208-210AB	1-2, 23-24 Oestlund, Chapman
		2, 3 MWF	208-210AB	Oestlund, Chapman
*107-108	6	Gen. Ecology of Insects.	Jr., sr., grad. 208-210AB	1-2, 23-24 Oestlund, Chapman
		2, 3, 4 TTh	208-210AB	Oestlund, Chapman
*117-118	6	Mammalogy .....	Jr., sr., grad. 107-109, 211AB	1-2, 7-8 or 19-20 Johnson
		4, 5 MWF	107-109, 211AB	Johnson
*119-120	6	Vertebrate Histology ....	Sr., grad. 201, 211AB	1-2, 7-8, Anat. 112 Downey
		3, 4 TThS	201, 211AB	Downey
*123-124	6†	Blood of Vertebrates.....	Sr., grad. 201, 211AB	1-2, 7-8, Anat. 112, 131-132, reading knowledge of French and German.
		3, 4 TThS	201, 211AB	Downey
*131-132	6†	Embryology .....	Jr., sr., grad. 211, 202AB	1-2, 7-8 Nachtrieb
		10, 11 MWF	211, 202AB	Nachtrieb

† Both semesters must be completed before credit is given for the first semester.

‡ Courses 51 and 56 may be combined for a year course.

†† So far as possible students should register for both lecture and laboratory work in the same section.



DEPARTMENTAL STATEMENTS

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No.	Credits	Title	Offered to	Prereq. courses
*143-144	6	Genetics and Eugenics... 2, 3, 4 TTh	Sr., grad. 202, 211AB	1-2 Nachtrieb
*161-162	6 or 12	Problems .....	Sr., grad.	1-2 and other courses prescribed by the de- partment

Hours, days, and rooms arranged

ASTRONOMY

Professor FRANCIS P. LEAVENWORTH; Assistant Astronomer WILLIAM O. BEAL.

REQUIREMENTS OF THE DEPARTMENT

For B.A. with Honors, the general requirements (page 13), Courses 51-52, 101-102 (as a twelve credit course), and six credits in Physics.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
11a	3	Descriptive Astronomy .. 9 MWF 11 TThS	Soph., jr., sr. 124F 124F	None Leavenworth Beal
11b	3	Descriptive Astronomy .. 11 MWF 11 TThS	Soph., jr., sr. 124F 124F	None Leavenworth Beal
13-14†	6	Descr. Astr. & Obs. Pract. 9 TThS	Soph., jr., sr. 124F	None Beal
51-52†	6	General Astronomy .....	Jr., sr. 124F 124F	1 yr. mathematics Beal Leavenworth
*62a	3	Elements of Pract. Astr.. Ar Ar	Jr., sr. 124F	1 yr. mathematics and Ast. 11, or 13, or 51 Beal
*62b	3	Elements of Pract. Astr.. Ar Ar	Jr., sr. 124F	1 yr. mathematics and Ast. 11, or 13, or 51 Beal
*101-102	6 or 12	Practical Astronomy .....	Jr., sr., grad. 10 TThS or MTWThFS	Math. 7 and 11 and Ast. 11, or 13, or 51 Leavenworth
*140	2 or 3	Method of Least Squares Ar Ar	Sr., grad. O	Math. 51 Leavenworth

† No credit is given for either of these courses.

BACTERIOLOGY

Associate Professor WINFORD P. LARSON; Instructors ARTHUR T. HENRICI, ANNE BENTON; Assistants IKEDA and DIEHL.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
*6a	3	Elementary Bacteriology .... M 2, 3, 4; W 2, 3	All Lab.PHP	None Larson, et al.
*6b	3	Elementary Bacteriology .... M 3, 4; W 3, 4; F 3	All Lab.PHP	None Larson, et al.
*114	1½	Advanced Bacteriology .....	All TTh 2, 3, 4 (or 2:30-5:30) Lab.PHP	6a or 6b Larson, et al.

## BOTANY

Professors CARL OTTO ROSENDAHL, JOSEPHINE E. TILDEN; Assistant Professors HERBERT F. BERGMAN, FREDERIC K. BUTTERS, NED L. HUFF; Instructor WILLIAM S. COOPER; Teaching Fellows ARTHUR M. JOHNSON, VINNIE A. PEASE.

## REQUIREMENTS OF THE DEPARTMENT

For *B.A. with Honors*, the general requirements (page 13); thirty-six credits in Botany, of which twenty-four shall be selected from advanced Courses 105-106 to 119-120 inclusive. Those electing the Honors Course are urged to secure twelve credits during the sophomore year.

For a *Teacher's Certificate*, an average of at least one honor point for each credit hour in one introductory and one intermediate course, and in Course 121-122. One year of Zoology is also advised.

Students entering the department without preparation must take Course 1 followed by 2. Students coming from an approved high school course will take Course 1 or 2 according to preparation.

## COURSES

*Introductory Courses*

No.	Credits	Title	Offered to	Prereq. courses
1a	3	Gen. Botany, Lab. & Class	All	None
		8, 9 MWF	207P	†
		10, 11 MWF	207P	†
		1, 2 MWF	207P	†
		2, 3, 4 MF	207P	†
		3, 4 MWF	207P	†
		8, 9 TThS	207P	†
		10, 11 TThS	207P	†
		1, 2, 3 TTh	207P	†
		2, 3, 4 TTh	207P	†
1b	3	Gen. Botany, Lab. & Class	All	None
		8, 9 MWF	214P	†
		2, 3, 4 MF	214P	†
2a	3	Gen. Botany, Lab. & Class	All	1 or approved High School Botany
		8, 9 MWF	214P	†
		2, 3, 4 MF	214P	†
2b	3	Gen. Botany, Lab. & Class	All	1 or approved High School Botany
		8, 9 MWF	207P	†
		10, 11 MWF	207P	†
		2, 3 MWF	207P	†
		8, 9 TThS	207P	†
		10, 11 TThS	207P	†
		2, 3, 4 TTh	207P	†
		2, 3, 4 MF	207P	†

*Intermediate Courses*

5a	3	Plant Morphology .....	Soph., jr., sr.	6 cred.; see bulletin statement
		10, 11 MWF	214P	Butters, Huff

No.	Credits	Title	Offered to	Prereq. courses
5b	3	Plant Morphology .....	Soph., jr., sr.	6 cred.; see bulletin statement
		10, 11 MWF	214P	Butters, Huff
6b	3	Plant Morphology ... ..	214P	Butters, Huff
		10, 11 MWF		
7-8	6	Taxonomy .....	Soph., jr., sr.	6 cred.; see bulletin statement
		10, 11 MWF	20P	Rosendahl
9-10	6	Physiology and Ecology....	Soph., jr., sr.	6 credits
		1, 2, 3 MF	3G	Cooper
11	6	Industrial Botany .....	Soph., jr., sr.	6 credits
		10, 11 TThS	212P	Tilden
12	3	Industrial Botany .....	Soph., jr., sr.	6 credits
		10, 11 TThS	212P	Tilden

*Advanced Courses*

*105-106	6	Algae .....	Jr., sr., grad.	9 credits
		1, 2, 3 TTh	212P	Tilden
*110	3	Gymnosperms .....	Jr., sr., grad.	9 cred.; incl. 2 or 3, or 5-6
		Ar Ar		Butters
*111-112	6	Advanced Taxonomy .....	Jr., sr., grad.	7-8
		Ar Ar	20P	Rosendahl
*113-114	6	Advanced Ecology .....	Jr., sr., grad.	9-10
		Ar Ar	200P	Cooper
*117-118	6	Cytology .....	Jr., sr., grad.	9 credits
		Ar Ar	8P	Rosendahl
*119-120	6	Advanced Industrial Bot..	Jr., sr., grad.	11-12
		Ar TTh	212P	Tilden
*121-122	6	Plant Studies and Methods	Jr., sr., grad.	9 credits
		3, 4 MWF	214P	Huff

CHEMISTRY

THE SCHOOL OF CHEMISTRY

Professors GEORGE B. FRANKFORTER, CHARLES F. SIDENER; Associate Professors EVERHART P. HARDING, WILLIAM H. HUNTER; Assistant Professors IRA H. DERBY, EDWARD E. NICHOLSON; Instructors ROSS A. BAKER, FRANK W. BLISS, LILLIAN COHEN, J. GERHARD DIETRICHSON, ISAAC W. GEIGER, LAWRENCE M. HENDERSON, FRANK H. MACDOUGALL, EDWARD B. PECK, CARL L. SCHUMANN, WOLDEMAR STERNBERG, H. LEE WARD; Assistants ARTHUR R. CADE, DONALD C. FARLEY, WALTER M. LAUER, ALLEN F. NEWMAN, ANNA PETERSON, S. JOSEPH REICHERT.

REQUIREMENTS OF THE DEPARTMENT

In Chemistry the purpose of the honors course is served by the Five-Year Course in Arts and Chemistry. (See page 22.)

For a Teacher's Certificate, an average of at least one and one-half honor points for each credit hour in Courses 1-2 or 3-4 and 7-8 or 11-12; and 20.

## COURSES

*Division of General and Inorganic Chemistry*

No.	Credits	Title	Offered to	Prereq. courses
1-2	6†	General Chemistry .....	Those entering without chemistry	None
		8, 9 TThS	110	†
		10, 11 MWF	110	†
21-22	10	Inorganic and Qual. Chem.	Those entering without chemistry	None
		Lect. 1 F	100	†
		Lab. 8, 9 TThS	110	†
		Rec. 10 TThS	111	†
3-4	6†	Adv. Gen. Chemistry and Qual. Analysis .....	Fr., soph., jr.	Entrance cr. in Chem.
		Lect. 1 F	100	†
		Lab. 2, 3 MF	110	†
		Rec. 2 or 3 W	111	†
		Lab. 10, 11 TS	110	†
		Rec. 10 or 11 Th	115	†
7-8	6†	Qualitative Anal. ....	Soph., jr., sr.	1-2 Nicholson Bliss
		8, 9 MWF	210	
		10, 11 MWF	210	
10	1	Glass Blowing .....	Jr., sr.	Open only to those who are taking practice teaching in Chemistry
		Ar Ar	49	Baker
17	2	Inorganic Colloquium ...	Sr.	11-12
		8 MF	111	Baker
20	2	Teachers' Course .....	Sr.	3-4 or 7-8 or 21-22
		8 TTh	Ar	Ward
*167-168	4†	Adv. Inorganic Chem. ...	Sr.	2 yrs. college chem.
		Ar Ar	Ar	Baker
*169-170	4†	Chem. of Rare Elements.	Jr., sr.	11-12
		Ar Ar	Ar	Nicholson

*Division of Analytical Chemistry*

*11-12	8†	Quantitative Analysis ....	Soph., jr., sr.	3-4 or 7-8, or 21-22 and 1 yr. math. or Physics I
		1, 2, 3, 4 F	310	Sidener
		2, 3, 4 MW	310	Sidener
*107-108	6†	Adv. Quan. Analysis .....	Jr., sr.	11-12
		Ar Ar	317	Sidener

*Division of Organic Chemistry*

13-14	6†	Medical Organic Chem...	Soph.	3-4 or 7-8 or 21-22
		Lect. 11 MWF	100	Hunter
		Lab. 2-5 W or F	10	Hunter
		Rec. Ar	Ar	†
18	2	Organic Colloquium .....	Sr.	35-36
		8 WF	115	Frankforter

† Both semesters must be completed before credit is given for the first semester.

No.	Credits	Title	Offered to	Prereq. courses
*35-36	8†	Organic Chemistry .....	Soph., jr., sr.	3-4 or 7-8 or 21-22 and 1 yr. Biol. Sci.
		Lect. 11 TTh	100	Frankforter
		Lab. 2, 3, 4 MW	10	Schumann
		Rec. 1 W	315	Schumann
*115	2	Adv. Organic Chem. ....	Sr.	35-36
		9 MWF	325	Hunter
*116	2	Theoretical Org. Chem. ...	Sr.	35-36
		9 MWF	325	Hunter

*Division of Physical Chemistry*

*121-122	4†	Physical Chemistry .....	Jr., sr.	‡35-36, Physics 2 & 4
		11 WF	115	MacDougall
*123-124	2†	Physico-chemical Lab. ...	Jr., sr.	Must be taken in con- junction with 121-122
		2, 3, 4 F	117	MacDougall
*125-126	6†	Adv. Physical Chem. ....	Sr.	121-122
		Ar Ar	Ar	Derby
*127	2	Radiochemistry Lectures..	Jr., sr.	3-4 or 7-8 or 21-22 & ‡Physics 2 and 4
		Ar Ar	Ar	Henderson
*128	2	Radiochemistry Lab. ....	Jr., sr.	127
		Ar Ar	Ar	Henderson

*Division of Technological Chemistry*

27-28	4†	Chem. in Every-Day Life.	Jr., sr.	3-4 or 7-8 or 21-22
		2-5:30 TTh	Ar	Geiger

*Division of Industrial Chemistry*

15	2	Photochemistry .....	Jr., sr.	3-4 or 7-8 or 21-22
		Lect. 8 M	27	Peck
		Lab. 2, 3, 4 Th	27	Peck
16	2	Color Photography .....	Jr., sr.	15
		Lect. 8 M	27	Peck
		Lab. 2, 3, 4 Th	27	Peck

† Both semesters must be completed before credit is given for the first semester.

‡ This physics may be taken at the same time.

## COMPARATIVE PHILOLOGY

Professor FREDERICK KLAEBER.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
*101	2	Science of Language....	Jr., sr., grad.	See bulletin statement
		2 TTh	205F	Klaeber
*102	2	Sci. of Language (Adv.).	Jr., sr., grad.	Same as for 101
		2 TTh	205F	Klaeber
		See bulletin statement		
*105	1	Universal Language ....	Jr., sr., grad.	Same as for 101
		10 S	221F	Klaeber
*109-110	4†	History of the German Language .....	Jr., sr., grad.	German 53, 54
		2 WF	205F	Klaeber
		See bulletin statement		

† Both semesters must be completed before credit is given for either semester.

Identical with German 109-110.

## DRAWING AND DESCRIPTIVE GEOMETRY

Professor WILLIAM H. KIRCHNER; Instructor ROBERT W. FRENCH.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
21-22	4	Technical Drawing .....	All	None
		8, 9 MWF	13MechE	Kirchner, French, et al.

## ECONOMIC ZOOLOGY

## COLLEGE OF AGRICULTURE

Professor FREDERICK L. WASHBURN; Associate Professor ARTHUR G. RUGGLES; Assistant Professors CHARLES W. HOWARD, WILLIAM MOORE.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
3	Economic Entomology .....	3	Jr.	An. Biol. 3 and 4
4	Economic Vertebrate Zoology....	2	Jr., sr.	An. Biol. 3 and 4
14	Insects and Public Health.....	2	Jr., sr.	An. Biol. 3 and 4
*18	Control of Insect Pests.....	3	Jr., sr.	3, Pl. Path. 14, Hort., 1 sem.
*104	Methods in Economic Entomology	3	Jr., sr.	3
*105-106	Special Problems .....	6	Jr., sr.	3
*107-108	Immature Stages of Insects.....	3 or 6	Jr., sr.	3
*109-110	Action of Insecticides.....	3 or 6	Jr., sr.	3

## ECONOMICS

Professors JOHN H. GRAY, E. DANA DURAND; Assistant Professors ROY G. BLAKEY,\* WILLIAM W. CUMBERLAND, J. FRANKLIN EBERSOLE, THOMAS WARNER MITCHELL; Instructors LLOYD M. CROSGRAVE, ALBERT C. HODGE, ALBERT C. JAMES, J. WARREN STEHMAN; in the General Extension Division, Associate Professor CLARE L. ROTZEL; Assistant Professors CHARLES H. PRESTON, GERHARD A. GESELL; Instructor RAYMOND V. PHELAN.

## REQUIREMENTS OF THE DEPARTMENT

*For B.A. with Honors*, the general requirements, including thirty credits in the major line of work with the usual supporting credits.

*For a Teacher's Certificate in business subjects*, twenty-four credits in Economics, including Accounting and Economic Geography.

*Vocational Course in Business Education*. The requirements for this course leading to the B.A. degree may be found on pages 16-18.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
2b	3	Industries and Commerce.. of the United States .....	Soph., jr., sr.	None
	Sec. 1	9 MWF	9F	Ar
	Sec. 2	10 MWF	109MA	Ar
	Sec. 3	11 MWF	5F	Ar

No.	Credits	Title	Offered to	Prereq. courses
3-4	6†	General Economics .....	Soph., jr., sr.	None
		Sec. 1 9 TThS	209MA	Stehman, Blakey
		Sec. 2 11 TThS	102MA	Hodge, Crossgrave
		Sec. 3 3 MWF	202MA	James, Stehman
3b	3†	General Economics .....	Soph., jr., sr.	None
		Sec. 1 11 TThS	114F	Hodge
		Sec. 2 3 MWF	102MA	James
4	3	General Economics .....	Soph., jr., sr.	3
		9 TThS	209MA	Blakey
		Ar Ar	Ar	Blakey
7-8	6††	Principles of Economics....	Soph., jr., sr.	None
		11 MWF	202MA	James, Stehman
7b	3††	Principles of Economics....	Soph., jr., sr.	None
		11 MWF	102MA	James
9	3	Industrial History .....	Soph., jr., sr.	None
		11 MWF	102MA	Ar
13	3	Econ. Geog. of Foreign Countries .....	Soph., jr., sr.	None
		2 MWF	202MA	Ar
34b	3	Business Management .....	Soph., jr., sr.	3 or 7
		10 TThS	202MA	Mitchell
35-36	6†	Accounting Principles ....	Soph., jr., sr.	None
		Sec. 2 Lect. & Quiz. 10 WF	301MA	Hodge
		Sec. 1 Lect. & Quiz. 11 TS	301MA	Mitchell
		Sec. 1 Lab. 11, 12 Th	301MA	Mitchell
		Sec. 2 Lab. 1, 2 T	301MA	Hodge
		Sec. 3 Lab. 1, 2 Th	301MA	Hodge
		Sec. 3 Lect. & Quiz. 2 MF	301MA	Hodge
37	3	Marketing of Products....	Soph., jr., sr.	3 credits
		9 TThS	202MA	James
38	3	Advertising .....	Soph., jr., sr.	3 credits
		11 TThS	125F	James
41	3	Financial History .....	Soph., jr., sr.	3 or 7
		10 TThS	209MA	Blakey
43a	3	Banking .....	Soph., jr., sr.	3 or 7
		Sec. 1 9 MWF	209MA	Stehman
		Sec. 2 10 MWF	202MA	Stehman
43b	3	Banking .....	Soph., jr., sr.	3 or 7
		Sec. 1 10 MWF	209MA	Stehman
		Sec. 2 2 MWF	109MA	Stehman
49	3	Insurance .....	Soph., jr., sr.	3-4
		11 TThS	109MA	James
*76	3	Commercial Policies .....	Jr., sr.	6 cr. inc. 3 or 7
		10 TThS	209MA	Blakey
*88	3	Retail Marketing .....	Jr., sr.	6 cr. inc. 37
		9 TThS	202MA	James
*101	3	Statistics .....	Jr., sr., grad.	6 cr. inc. 3 or 7
		11 TThS	303MA	Durand
*142	3	Invest. and Speculations...	Jr., sr., grad.	6 cr. inc. 3 or 7
		9 MWF	109MA	Hodge

† Both semesters must be completed before credit is given.

‡ Credit is given only after Course 4 is completed.

†† Open only to students in the vocational curriculum.

No.	Credits	Title	Offered to	Prereq. courses
*143	3	Money and Prices..... 10 TThS	Jr., sr., grad. 109MA	3 or 7, and 41 or 43 Stehman
*145	3	The Modern Business Cor- poration .. 9 MWF	Jr., sr., grad. 102MA	6 cr. inc. 3 or 7 Hodge
*146	3	Public Utilities .. 9 MWF	Jr., sr., grad. 102MA	145 Durand
*161	3	Labor Problems .. 11 MWF	Jr., sr., grad. 209MA	6 cr. inc. 3 or 7 Crosgrave
*162	3	Labor Legislation .. 11 MWF	Jr., sr., grad. 209MA	6 cr. inc. 3 or 7 Crosgrave
*165	3	Socialism .. 11 TThS	Jr., sr., grad. 213MA	6 cr. inc. 3 or 7 Crosgrave
*173	3	Railway Problems .. 9 TThS	Jr., sr., grad. 213MA	6 cr. inc. 3 or 7 Ar
*174	3	Railway Rate Regulation... 9 TThS	Jr., sr., grad. 213MA	173 Ar
*191	3	Public Finance .. 11 TThS	Jr., sr., grad. 209MA	6 cr. inc. 3 or 7 Blakey
*192	3	State and Local Taxation.. 11 TThS	Jr., sr., grad. 209MA	191 Blakey
253-254	6	Seminar in Accounting and Business Management ... Ar Ar	Sr., grad. Ar	12 cr. inc. 35-36, and 131 Mitchell
259-260	6	Seminar in Corporation and Trust Problems .. Ar Ar	Sr., grad. Ar	12 credits Durand

## EDUCATION

Professors LOTUS D. COFFMAN, MELVIN E. HAGGERTY, ALBERT W. RANKIN, FLETCHER H. SWIFT; Assistant Professor WILFORD S. MILLER; Instructors JEAN H. ALEXANDER, CHARLES L. HARLAN, REWEY BELLE INGLIS, G. A. MCGARVEY, WILLIAM D. REEVE; Assistant OSCAR J. JOHNSON; Scholar FRANCES KELLEY; Special Lecturers CHARLES H. KEENE, GEORGINA LOMMEN, ANGUS W. MORRISON, HORACE NEWHART, RICHARD E. SCAMMON, JULIUS P. SEDGWICK.

## REQUIREMENTS OF THE DEPARTMENT

Six credits in Psychology are prerequisite for all courses in Education.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
*1a	3	Brief Course in Hist. of Educ. .... 8 TThS 9 TThS 9 MWF	Jr., sr. 205Ed 205Ed 205Ed	Phil. 1-2 Swift, Alexander Swift, Alexander Swift, Alexander
*1b	3	Brief Course in Hist. of Educ. .... 9 TThS	Jr., sr. 204Ed	Phil. 1-2 Alexander



DEPARTMENTAL STATEMENTS

No.	Credits	Title	Offered to	Prereq. courses
*3a	3	Social Aspects of Educ... 4 MWF	Jr., sr. 204Ed	Phil. 1-2
*3b	3	Social Aspects of Educ.... 8 MWF	Jr., sr. 204Ed	Phil. 1-2 Rankin
*3bt	3	Social Aspects of Educ.... 8-9:50 S	Teachers	Phil. 1-2
		1 hr. Ar	111Ed	Rankin
*11a	3	Technique of Teaching.... 8 MWF	Jr., sr. 205Ed	Phil. 1-2 Harlan
		9 MWF	204Ed	Miller
*11b	3	Technique of Teaching.... 9 MWF	Jr., sr. 204Ed	Phil. 1-2 Harlan
*15a	3	Practice Teaching .....	Sr.	See bulletin statement
		Ar Ar	Ar	Miller
*15b	3	Practice Teaching .....	Sr.	See bulletin statement
		Ar Ar	Ar	Miller
*101	3	Hist. Found. of Mod. Educ. 2-3:30 TTh	Jr., sr., grad. 205Ed	Phil. 1-2 and 6 cr. in Dept. of History Swift
*102	3	History of Educ. since Ref- ormation .....	Jr., sr., grad. 205Ed	Phil. 1-2 and 6 cr. in Dept. of History Swift
		2-3:30 TTh	205Ed	Swift
*103	3	Educational Classics .....	Jr., sr., grad.	1 or 101-102
		10 TThS	205Ed	Swift, Alexander
*104	3	Educational Classics .....	Jr., sr., grad.	1 or 101-102
		10 TThS	205Ed	Swift, Alexander
*105	3	Educational Psychology ... 11 MWF	Sr., grad. 204Ed	Phil. 1-2 Haggerty
*106	3	Educational Psychology ... 11 MWF	Sr., grad. 205Ed	Phil. 1-2 Haggerty
*109	2	Educational Diagnosis .... 10-11:40 S	Sr., grad. 204Ed	1 or 101-102 and 3 Haggerty
*119	3	School Curricula .....	Sr., grad. 205Ed	1 or 101-102 and 3 Rankin
		4 MWF	205Ed	Rankin
*121a	3	School Organ. & Admin... 3 MWF	Sr., grad. 205Ed	1 or 101-102 and 3 Rankin
*121b	3	School Organ. & Admin... 3 MWF	Sr., grad. 205Ed	1 or 101-102 and 3 Rankin
*123	3	Theory of Supervision.... 11 MWF	Sr., grad. 205Ed	1 or 101-102 and 3 Coffman
*124	3	Educational Administration 3 MWF	Sr., grad. 111Ed	121 Coffman
*125	2	Methods in Educ. Research 3 MW	Sr., grad. 111Ed	1 or 101-102 and 3 Coffman
*131	3	German Schools .....	Sr., grad. 111Ed	1 or 101-102 and 3 Alexander
		4 MWF	111Ed	Alexander
*132	3	French Schools .....	Sr., grad. 111Ed	1 or 101-102 and 3 Alexander
		4 MWF	111Ed	Alexander
*134	2	Mental Diagnosis .....	Sr., grad.	Phil. 1-2
		10-11:40 S	MH	Haggerty, et al.
*135	2	Mental Tests .....	Jr., sr., grad.	Phil. 1-2
		2, 3 WF	MH	Haggerty, Johnson
*136	2	Experimental Education .. 2, 3 WF	Jr., sr., grad. MH	Phil. 1-2 Haggerty, Johnson
*137-138	1 to 6	Psycho-Educational Clinic..	Sr., grad.	Phil. 1-2; Ed. 109, 134, or 135
		12:30-2:30 MWF	126-128MH	Haggerty

No.	Credits	Title	Offered to	Prereq. courses
*141	3	School Sanitation .....	Sr., grad.	1 or 101-102 and 3
		8 MWF	204Ed	Rankin
*142	3	Industrial Education .....	Sr., grad.	1 or 101-102 and 3
		4 MWF	205Ed	Rankin
*146	3	Hist. and Prin. of Religious	Jr., sr., grad.	Phil. 1-2
		Education .....	205Ed	Swift
		9 TThS		

## ENGLISH

Professors RICHARD BURTON,<sup>1</sup> CARLETON BROWN, HARDIN CRAIG, FREDERICK KLAEBER, ELMER E. STOLL; Associate Professor OSCAR W. FIRKINS; Assistant Professors JOSEPH W. BEACH, GEORGE N. NORTHPRO.<sup>2</sup>

## REQUIREMENTS OF THE DEPARTMENT

*For B.A. with Honors*, the general requirements (page 13), twenty-four 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 a Teacher's Certificate*

a. English as the major subject of teaching:

English 1-2, 3, 5 or 7, and 28; Rhetoric 1-2, either 11-12 or 15-16, and 41-42.

b. English as the minor subject of teaching:

English 1-2, and 3; Rhetoric 1-2, and either 11-12 or 15-16.

In order to be recommended, a student must secure an average of at least one and one-half honor points for each credit hour of all the work taken in the departments of English and Rhetoric.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2	6	General Survey Eng. Lit....	Soph., jr., sr.	Rhet. 1-2
		11 MWF	204F	†
		11 MWF	109F	†
		11 MWF	212F	†
		11 MWF	205F	†
		11 MWF	110F	†
		3 MWF	301F	†
		3 MWF	204F	†
		3 MWF	110F	†
		3 MWF	205F	†
		3 MWF	114F	†
3	3	Old English .....	Soph., jr., sr.	1-2†
		9 TThS	205F	Klaeber
		10 TThS	110F	Firkins
5a	3	Chaucer .....	Soph., jr., sr.	1-2†
		9 TThS	204F	Brown

† This course may be taken at the same time with English 1.

<sup>1</sup> Absent on leave during second semester.

<sup>2</sup> Absent on leave.

No.	Credits	Title	Offered to	Prereq. courses
5b	3	Chaucer .....	Soph., jr., sr.	1-2†
		10 TThS	110F	Firkins
7	3	Shakespeare .....	Soph., jr., sr.	1-2†
		10 TThS	301F	Stoll
26	3	Advanced Old English....	Soph., jr., sr.	3
		9 TThS	205F	Klaeber
28	1	Hist. of English Language.	Jr., sr.	3
		3 T	206F	Klaeber
*51	3	Spenser .....	Jr., sr.	1-2
		2 MWF	110F	Firkins
*54	3	American Literature .....	Jr., sr.	1-2
		9 MWF	204F	Craig
*58	3	Nineteenth Century Prose.	Jr., sr.	1-2
		10 MWF	204F	Beach
*67	3	English Novel .....	Jr., sr.	1-2
		10 MWF	301F	Burton
*80a	3††	Teachers' Course .....	Jr., sr.	See statement
		3-4:30 TTh	206Ed	Ingllis
*80b	3††	Teachers' Course .....	Jr., sr.	See statement
		3-4:30 TTh	206Ed	Ingllis
*107	3	Eighteenth Century Prose.	Jr., sr., grad.	1-2 and 6 credits in courses below 10
		9 MWF	204F	Craig
*113-114	6	Drama .....	Sr., grad.	1-2, 7, and 3 credits in courses below 10
		3 MWF	206F	Firkins
*118a	2	Bible as Literature.....	Jr., sr., grad.	1-2 and 6 credits in courses below 10
		11 TTh	107F	Burton
*119-120	6	Prin. of Literary Criticism	Jr., sr., grad.	1-2 and 6 credits in courses below 10
		11 TThS	204F	Firkins
*123-124	4	Seminary in Novelists.....	Sr., grad.	1-2 and 6 credits in courses below 10
		3, 4 T	221F	Beach
*129	3	Modern Drama .....	Sr., grad.	1-2, 7, and 3 credits in courses below 10
		11 MWF	301F	Burton
*136	3	Advanced Shakespeare ...	Jr., sr., grad.	1-2, 7, and 3 credits in courses below 10
		10 TThS	304F	Stoll
*140	2	Advanced Chaucer .....	Jr., sr., grad.	1-2, 5a or 5b, and 3 cred. in courses below 10
		9 TTh	204F	Brown
*143	3	Recent English Poetry....	Jr., sr., grad.	1-2 and 6 credits in courses below 10
		4 MWF	204F	Beach
*146	3	Metrical Romances .....	Jr., sr., grad.	1-2 and 6 credits in courses below 10
		11 MWF		Brown

† This course may be taken at the same time with English 2.

†† Carries credit only in Department of Education.

## GEOLOGY AND MINERALOGY

Professors WILLIAM H. EMMONS, CLINTON R. STAUFFER; Associate Professor FRANK F. GROUT; Assistant Professors A. WALFRED JOHNSTON, CHESSLEY J. POSEY, TERENCE T. QUIRKE; Instructor THOMAS M. BRODERICK; in the General Extension Division, Assistant Professor EDWARD M. LEHNERTS.

## REQUIREMENTS OF THE DEPARTMENT

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

57, 58, 108, 109 in Paleontology  
106, 131, 132, 140 in Petrology  
112, 124, 137, 140, 144 in Economic Geology  
106, 112, 124 in Structural Geology  
36, 39, 116, 118 in Geogrpahy

For a *Teacher's Certificate in Geography*, eighteen credits, five of which shall be from starred courses; Course 55 required and the remaining credits from Courses 1 or 29, 30, 34, 35, 36, 39, 116, 118, and 188, with an average of at least one and one-half honor points for each credit hour.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1	3†	General Geology .....	Soph., jr., sr.	None
		8 MWF	105P	Johnston
		10 TThS	110P	Emmons
		11 MWF	110P	Johnston
		3 MWF	110P	Johnston
3	1	General Geology Lab. ...	Soph., jr., sr.	Supports 1
		Ar.	112P	Johnston
4	3	Geology of Minnesota....	Soph., jr., sr.	Course 1
		11 MWF	110P	Johnston
*5	3	Economic Geology .....	Jr., sr.	1 and 6
		9 MWF	104P	Quirke
6	3†	Historical Geology .....	Soph., jr., sr.	Course 1
		8 MWF	105P	Johnston
		10 TThS	110P	Emmons
		11 TThS	105P	Quirke
		3 MWF	105P	Quirke
8	1	Historical Geology Lab. ...	Soph., jr., sr.	Supports 4 and 6
		Ar.	112P	Johnston
10	3	Elements of Paleontology.	Soph., jr., sr.	Course 1
		10 MWF	104P	Stauffer
11	3	Paleontology .....	Jr., sr.	Course 6
		Lect. 9 M	104P	Stauffer
		Lab. 2-4 WF	104P	Stauffer
12	3	Paleontology .....	Jr., sr.	Course 11
		Lect. 9 M	104P	Stauffer
		Lab. 2-4 WF	104P	Stauffer
14	3	Applied Geol. for Civ. Eng.	Soph., jr., sr.	Course 1
		8 TThS	110P	Quirke

† Geology 1 and 6 constitute a year's course; both semesters must be completed before credit is given for the first semester.

DEPARTMENTAL STATEMENTS

No.	Credits	Title	Offered to	Prereq. courses
15a or 15b	1	Minerals and Rocks.... Ar.	Jr., sr. 100P	1 Grout
21	3	Elements of Mineralogy. Lect. 11 TThS Lab. 8 TThS Lab. 10 TThS Lab. 2-5 W	Soph., jr., sr. 110P 100P 100P 100P	See bulletin statement Broderick Broderick Broderick Broderick
22	3	Descriptive Mineralogy... Lect. 11 TThS Lab. 10 TThS	Soph., jr., sr. 110P 100P	21 Broderick Broderick
27a or 27b	1	Outlines of Mineralogy.. Ar.	Jr., sr. 100P	None Grout
29	3	General Physiography ... 10 TThS	Soph., jr., sr. 105P	None Posey
30	3	Principles of Geography. 10 MWF	Soph., jr., sr. 105P	None; 29 desirable Posey
34	3	Meteorology ..... 8 TThS	Soph., jr., sr. 105P	None Posey
35	1	Laboratory work ..... Ar.	Soph., jr., sr. 104P	See bulletin statement Posey
*36	3	Geog. of North America. 10 TThS	Jr., sr., grad. 105P	1 or 29 and 3 creds. from 5, 6, 30, 34, 39 Posey
37	3	Physical & Com. Geog... 9 MWF	Fr. 204P	None Posey
*39	3	Geographic Influences ... 10 MWF	Jr., sr., grad. 105P	3 cred. from 1, 29, 30, and History 5 or its equivalent Posey
*55	3	Teachers' Course in Geog. 8 TThS	Jr., sr., grad. 105P	Any one of 36, 39, 116, or 118 Posey
*57	3	Paleontology ..... 9-11 TThS	Jr., sr. 104P	6 Stauffer
*58	3	Paleontology ..... 9-11 TThS	Jr., sr. 104P	57 Stauffer
*61	3	Physical Mineralogy .... Ar.	Jr., sr. Ar.P	22 Grout
*65	3	Morphology of Minerals: Ar.	Jr., sr. Ar.P	22 Grout
*105	3	Elements of Rock Study. 2-4 TTh	Jr., sr., grad. 200P	See bulletin statement Grout
*106	3	Petrology ..... 2-4 TTh	Jr., sr., grad. 200P	105 Grout
*108	3	Paleontologic Practice ... 2-4 MWF	Jr., sr., grad. 107P	58 Stauffer
*109	3	Advanced Paleontology .. 8-10 MWF	Jr., sr., grad. 107P	58 Stauffer
*110	3	Advanced Paleontology .. 8-10 MWF	Jr., sr., grad. 107P	109 Stauffer
*111	4	Ore Deposits ..... 8 TWThF	Sr., grad. 110P	6, 22, 105 Emmons
*112	4	Problems in Ore Deposits 2-6 W	Sr., grad. 104P	111 Emmons
*116	3	Geog. of Latin America.. 9 MWF	Jr., sr., grad. 105P	6 cred. from 1, 6, 29, 30, 34, 36, 39 Posey

No.	Credits	Title	Offered to	Prereq. courses
*124	3	Structural & Metam. Geol. 10 TThS	Sr., grad. 112P	6, 22, 105 Johnston
*131-132	6	Advanced Petrology .... Ar.	Jr., sr., grad. 200P	106 Grout
*137	3	Testing Econ. Minerals.. Lect. 11 MW Lab. 2-4 W	Jr., sr., grad. 200P 200P	6, 22, 105 Grout Grout
*140	3	Applied Petrology .....	Jr., sr., grad. 200P	See bulletin statement Grout
*144	3	Construction of Geol. Maps Ar.	Jr., sr., grad. 112P	1, 6 Quirke
§150	8	Field Geol. (Black Hills) Spring of 1918	Jr., sr., grad.	See members of dept. Johnston, Emmons
*151	3	Advanced General Geol.. 11 MWF	Jr., sr., grad. 104P	6 Stauffer
*152	3	Advanced General Geol.. 11 MWF	Jr., sr., grad. 104P	151 Stauffer
*160	6	Field Geology .....	Jr., sr., grad.	See bulletin statement
*188	6	Field Work in Geography	Jr., sr., grad.	See bulletin statement

### GERMAN

Professor CARL SCHLENKER; Assistant Professors OSCAR C. BURKHARD, JAMES DAVIES, ALFRED E. KOENIG, SAMUEL KROESCH, WALTER R. MYERS; Instructors ARTHUR R. GRAVES, HAROLD W. SOULE, EDWIN H. ZEYDEL; Teaching Fellow .....

#### REQUIREMENTS OF THE DEPARTMENT

For *B.A. with Honors*, the general requirements (page 13), and fifteen credits during the junior year in courses numbered between 51 and 100, of which Courses 53-54 and 55-56 are required; eight credits during the senior year, including at least one course numbered between 101 and 200, and one course numbered above 200; and the special thesis, to be completed under the direction of the instructor in charge of the latter course.

*Teacher's Certificate in German.* For a minor recommendation, a minimum of fourteen credits; required courses are German 29-30, 31-32 and 59-60. For a major recommendation, a minimum of twenty-eight credits; required courses are German 29-30, 31-32, 53-54, 55-56 and 59-60. German 57-58 is strongly recommended. German 1 and 3 shall not be counted toward either a minor or a major recommendation. To obtain either a minor or a major recommendation the student must obtain an average of one and one-half honor points for each credit hour for all German courses taken.

For courses in Germanic Philology see the statement of the Department of Comparative Philology.

#### COURSES

a. Only students who are taking or who have taken Course 5-6 or Course 16 may elect the supplementary courses 25-26 and 27-28, either

one or both. But students electing Course 11-12 or Course 14 may elect Course 25-26. No credit will be granted for Course 25-26 or Course 27-28 if students elect them when taking or when they have taken courses numbered above 50.

b. Only students who are taking or who have taken Courses 7-8 or Course 9-10 or Course 11-12 or Course 14 or Course 21-22 or Course 23-24 may elect the supplementary courses 29-30 and 31-32, either one or both together. Students electing Course 11-12 or Course 14 or Course 21-22 should take courses 29-30 and 31-32 only after consultation with the instructor in charge.

c. Credit for only one of the following courses will be granted: Courses 5-6, 16, 21-22.

d. Credit for only one of the following courses will be granted: Courses 7-8, 9-10, 11-12, 14, 21-22, 23-24.

e. Freshmen must complete intermediate course before credit is given for beginning course.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1a	6	Beginning .....	All	None
		8 MTWThFS	207F	†
		9 MTWThFS	207F	†
		10 MTWThFS	207F	†
		11 MTWThFS	207F	†
1b	6	Beginning .....	All	None
		9 MTWThFS	101F	†
3a	6	Intermediate .....	All	1a or 1b
		11 MTWThFS	209F	†
3b	6	Intermediate .....	All	1a or 1b
		8 MTWThFS	207F	†
		9 MTWThFS	207F	†
		10 MTWThFS	207F	†
		11 MTWThFS	207F	†
5-6	6†	Prose and Poetry .....	Fr., soph.	2 yrs. prep. German
		8 TThS	209½F	†
		9 MWF	212F	†
		10 TThS	213F	†
		11 TThS	110F	†
		2 MWF	213F	†
6a	3	Prose and Poetry .....	Fr., soph.	5a or 5b
		2 MWF	209F	Graves
7-8	6	Drama .....	All	5-6 or 4 yrs. prep. German
		9 TThS	212F	Burkhard
		10 MWF	212F	Schlenker
		11 TThS	212F	Davies
11-12	6†	Rapid Reading .....	Soph., jr., sr.	3a or 3b
		9 TThS	213F	Koenig
		10 MWF	213F	Graves
		11 MWF	213F	Koesch
§14	6	Rapid Reading .....	Soph., jr., sr.	3a or 3b
		11 MTWThFS	209F	Zeydel

† Both semesters must be completed before credit is given for either semester.

§16	6	Prose and Poetry.....	All	2 yrs. prep. German
		11 MTWThFS	113F	
21-22	6†	Scientific Intermediate ....	Soph., jr.	3a or 3b
		11 TThS	213F	Graves
23-24	6†	Scientific Advanced .....	Soph., jr.	5-6 or 16 or 21-22
		10 MWF	206F	Soule
25-26	2†	Elementary Composition ..	Fr., soph., jr.	See note a
		9 S	209½F	Zeydel
		10 S	209½F	Koenig
27-28	2†	Elementary Conversation..	Fr., soph., jr.	See note a
		8 WF	209½F	Zeydel
		9 TTh	209½F	Graves
		10 TTh	209½F	Soule
29-30	2†	Advanced Conversation ...	Soph., jr., sr.	See note b
		9 WF	209½F	Zeydel
		10 TTh	209F	Davies
31-32	2†	Intermediate Composition..	Soph., jr., sr.	See note b
		9 M	209½F	Graves
		10 S	209F	Davies
*51	2	Faust, Part I .....	Soph., jr., sr.	7-8 or 9-10 or 11-12 or 14 or 23-24
		11 WF	209½F	Schlenker
*53	3	Survey through Classic Period .....	Soph., jr., sr.	7-8 or 9-10 or 11-12 or 14 or 23-24
		9 MWF	209F	Burkhard
		9 TThS	209F	Myers
*54	3	Survey since Classic Period	Soph., jr., sr.	53
		9 MWF	209F	Burkhard
		9 TThS	209F	Myers
*55-56	2†	Advanced Composition ...	Jr., sr.	31-32
		3 M	207F	Kroesch
		3 M	209F	Myers
*57-58	4	Oral Diction .....	Jr., sr.	See statement
		10 MW	209½F	Koenig
*59-60	2†	Teachers' Course .....	Jr., sr.	29-30 and 31-32 or 53-54
		4 F	209F	Schlenker
*61	2	Romantic School .....	Jr., sr.	7-8 or 9-10 or 11-12 or 14 or 23-24
		11 TTh	209½F	Schlenker
*62	2	Drama since 1880 .....	Jr., sr.	2 credits in starred courses
		11 TTh	209½F	Schlenker
*107-108	4†	Middle High German .....	Jr., sr., grad.	4 credits in starred courses
		4 WF	209½F	Kroesch
*109-110	4†	Hist. of German Language	Jr., sr., grad.	4 credits in starred courses
		2 WF	205F	Klaeber
*119-120	4†	Drama of Schiller.....	Sr., grad.	4 credits in starred courses
		2, 3 Th	209½F	Myers
*127-128	4	Eighteenth and Nineteenth Century Lyric .....	Sr., grad.	4 credits in starred courses
		2, 3 F	207F	Davies



No.	Credits	Title	Offered to	Prereq. courses
*137-138	4†	Aspects of Nineteenth Century Literature .....	Sr., grad.	4 credits in starred courses
		2, 3 W	209½F	Burkhard
*143-144	4†	Heine und das Junge Deutschland .....	Sr., grad.	4 credits in starred courses
		4 TTh	207F	Graves
*225-226	4†	Literary Problems .....	Honors and grad.	
		2, 3 T	209½F	Schlenker

† Both semesters must be completed before credit is given for either semester.

## GREEK

Professor CHARLES ALBERT SAVAGE.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2	10†	First Year Greek .....	Fr., soph., jr., sr.	None
		9 TWThFS	114F	Savage
3-4	6†	Anabasis-Iliad .....	Fr., soph., jr., sr.	1-2
		10 MWF	114F	Savage
*51	3	Philosophy .....	Jr., sr.	3-4
		10 TThS	114F	Savage
*52	3	Oratory .....	Jr., sr.	3-4
		10 TThS	114F	Savage
*101	3	Lyric Poetry .....	Sr., grad.	51-52
		11 MWF	113F	Savage
*102	3	Tragedy .....	Sr., grad.	101 or 51-52
		11 MWF	113F	Savage
<i>Courses open to all. No knowledge of Greek required.</i>				
61	2	Drama .....	Jr., sr.	None
		2 TTh	114F	Savage
62	2	Literature and Life .....	Jr., sr.	None
		2 TTh	114F	Savage
63	1	Mythology .....	Jr., sr.	None
		3 Th	114F	Savage

† Both semesters must be completed before credit is given for the first semester.\*

## HISTORY

Professors GUY STANTON FORD, WILLIAM STEARNS DAVIS, WALLACE NOTE-STEIN, ALBERT BEEBE WHITE; Associate Professors SOLON JUSTUS BUCK, AUGUST CHARLES KREY; Lecturer LESTER BURRELL SHIPPEE; Instructor WAYNE EDSON STEVENS; Teaching Assistant WILSON PORTER SHORTRIDGE; Assistants ALICE H. FELT, FRANCES IRWIN, CECIL W. SHIRK.

## REQUIREMENTS OF THE DEPARTMENT

For B.A. with Honors, see general statement (page 13).

For a Teacher's Certificate, eighteen credits in History, including at least three credits in intensive courses. In addition the student must take History 56-7.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2	6	Med. and Modern Europe.	All	None
	(Lecture)	1 W	30Ph	Ford, Krey
		8 TS	111L	†
		9 MF	111L	†
		9 TS	111L	†
		10 MF	111L	†
		11 MF	15F	†
		11 TS	111L	†
		3 MF	111L	†
2a-1b	6	Med. and Modern Europe.	All	None
		10 TThS	101F	†
3-4	6	English, 1066 to present...	All	None
	(Lecture)	1 M	301F	White
	(Lecture)	1 M	308F	Notestein
		9 WF	112L	†
		9 TTh	112L	†
		10 WF	112L	†
		10 TTh	112L	†
		11 WF	112L	†
		11 TTh	112L	†
		2 WF	112L	†
		3 WF	112L	†
5-6	6	American History .....	Soph., jr., sr.	6 credits
	(Lecture)	10 M	5F	Shippee
		10 WF	5F	†
		10 ThS	5F	†
		11 WF	3F	†
7-8	6	English History, 1783-1917.	Soph., jr., sr.	6 credits
		2 MWF	218bL	Notestein
10	3	Europe in 19th Century..	Soph., jr., sr.	6 credits
		11 MWF	111L	Ford
14	3	Renaissance and Reform'n.	Soph., jr., sr.	6 credits
		9 MWF	3F	Krey
15	3	Military History .....	See note†	See bulletin statement
		10 TThS	3F	Davis
*21	3	Outlines of Greek History.	Jr., sr.	9 credits
		3 MWF	3F	Davis
*22	3	Outlines of Roman History	Jr., sr.	9 credits
		3 MWF	3F	Davis
*56-57	3	Teachers' Course .....	Jr., sr.	See statement
		4 MW	111L	Krey
‡61	3	National Expansion and Jacksonian Democracy, 1816-1840 .....	Jr., sr.	9 credits (inc. 5-6)
		3 MWF	5F	Stevens
‡62	3	Recent American History..	Jr., sr.	9 credits (inc. 5-6)
		3 MWF	5F	Shippee
*101	3	French Revolution .....	Jr., sr., grad	9 credits
		11 MWF	111L	Ford

† Note: Course No. 15 open without prerequisites to students enrolled for the Officers' Reserve Course. Open to juniors and seniors who have had History 1-2 or 3-4.

No.	Credits	Title	Offered to	Prereq. courses
*104	3	The Near East.....	Jr., sr., grad	9 credits
		10 TThS	111L	Davis
*133-134	6	Ancient Civilization .....	Jr., sr., grad.	See statement
		11 TThS	3F	Davis
*137	3	English Constitutional Hist.	Jr., sr., grad.	9 credits
		4-5:30 TTh	218bL	White
*141	3	West in American History.	Jr., sr., grad.	9 credits (inc. 5-6)
		3 MWF	218bL	Buck
*144	3	History of Minnesota.....	Jr., sr., grad.	9 credits (inc. 5-6)
		3 MWF	218bL	Buck
*155	3	American Economic and Social History 1860-76...	Sr., grad.	12 credits (inc. 5-6)
		2-3:30 TTh	112L	Shippee
*162	3	Beginnings of Parliament.	Jr., sr., grad.	See bulletin statement
		4-5:30 TTh	218bL	White
*183	3	Stuart Period .....	Sr., grad.	See bulletin statement
		4-5:30 WF	218bL	Notestein
*191	3	Age of the Crusades.....	Sr., grad.	See bulletin statement
		1:30-3 TTh	218bL	Krey

## HOME ECONOMICS

## COLLEGE OF AGRICULTURE

Professor JOSEPHINE T. BERRY; Assistant Professors HARRIET GOLDSTEIN, AMY P. MORSE, MILDRED WEIGLEY, MARION WELLER, GRACE I. WILLIAMS;<sup>1</sup> Instructors BESSIE E. BEMIS, VETTA GOLDSTEIN, ETHEL L. PHELPS, ALICE L. THOMAS, ELIZABETH VERMILYE; Lecturer MARTHA B. MOORHEAD.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
11a or 1b	2	Textiles .....	All	None
		8:00-9:40 MW	307, 211He	Phelps
		8:00-9:40 TTh	307, 211He	Ronzone
		2:00-3:40 MF	307, 211He	Phelps
11a or 11b	3	Garment Making .....	All	None
		8:00-9:40 MWF	304He	Phelps
		8:00-9:40 TThS	305He	¶
		2:00-4:30 MF	304He	Phelps
		2:00-4:30 TTh	304He	Phelps
13a or 31b	3	Dressmaking .....	Soph., jr., sr.	1, 11
		9:50-11:30 MWF	304He	Ronzone
		9:50-11:30 TThS	304He	Phelps
21a	3	Foods and Cookery.....	Soph., jr., sr.	Chem. 3, or equiv.; 1 entrance unit Do- mestic Sci.; Physi- ology 3 parallel
		2:00-4:30 MF	209, 309He	Bemis
22a	3	Food Economics .....	Soph., jr., sr.	21 or 23
		2:00-4:30 MF	207, 205He	Weigley

<sup>1</sup> On leave of absence 1917-18.

No.	Credits	Title	Offered to	Prereq. courses
22b	3	Food Economics .....	Soph., jr., sr.	21 or 23
		2:00-4:30 TTh	209, 205He	Bemis
		9:50-11:30 MWF	209, 205He	Thomas
23a or 23b	5	Foods and Cookery.....	Soph., jr., sr.	Chem. 3, or equiv.; Physiol. 3 parallel
		2:00-4:30 MF	107, 106He	Thomas
		2:00-3:40 W*	107, 106He	Thomas
33	1	Home Care of the Sick....	Jr.	Chem. 3, 7, or 21; Bacteriol. 58
		8:00-8:55 T	203He	Moorhead
		8:00-8:55	*NW WH	Fisher
51a or 51b	3	Drawing and Design.....	All	None
		8:00-9:40 MWF	311He	H. Goldstein
		8:00-9:40 TThS	311He	V. Goldstein
		2:00-3:40 MWF	311He	V. Goldstein
53a or 53b	3	Advanced Design.....	Soph., jr., sr.	51
		9:50-11:30 MWF	313He	Morse
		2:00-3:40 MWF	313He	H. Goldstein
		2:00-4:30 TTh	313He	H. Goldstein

\* New Wing, Women's Hall.

## HUMAN ANATOMY

### THE MEDICAL SCHOOL

Professors CLARENCE M. JACKSON, JOHN B. JOHNSTON, THOMAS G. LEE,  
RICHARD E. SCAMMON; Associate Professor CHARLES A. ERDMANN;  
Instructors JAY A. MYERS, ANDREW T. RASMUSSEN.

### COURSES

	Offered to	Prereq. courses	Offered to	Prereq. courses
3-4	10	Gross Human Anatomy.....	Soph., jr., sr.	An. Biol. 1-2
		Lab. 8, 9, 10, 11 TThS	304-308IA	Jackson, et al.
		Lect. 1 MW	304IA	Jackson
*101	5	Human Histology .....	Jr., sr., grad.	An. Biol. 718
		Lab. 8, 9, 10 MWF	106-108IA	Scammon, et al.
		Lect. 11 WF	102IA	Scammon
*102	3	Human Embryology .....	Jr., sr., grad.	An. Biol. 7-8
		Lect. 11 MW	102IA	Scammon
		Quiz. 3 Th	106-108IA	Lee, et al.
*103	3	Human Neurology .....	Sr., grad.	Anat. 101 and 102, or An. Biol. 7-8 or 19-20
		Lab. 8, 9, 10 TThS	108-214-215IA	Johnston, Rasmussen, et al.
		111a,b 3 Anatomical Technique .....	Soph., jr., sr.	Histology or Embryol.
*114	3	1, 2, 3 TS	113IA	Lee
		Topographic Anatomy .....	Sr., grad	3-4
		Lab. 1, 2, 3 TTh	313IA	Jackson
*115	3	Fetal Anatomy .....	Sr., grad.	3-4 and 102 or An. Biol. 137
		Lab. Ar. TTh	20IA	Scammon

NOTE: Since the number of students in anatomy Courses Nos. 3-4, 101, and 102 is limited, students will not be permitted to register for these courses without written permission by the head of the department.

## HUMAN PHYSIOLOGY

## THE MEDICAL SCHOOL

Professor ELIAS P. LYON; Associate Professors RICHARD OLDRING BEARD, FREDERICK H. SCOTT; Assistant Professors JOHN F. MCCLENDON, M. RUSSELL WILCOX; Instructors FRANCIS B. KINGSBURY, CHAUNCEY J. V. PETTIBONE; Assistant ALBERT M. SNELL.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
3a,b	3†	Elem. Human Physiology	Soph., jr., sr.	1 yr. Chem., half yr. Biol.
		1:30-4 T		
		1:30-5 Th	214MH	Beard, or Lyon, et al.
4	3†	Elementary Physiology ...	Soph., jr., sr.	Elem. Chem. & Biol. or Anat.
		9-10 T		
		9-12 Th		
		9-10 S	214, 301MH	Beard or Lyon, et al.
6	3	Elem. Physiol. Chemistry..	Soph., jr., sr.	Elem. Chem. & Biol. or Anat.
		10-12 T		
		10-12 S	214, 310MH	Pettibone, et al.
*102	5	Physiologic Chemistry ...	Jr., sr., grad.	Organic Chem.
		8-11 MW		
		8-12 F	214, 310MH	Pettibone, et al.
*103	4	Physiol. Muscle, etc.....	Jr., sr., grad.	An. Biol. 1-2 and 7-8 or Anat. 101
		1-3 M		
		1-4:30 W		
		1-3:30 F	214, 301MH	Scott, et al.
*104	4	Physiol. Nerv. Sys., etc..	Jr., sr., grad.	An. Biol. 1-2 and 7-8 or Anat. 101
		1-3 M		
		1-4 W		
		1-4 F	214, 301MH	Lyon, et al.
*111	3	Physical Chem. of Cells..	Jr., sr., grad.	Organ. Chem. & An. Biol. 1-2
		2-5 TTh	303MH	McClendon
*112	3	Electro-Physiology .....	Jr., sr., grad.	Organ. Chem. & An. Biol. 1-2
		2-5 TTh	303MH	McClendon
*113-114	3‡	Problems in Physiology..	Jr., sr., grad.	Physiol. 103
		1-4 TTh or Ar.	301MH	Lyon, Scott, or McClendon
*115-116	1½	Conference .....	Jr., sr., grad.	Physiol. 102, 103, 104
		Ar Ar	315MH	Lyon or Scott
*131	1½	Physiology of the Blood..	Jr., sr., grad.	Physiol. 102, 103, 104
		2-5 TTh	301MH	Scott
*132	¼ or 1½	Physiol. of Circulation...	Jr., sr., grad.	Physiol. 102, 103, 104
		2-5 TTh	301MH	Scott
*137a,b	2	Foods and Pract. Dietics	Jr., sr.	Physiol. 3 or equiv.
		2:30-5 Th	116MH&UH	Beard
*138	2	Physiol. of Development..	Jr., sr.	Physiol. 3 or equiv.
		2:30-3:30 TTh	116MH&UH	Beard
*151-152	6	Physiologic Chemistry ...	Jr., sr., grad.	Organic Chem.
		1-4 TTh	315, 310MH	Kingsbury, et al.
*153-154	6	Adv. Physiol. Chem.....	Jr., sr., grad.	Physiol. 102
		Ar Ar	Ar	Pettibone or Kingsbury

† Students may not receive credit for any two of Courses 3 and 4.

‡ Or more.

No.	Credits	Title	Offered to	Prereq. courses
*161	1½	Urinalysis .....	Jr., sr., grad.	Physiol. Chem.
		1-4 TTh	310MH	Pettibone, 1st qr.
*163	¾ or 1½	Metabolism .....	Jr., sr., grad.	Physiol. Chem.
		1-4 TTh	310MH	Pettibone, 1st qr.
*164	3	Quantitative Methods ....	Jr., sr., grad.	Physiol. Chem.
		Ar Ar	310MH	Kingsbury

For a full list of courses offered by the department, see the bulletin of the Medical School.

## JOURNALISM.

### COLLEGE OF AGRICULTURE

Associate Professor WILLIAM P. KIRKWOOD; Assistant Professor PHIL C. BING.

#### COURSES

No.	Credits	Title	Introductory Courses†	
			Offered to	Prereq. courses
2	3	Reporting, Lab. and Class.....	Soph., jr., sr.	Rhet. 1 yr.
		8 MWF	5Ad	Bing
3	3	Advanced Reporting .....	Jr., sr.	2
		8 MWF	4Ad	Bing
4	3	News Editing .....	Jr., sr.	3 and 5
		3:45 MWF	5Ad	Bing
5	3	Copy Reading .....	Jr., sr.	3 or parallel 3
		3:45 MWF	5Ad	Bing
7	3	Editorial Administration .....	Sr.	4
		8 MWF	317Ad	Kirkwood

† All classes meet in Administration building of the Agricultural College.

## LATIN

Professors JOSEPH B. PIKE, JOHN E. GRANRUD.

#### REQUIREMENTS OF THE DEPARTMENT

For a Teacher's Minor Recommendation, Courses 5, 6, 57, 58, and 101; for a Major Recommendation, these same courses with the addition of Course 102, with an average of at least one and one-half honor points per credit hour.

For B.A. with Honors, the general requirements (page 13) and a fair reading knowledge of German or French or Greek. Six credits in Latin a semester during the junior and senior years are to be selected from Courses 57 to 204. (Students who do not desire a recommendation for teaching Latin may, by selecting courses that are given in alternate years, secure enough work for the honors course without being obliged to take Course 101 or 102.) Instead of taking all the work indicated above in Latin, the student may substitute six credits in Greek (third-year Greek or above), or six credits in Greek or Roman History, or six credits in ancient Philosophy.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
§1	6	Beginning Latin .....	All	None
		9 MTWThFS	107F	¶
§2	6	Selections from Caesar†..	All	1
		9 MTWThFS	107F	¶
3	3	Select. from Latin Authors	All	1-2 or 2 or 3 yrs. prep. Latin
	10	MWF	109F	¶
4	3	Select. from Latin Authors†	All	1-2 or 2 or 3 yrs. prep. Latin
		10 MWF	109F	¶
5	3	Livy .....	All	3-4 or 4 yrs. prep. Latin
		10 TThS	109F	¶
6	3	Plautus and Terence††...	All	3-4 or 4 yrs. prep. Latin
		10 TThS	109F	¶
*57	3	Horace .....	Soph., jr., sr.	6
		9 MWF	109F	Pike
*58	3	Pliny .....	Soph., jr., sr.	57
		9 MWF	109F	Pike
*101	3	Advanced Caesar .....	Jr., sr.	58
		9 TThS	109F	Pike
*102	3	Advanced Virgil .....	Jr., sr.	101
		9 TThS	109F	Pike
*105	3	Roman Elegy .....	Jr., sr., grad.	58
		10 MWF	107F	Granrud
*108	3	Tacitus .....	Jr., sr., grad.	58
		11 MWF	107F	Granrud
9	1	Roman Architecture .....	Jr., sr.	None
		11 S	107F	Granrud
10	1	Roman Art .....	Jr., sr.	None
		11 S	107F	Granrud
*203-304	6	Lucretius .....	Grad. and honor	Consult department
		3, 4, 5 T	109F	Pike
§*205-206	6	Roman Comedy .....	Grad. and honor	Consult department
		3, 4, 5 Th	107F	Granrud

† Students entering at midyear with one year of Latin may take Course 2.

‡ Students entering at midyear with two or three years of Latin may take Course 4.

†† Students entering at midyear with four years of Latin may take Course 6.

## MATHEMATICS

Professors GEORGE N. BAUER, FRANCIS P. LEAVENWORTH; Associate Professors WILLIAM H. BUSSEY, ROYAL R. SHUMWAY; Assistant Professors HERMON L. SLOBIN, ANTHONY L. UNDERHILL, WILLIAM D. REEVE; Instructors RALPH M. BARTON, RAYMOND W. BRINK, EDWARD A. T. KIRCHER.

## REQUIREMENTS OF THE DEPARTMENT

For B.A. with Honors, the general requirements, (page 13). In junior and senior years any courses above 50 may be presented, except

Course 54. Astronomy 101-102, Physics 121-122, and with the consent of the Department of Mathematics, other courses in Astronomy and Physics open only to juniors and seniors may be presented.

For a *Teacher's Certificate*, an average of at least one and one-half honor points per credit hour through Course 51; Course 54; and an average of at least one honor point per credit hour in all other courses taken in the department. Course 6 must be included if not offered for admission.

## COURSES

Year courses for freshmen and sophomores. Course 1-2 is a year course open to students who presented for entrance one unit of Elementary Algebra. Course 3a-4b and Course 5-9b are two alternative year-courses open to those who presented for entrance one unit of Elementary Algebra and one-half unit of Higher Algebra. Students who intend to specialize in Mathematics are advised to take Course 5-9b. Course 9a-11b is a year course for sophomores who had Course 1-2 or Course 3a-4b in the freshman year. Course 11a-51b is a year-course for sophomores who had Course 5-9b in the freshman year.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2	5	Algebra I, II, and Pl. Trig...	Fr., soph.	Elem. Algebra
	8	TWThFS	125F	¶
	9	TWThFS	125F	¶
	11	TWThFS	104F	¶
	2	MTWThF	104F	¶
1b	5	Algebra I .....	Fr., soph.	Elem. Algebra
	8	TWThFS	105F	¶
3a	3	Algebra II .....	Fr., soph.	Prep. Higher Algebra
	10	MWF	104F	¶
	10	TThS	104F	¶
	2	MWF	101F	¶
	3	MWF	104F	¶
3b	3	Algebra II .....	Fr., soph.	Prep. Higher Algebra
	8	MWF	104F	¶
4a	3	Trigonometry .....	Fr., soph.	3
	8	TThS	104F	¶
4b	3	Trigonometry .....	Fr., soph.	3
	10	MWF	104F	¶
	10	TThS	104F	¶
	2	MWF	101F	¶
	3	MWF	104F	¶
5	5	Algebra II and Pl. Trig. ....	Fr., soph.	Prep. Higher Algebra
	9	TWThFS	104F	¶
	10	TWThFS	105F	¶
6	2	Solid Geometry .....	Soph., jr., sr.	1-2 or 3-4 or 5-9
			who have not had	
			Solid Geometry	
	11	WF	101F	Bussey
9a	5	Pl. & Sol. Anal. Geom. ....	Soph., jr., sr.	2 or 4 or 5
	9	TWThFS	101F	Slobin
	2	MTWThF	102F	Brink



No.	Credits	Title	Offered to	Prereq. courses
9b	5	Pl. & Sol. Anal. Geom. ....	Fr., soph., jr., sr. 2 or 4 or 5	
		9 TWThFS	104F	¶
		10 TWThFS	105F	¶
11a	3	Differential Calculus .....	Soph., jr., sr.	7 or 9
		11 TThS	102F	Barton
11b	3	Differential Calculus .....	Soph., jr., sr.	7 or 9
		9 TThS	102F	Bauer
		2 MWF	102F	Brink
51a	3	Integral Calculus .....	Soph., jr., sr.	11
		11 TThS	101F	Bauer
51b	3	Integral Calculus .....	Soph., jr., sr.	11
		11 TThS	102F	Slobin
*54a	2	Teachers' Course .....	Jr., sr.	11
		3 TTh	115Ed	Reeve
*54b	2	Teachers' Course .....	Jr., sr.	11
		3 TTh	115Ed	Reeve
*6a	3	Theory of Equations .....	Jr., sr.	11
		2 MWF	125F	Bussey
*71	3	Solid Anal. Geom. ....	Jr., sr.	11
		9 MWF	102F	Underhill
*102	3	Adv. Pl. Anal. Geom. ....	Jr., sr., grad.	11
		9 MWF	102F	Shumway
*107	3	Adv. Differential Calculus ....	Jr., sr., grad.	51
		11 MWF	102F	Bussey

Any of the following courses for which a sufficient number of students apply will be given in 1917-18.

No.	Credits	Title	Offered to	Prereq. courses
106a or 106b	3	Differential Equations..	Sr., grad.	51
119a or 119b	3	Modern Higher Algebra	Sr., grad.	51, 62
125-126	6	Differential Geometry..	Sr., grad.	51
127a or 127b	3	Infinite Series .....	Sr., grad.	17 cred. besides Alg. and Trig.
140	2	Meth. of Least Squares	Sr., grad.	51

MILITARY SCIENCE AND TACTICS

Professors GEORGE W. MOSES (Commandant), THEODORE B. TAYLOR, JAMES B. WOOLNOUGH, OWEN R. MEREDITH.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2	None	Military Drill .....	Fr.	None
		2, 3, 4 Th	A	Major Moses
3-4	None	Military Drill .....	Soph.	1 year's drill
		2, 3, 4 T	A	Major Moses
5-6	3†	Military Drill .....	Jr., sr.	2 years' drill
		2, 3, 4 Th or F	A	Major Moses
8	2‡	Military Science .....	Jr., sr.	2 years' drill
		Ar MWF or TThS	A	Major Moses

† No student may receive more than a total of six credits for elective work in both Physical Education and Military Drill.

‡ If taken in connection with Course 5-6.

## MUSIC

Professor CARLYLE SCOTT; Assistant Professor DONALD FERGUSON; Instructor GERTRUDE REEVES; Special Instructors MAXIMILIAN DICK, THADDEUS GIDDINGS, GERTRUDE HULL.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2	6	Harmony .....	Jr., sr.	None
		11 MWF	Mu	Scott
		11 TThS	Mu	Scott
3-4	4	Counterpoint .....	Jr., sr.	Harmony
		11 TTh	Mu	Ferguson
5-6	4	Composition .....	Jr., sr.	.....
		Ar Ar	Mu	Ferguson
7-8	2	Analysis .....	Jr., sr.	Harmony
		12 W	Mu	Scott
9-10	6	History of Music.....	Soph., jr., sr.	None
		9 MWF	Mu	Ferguson
11-12	2	Appreciation of Music.....	Jr., sr.	None
		1 M	Mu	Reeves
13-14	4	Bach-Beethoven .....	Jr., sr.	None
		1, 2 T	Mu	Ferguson
15-16	4 or 8	Pianoforte .....	Jr., sr.	.....
		Ar Ar	Mu	Scott, Ferguson, Reeves
19-20	4 or 8	Violin .....	Jr., sr.	.....
		Ar Ar	Mu	Dick
21-22	4	Voice .....	Jr., sr.	.....
		Ar Ar	Mu	Hull
27-28	6	Public School Music.....	Jr., sr.	.....
		4, 5 WF	Ed	Giddings
29-30	6	Normal Piano .....	Jr., sr.	.....
		3 TF	Mu	Reeves
31-32	4	Ensemble .....	Jr., sr.	.....
		12 F	Mu	Dick
33-34	2	Ear Training .....	Jr., sr.	None
		2 Th	Mu	Reeves
35-36	2	Orchestra .....	Soph., jr., sr.	.....
		7:30 M	ME	Ferguson
§37-38	6	Advanced Normal Piano.....	Sr., grad.	29-30
		4 TF	Mu	Reeves
§39-40	6	Adv. Public School Music...	Sr., grad.	27-28
		4, 5 WF	Mu	¶

## PHILOSOPHY

Professors NORMAN WILDE, DAVID F. SWENSON; Assistant Professor RUPERT C. LODGE.

## REQUIREMENTS OF THE DEPARTMENT

For *B.A. with Honors*, besides the general requirements, twenty-four credits in starred courses, including one of the following: 124, 125, 136, 138, 141-142.

Six credits in Psychology 1-2 will be accepted as prerequisites in Philosophy, except where otherwise stated.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1	3†	Problems of Philosophy..	Soph., jr., sr.	None
	9	MWF	322F	Swenson
	11	TThS	322F	Lodge
2	3†	Logic .....	Soph., jr., sr.	None
	9	MWF	322F	Swenson
	11	TThS	322F	Lodge
3a	3†	Ethics .....	Soplr., jr., sr.	None
	10	TThS	322F	Wilde
3b	3†	Ethics .....	Soph., jr., sr.	None
	9	MWF	304F	Wilde
*20	3	Present Day Philosophy..	Jr., sr.	6 credits
	10	TThS	322F	Wilde
*55	3	Esthetics .....	Jr., sr.	6 credits
	8	TThS	322F	Swenson
*63	3	Development of Religion.	Jr., sr.	6 credits
	9	TThS	322F	Swenson
*64	3	Philosophy of Religion...	Jr., sr.	6 credits
	9	TThS	322F	Swenson
§*100	3	Critical Idealism .....	Jr., sr., grad.	6 credits in Phil.
	11	MWF	311F	Lodge
*117	3	Advanced Ethics .....	Jr., sr., grad.	6 credits incl. 3
	10	MWF	322F	Wilde
*121-122	6	General History of Philos.	Jr., sr., grad.	6 credits
	11	MWF	322F	Wilde
*124	3	19th Century Philosophy.	Jr., sr., grad.	9 credits incl. 6 in Phil.
	Ar	Ar	316F	Lodge
*125	3	Plato .....	Jr., sr., grad.	9 credits incl. 6 in Phil.
	Ar	Ar	316F	Lodge
§*133	3	Ancient Phil. Theories of the State .....	Jr., sr., grad.	6 credits in Phil. or Political Science
	2	MWF	322F	Lodge
*136	3	Scandinavian Philosophy.	Jr., sr., grad.	9 credits
	4-5:30	WF	322F	Swenson
§*138	3	Advanced Logic .....	Jr., sr., grad.	9 credits incl. 2
	10	MWF	322F	Swenson
*141-142	6	Seminar in Philosophy...	Sr., grad.	12 credits in Phil.

† 1 and 2 or 3 may be combined as a year course.

## PHYSICAL EDUCATION

## FOR MEN

Director LOUIS J. COOKE; Assistant Director WILLIAM K. FOSTER; Instructor JOHN C. WEST; Assistant BOTTLF M. OHNSTAD.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1	None	Personal Hygiene .....	Fr.	None
	2	MF	201A	Cooke
	3	MF	201A	Cooke
	11	TS	201A	Cooke
	11	WF	201A	Cooke

No.	Credits	Title	Offered to	Prereq. courses
3-4	None	Gymnasium .....	Fr.	None
	2	MF	100A	Foster-West
	3	MF	100A	Foster-West
	11	TS	100A	Foster-West
	11	WF	100A	Foster-West
5-6	None	Intermediate Gymnastics ...	Fr.	None
	2	MF	100A	Foster-West
	3	MF	100A	Foster-West
	11	TS	100A	Foster-West
	11	WF	100A	Foster-West
7-8	2†	Advanced Leaders .....	Soph., jr., sr.	1, 3-4, 5-6
	2	MF	100A	Foster-West
	3	MF	100A	Foster-West
	11	TS	100A	Foster-West
	11	WF	100A	Foster-West
9-10	None	Corrective Gymnastics .....	All	None
	Ar	Ar	100A	Ohnstad
11-12	None	Wrestling .....	Soph., jr., sr.	None
	5	MWF	106A	Foster-Ohnstad
13-14	None	Advanced Gymnastics .....	Soph., jr., sr.	None
	Ar	Ar		West-Foster
15-16	None	Intermediate Swimming .....	All	None
	Ar	Ar		Ohnstad
17-18	None	Advanced Swimming .....	All	15-16
	Ar	Ar		Foster-Ohnstad

† Both semesters must be completed before credit is given for the first semester.

## PHYSICAL EDUCATION

### FOR WOMEN

Assistant Professor J. ANNA NORRIS; Instructors MAY S. KISSOCK,<sup>1</sup> VALERIA G. LADD, GERTRUDE D. SCHILL, ALICE H. TOLG, LILLIAN HANSEN.

Six credits the maximum number that can be gained by taking courses in exercise (Courses 3-4, 5-6); only one of these courses may be taken for credit in a semester.

### COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2	None	Elem. Physical Training...	Required of all new students	None
	10	TThS	3, 151, 153WGm	¶
	11	MWF	3, 151, 153WGm	¶
	11	TThS	3, 151, 153WGm	¶
	3	MWF	3, 151, 153WGm	¶
3-4	3	Intermediate Phys. Training	Soph., jr., sr.	Equivalent of 1-2
	3	TTh	153WGm	Schill
		One other hour to be arranged		
5-6	3	Advanced Phys. Training...	Jr., sr.	3-4, permission of director
	4	TTh	153WGm	Ladd
		One other hour to be arranged		

<sup>1</sup> On leave of absence 1917-18.

No.	Credits	Title	Offered to	Prereq. courses
11	None	Preliminary Hygiene .....	Required of all new students	None
		12 M	201 WGm	¶
		2 T	201 WGm	¶
		11 W	201 WGm	¶
		8 S	201 WGm	¶
13	3	Personal Hygiene .....	Soph., jr., sr.	An. Biol. 1-2
		9 TThS	201 WGm	Norris
14	3	Hygiene of the Family....	Jr., sr.	13
		9 TThS	201 WGm	Norris
15-16	6	Principles of Phys. Educ...	Sr.	1-2, 3-4, 21-22, 31-32, 33-34
		Lect. 10 MWF	201 WGm	Ladd, Schill, Tolg
		Lab. 2 MWF	3, 151, 153 WGm	Ladd, Schill, Tolg
21-22	None	Elem. Dancing .....	All	None
		4 MWF	153 WGm	Ladd
31-32	None	Folk Dancing & Org. Games	All	None
		10 WF	151 WGm	Ladd, Schill
		2 TTh	151 WGm	Ladd, Schill
33-34	None	Hockey, Basket & Base Ball	All	Permission of director
		4 MW	151 WGm	Schill
		4 TTh	151 WGm	Schill
43-44	None	Elementary Swimming .....	Required of soph. who need instr. in swimming	None
		2 MF	51 WGm	Hansen
		2 TTh	51 WGm	Hansen
		3 MF	51 WGm	Hansen
		3 TTh	51 WGm	Hansen
		4 MF	51 WGm	Hansen

The natatorium will be open and instruction will be given to beginners or advanced students at 2:30 MThF, 3:30 MTThF, 4:30 MThF. General swimming (without instruction) at 12 TTh and 5 MW.

Roller skating at 1:00 MWF.

## PHYSICS

Professors HENRY A. ERICKSON, ANTHONY ZELENY; Associate Professor LOUIS W. MCKEEHAN; Assistant Professor JOHN T. TATE; Instructors ERNEST O. DIETERICH, PAUL E. KLOPSTEG.

### REQUIREMENTS OF THE DEPARTMENT

For *B.A. with Honors*, the general requirements (page 13); work chosen from any courses above 40, except 90; and any course in mathematics open only to juniors and seniors if approved by the department. Mathematics 106, 107, 108, 140 have already been thus approved. Thesis in connection with any course in Physics above 150.

For a *Teacher's Certificate*, fourteen credits, including Course 90.

Courses 21, 22, 31, 42, 44, 161, 52, 54, with prerequisites in mathematics comprise a three-year course in Physics beginning with the freshman year. It is designed to meet the needs of those who intend to take up the teaching of Physics or who are planning to enter the field of industrial

research. It is recommended to those students desiring honors in Physics. Students who have completed courses 1, 2, 3, 4, or Courses 7, 8, 9, 10, may continue with the second year of this course after conference with the department.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1	3	General Physics .....	Soph., jr., sr.	Math. 2 or 4 or reg. in Math. 2 or 4
		1 M	30Ph	Zeleny
		8 TTh	17Ph	Klopsteg
		9 TTh	17Ph	Zeleny
		10 TTh	17Ph	Zeleny
		11 TTh	17Ph	Klopsteg
		11 WF	17Ph	Klopsteg
2	3	General Physics .....	Soph., jr., sr.	1 or 7
		1 M	30Ph	Zeleny
		8 TTh	17Ph	Klopsteg
		9 TTh	17Ph	Zeleny
		10 TTh	17Ph	Zeleny
		11 TTh	17Ph	Klopsteg
		11 WF	17Ph	Klopsteg
3	1	General Lab. Practice.....	Soph., jr., sr.	Registration in 1
		Ar Ar	23Ph	Ar
4	1	General Lab. Practice.....	Soph., jr., sr.	See statement
		Ar Ar	23Ph	Ar
7	4	General Physics .....	Soph., jr., sr.	Math. 2 or 4, see statement
		1 F	30Ph	Erikson
		8 MWF	17Ph	Tate
8	4	General Physics .....	Soph., jr., sr.	7, see statement
		1 F	30Ph	Erikson
		8 MWF	17Ph	Tate
9	1	General Lab. Practice.....	Soph., jr., sr.	See statement
		Ar Ar	23Ph	Ar
10	1	General Lab. Practice.....	Soph., jr., sr.	See statement
		Ar Ar	23Ph	Ar
21	3	Elements of Mechanics...	Fr., soph.	High School Physics, Math. 2 or 4 or reg. in Math. 2 or 4
		Lect. Ar Ar	Ar	Tate
		Lab. Ar Ar	16Ph	Tate
22	3	Elements of Mechanics...	Fr., soph.	21, Math. 9 or reg. in Math. 9b
		Lect. Ar Ar	Ar	Tate
		Lab. Ar Ar	16Ph	Tate
31	3	Acoustics .....	Soph., jr., sr.	See statement
		9 TThS	30Ph	Erikson
42	3	Heat .....	Soph., jr., sr.	2, 8, or 22, Math. 2 or 4
		Ar Ar	Ar	Ar
44	1	Experiments in Heat.....	Soph., jr., sr.	Registration in 42
		Ar Ar	Ar	Ar
52	3	Light .....	Soph., jr., sr.	2, 8, or 22, Math. 2 or 4
		Ar Ar	Ar	Ar

DEPARTMENTAL STATEMENTS

No.	Credits	Title	Offered to	Prereq. courses
54	1	Experiments in Light. .... Ar Ar	Soph., jr., sr. Ar.Ph	Reg. in 52 Erikson
81	2	Physical Manipulation and Laboratory Technique .. 2, 3, 4 TTh	Soph., jr., sr. 2Ph	2 & 4, 8 & 10, or 22 McKeehan
82	2	Physical Instruments of Precision .....	Soph., jr., sr. 2Ph	81 McKeehan
*90	2	Teachers' Course .....	Sr.	2 & 4, 8 & 10, or 2 years of physics
*121-122	6	Dynamics .....	Ar Jr., sr., grad.	Klopsteg 20r 80r (22) and Math. 51
*155	3	Spectrometry .....	17Ph Jr., sr., grad.	Tate 52 and 82
*161	4	Electricity and Magnetism. Ar Ar	Jr., sr., grad. 4Ph	Erikson 2 & 4, 8 & 10, or 22, Math. 51
*162	3	Electrical Measurements .. Ar Ar	Ar.Ph Jr., sr., grad.	Zeleny 161, 2 & 4, or 8 & 10
*163	2	Electrical Measurements .. 3, 4 MW	Jr., sr., grad. 31Ph	Zeleny 161, 2 & 4, or 8 & 10
*166	3	Elec. Meas. of Precision.. 10, 11 TTh	31Ph Jr., sr., grad.	Zeleny 162 or 163
*174	3	Radioactivity and Roentgen Rays .....	Sr., grad. Ar	2 adn 4 McKeehan
*177	3	Radioactivity .....	Sr., grad. 15Ph	8 cr. in Physics and Math. 11 McKeehan
*178	3	Radioact. Measurements .. Ar Ar	Sr., grad. 15Ph	177 McKeehan
*181	3	Adv. Phys. Measurements. 2, 3, 4 MW	Sr., grad. Ar	82 or 155 or 166 or 178 Ar
*182	3	Adv. Phys. Measurements. 2, 3, 4 MW	Sr., grad. Ar	181 Ar
*191a	3	Elem. Phys. Investigation. 2, 3, 4 MW	Sr., grad. Ar	82 or 155 or 166 or 178 Ar
*192a	3	Elem. Phys. Investigation. 2, 3, 4 MW	Sr., grad. Ar	82 or 155 or 166 or 178 Ar
*191b	3	Elem. Phys. Investigation. 2, 3 MWF	Sr., grad. Ar	191 Ar
*192b	3	Elem. Phys. Investigation. 2, 3, 4 MW	Sr., grad. Ar	191 Ar

POLITICAL SCIENCE

Professors WILLIAM A. SCHAPER, CEPHAS D. ALLIN, JEREMIAH S. YOUNG;  
Instructor WILLIAM ANDERSON; Teaching Fellow RINEHART J.  
SWENSON.

## REQUIREMENTS OF THE DEPARTMENT

For B.A. with Honors, see general requirements (page 13).

For a Teacher's Certificate in Government, courses 1, 6, and 7 in Political Science and eighteen credits in History.

## COURSES

No. Credits	Title	Offered to	Prereq. courses
<i>Introductory Courses</i>			
1a 3	American Government .....	Soph., jr., sr.	None
	9 MWF	109MA	Swenson
	9 TThS	102MA	Schaper
	10 MWF	209MA	Anderson
	11 TThS	202MA	Young
	11 MWF	109MA	Anderson
	2 MWF	102MA	Young
1b 3	American Government .....	Soph., jr., sr.	None
	9 TThS	109MA	Anderson
	10 MWF	202MA	Anderson
	2 MWF	209MA	Swenson
<i>General Courses</i>			
3 3	Comparative Government .....	Soph., jr., sr.	1
	10 TThS	102MA	Anderson
5 3	European Municipal Admin....	Soph., jr., sr.	1
	11 MWF	213MA	Schaper
6 3	American Municipal Admin....	Soph., jr., sr.	1
	11 MWF	109MA	Schaper
7a 3	State and Local Government..	Soph., jr., sr.	1
	9 TThS	109MA	Anderson
7b 3	State and Local Government..	Soph., jr., sr.	1
	11 TThS	202MA	Young
	2 MWF	202MA	Anderson
*51 3	Business Law, I.....	Jr., sr.	6 credit in Pol. Sci., or 6 in Econ., or 3 in each
	9 MWF	202MA	Young
*52 3	Business Law, II.....	Jr., sr.	51
	9 MWF	202MA	Young
*54 3	Latin American Governments..	Jr., sr.	6 credits
	9 TThS	102MA	Schaper
*58 3	Amer. Diplomatic Problems....	Jr., sr.	6 credits
	11 TThS	213MA	Anderson
<i>Special Courses</i>			
25 3	American Govt. (Eng.).....	Jr., sr.	None.
	11 TThS	Ar	
26 3	Business Law (Eng.).....	Jr., sr.	25
	8 TThS	Ar	
28 3	Business Law (Agr.).....	Jr., sr.	1 or 6 credits in Eco- nomics
	1 MWF	Ar	
*56-57 3	Teachers' Course .....	Jr., sr.	See statement
	4 MW	Lib.	Schaper
<i>Advanced Courses</i>			
*101 3	Constitutional Law .....	Jr., sr., grad.	6 credits
	9 MWF	213MA	Schaper
*102 3	Modern Political Thought.....	Jr., sr., grad.	6 credits
	9 MWF	213MA	Schaper



No.	Credits	Title	Offered to	Prereq.courses
*105	3	Comparative Administration ... 10 MWF	Jr., sr., grad. 102MA	6 credits Young
*106	3	Legislative Power and Methods 10 MWF	Jr., sr., grad. 102MA	6 credits Young
*108	3	Police Power .....	Jr., sr., grad. 213MA	6 credits Young
*109	3	Diplomacy .....	Jr., sr., grad. 213MA	6 credits or 1 and History 10 Allin
*110	3	International Law .....	Jr., sr., grad. 102MA	1 and 3 or 58 or 109 Allin
*114	3	Govt. of the British Empire.. 10 TThS	Jr., sr., grad. 102MA	6 credits or 1 and History 7 Allin
§133	3	Anct. Phil. Theories of the State 2 MWF	Jr., sr., grad. 322F	6 credits in either Po- litical Science or Philosophy Lodge
*201-202		Seminar .....	Sr., grad. 213MA	Major in Political Sci. Schaper et al.
		3-4 Th		

PSYCHOLOGY

Professors ROBERT M. YERKES, MELVIN E. HAGGERTY; Associate Professor HERBERT WOODROW; Assistant Professors JOSEPH PETERSON, HENRY T. MOORE; Instructor KARL S. LASHLEY; Teaching Fellow J. D. Dodson.

REQUIREMENTS OF THE DEPARTMENT

For B.A. with Honors, besides the general requirements, twenty-four credits in starred courses. Starred courses in Educational Psychology and, to the extent of six hours, in philosophy, may be counted in partial fulfillment of this requirement.

COURSES

No.	Credits	Title	Offered to	Prereq.courses
1-2	6	General Psychology .....	Soph., jr., sr.	None
		Rec. 8 MWF	321F	Peterson
		9 MWF	321F	¶
		9 TThS	321F	Moore
		9 TThS	304F	Lashley
		10 MWF	321F	Moore
		10 TThS	321F	Moore
		11 MWF	321F	Dodson
		11 MWF	311F	¶
		11 TThS	311F	¶
		1 MWF	Ar(Farm)	Woodrow
		2 MWF	321F	Lashley
		3 MWF	321F	Lashley
tb	3	General Psychology .....	Soph., jr., sr.	None
		Ar (Farm)	Ar	Woodrow
		Ar (Music)	Ar	Woodrow

No.	Credits	Title	Offered to	Prereq. courses
*101a	3	Experimental Psychology ...	Jr., sr., grad	1-2
		4 T	316F	Woodrow
		2, 3 TTh	318F	Woodrow
*101b	3	Experimental Psychology ...	Jr., sr., grad	1-2
		4 T	316F	Woodrow
		2, 3 TTh	318F	Woodrow
§*102	3	Experimental Psychology ...		(Consult instructors before registering)
		Ar	318F	Woodrow, Moore
§*103-104	6	Comparative and Genetic Psychology .....	Jr., sr., grad	1-2
		11 TThS	321F	Lashley
*105	2	Mental Retardation .....	Jr., sr., grad	1-2
		4, 5 TTh	321F	Woodrow
*107	3	Social Psychology .....	Jr., sr., grad	1-2
		3 MWF	322F	Moore
§*108	3	Applied Psychology .....	Jr., sr., grad	1-2
		3 MWF	322F	Moore
§*109	3	History of Psychology .....	Jr., sr., grad.	9 credits
		8 TThS	321F	Peterson
*110	3	Abnormal Psychology .....	Jr., sr., grad	1-2
		8 TThS	321F	Peterson
*115-116	6	Seminar in Experimental and Physiological Psychology..	Sr., grad	12 credits including 101
		Ar	316F	Woodrow, Peterson
§*117-118	6	Seminar in Comparative and Genetic Psychology .....	Sr., grad.	12 credits
		Ar	316F	Moore, Lashley

### RHETORIC AND PUBLIC SPEAKING

Professor JOSEPH M. THOMAS; Assistant Professors DANIEL FORD, HALDOR GISLASON, CHARLES W. NICHOLS, SIDNEY F. PATTISON, ANNA H. PHELAN, FRANK M. RARIG,<sup>1</sup> CHARLES E. SKINNER, HELEN A. WHITNEY; Instructors ELIZABETH HAWTHORN, CYRIL A. HERRICK, JAMES T. HILLHOUSE, ELIZABETH JACKSON, ERNEST P. KUHLE, MARTIN B. RUUD, FRANK SMOYER, ARTHUR J. TIEJE, HOWARD T. VIETS; Assistant RAY M. WILCOX.

### REQUIREMENTS OF THE DEPARTMENT

*For B.A. with Honors.* The general requirements (page 13). A reading knowledge of either Latin, French, or German. At least fifteen credits in departmental starred courses, four of these credits to be in Course 119-120.

*For a Teacher's Certificate in English.* (a) English as the major subject of teaching: Rhetoric 1-2, either 11-12 or 15-16, and 41-42; English 1-2, 3, 5 or 7, and 28. (b) English as a minor subject of teaching: Rhetoric 1-2, and either 11-12 or 15-16; English 1-2, and 3. In order to be recommended, a student must secure an average of at least one and

<sup>1</sup> On leave of absence 1917-18.

one-half honor points for each credit hour of all the work taken in the Departments of English and Rhetoric.

*For a Teacher's Certificate in Public Speaking*, a student must satisfy the Department that he is actively interested in some phase of Public Speaking either as a member of a literary or debating society, or as a participant in a contest or dramatic performance, or as a lecturer; must have the approval of the Department of Rhetoric and Public Speaking and must complete the following courses: Rhetoric 1-2, 11-12 or 15-16, 41-42, and six additional hours in Public Speaking.

## COURSES

45. Open to those who have completed 1-2 and 41-42, or 1-2 and have had training in debating in preparatory school.
47. Open to juniors and seniors who are awarded places on the inter-collegiate debating squad.
80. Open to juniors, seniors, graduates, qualifying for a major recommendation in English. Credit only in Education.
102. Open to those who have taken 11-12 or 15-16, and have taken or are taking 6 hours in the historical study of English poetry.
- 107, 110. Open to students who have received a grade of A or B in either semester of 11-12 or 15-16.
- 115-116. Open to those who have taken 11-12, and who have taken or are taking 113-114 or 129 in English.
- 119-120. Open with special permission to seniors and graduates. Prerequisites: Courses 1-2, 11-12, and at least one other course in Rhetoric. Required of Honors Course students.
- 201-202. Open to graduates and to seniors taking the Honors Course. Prerequisites: Courses 1-2, 11-12 or 15-16, and at least one other course.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2	6	Composition and Rhetoric..	Fr.	None
	8	MWF		To be assigned on registration
	9	MWF		To be assigned on registration
	10	MWF		To be assigned on registration
	11	MWF		To be assigned on registration
	2	MWF		To be assigned on registration
	3	MWF		To be assigned on registration
	8	TThS		To be assigned on registration
	9	TThS		To be assigned on registration
	10	TThS		To be assigned on registration
	11	TThS		To be assigned on registration
1b	3	Composition and Rhetoric..	Fr.	None
	11	MWF	306F	¶
	3	MWF	305F	¶
	11	TThS	303F	¶
2a	3	Composition and Rhetoric..	Fr.	None
	11	MWF	306F	¶
	3	MWF	305F	¶

## SCIENCE, LITERATURE, AND THE ARTS

No.	Credits	Title	Offered to	Prereq. courses
3-4	6	Composition for Engineers. See program for the College of Engineering.	Fr. Eng	None
11-12	6	Exposition, Description, Nar- ration .....	Soph., jr., sr.	1-2
	9	MWF	311F	Hillhouse
	11	MWF	303F	Skinner
	2	MWF	311F	Ruud
	9	TThS	311½F	Whitney
	10	TThS	306F	Phelan
15-16	6	Exposition and Argument..	Soph., jr., sr.	1-2
	9	MWF	303F	Ford
	11	TThS	305F	Tieje
31	2	Technical Writing .....	Sr. Eng.	3-4
		See program for the College of Engineering.		
41-42	6	Public Speaking .....	Soph., jr., sr.	1-2
	9	MWF	308F	¶
	2	MWF	308F	Wilcox
	8	TThS	308F	Wilcox
	9	TThS	308F	Gislason
	10	TThS	308F	¶
	11	TThS	308F	¶
41	3	8 MWF	308F	¶
45	3	Argumentation and Debate 10 MWF	Soph., jr., sr.	See note
			308F	Gislason
47	3	Advanced Debate .....		See note
		Ar	308F	Gislason
*80a	3	Teachers' Course .....	Jr., sr.	See note
		3-4:30 WF	206Ed	Inglis
*80b	3	Teachers' Course .....	Jr., sr.	See note
		3-4:30 WF	206Ed	Inglis
*81-82	6	Interpretative Reading ....	Jr., sr.	1-2, 41-42
		11 MWF	308F	Wilcox
*84	3	Advanced Public Speaking. 3 MWF	Jr., sr.	1-2, 41-42
			308F	Gislason
*102	3	Versification .....	Jr., sr., grad.	See note
		10 TThS	302F	Nichols
*103-104	6	Studies in Structure and Style .....	Jr., sr., grad.	1-2, 11-12, or 15-16
		2 MWF	303F	Ford
*107	3	Imitative Writing .....	Jr., sr., grad.	See note
		11 MWF	304F	Thomas
*110	3	Short-story Writing .....	Jr., sr., grad.	See note
		11 MWF	304F	Thomas
*111-112	6	Essay Writing .....	Jr., sr., grad.	1-2, 11-12, or 15-16
		11 TThS	302F	Pattison
*115-116	6	Dramatic Technique .....	Sr., grad.	See note
		Rec. 2 WF		
		Lab. Ar Ar	302F	Skinner
*119-120	4	Seminar in Writing.....	Sr., grad.	See note
		2-4 T	302F	Thomas
*201-202	6	Seminar in Rhetoric.....	Sr., grad.	See note
		2-4 Th	302F	Thomas

## ROMANCE LANGUAGES

Professors EVERETT W. OLMSTED, COLBERT SEARLES, IRVILLE C. LeCOMPTE; Assistant Professors FRANCIS B. BARTON, JULES FRELIN, RUTH S. PHELPS, EDWARD H. SIRICH; Instructors PEDRO HENRÍQUEZ UREÑA, WILLIAM D. MAYNARD, GUSTAAF VAN ROOSBROECK; Teaching Fellows HERBERT CLEPTON, ENRIQUE JIMÉNEZ, CHARLES MILLER.

## REQUIREMENTS OF THE DEPARTMENT

For a B.A. with Honors, general requirements (page 13); a reading knowledge of Latin or German with two years work in Spanish or Italian. In the Junior year, Courses 61-62, 63-64, 75-76, 101-102; in the Senior year, Courses 103-104, 107-108, 109-110, 115-116 (or 117-118). Substitutions for these courses may be granted by the Department in special cases. Alternation of courses required in the Junior and Senior years is allowable.

For Major Recommendation for Teacher's Certificate, in addition to Courses 1a and 3a, twenty-six credits.

For Minor Recommendation for Teacher's Certificate, in addition to Courses 1a and 3a, twelve credits in one Romance Language.

Prerequisite for Teachers' Course, in addition to Course 5-6, one Conversation-Composition Course and one Literary Course.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses	
1a	6	Beginning French .....	All	None	
		8 MTWThFS	201F		
		9 MTWThFS	201F		
		10 MTWThFS	227F		
		11 MTWThFS	226F		
1b	6	Beginning French .....	All	None	
		11 MTWThFS	25F		
3a	6	Intermed. French .....	All	1a or equiv.	
		10 MTWThFS	205F		
		11 MTWThFS	25F		
3b	6	Intermed. French .....	All	1a or equiv.	
		8 MTWThFS	201F		
		9 MTWThFS	201F		
		10 MTWThFS	227F		
		11 MTWThFS	226F		
4	6	Survey French Lit. ....	All	3a or equiv.	
		9 MTWThFS	5F		van Roosbroeck
5-6	6	Survey Fr. Lit. (year course) .....	All	3a or equiv.	
		9 TThS	202F		LeCompte
		10 TThS	202F		Phelps
		11 TThS	5F		Maynard
		2 MWF	201F		Barton
7-8	2	Element. French Convers.	All	3a or equiv.	
		9 TTh	227F		Barton
		3 MW	227F		Frelin
9-10	2	Element. French Compos..	All	3a or equiv.	
		9 S	227F		Barton
		3 F	227F		Frelin

No.	Credits	Title	Offered to	Prereq. courses
31a	6	Beginning Spanish .....	All	None
		9 MTWThFS	301F	Maynard
		10 MTWThFS	25F	Henríquez
31b	6	Beginning Spanish .....	All	None
		10 MTWThFS	25F	Barton
33-34	6	Beginning Spanish (year course) .....	All	None
		8 TThS	202F	van Roosbroeck
		11 MWF	201F	Olmsted
		11 TThS	205F	Sirich
35b	6	Intermed. Spanish .....	All	31a or equiv.
		9 MTWThFS	15F	Maynard
		10 MTWThFS	125F	Henríquez
37-38	6	Intermed. Span. (year course) .....	All	31a or equiv.
		10 TThS	201F	Sirich
39-40	6	Survey of Span. Lit. ...	All	35a or equiv.
		9 MWF	227F	Henríquez
41-42	2	Elemen. Spanish Convers.	All	35a or equiv.
		2 MW	226F	Jiménez
43-44	2	Elemen. Spanish Compos.	All	35a or equiv.
		2 F	226F	Jiménez
51-52	6	Beginning Italian .....	All	None
		9 MWF	202F	Phelps
53-54	6	Represent. Italian Authors	Soph., jr., sr.	51-52 or equiv.
		11 TThS	201F	Phelps
61-62	2	Advanced French Convers.	Jr., sr.	7-8 or equiv.
		11 TTh	202F	LeCompte
63-64	2	Advanced Fr. Compos. ...	Jr., sr.	9-10 or equiv.
		11 S	202F	LeCompte
*75-76	6	French Lit.: 19th Century	Soph., † jr., sr.	5-6 or equiv.
		11 TThS	15F	Barton
*101-102	6	French Lit.: 18th Century	Jr., sr., grad.	5-6 or equiv.
		11 MWF	202F	Searles
*103-104	6	French Lit.: 17th Century	Jr., sr., grad.	5-6 or equiv.
		10 MWF	201F	Olmsted
*105-106	6	French Lit.: 16th Century	Jr., sr., grad.	101-102; 103-104 or equiv.
		11 MWF	Seminar	Sirich
*107-108	4	French Oral Diction.....	Jr., sr., grad.	61-62 or equiv.
		10 MW	202F	LeCompte
*109-110	2	French Syntax .....	Jr., sr., grad.	63-64 or equiv.
		10 F	202F	LeCompte
*113-114	4	Fr. Literature: Classicism	Sr., grad.	103-104 or equiv.
		11 TTh	Seminar	Searles
*117-118	4	French Dramatic Lit. ...	Sr., grad.	103-104 or equiv.
		10 TTh	Seminar	Olmsted
§*131-132	2	Advanced Span. Convers.	Jr., sr., grad.	41-42 or equiv.
		2 MW	227F	Henríquez
*133-134	2	Adv. Spanish Compos. ...	Jr., sr., grad.	43-44 or equiv.
		2 F	227F	Henríquez
§*147-148	4	Spanish Lectures .....	Jr., sr., grad.	41-42; 43-44; or equiv.
		3 MW	201F	Henríquez

† Who have had the five years preparation required.

No.	Credits	Title	Offered to	Prereq. courses
*151-152	4	Dante, Petrarch, Boccaccio	Jr., sr., grad.	51-52 or equiv. and either 53-54; 5-6 or English 1
	2	MW	202F	Phelps
*153-154	2	Dante, (In English).....	Jr., sr., grad.	Hist. 1-2 and either Engl. 1 or Fr. 5-6. Prereq. for persons taking in addition Course 151-152 same as listed for 151-152
	2	F	202F	Phelps
*161-162	2	Teachers' Course .....	Jr., sr., grad.	See above
	2	Th	201F	Barton, et al.

NOTE: Course 7-8 may be taken only with 9-10. 9-10 may be taken separately. Course 41-42 may be taken only with 43-44. 43-44 may be taken separately. Course 61-62 may be taken only with 63-64. 63-64 may be taken separately. Course 151-152 may be taken only with 153-154. 153-154 may be taken separately. Courses 1, 3, 31, 35, 4, are double courses. Students are advised to take Course 75-76 as a natural preparation for Courses 101-102 and 103-104. Permission to register for courses from 75-76 to 161-162 inclusive may be granted by the department in special cases. Both semesters of any year course must be completed before credit is allowed for the first semester. The preceding statement applies also to Courses 1a and 3b for freshmen and Courses 31a and 35b for freshmen.

SCANDINAVIAN

Professors GISLE BOTHE, ANDREW A. STOMBERG.

REQUIREMENTS OF THE DEPARTMENT

For B.A. with Honors, the general requirements (page 13) and thirty credits of Scandinavian.

Teacher's Certificate in Scandinavian. For a minor recommendation, a minimum of twelve credits in one of the Scandinavian languages. For a major recommendation, a minimum of twenty-two credits in one of the Scandinavian languages. Courses 1-2 or 5-6 shall not be counted toward either a minor or a major recommendation. To obtain either a minor or a major recommendation the student must obtain an average of one and one-half honor points for each credit hour for all Scandinavian courses taken.

Course 13-14 is especially recommended to all students who intend to take courses in Scandinavian literature.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
1	6‡	Beginning Norwegian.....	All	None
	8	MTWThFS	206F	¶
2	6‡	Intermediate Norwegian...	All	1
	8	MTWThFS	206F	¶

‡ Freshmen must complete intermediate course before credit is given for beginning course.

No.	Credits	Title	Offered to	Prereq. courses
3-4	6†	Advanced Norwegian ....	Soph., jr., sr.	2
		9 TThS	110F	Bothne
5	6‡	Beginning Swedish.....	All	None
		9 MTWThFS	206F	Stomberg
6	6‡	Intermediate Swedish....	All	5
		9 MTWThFS	206F	Stomberg
7-8	6	Advanced Swedish .....	Soph., jr., sr.	6
		8 MWF	205F	Stomberg
§13-14	6	History of North. Europe.	Soph., jr., sr.	Consult department
		11 MWF	206F	Stomberg
*101-102	6	Modern Norwegian Lit. ...	Jr., sr., grad.	3-4
		10 TThS	206F	Bothne
*103	3	Earlier Norwegian Lit. ...	Sr., grad.	101-102
		11 TThS	206F	Bothne
*104	2	Henrik Ibsen .....	Sr., grad.	101-102.
		11 TTh	206F	Bothne
*107-108	6	Swedish Literature .....	Jr., sr., grad.	7-8
		2 MWF	206F	Stomberg
*109	2	Strindberg .....	Sr., grad.	107-108
		Ar Ar	206F	Stomberg
*110	2	Teachers' Course in Nor- wegian .....	Sr., grad.	3-4
		4 & 5 Th	206F	Bothne
*113-114	4	Old Norse (Icelandic) ...	Sr., grad.	See statement
		Ar Ar	206F	Bothne
*116	2	Teachers' Course in Swed- ish .....	Sr., grad.	7-8
		Ar Ar	206F	Stomberg

† Both semesters must be completed before credit is given for the first semester.

‡ Freshmen must complete intermediate course before credit is given for beginning course.

## SOCIAL AND CIVIC WORK

(For full details see separate bulletin)

Professor ARTHUR J. TODD; Associate Professor LOUIS L. BERNARD; Instructor LLOYD M. CROSGRAVE; Lecturers CAROL ARONOVIC, FRANK J. BRUNO, OTTO W. DAVIS, CHARLES C. STILLMAN, ARTHUR H. TAYLOR, EDWARD F. WAITE; Supervisors of Practice Field Work CAROLINE BEDFORD, HENRY F. BURT, MARION E. TEBBETTS, ELIZABETH YERXA.

Sociology and Anthropology 1 or 6 is prerequisite to all courses in this department.

### COURSES

No.	Credits	Title	Offered to	Prereq. courses
51	3	Treatment of Dependents and Defectives .....	Jr., sr.	Soc. & An. 1 or 6
		8 TThS	9F	Bruno
*52	3	Child Welfare .....	Jr., sr.	Social Work 51
		8 TThS	9F	Taylor
*53	3	Treatment of Delinquents.	Jr., sr., grad.	Soc. & An. 1 or 6, and Psychol. 1-2
		9 MWF	9F	Todd



DEPARTMENTAL STATEMENTS

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No.	Credits	Title	Offered to	Prereq. courses
*55	2	Housing Problems ..... 8 MW	Jr., sr. 9F	Soc. & An. 1 and 6 Davis
*104	2	State Care of Dependents, Defectives, and Delinqts.	Jr., sr., grad. 9F	Social Work 51 and 52 or 53 Todd and Supts.
*122	2	3, 4 F Social Statistics and Social Surveys .....	Sr., grad. 9F	2 courses in this dept. Aronovici
*162	3	4, 5 W Social and Industrial Leg- islation .....	Sr., grad. 209MA	2 courses in this dept. and 6 cr. in Econ. Crosgrave
*124	2	11 MWF Methods of Community Or- ganization and Social Work in Small Towns and Country .....	Sr., grad. 9F	2 courses in this dept. Todd and Bernard
*125-126	4	4, 5 Th Settlement and Social Cen- ter Work .....	Sr., grad. 5F	2 courses in this dept. Aronovici, Burt
*128	1	4, 5 W & app't. Charitable Admin., Finance, and Publicity .....	Sr., grad. 9F	2 courses in this dept. Davis, Stillman
*130	2	8 F Technique of Family Treat- ment .....	Sr., grad. 9F	Social Work 51 and 52 Bruno
*132	2	4, 5 T Juvenile Courts & Probatn. 8 MW & app't.	Sr., grad. 9F	Social Work 51 or 52, 53 Todd, Waite
113-114	2	Field Work in Hospital Social Service .....	Sr., grad.	Consent of director Tebbetts, Yerxa
		By appointment		

SOCIOLOGY AND ANTHROPOLOGY

Professors ALBERT ERNEST JENKS, ARTHUR J. TODD; Associate Professor LOUIS L. BERNARD; Assistant Professor HENRY T. MOORE; Lecturers FRANK J. BRUNO, OTTO W. DAVIS, ARTHUR H. TAYLOR; Superintendents of State Board of Control Institutions.

REQUIREMENTS OF THE DEPARTMENT

*For B.A. with Honors, see general requirements (page 13).*

*For Recommendation for Teaching, credits in the following courses: I, 4, 6, and two advanced courses.*

To this end the Department offers elementary courses dealing with peoples, with social forces, institutions, and movements. Its more advanced courses are designed especially for students majoring in the Social Sciences; namely, Sociology and Anthropology, Economics, History, and Political Science.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1a	3	General Introduction .....	Soph., jr., sr.	None
		8 MWF	203He	Bernard
		10 MWF	9F	Jenks
		10 TThS	9F	Todd
		2 MWF	301F	Bernard
1b	3	2 MWF	301F	Bernard
4	3	Cultural Anthropology ...	Soph., jr., sr.	1
		10 MWF	9F	Jenks
6	3	Social Reform Movements.	Soph., jr., sr.	1
		10 TThS	9F	Todd
<i>General Courses</i>				
51	3	Treatment of Dependents and Defectives .....	Jr., sr.	1, or 6
		8 TThS	9F	Bruno
*52	3	Child Welfare .....	Jr., sr.	51
		8 TThS	9F	Taylor
*53	3	Treatment of Delinquents.	Jr., sr., grad.	1 or 6 & Psychol. 1-2
		9 MWF	9F	Todd
*55	2	Housing Problems .....	Jr., sr.	1 and 6
		8 MW	9F	Davis
14	3	Rural Community .....	Jr., sr.	1
		8 MWF	203He	Bernard
<i>Advanced Courses</i>				
*102a	3	Social Theory .....	Jr., sr., grad.	1, 9 or 10, & 1 other
		9 TThS	9F	Bernard
*104	2	State Care of Dep., Def., and Delinquents .....	Jr., sr., grad.	51, and 52 or 53
		3, 4 F	9F	Todd and Supts.
*107	3	Social Psychology .....	Jr., sr., grad.	See statement
		3 MWF	322F	Moore
*110a	3	Physical Anthropology ...	Jr., sr., grad.	See bulletin statement
		2 MWF	9F	Jenks
*112	3	American Negro .....	Jr., sr., grad.	1 and two others
		2 MWF	9F	Jenks
*113	3	American People .....	Jr., sr., grad.	1 and two others
		11 MWF	9F	Jenks
*114	3	American People (cont'd.).	Jr., sr., grad.	1, 113, and one other
		11 MWF	9F	Jenks
*119	3	The Family .....	Jr., sr., grad.	9 credits
		11 TThS	9F	Todd
*120	3	Social Progress .....	Sr., grad.	See bulletin statement
		11 TThS	9F	Todd
*123-124	3	Seminar in Anthropology..	Sr., grad.	For sr. four corre-
(each)		2, 3 Th	205Lib	lated courses
				Jenks

## A GENERAL COLLEGE COURSE

*Recent European History and Politics.* Open to sophomores, juniors, seniors. No prerequisites. Lectures, required reading, and quizzes. Two credits not to apply in any one department. Lectures open to the public, 4:00 MW, Law Lecture Room. Members of staff in History, Political Science and other departments.

COURSES IN OTHER DEPARTMENTS OF THE UNIVERSITY  
OPEN TO JUNIORS OR SENIORS OF THIS COLLEGE

## COLLEGE OF AGRICULTURE

*First Semester*

## Agricultural Chemistry

Course 3a (3) 8:55 to 9:40 TThS

## Agricultural Economics

Course 18a (3) 9:50-10:35 MWF

Course 251-2 (6) Ar

## Agricultural Education

Course 151a (3) 10:45-11:30 MWF

## Agronomy (3)

Course 1 Lecture 8:00-8:45 ThS

Course 1 Lab. 8:00-9:40 T

## Animal Husbandry

Course 1a (3) 8:00-9:40 MWF

## Poultry Husbandry

Course 1 (3) 8:00-8:45 MWF

## Dairy Husbandry

Course 7a (3) 8:00-9:40 TThS

## Horticulture

Course 71 (3) 8:55-9:40 MWF

Course 90a (3) 8:55-9:40 MWF

## Plant Pathology and Botany

Course 1 (3) 2:00-4:30 WF or

8:00-9:40 TThS

Course 103 (3) Ar

*Second Semester*

## Agricultural Chemistry

Course 3b (3) 8:55-9:40 TThS

## Agricultural Education

Course 151b (3) 10:45-11:30 MWF

## Agronomy

Course 1b (3) Lec. 8:00-8:45 ThS; Lab.  
8:00-9:40 T

## Animal Husbandry

Course 1b (3) 8:00-9:40 MWF

## Dairy Husbandry

Course 26b (3) 8:00-9:40 TThS

## Poultry Husbandry

Course 30 (2) Ar

## Agricultural Economics

Course 18b (3) 9:50-10:35 MWF

Course 251-2 (6) Ar

## Horticulture

Course 50 (3) 9:50-10:35 TTh; Lab.  
2:00-4:30 F

Course 56 (1) 9:50-10:35 MWF

Course 90b (3) 8:55-9:40 MWF

## Plant Pathology and Botany

Course 104 (3) Ar

## LAW SCHOOL

*First Semester*

Contracts (3) 8:00 MWF  
 Carriers (2) 10:00 TTh  
 Personal Property (3) 10:00 MWF

*Second Semester*

\*Contracts  
 \*Agency (3)

## SCHOOL OF MINES

*First Semester*

Metallurgy  
 Course 3 8:00 WThF  
 Course 105 9:00 WThFS  
 Course 153 Ar

*Second Semester*

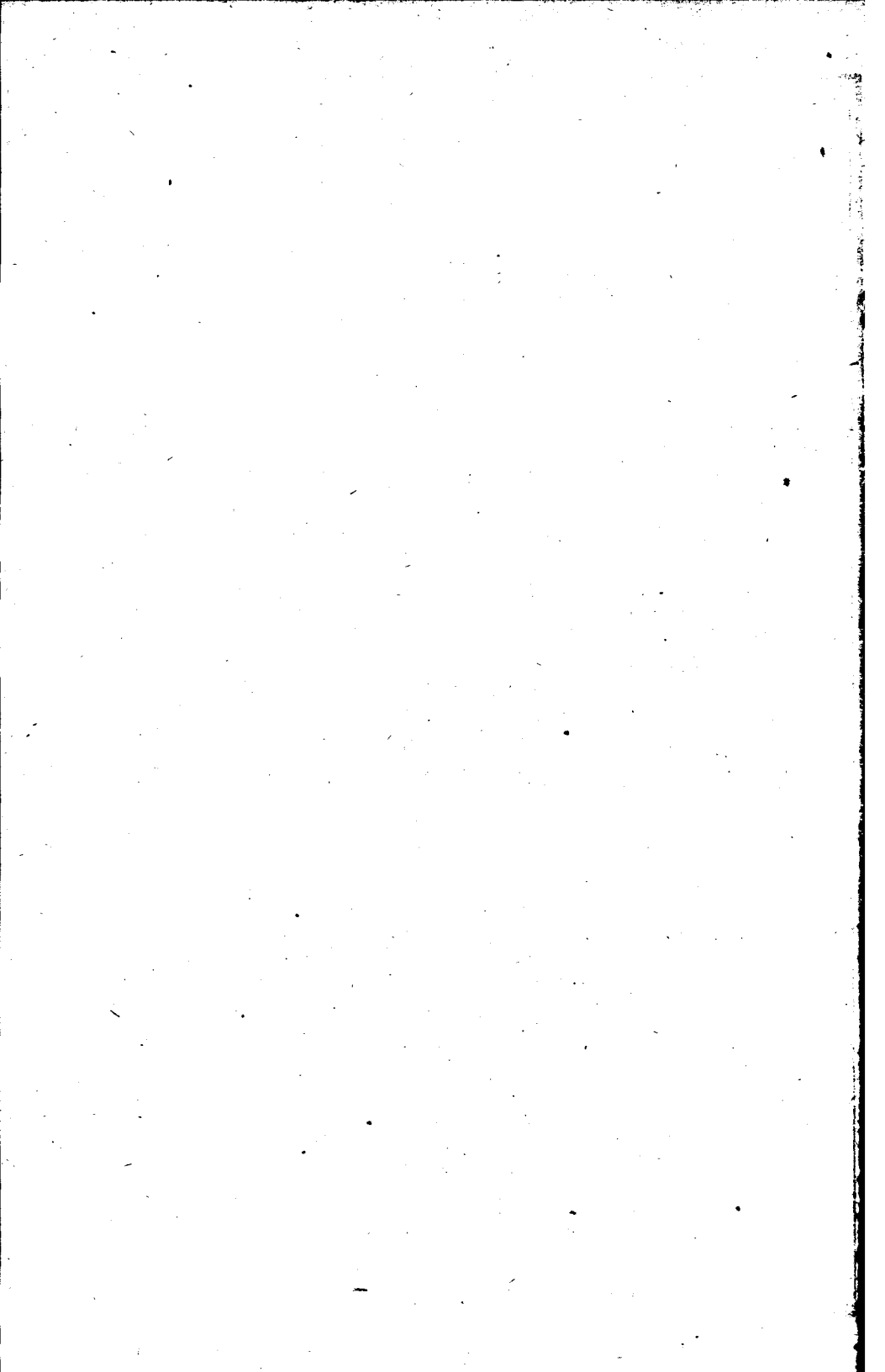
Metallurgy  
 Course 4 8:00 WThF  
 Course 2 8:00-4:00 M; 11:00 TWThF  
 Course 106 9:00 WThFS  
 Course 154 Ar

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\* Open only to students who have taken contracts in the first semester.

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# *The Bulletin* *of the University of* **Minnesota**

*The College of Science, Literature,*  
*and the Arts*  
**1917-1918**



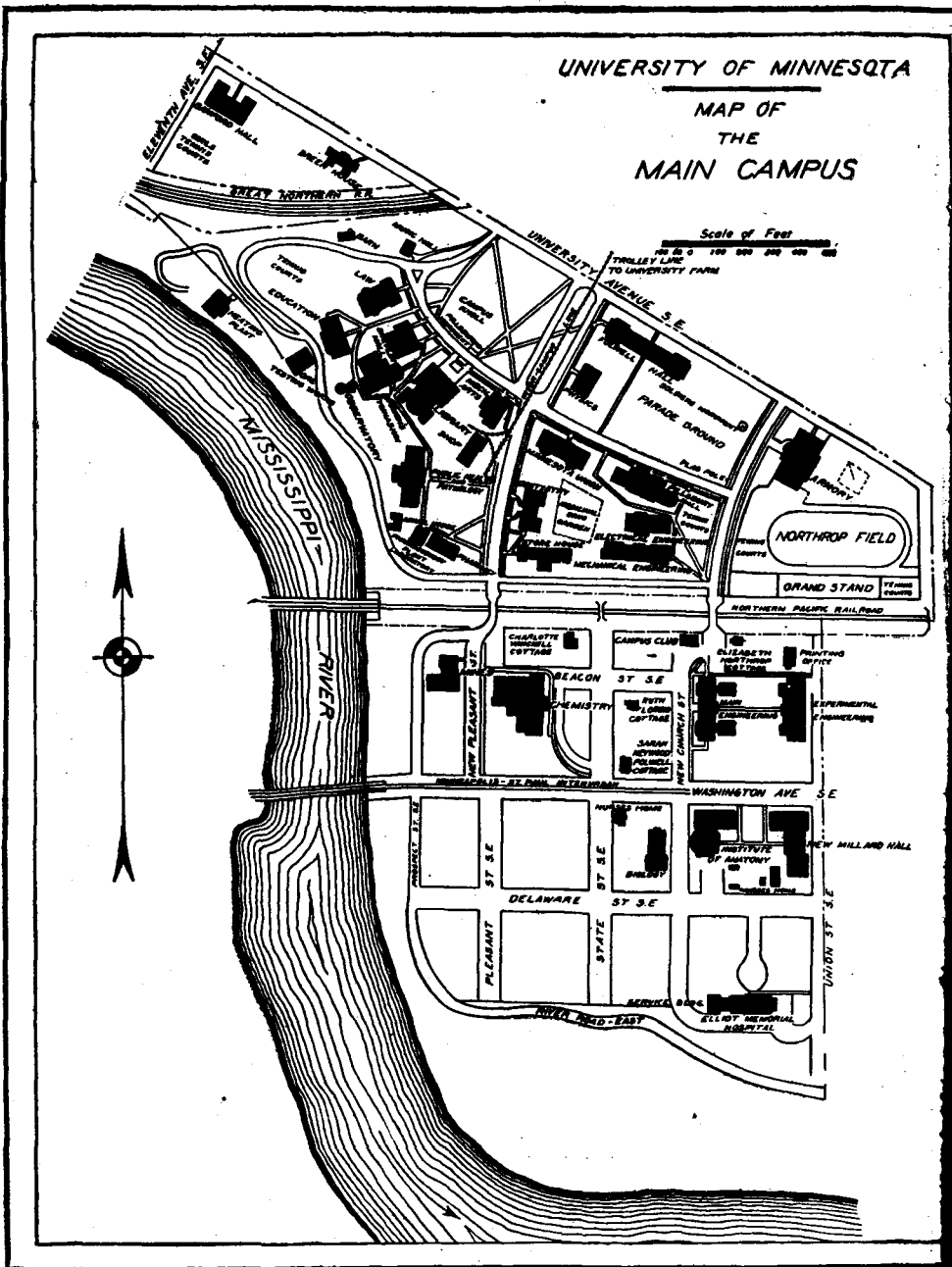
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Vol. XX No. 54 January 19 1918

*Entered at the post-office*  
*in Minneapolis as second-class matter*  
*Minneapolis, Minnesota*

# UNIVERSITY OF MINNESOTA

## MAP OF THE MAIN CAMPUS

Scale of Feet  
0 100 200 300 400 500

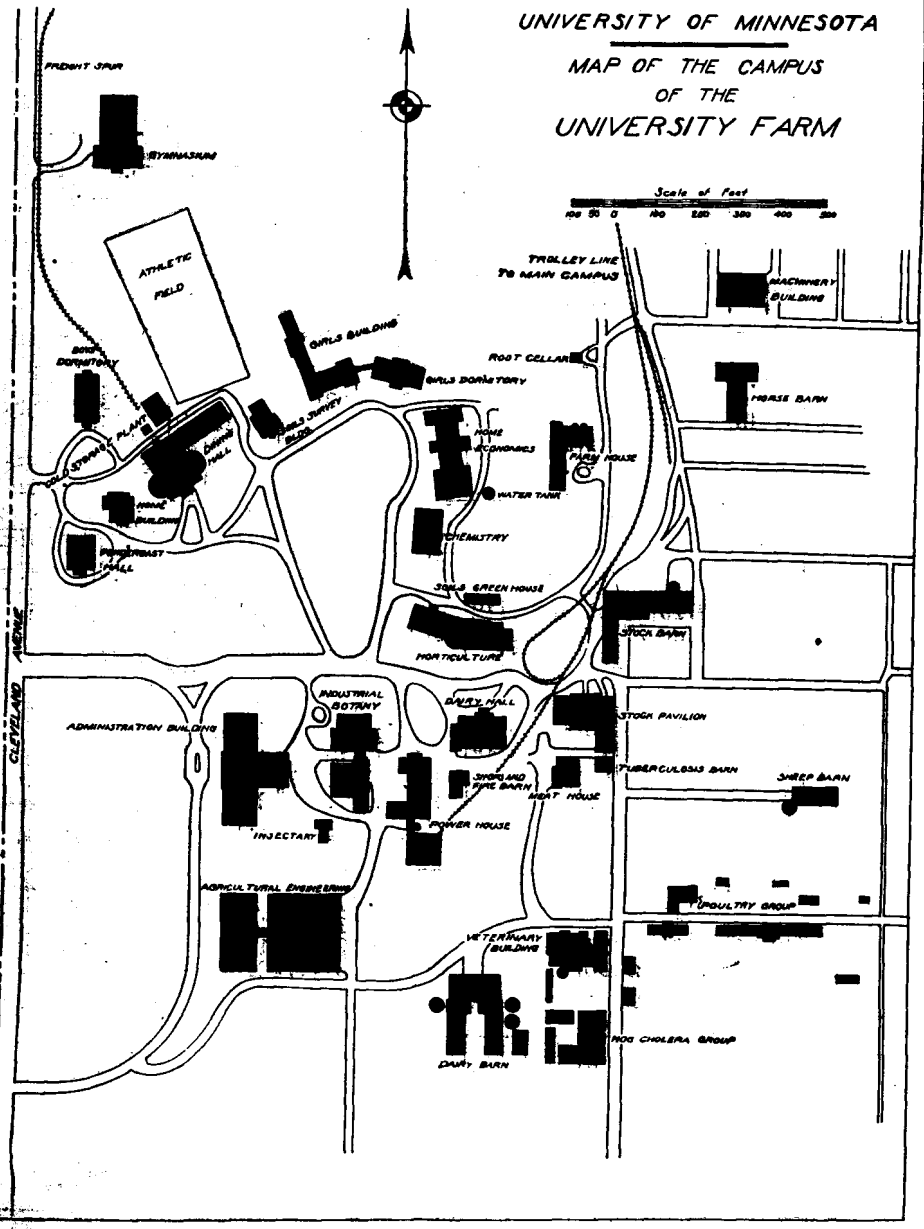


Area of Main Campus, 108.5 acres



UNIVERSITY OF MINNESOTA

MAP OF THE CAMPUS  
OF THE  
UNIVERSITY FARM



Area of University Farm, 422.56 acres



# UNIVERSITY CALENDAR

1917-1918

1917			
September	26	Wednesday	Registration closes for all students
September	26	Week	Fees payable for all students
October	3	} Monday	First semester evening extension classes begin
October	1		
October	2-9	Week	Examinations for removal of conditions (except for Colleges of Agriculture and Forestry), and entrance examinations
October	10	Wednesday	First semester begins
October	15	Monday	Agricultural College, farm experience examinations
October	18	Thursday	Senate meeting, 4:00 p.m.
October	29	Monday	School of Agriculture, first term begins
November	5	Monday	Dairy School opens
November	28	Wednesday	Thanksgiving recess begins 9:00 p.m.
December	1	Saturday	Dairy School closes
December	3	Monday	Thanksgiving recess ends 8:00 a.m.
December	3-8	Week	Second semester condition examinations, Colleges of Agriculture and Forestry
December	3-8	Week	Short course for ice-cream makers
December	5	Wednesday	Medical School second quarter begins
December	20	Thursday	Senate meeting, 4:00 p.m.
December	21	Friday	School of Agriculture, first term closes
December	21	Friday	Christmas vacation begins 9:00 p.m.
1918			
December	31	} Week	Farmers' and Home-Makers' Week
January	5		
January	2	Wednesday	Short Course
January	2	Wednesday	Christmas vacation ends 8:00 a.m.
January	2	Wednesday	School of Embalming begins, eight weeks' session
January	8	Tuesday	School of Agriculture, second term begins
January	25	Friday	First semester evening extension classes close
February	4	Monday	Second semester registration closes
February	4	Monday	Second semester evening extension classes begin
February	4-9	Week	Merchants' Short Course

February	11	Monday	Final examinations begin
February	11	Monday	Payment of fees for second semester closes
February	12	Tuesday	Lincoln's Birthday; a holiday
February	18	Monday	Second semester begins
February	18	Monday	Second semester evening extension classes begin
February	21	Thursday	Senate meeting, 4:00 p.m.
February	22	Friday	Washington's Birthday; a holiday
March	27	Wednesday	School of Agriculture closes
March	28	Thursday	Easter recess begins 9:00 p.m.
April	1	Monday	Easter recess ends 8:00 a.m.
April	1-6	Week	Boys' and Girls' Week
April	1-6	Week	Condition examinations in certain colleges
April	15	Monday	Medical School fourth quarter begins
April	30	Tuesday	Traction Engineering Short Course begins
May	16	Thursday	Senate meeting, 4:00 p.m.
May	24	Friday	Second semester evening extension classes close
May	30	Thursday	Memorial Day; a holiday
May	31	Friday	Traction Engineering Short Course closes
June	8	Saturday	Final examinations begin 2:00 p.m.
June	15	Saturday	Second semester closes
June	16	Sunday	Baccalaureate service
June	17	Monday	Senior Class Day exercises
June	19	Wednesday	Alumni Day
June	20	Thursday	Forty-sixth Annual Commencement
June	21	Friday	Summer vacation begins
June	24	Monday	Summer Session begins

The University year for 1918-19 probably will begin Tuesday, September 17. Classes will begin September 25.

*Program of Entrance Examinations 1917-1918*

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,	Oct. 2	9 a.m.	Business Subjects, Elementary Algebra, Plane Geometry
		2 p.m.	Manual Subjects, Domestic Art and Science, Agriculture, Higher Algebra, Solid Geometry

Wednesday,	Oct. 3	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,	Oct. 4	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 to 12 to give information and advice.

#### *Condition Examinations*

Examinations for the removal of conditions are given at no other times than (1) the week following the Easter recess, (2) the registration week in October, and (3) the week following the Thanksgiving recess, for students in the Colleges of Agriculture and Forestry.

The examinations in second-semester courses are given in the October period and those in first-semester courses are given after the Easter recess or in October, or at both times, as each school or college may determine. No student may take more than one examination to remove a condition.

Examination schedules for the respective schools and colleges may be secured at the Registrar's office.

## 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 new rule regarding 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 six hours' work 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 hour for all work taken in this college which is to be counted toward a degree.

### CLASS ROUTINE AND SCHOLASTIC REQUIREMENTS

Classes are held every week day except Saturday afternoon. Recitation periods are fifty minutes long and begin at eight, nine, ten, eleven, one, two, three, four, and five o'clock. A general assembly of faculty and students is held at noon on days to be announced.

Most of the courses of instruction are given in three periods a week on alternate days. Students are advised to arrange their programs so as to secure as even a distribution of classes as possible.

Examinations are held at the close of each semester. 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 finished is marked I (incomplete). An "incomplete" must be removed within one month after the opening of the following semester; otherwise it becomes a "condition." A "condition," if not removed before the opening of the corresponding semester of the following year becomes a "failure." A "failure" in a subject required for the given student must be removed by pursuing the work again in class the next time the course is offered.

Requirements for graduation are expressed in credit hours, indicating amount of work; and in honor points, indicating grade of work. Each credit hour 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 hour with the grade of A carries three honor points; each credit hour with the grade of B, two honor points; each credit hour with the grade of C, one honor point.

Continued residence in the college is conditioned on reasonable advance toward graduation. The Administrative Board will 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 re-enter the University until a full semester has elapsed.

The student must secure in any semester credit in at least sixty per cent of the work carried, together with as many honor points as the Administrative Board may prescribe.

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 hour carried. 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.

## 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:*

A general course leading to the degree of Bachelor of Arts.

An intensive course leading to the degree of Bachelor of Arts with Honors.

A four-year course leading to the degree of Bachelor of Arts in Music.

A four-year course in Business Education leading to the degree of Bachelor of Arts.

A five-year course in Training for Social and Civic Work, leading to the degrees of Bachelor of Arts and Master of Arts.

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

### REGULATIONS APPLYING TO ALL COURSES

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

Rhetoric 1-2 is required of all freshmen.

No student may elect work during any semester in more than five departments.

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

Students may ordinarily elect not more than seventeen credit hours. After the freshman year a student who has, during the preceding semester or two semesters, earned an average of one and one-half honor points for each credit hour taken and who has had no condition or failure the preceding semester, may elect eighteen hours.



## 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 fulfills all the requirements stated below.

### AMOUNT AND GRADE OF WORK

1. During his entire course the student must earn one hundred and twenty hours of credit and one hundred and twenty 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 thirty 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.

### DISTRIBUTION OF WORK

#### REQUIREMENTS FOR FRESHMEN AND SOPHOMORES

Rhetoric 1-2 to be taken in the freshman year, and one year-course each year in each of the following groups of subjects.

A year-course consists of the continuous study of closely related subject matter through the year. When two courses are designated by a department to serve as a year-course both semesters must be completed to meet this requirement. Either in the freshman or the sophomore year the subject chosen from Group C must be a laboratory science.

#### GROUP A

#### GROUP B

#### GROUP C

#### OPEN TO FRESHMEN AND SOPHOMORES

Foreign Languages  
Rhetoric and Public  
Speaking

History

Mathematics  
Animal Biology  
Botany  
Chemistry  
\*Physics

#### ADDITIONAL SUBJECTS OPEN TO SOPHOMORES

English

Economics  
Philosophy  
Political Science  
Psychology  
Sociology and  
Anthropology

Astronomy  
Geology and Mineralogy  
Physics

\*Physics open to a limited number of freshmen under special conditions. See departmental statement.

Subjects for which freshmen register must be continued throughout the year.

#### REQUIREMENTS FOR JUNIORS AND SENIORS

Thirty credits in starred courses of which twelve credits must be in one department.

#### THE JUNIOR AND SENIOR COLLEGES

The work of the Junior College comprises all courses which are open to freshmen and sophomores. The work of the Senior College comprises all courses which are open only to juniors, seniors, or graduates.

Senior College courses are indicated in the bulletin by an asterisk (\*) and are commonly known as *starred courses*. They have as prerequisites courses amounting to six credits when the department concerned 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. In foreign languages it is provided that Senior College courses may be elected by sophomores who have had five years of the language including one year in the college.

#### 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.

#### CHANGES IN THE REQUIREMENTS FOR GRADUATION

Important changes in the curriculum having been made, students previously registered in the college may graduate under the requirements in force when they entered if they so desire. For information regarding major and minor requirements see previous bulletins or consult the departments concerned.

#### THE UNIVERSITY STATE TEACHERS' CERTIFICATE

The University State Teachers' Certificate is granted to graduates of the College of Science, Literature, and the Arts who include the following prescribed work in their course, and who receive the recommendation of at least two departments concerned with high-school studies:

a. General Psychology ..... 6 credits  
(Normally taken during the sophomore year)

b. Prescribed work in Education

This work must include all of the following courses  
except in the case of honor students

Practice Teaching ..... 3 credits

Teachers' Course in two subjects, together carrying at least.....	3 credits
Technique of Teaching.....	3 credits
History of Education.....	3 credits
Social Aspects of Education.....	3 credits

Honor students must take Psychology, Practice Teaching, Teachers' Courses, and at least one of the last three subjects named.

Part of this work must be taken in the junior year. The student must inform himself in advance so as to arrange his program properly.

#### SPECIAL COURSES FOR TWIN CITY TEACHERS

Arrangements have been made for offering courses in various departments at times which will make them readily available for teachers in the Twin Cities and environs. These courses will be scheduled to come Saturday mornings or week days after four p.m.

## 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 sixty credits and ninety 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 105 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 all students.

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

##### I. 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 (six 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 105 credits. The student is advised to take from twenty-four to thirty hours in his junior year.

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

The requirements for admission are the same as those for admission to the regular freshman class, 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.

Violin: Candidate must be able to play the first ten of Kreutzer's *Forty Etudes*, and the easier Handel and Mozart Sonatas.

Violoncello, organ, and orchestral instruments. Candidate must pass entrance examinations equal to the above grade.

Voice: Candidate must possess good natural equipment, some previous vocal training, be a ready sight reader, and have a reading knowledge of the standard German and English songs.

The number of credits required for the degree in Music is one hundred and twenty, 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 twenty honor points.

The number of credit hours a semester is the same as for the B.A. degree.

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

#### OUTLINE OF COURSE

*Freshman Year* (Sixteen or Seventeen Credits Each Semester).

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)
- Cello (2)
- Voice (2)

2. Harmony (3)
3. Rhetoric (3)
4. Beginning Modern Language (6) or two 3-hour courses if entrance credits are offered in two languages.
5. Orchestra (1) elective.

*Sophomore Year (Sixteen or Seventeen Credits).*

## A

1. Piano (4)
- Violin (4)
- Cello (4)

## B

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

2. Counterpoint (2)
3. Acoustics (3) First Semester. General Psychology (3) Second Semester.
4. Modern Language (3)
5. History (3)
6. Ear Training (1)
7. Orchestra (1) elective.

*Junior Year (Seventeen or Eighteen Credits)*

## A

1. Piano (4)
- Violin (4)
- Cello (4)

## B

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

2. English Survey (3)
3. History of Music (3)
4. Normal Piano (3) or Public School Music (3). The subject elected must be continued through two years.
5. Elect four credits from A, including Appreciation of Music (for Public School Music students).

## A

- Ensemble (2)
- Appreciation of Music (1)
- Musical Composition (2)
- Analysis (1)
- 6. Orchestra (1) elective.

- Required Subjects for Public School Music Students
- Technic of Teaching (3)
- Appreciation of Music (1)

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\* Not offered during 1917-18.

*Senior Year* (Twelve or Thirteen Credits)

- | A  | B          |
|--|------------|
| 1. Piano (4)   | Piano (2)  |
| Violin (4)   | Violin (2) |
| Cello (4)  | Cello (2)  |
|  | Voice (2)  |
| 2. Bach and Beethoven (2) First Semester. Brahms and Wagner (2) Second Semester.   |            |
| 3. English Literature (3) or Modern Language (3); for Public School Music Students, Aspects of Social Education (3) History of Education (3) required. |            |
| 4. Advanced Normal Piano (3) or Advanced Public School Music (3).  |            |
| 5. Orchestra (1) elective.   |            |

#### IV. FOUR-YEAR COURSE IN BUSINESS EDUCATION, LEADING TO THE DEGREE OF B.A.

This course differs from the general B.A. course in two ways. The student is able to give a larger part of his time to studies of especial value in preparation for business, and a somewhat higher grade of scholarship is required for advancement and graduation.

The sequence of studies has been determined by the aims of the course. It is the aim in the freshman and sophomore years to give a broad training in those subjects which furnish the foundation for the study of business processes; to acquaint the student with the relations of those processes to the social organization; and to provide the common tools needed in these studies and in the prosecution of business dealings.

It is the aim in the junior and senior years to provide instruction in such branches of economics, political science, law, etc., as give an adequate preparation for general business activities, and to offer in elective courses opportunity either for limited specialization in business lines or for such other work as the student desires.

*Language requirement.* Before beginning the work of the senior year the student must satisfy the language department concerned, by examination, that he can read readily business and economic literature in French, German, or Spanish. This examination, if taken earlier in the course or at the time of entrance, will relieve the student of further required courses in modern languages.

*Scholarship requirement.* In order to enter upon the work of the sophomore year in this course the student must have secured one honor point for each credit hour in the freshman year and have had no conditions or failures, or he must have secured one and one-half honor points for each credit hour. In the sophomore, junior, and senior years the student must secure one and one-half honor points for each credit hour carried.

COURSES OF STUDY

17

FRESHMAN YEAR

	Credits
Rhetoric 1-2 .....	6
Modern Language .....	12 or 6
Laboratory Science or Mathematics.....	0 or 6
History 3-4 (English History).....	6
Physical Geography (Geology 37).....	3
Industries and Commerce (Economics 2).....	3
	<hr style="width: 10%; margin-left: auto; margin-right: 0;"/> 30

SOPHOMORE YEAR

	Credits
Modern Language (continued for those who begin it in the University) .....	6
Laboratory Science or Mathematics (if not taken in freshman year) .....	6
Principles of Economics (Economics 7-8).....	6
Principles of Accounting (Economics 35-36).....	6
History (American or Modern Europe).....	6
And the following subjects if the student's program permits:	
Political Science .....	6
Psychology .....	3
Elective .....	3
	<hr style="width: 10%; margin-left: auto; margin-right: 0;"/> 30

JUNIOR YEAR

	Credits
The above courses in Political Science and Psychology if not taken in the sophomore year.....	9
English or Advanced Composition.....	6
Political Science .....	6
Economics .....	6
Electives .....	3 or 12
	<hr style="width: 10%; margin-left: auto; margin-right: 0;"/> 30

SENIOR YEAR

	Credits
Political Science .....	6
Economics .....	12
Electives .....	12
	<hr style="width: 10%; margin-left: auto; margin-right: 0;"/> 30

Attention should be called to the fact that the term "Economics" as used in the above outline includes a wide range of business subjects (Business Management, Accounting, Marketing, Advertising, Insurance, Investment, etc.) which are taught in the Department of Economics. Also,

the term "Electives" indicates that the student is free to spend this part of his time either in these business subjects or in any other work which the College offers.

The National City Bank of New York offers each year to students in this course one or more scholarships for the purpose of training young men in banking and foreign trade. These scholarships provide for expenses during certain periods of practical work and study in the National City Bank.

#### V. FIVE-YEAR COURSE IN SOCIAL AND CIVIC WORK, LEADING TO THE DEGREES OF BACHELOR OF ARTS 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.A. 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's 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.

#### FIRST YEAR STUDIES

##### 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 a year of 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

## 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

## 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

## (SPECIAL NOTE)

For a fifth year's work consisting of 9 hours class work and 12 hours of supervised field work per week for two semesters 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.

## Courses on Public Health

*Economics*

Principles of Accounting

Public Finance

*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

## OTHER VOCATIONAL COURSES

For information and advice regarding the selection of studies in preparation for various vocations, the student should consult the heads of departments concerned. Young women should consult the Vocational Adviser in the office of the Dean of Women. The studies offered by the college are so varied and the opportunities for election are so great that the student who first forms an intelligent plan can usually find an excellent combination and sequence of courses serving his particular purpose.

## COMBINED ARTS AND PROFESSIONAL COURSES

### VI. SIX-YEAR COURSE IN ARTS AND LAW, LEADING TO THE DEGREES OF BACHELOR OF ARTS AND BACHELOR OF LAWS

The work of the first three years of this course is done in the College of Science, Literature, and the Arts and is subject to the regulations which govern the work of other Arts students. During these three years the student must secure not less than ninety credits, including fifteen credits in starred courses. The first year of the course in the Law School counts as the equivalent of the fourth year (thirty credits) of the Arts course. During the four years the student must earn one hundred and twenty honor points.

SHORTER PRE-LEGAL COURSES

While the faculty of the Law School strongly recommends the above course, two other courses are open to students who wish the degree of Bachelor of Laws alone. They may take two years' work in the College of Science, Literature, and the Arts, under the regulations which govern other Arts students, or they may take the special pre-legal course outlined below. The student's registration blank must show which course is chosen and that course must be followed without variation. In either case the student must secure at least fifty-eight credits in order to be eligible for admission to the Law School.

In case any student after taking the special pre-legal course shall become a candidate for the B.A. degree, he must satisfy all the regular requirements for that degree.

Students who offer for entrance less than two units of natural science must take one year of natural science.

FRESHMAN YEAR

	Credits
Rhetoric 1-2 .....	6
Mathematics or Science.....	6 (or 10)
(1) The student must complete the equivalent of Mathematics 1 and 2, or 3 and 4. If he has had this, he may elect 6 credits in science.	
Language .....	6 (or 12)
(1) The student with two or more units of entrance credits in Latin is strongly advised to take Latin (6 credits).	
(2) The student not taking Latin must take French or German.	
History 3-4 .....	6
Economics 3-4 .....	6
Political Science I.....	6
Military Drill and Gymnasium, for men.	

28-36

SOPHOMORE YEAR

Rhetoric 15-16 .....	6
Language .....	4-6
A continuation of same language taken in freshman year.	
History 5-6	
Economics:	
3-4 (if not previously taken), and not more than three of the following courses: 2, 5, 13, 18, 76, 35-36, 41, 43, 47	
Political Science:	
Not less than one nor more than four of the following courses: 1 (if not previously taken), 3, 5, 6, 7, 9.	
Military Drill, for men	

28-34

VII. FIVE-YEAR COURSE IN ARTS AND CHEMISTRY, LEADING TO THE DEGREES OF BACHELOR OF ARTS AND BACHELOR OF SCIENCE IN CHEMISTRY

During his first three years, the student does his work in the College of Science, Literature, and the Arts subject to the regulations governing other Arts students, and must secure at least ninety credits, including fifteen credits in starred courses. This work must include:

- a. Rhetoric 1-2 and twelve credits in German.
- b. Twelve credits in Group B (see page 11).
- c. The following courses:
  - General Chemistry and Qualitative Analysis, or equivalent.
  - Quantitative Analysis, one year.
  - Technical Drawing 21-22, one year.
  - Geology 21, one semester.
  - Metallurgy 2 (men) or Geology 22 (women), one semester.
  - Biological Science, one year.
  - General Physics with laboratory work, one year.
  - Mathematics, ten credits.
  - Glass Blowing, one credit.

The fourth year of the course is the same as the junior year of the Analytical Course of the School of Chemistry and counts as the equivalent of the fourth year (thirty credits) of the Arts course. During the four years the student must earn one hundred and twenty honor points.

POST-SENIOR YEAR

The student's fifth year is the same as the fourth year of the Analytical Course of the School of Chemistry, and upon its completion he will be entitled to the degree of Bachelor of Science in Chemistry.

During the senior and post-senior years the student, if prepared, has the privilege of specializing for not less than two semesters along one of the following lines: Organic Chemistry, Physical Chemistry, Analytical Chemistry, Applied Chemistry, Photochemistry, Physiological Chemistry, Geochemistry, Bromatology.

VIII. EIGHT-YEAR COURSE IN ARTS AND MEDICINE, LEADING TO THE DEGREES OF BACHELOR OF ARTS AND DOCTOR OF MEDICINE

During the first three years of this course, the student does his work in the College of Science, Literature, and the Arts subject to the regulations governing other Arts students and must secure ninety credits including fifteen credits in starred courses. The first year of the course in the Medical School counts as the equivalent of the fourth year (thirty credits) of the Arts course. During the four years the student must earn one hundred and twenty honor points.

FRESHMAN AND SOPHOMORE YEARS

The following subjects must be included:

Rhetoric 1-2, six credits.

Zoology 1-2, six credits.

Qualitative Analysis and Medical Organic Chemistry with the elementary courses prerequisite to them.

German sufficient to secure a reading knowledge, to be tested by a committee of the Medical faculty.

Physics 1, 2, 3, and 4, (not Physics 21-22), eight credits. This work must be preceded by Mathematics 1 and 2, ten credits, or 3 and 4, six credits.

The following subjects are recommended as electives: Economics, Free-hand Drawing, and Psychology.

JUNIOR YEAR

The work of the junior year is elective, subject to the requirement of fifteen credits in starred courses.

SENIOR YEAR

This year is taken in the Medical School, and is counted toward the B.A. degree.

IX. SEVEN-YEAR COURSE IN SCIENCE AND MEDICINE, LEADING TO THE DEGREES OF BACHELOR OF SCIENCE AND DOCTOR OF MEDICINE

To be eligible for admission to the Medical School, students in this course must secure in the College of Science, Literature, and the Arts not less than sixty credits including the subjects required during the freshman and sophomore years of the Eight-Year Course in Arts and Medicine.

JUNIOR AND SENIOR YEARS

The work during these two years is taken in the Medical School, and is credited toward the B.S. degree. To secure this degree the student

must have one hundred and twenty credits and one hundred and twenty honor points.

Students who have completed elsewhere two or more years of collegiate or university work which includes the required subjects specified above and which is in other respects the full equivalent of the two years of Academic work required in the seven-year combined course, will be awarded the degree of Bachelor of Science on recommendation of the Faculty of the College of Science, Literature, and the Arts, provided they meet the scholarship requirements stated above. The credit value of work done elsewhere shall be determined by the Administrative Board of the College of Science, Literature, and the Arts, but such credits shall not become effective until the student shall have completed, with the required standing, two full years of work in the Medical School of the University of Minnesota.

#### X. SIX-YEAR COURSE IN ARTS AND DENTISTRY, LEADING TO THE DEGREES OF BACHELOR OF ARTS AND DOCTOR OF DENTAL SURGERY

During the first three years of this course the student does his work in the College of Science, Literature, and the Arts, subject to the regulations governing other Arts students and must secure ninety credits, including fifteen credits in starred courses. The final year of the course in the College of Dentistry counts as the equivalent of the fourth year (thirty credits) of the Arts course. During the four years the student must earn one hundred and twenty honor points.

#### XI. 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. 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 juniors and seniors who have completed two years of drill 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. Any student who for satisfactory reasons is permitted to withdraw from this course must reimburse the War Department for all moneys received.

Juniors and seniors who take the course required by General Orders No. 49, which includes two camps of four weeks each, will receive an allowance of thirty 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 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.

The course includes three hours a week of drill and three of study in the Military Department and also includes the following courses of study for students of this college:

(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.

FRESHMAN—YEAR COURSE

Subjects	Credits
Rhetoric .....	3
Modern Language .....	6 or 3
Mathematics .....	3 or 5
History .....	3
Elective .....	0 or 3
<hr/>	
Total of .....	15 or 17

SOPHOMORE—YEAR COURSE

Modern Languages .....	3 or 6
Physics .....	4
Drawing (Mechanical) .....	3
Economics or Political Science.....	3
(Industries and Commerce, first or second semester; American Government, first or second semester)	
Elective .....	3
<hr/>	
Total of .....	16

JUNIOR—FIRST SEMESTER

Reserve School (required) .....	3
Military History .....	3
Transportation and Supply.....	3
Diplomatic Relations .....	3
Elective .....	3
<hr/>	
Total of .....	15

## JUNIOR—SECOND SEMESTER

Subjects	Credits
Reserve School (required) .....	3
Surveying .....	3
International Law .....	3
Elementary Psychology .....	3
Elective .....	3
	<hr/>
Total of .....	15

## SENIOR—YEAR COURSE

Reserve School (required both semesters) .....	3
Other subjects elective	



## DEPARTMENTAL STATEMENTS

### EXPLANATION OF COURSE NUMBERS

Odd numbers indicate first-semester courses; even numbers, second-semester courses. A combination of the two (e.g., 5-6) indicates courses continuing through the year. The suffixes *a* and *b* apply to one-semester courses offered both semesters, *a* indicating the first semester and *b* the second semester (e.g., 3a,b; 4a,b). Courses marked with a *t* are given at hours convenient for teachers.

All undergraduate courses are numbered from 1 to 100. All courses open to undergraduates and graduates are numbered from 101 to 200. Strictly graduate courses are numbered from 201 up.

*For graduation a student must secure, during the junior and senior years, thirty credits in starred courses of which twelve credits must be in one department.*

The following abbreviations are used: A, Armory; AB, Animal Biology; Ar indicates that the days, hours, or room are to be arranged (for information, apply to head of the department concerned); C, Chemistry Building; Ed, Education Building; En, Engineering Building, University Farm; F, Folwell Hall; G, Greenhouse; He, Home Economics Building, University Farm; L, Law Building; Lib, Library Building; MA, Mechanic Arts; ME, Main Engineering Building; Mech E, Mechanical Engineering Building; MH, Millard Hall; Mu, Music Building; O, Observatory; P, Pillsbury Hall; PH&P, Institute of Public Health and Pathology; Ph, Physics Building; WGM, Women's Gymnasium.

The symbol ¶ indicates that the instructor is to be assigned.

The symbol § indicates a course not described in previous bulletins. For information students should consult the department.

### ANIMAL BIOLOGY

Professors HENRY FRANCIS NACHTRIEB, HAL DOWNEY, JOHN B. JOHNSTON, THOMAS S. ROBERTS, CHARLES P. SIGERFOOS; Assistant Professors ELMER J. LUND, OSCAR W. OESTLUND; Instructors GEORGE DELWIN ALLEN, ROYAL N. CHAPMAN, CHARLES E. JOHNSON; Assistants EMILY PAYNE, ADOLPH RINGOEN; Teaching Fellow GEORGE A. THIEL; Artist HELEN CHAPMAN.

#### REQUIREMENTS OF THE DEPARTMENT

*For B.A. with Honors*, freshman year, Course 1-2; sophomore year the student may elect from Courses 7-8, 15-16, 19-20, 23-24; during the junior year the student must elect from Courses 31-144, and must include some line of work begun in the sophomore year which he expects to pursue during the senior year under 161-162.

*For a Teacher's Certificate* an average of one and one-half honor points in Courses 1-2, 31-32, and six other credits in Animal Biology and six credits in Botany.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2	6†	General Zoology††	All	None
		Sec. 1. Lab. 8, 9	WF 101AB	¶
		Lect. 10	WF 313AB	¶
		Sec. 2. Lab. 10, 11	WF 101AB	¶
		Lect. 9	WF 313AB	¶
		Sec. 3. Lab. 1, 2	M 101AB	¶
		Lab. 2, 3	W 101AB	¶
		Lect. 1	WF 313AB	¶
		Sec. 4. Lab. 8, 9	ThS 101AB	¶
		Lect. 10	ThS 313AB	¶
		Sec. 5. Lab. 10, 11	ThS 101AB	¶
		Lect. 9	ThS 313AB	¶
		Extra Lab. Classes		
7-8	6†	Histology-Embryology	Soph., jr., sr.	1-2
		10, 11 MWF	201, 211	Downey
12	3	Histological Technique	Soph., jr., sr.	1-2 and 7
		See Anatomy Schedule		
*15-16	6†	Gen. Physiology	Jr., sr.	12 credits in An. Biol. or Zool. 1-2 & Chem. 13-14 or 35-36
		2, 3 MWF	10AB	Lund
19-20	6†	Comp. Gross Anat. of Vert.	Soph., jr., sr.	1-2
		2, 3 MWF	107-109, 211AB	Johnson
23-24	6†	Entomology	Soph., jr., sr.	1-2
		10, 11 MWF	208-210AB	Oestlund
		8, 9 TThS	208-210AB	Oestlund
28	3	Ornithology	Soph., jr., sr.	1-2
		2, 3, 4 TTh	211, 314AB	Roberts
*31-32	3†	Nature Study	Jr., sr.	12 credits in An. Biol.
		2, 3, 4 T	213AB	Sigerfoos
*51	3†	Protozoology	Jr., sr.	9 credits incl. 1-2
		8, 9 TThS	213AB	Sigerfoos
*56	3†	Morphology of Invertebr.	Jr., sr.	9 credits incl. 1-2
		8, 9 TThS	213AB	Sigerfoos
*101-102	6	Advanced Entomology	Jr., sr., grad.	1-2, 23-24
		2, 3 MWF	208-210AB	Oestlund, Chapman
*107-108	6	Gen. Ecology of Insects	Jr., sr., grad.	1-2, 23-24
		2, 3, 4 TTh	208-210AB	Oestlund, Chapman
*117-118	6	Mammalogy	Jr., sr., grad.	1-2, 7-8 or 19-20
		4, 5 MWF	107-109, 211AB	Johnson
*119-120	6	Vertebrate Histology	Sr., grad.	1-2, 7-8, Anat. 112
		3, 4 TThS	201, 211AB	Downey
*123-124	6†	Blood of Vertebrates	Sr., grad.	1-2, 7-8, Anat. 112, 131-132, reading knowledge of French and German.
		3, 4 TThS	201, 211AB	Downey
*131-132	6†	Embryology	Jr., sr., grad.	1-2, 7-8
		Not given in 1917-18.		

† Both semesters must be completed before credit is given for the first semester.

‡ Courses 51 and 56 may be combined for a year course.

†† So far as possible students should register for both lecture and laboratory work in the same section.

No.	Credits	Title	Offered to	Prereq. courses
*143-144	6	Genetics and Eugenics... Not given in 1917-18.	Sr., grad.	1-2
*161-162	6 or 12	Problems .....	Sr., grad.	1-2 and other courses prescribed by the de- partment
Hours, days, and rooms arranged				

## ASTRONOMY

Professor FRANCIS P. LEAVENWORTH; Assistant Astronomer WILLIAM O. BEAL.

### REQUIREMENTS OF THE DEPARTMENT

*For B.A. with Honors, the general requirements (page 13), Courses 51-52, 101-102 (as a twelve credit course), and six credits in Physics.*

### COURSES

No.	Credits	Title	Offered to	Prereq. courses
11a	3	Descriptive Astronomy .. 9 MWF 11 TThS	Soph., jr., sr. 124F 124F	None Leavenworth Beal
11b	3	Descriptive Astronomy .. 11 MWF 11 TThS	Soph., jr., sr. 124F 124F	None Leavenworth Beal
13-14†	6	Descr. Astr. & Obs. Pract. 9 TThS	Soph., jr., sr. 124F	Consult dept. Beal
18	3	Navigation & Naut. Astr.. 9 MWF	All 124F	None Leavenworth
51-52†	6	General Astronomy .....	Jr., sr. 124F	1 yr. mathematics Leavenworth
*62a	3	Elements of Pract. Astr.. Ar Ar	Jr., sr. 124F	1 yr. mathematics and Ast. 11, or 13, or 51 Beal
*62b	3	Elements of Pract. Astr.. Ar Ar	Jr., sr. 124F	1 yr. mathematics and Ast. 11, or 13, or 51 Beal
*101-102	6 or 12	Practical Astronomy .....	Jr., sr., grad. 10 TThS or MTWThFS	Math. 7 and 11 and Ast. 11, or 13, or 51 Leavenworth
*140	2 or 3	Method of Least Squares. Ar Ar	Sr., grad. O	Math. 51 Leavenworth

† Both semesters must be completed before credit is given for the first semester.

## BACTERIOLOGY

Associate Professor WINFORD P. LARSON; Instructors ARTHUR T. HENRICI, ANNE BENTON; Assistants IKEDA and DIEHL.

### COURSES

No.	Credits	Title	Offered to	Prereq. courses
§6a	3	Elementary Bacteriology .... M 2, 3, 4; W 2, 3	All Lab.PHP	None Larson, et al.
§6b	3	Elementary Bacteriology .... M 3, 4; W 3, 4; F 3	All Lab.PHP	None Larson, et al.
§114	1½	Advanced Bacteriology .....	All TTh 2, 3, 4 (or 2:30-5:30) Lab.PHP	6a or 6b Larson, et al.

## BOTANY

Professors CARL OTTO ROSENDAHL, JOSEPHINE E. TILDEN; Assistant Professors FREDERIC K. BUTTERS, NED L. HUFF; Instructor WILLIAM S. COOPER; Teaching Fellows ARTHUR M. JOHNSON, VINNIE A. PEASE, HORACE GUNTHORP, PAUL HARVEY; Assistant LOIS CLARK.

## REQUIREMENTS OF THE DEPARTMENT

For *B.A. with Honors*, the general requirements (page 13); thirty-six credits in Botany, of which twenty-four shall be selected from advanced Courses 105-106 to 119-120 inclusive. Those electing the Honors Course are urged to secure twelve credits during the sophomore year.

For a *Teacher's Certificate*, an average of at least one honor point for each credit hour in one introductory and one intermediate course, and in Course 121-122. One year of Zoology is also advised.

Students entering the department without preparation must take Course 1 followed by 2. Students coming from an approved high school course will take Course 1 or 2 according to preparation.

## COURSES

Introductory Courses					
No.	Credits	Title		Offered to	Prereq. courses
1a	3	Gen. Botany, Lab. & Class		All	None
		8, 9	MWF	207P	¶
		10, 11	MWF	207P	¶
		1, 2	MWF	207P	¶
		2, 3, 4	MF	207P	¶
		3, 4	MWF	207P	¶
		8, 9	TThS	207P	¶
		10, 11	TThS	207P	¶
		1, 2, 3	TTh	207P	¶
		2, 3, 4	TTh	207P	¶
1b	3	Gen. Botany, Lab. & Class		All	None
		8, 9	MWF	214P	¶
		8, 9	TThS	214P	¶
2a	3	Gen. Botany, Lab. & Class		All	1 or approved High School Botany
		8, 9	MWF	214P	¶
		2, 3, 4	MF	214P	¶
2b	3	Gen. Botany, Lab. & Class		All	1 or approved High School Botany
		8, 9	MWF	207P	¶
		10, 11	MWF	207P	¶
		2, 3	MWF	207P	¶
		8, 9	TThS	207P	¶
		10, 11	TThS	207P	¶
		2, 3, 4	TTh	207P	¶
		2, 3, 4	MF	207P	¶
Intermediate Courses					
5a	3	Plant Morphology . . . . .		All	Botany 2
		10, 11	MWF	214P	Butters, Huff

No.	Credits	Title	Offered to	Prereq. courses
5b	3	Plant Morphology .....	All	Botany 2
		8, 9 MWF	214P	Huff
		2, 3, 4 MF	214P	Butters
6b	3	Plant Morphology .....	Soph., jr., sr.	Botany 5
		10, 11 MWF	214P	Butters
7-8	6	Taxonomy .....	Soph., jr., sr.	6 credits
		10, 11 MWF	20P	Rosendahl
9-10	6	Physiology and Ecology...	Soph., jr., sr.	6 credits
		1, 2, 3 MF	3G	Cooper
11	6	Industrial Botany .....	Soph., jr., sr.	6 credits
		10, 11 TThS	212P	Tilden
12	3	Industrial Botany .....	Soph., jr., sr.	6 credits
		10, 11 TThS	212P	Tilden
<i>Advanced Courses</i>				
*105-106	6	Algae .....	Jr., sr., grad.	9 credits
		1, 2, 3 TTh	212P	Tilden
*110	3	Gymnosperms .....	Jr., sr., grad.	9 credits; incl. 2 or 3, or 5-6
		Ar Ar		Butters
*111-112	6	Advanced Taxonomy .....	Jr., sr., grad.	7-8
		Ar Ar	20P	Rosendahl
*113-114	6	Advanced Ecology .....	Jr., sr., grad.	9-10
		Ar Ar	200P	Cooper
*117-118	6	Cytology .....	Jr., sr., grad.	9 credits
		Ar Ar	8P	Rosendahl
*119-120	6	Advanced Industrial Bot...	Jr., sr., grad.	11-12
		Ar TTh	212P	Tilden
*121-122	6	Plant Studies and Methods	Jr., sr., grad.	9 credits
		3, 4 MWF	214P	Huff

## CHEMISTRY

## THE SCHOOL OF CHEMISTRY

Professors GEORGE B. FRANKFORTER, CHARLES F. SIDENER; Associate Professors EVERHART P. HARDING, WILLIAM H. HUNTER; Assistant Professors IRA H. DERBY, FRANK H. MACDOUGALL, EDWARD E. NICHOLSON; Lecturer FRED L. BARDWELL; Instructors ROSS A. BAKER, FRANK W. BLISS, LILLIAN COHEN, ISAAC W. GEIGER, CARL L. SCHUMANN, WOLDEMAR STERNBERG, H. LEE WARD; Assistants BOZETECH C. BREN, ARTHUR R. CADE, ROSCOE N. CARTER, ALBERT E. COXE, DONALD C. FARLEY, L. FRANCES HOWE, ALONZO G. MAYERS, NORMAN H. MOORE, ANNA PETERSON, MRS. HEDWIG S. WILSON, WILLIAM F. WOLF.

## REQUIREMENTS OF THE DEPARTMENT

In Chemistry the purpose of the honors course is served by the Five-Year Course in Arts and Chemistry. (See page 22.)

For a *Teacher's Certificate*, an average of at least one and one-half honor points for each credit hour in Courses 1-2 or 3-4 and 7-8 or 11-12; and 20.

## COURSES

*Division of General and Inorganic Chemistry*

No. Credits	Title	Offered to	Prereq. courses
1-2	6† General Chemistry .....	Those entering without chemistry	None
	8, 9 TThS	110	†
	10, 11 MWF	110	†
21-22	10 Inorganic and Qual. Chem.	Those entering without chemistry	None
	Lect. 1 F	100	†
	Lab. 8, 9 TThS	110	†
	Rec. 10 TThS	111	†
3-4	6† Adv. Gen. Chemistry and Qual. Analysis .....	Fr., soph., jr.	Entrance cr. in Chem.
	Lect. 1 F	100	†
	Lab. 2, 3 MF	110	†
	Rec. 2 or 3 W	111	†
	Lab. 10, 11 TS	110	†
	Rec. 10 or 11 Th	115	†
7-8	6† Qualitative Anal. ....	Soph., jr., sr.	1-2 Nicholson
	8, 9 MWF	210	
10	1 Glass Blowing .....	Jr., sr.	Open only to those who are taking practice teaching in Chemistry
	Ar Ar	49	Baker
17	2 Inorganic Colloquium ...	Sr.	11-12
	8 MF	111	Baker
20	2 Teachers' Course .....	Sr.	3-4 or 7-8 or 21-22
	8 TTh	Ar	Ward
*167-168	4† Adv. Inorganic Chem. ...	Sr.	2 yrs. college chem.
	Ar Ar	Ar	Baker
*169-170	4† Chem. of Rare Elements..	Jr., sr.	11-12
	Ar Ar	Ar	Nicholson

*Division of Analytical Chemistry*

*11-12	8† Quantitative Analysis ....	Soph., jr., sr.	3-4 or 7-8, or 21-22 and 1 year math. or Physics 1
	1, 2, 3, 4 F	310	Sidener
	2, 3, 4 MW	310	Sidener
*107-108	6† Adv. Quan. Analysis.....	Jr., sr.	11-12
	Ar Ar	317	Sidener

*Division of Organic Chemistry*

13-14	6† Medical Organic Chem....	Soph.	3-4 or 7-8 or 21-22
	Lect. 11 MWF	100	Hunter
	Lab. 2-5 W or F	10	Hunter
	Rec. Ar	Ar	†
18	2 Organic Colloquium .....	Sr.	35-36
	8 WF	115	Frankforter

† Both semesters must be completed before credit is given for the first semester.

No.	Credits	Title	Offered to	Prereq. courses
*35-36	8†	Organic Chemistry .....	Soph., jr., sr.	3-4 or 7-8 or 21-22 and 1 yr. Biol. Sci.
	Lect.	11 TTh	100	Frankforter
	Lab.	2, 3, 4 MW	10	Schumann
	Rec.	1 W	315	Schumann
*115	2	Adv. Organic Chem. ....	Sr.	35-36
		9 MWF	325	Hunter
*116	2	Theoretical Org. Chem....	Sr.	35-36
		9 MWF	325	Hunter
<i>Division of Physical Chemistry</i>				
*121-122	4†	Physical Chemistry .....	Jr., sr.	‡35-36, Physics 2 and 4
		11 WF	115	MacDougall
*123-124	2†	Physico-chemical Lab. ...	Jr., sr.	Must be taken in con- junction with 121-122
		9, 10, 11 M	Ar	MacDougall
		2, 3, 4 F	117	MacDougall
*125-126	6†	Adv. Physical Chem. ....	Sr.	121-122
		Ar Ar	Ar	Derby
*127	2	Radiochemistry Lectures..	Jr., sr.	3-4 or 7-8 or 21-22 and ‡Physics 2 and 4
		Ar Ar	Ar	Henderson
*128	2	Radiochemistry Lab. ....	Jr., sr.	127
		Ar Ar	Ar	Henderson

*Division of Technological Chemistry*

27-28	4†	Chem. in Every-Day Life.	Jr., sr.	3-4 or 7-8 or 21-22
		2-5:30 TTh	Ar	Geiger

*Division of Industrial Chemistry*

15	2	Photochemistry .....	Jr., sr.	3-4 or 7-8 or 21-22
	Lect.	8 M	27	Peck
	Lab.	2, 3, 4 Th	27	Peck
16	2	Color Photography .....	Jr., sr.	15
	Lect.	8 M	27	Peck
	Lab.	2, 3, 4 Th	27	Peck

† Both semesters must be completed before credit is given for the first semester.

‡ This physics may be taken at the same time.

## COMPARATIVE PHILOLOGY

Professor FREDERICK KLAEBER.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
*101	2	Science of Language.....	Jr., sr., grad.	See bulletin statement
		2 TTh	205F	Klaeber
*102	2	Sci. of Language (Adv.).	Jr., sr., grad.	Same as for 101
		2 TTh	205F	Klaeber
		See bulletin statement		
*105	1	Universal Language .....	Jr., sr., grad.	Same as for 101
		10 S	221F	Klaeber
*109-110	4†	History of the German Language .....	Jr., sr., grad.	German 53, 54
		2 WF	205F	Klaeber
		See bulletin statement		

† Both semesters must be completed before credit is given for either semester. Identical with German 109-110.

## DRAWING AND DESCRIPTIVE GEOMETRY

Professor WILLIAM H. KIRCHNER; Instructor ROBERT W. FRENCH.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
21-22	4	Technical Drawing .....	All	None
		8, 9 MWF	13MechE	Kirchner, French, et al.

## ECONOMIC ZOOLOGY

## COLLEGE OF AGRICULTURE

Professor FREDERICK L. WASHBURN; Associate Professor ARTHUR G. RUGGLES; Assistant Professors CHARLES W. HOWARD, WILLIAM MOORE.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
3	Economic Entomology .....	3	Jr.	An. Biol. 3 and 4
4	Economic Vertebrate Zoology....	2	Jr., sr.	An. Biol. 3 and 4
14	Insects and Public Health.....	2	Jr., sr.	An. Biol. 3 and 4
*18	Control of Insect Pests.....	3	Jr., sr.	3, Pl. Path. 14, Hort., 1 sem.
*104	Methods in Economic Entomology	3	Jr., sr.	3
*105-106	Special Problems .....	6	Jr., sr.	3
*107-108	Immature Stages of Insects.....	3 or 6	Jr., sr.	3
*109-110	Action of Insecticides.....	3 or 6	Jr., sr.	3

## ECONOMICS

Professors WILLARD E. HOTCHKISS, JOHN H. GRAY,<sup>1</sup> E. DANA DURAND;<sup>1</sup> Assistant Professors ROY G. BLAKEY, WILLIAM W. CUMBERLAND,<sup>1</sup> J. FRANKLIN EBERSOLE;<sup>1</sup> Instructors LLOYD M. CROSGRAVE, ALBERT C. HODGE, ALBERT C. JAMES, J. WARREN STEHMAN; in the General Extension Division, Associate Professor CLARE L. ROTZEL; Assistant Professor CHARLES H. PRESTON.

## REQUIREMENTS OF THE DEPARTMENT

*For B.A. with Honors*, the general requirements, including thirty credits in the major line of work with the usual supporting credits.

*For a Teacher's Certificate in business subjects*, twenty-four credits in Economics, including Accounting and Economic Geography.

*Vocational Course in Business Education*. The requirements for this course leading to the B.A. degree may be found on pages 16-18.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
2b	3	Industries and Commerce of the United States....	Soph., jr., sr.	None
		Sec. 1 8 MWF	109MA	Robbins
		Sec. 2 9 MWF	109MA	Robbins
		Sec. 3 2 MWF	109MA	Robbins

<sup>1</sup> Absent on leave.



DEPARTMENTAL STATEMENTS

No. Credits	Title	Offered to	Prereq. courses
3-4	6† General Economics .....	Soph., jr., sr.	None
	Sec. 1 8 TThS	209MA	Blakey
	Sec. 2 9 TThS	209MA	Blakey
	Sec. 3 11 TThS	109MA	Crosgrave
	Sec. 4 11 TThS	109F	Stehman
	Sec. 5 3 MWF	202MA	Crosgrave
7-8	6†† Principles of Economics... 11 MWF	Soph., jr., sr. 202MA	None James
9	3 Industrial History .....	Soph., jr., sr.	None
	11 MWF	102MA	Ar
13	3 Econ. Geog. of Foreign Countries .....	Soph., jr., sr.	None
	2 MWF	202MA	Ar
35-36	6† Accounting Principles ....	Soph., jr., sr.	None
Sec. 2	Lect. & Quiz. 10 WF	301MA	Hodge
Sec. 1	Lect. & Quiz. 11 TS	301MA	Hodge
Sec. 1	Lab. 11, 12 Th	301MA	Hodge
Sec. 2	Lab. 1, 2 T	301MA	Hodge
Sec. 3	Lab. 1, 2 Th	301MA	Hodge
Sec. 3	Lect. & Quiz. 2 MF	301MA	Hodge
37	3 Marketing of Products.... 9 TThS	Soph., jr., sr. 202MA	3 credits James
41	3 Financial History .....	Soph., jr., sr.	3 or 7
	10 TThS	209MA	Blakey
43a	3 Banking .....	Soph., jr., sr.	3 or 7
	Sec. 1 9 MWF	209MA	Stehman
	Sec. 2 10 MWF	202MA	Stehman
43b	3 Banking .....	Soph., jr., sr.	3 or 7
	Sec. 1 9 MWF	209MA	Stehman
	Sec. 2 10 MWF	109MA	Stehman
49	3 Insurance .....	Soph., jr., sr.	3-4
	11 TThS	109MA	James
*52	3 Corporation Finance .....	Jr., sr.	6 cr. including 3 or 7
	9 TThS	213MA	Stehman
*76	3 Commercial Policies .....	Jr., sr.	6 cr. including 3 or 7
	10 TThS	202MA	Blakey
*86	3 Advertising and Selling... 11 TThS	Jr., sr. 102MA	3-4 James
*88	3 Retail Marketing .....	Jr., sr.	6 cr. including 37
	9 TThS	202MA	James
*101	3 Statistics .....	Jr., sr., grad.	6 cr. including 3 or 7
	11 TThS	303MA	Durand
*123b	3 Business Organization .... 10 MWF	Jr., sr., grad. 209MA	3-4 Hotchkiss
*132	3 Accounting Problems .... 11 MWF	Jr., sr., grad. 301MA	35-36 Hodge
*143	3 Money and Prices..... 10 TThS	Jr., sr., grad. 109MA	3 or 7, and 41 or 43 Stehman
*145	3 The Modern Business Cor- poration .....	Jr., sr., grad.	6 cr. including 3 or 7
	9 MWF	102MA	Hodge

† Both semesters must be completed before credit is given.

‡ Credit is given only after Course 4 is completed.

†† Open only to students in the vocational curriculum.

No.	Credits	Title	Offered to	Prereq. courses
*161	3	Labor Problems .....	Jr., sr., grad.	6 cr. including 3 or 7
		11 MWF	209MA	Crosgrave
*162	3	Labor Legislation .....	Jr., sr., grad.	6 cr. including 3 or 7
		11 MWF	209MA	Crosgrave
*165	3	Socialism .....	Jr., sr., grad.	6 cr. including 3 or 7
		11 TThS	213MA	Crosgrave
*173	3	Railway Problems .....	Jr., sr., grad.	6 cr. including 3 or 7
		9 TThS	213MA	Ar
*191	3	Public Finance .....	Jr., sr., grad.	6 cr. including 3 or 7
		11 TThS	209MA	Blakey
*192	3	State and Local Taxation..	Jr., sr., grad.	191
		11 TThS	209MA	Blakey
261-262	Ar	Seminar .....	Sr., grad.	12 credits
		Ar Ar	Ar	Hotchkiss, Blakey, et al.

### EDUCATION

Professors LOTUS D. COFFMAN, MELVIN E. HAGGERTY, ALBERT W. RANKIN, FLETCHER H. SWIFT; Assistant Professors WILFORD S. MILLER, MARVIN VAN WAGENEN; Instructors JEAN H. ALEXANDER, CHARLES L. HARLAN, REWEY BELLE INGLIS, G. A. MCGARVEY, WILLIAM D. REEVE; Assistant OSCAR J. JOHNSON; Scholar MARY CARUFEL; Special Lecturers CHARLES H. KEENE, GEORGINA LOMMEN, ANGUS W. MORRISON, HORACE NEWHART, RICHARD E. SCAMMON, JULIUS P. SEDGWICK.

### REQUIREMENTS OF THE DEPARTMENT

Six credits in Psychology are prerequisite for all courses in Education.

### COURSES

No.	Credits	Title	Offered to	Prereq. courses
*1a	3	Brief Course in Hist. of Educ. ....	Jr., sr.	Phil. 1-2
		8 TThS	205Ed	Swift, Alexander
		9 TThS	205Ed	Swift, Alexander
		9 MWF	205Ed	Swift, Alexander
*1b	3	Brief Course in Hist. of Educ. ....	Jr., sr.	Phil. 1-2
		9 TThS	204Ed	Alexander
*3a	3	Social Aspects of Educ....	Jr., sr.	Phil. 1-2
		4 MWF	204Ed	Van Wagenen
*3b	3	Social Aspects of Educ....	Jr., sr.	Phil. 1-2
		8 MWF	204Ed	Rankin, Van Wagenen
*3bt	3	Social Aspects of Educ....	Teachers	Phil. 1-2
		8-9:50 S		
		1 hr. Ar	111Ed	Rankin
*11a	3	Technique of Teaching....	Jr., sr.	Phil. 1-2
		8 MWF	205Ed	Harlan
		9 MWF	204Ed	Miller

No. Credits	Title	Offered to	Prereq. courses
*11b 3	Technique of Teaching.... 9 MWF	Jr., sr. 204Ed	Phil. 1-2 Harlan
*15a 3	Practice Teaching ..... Ar Ar	Sr. Ar	See bulletin statement Miller
*15b 3	Practice Teaching ..... Ar Ar	Sr. Ar	See bulletin statement Miller
*101 3	Hist. Found. of Mod. Educ. 2-3:30 TTh	Jr., sr., grad. 205Ed	Phil. 1-2 and 6 cr. in Dept. of History Swift
*102 3	History of Educ. since Reformation .....	Jr., sr., grad. 205Ed	Phil. 1-2 and 6 cr. in Dept. of History Swift
*103 3	Educational Classics ..... 10 TThS	Jr., sr., grad. 205Ed	1 or 101-102 Swift, Alexander
*104 3	Educational Classics ..... 10 TThS	Jr., sr., grad. 205Ed	1 or 101-102 Swift, Alexander
*105 3	Educational Psychology ... 11 MWF	Sr., grad. 202Ed	Phil. 1-2 Haggerty
*106 3	Educational Psychology ... 11 MWF	Sr., grad. 202Ed	Phil. 1-2 Haggerty
*109 2	Educational Diagnosis .... 10-11:40 S	Sr., grad. 206Ed	1 or 101-102 and 3 Haggerty
*110 3	Psychology of Secondary School Subjects .....	Jr., sr., grad. 204Ed	Psych. 1-2 Van Wageningen
*114 2	Psychology of Learning... 8-9:40 S	Teachers 112Ed	Psychol. 1-2 Van Wageningen
*119 3	School Curricula .....	Sr., grad. 205Ed	1 or 101-102 and 3 Rankin
*121a 3	School Organ. & Admin... 3 MWF	Sr., grad. 205Ed	1 or 101-102 and 3 Rankin
*121b 3	School Organ. & Admin... 3 MWF	Sr., grad. 205Ed	1 or 101-102 and 3 Rankin
*123 3	Theory of Supervision.... 11 MWF	Sr., grad. 205Ed	1 or 101-102 and 3 Coffman
*124 3	Educational Administration 3 MWF	Sr., grad. 111Ed	121 Coffman, van Wageningen
*125 2	Methods in Educ. Research 3 MW	Sr., grad. 111Ed	1 or 101-102 and 3 Coffman
*131 3	German Schools .....	Sr., grad. 111Ed	1 or 101-102 and 3 Alexander
*132 3	French Schools .....	Sr., grad. 111Ed	1 or 101-102 and 3 Alexander
*134 2	Mental Diagnosis .....	Sr., grad. MH	Phil. 1-2 Haggerty, et al.
*135 2	Mental Tests .....	Jr., sr., grad. MH	Phil. 1-2 Haggerty, Johnson
*136 2	Experimental Education ... 2, 3 WF	Jr., sr., grad. MH	Phil. 1-2 Haggerty, Johnson
*137-138 1 to 6	Psycho-Educational Clinic.. 12:30-2:30 MWF	Sr., grad. 126-128MH	Phil. 1-2; Ed. 109, 134, or 135 Haggerty
*141 3	School Sanitation .....	Sr., grad. 204Ed	1 or 101-102 and 3 Rankin

No. Credits	Title	Offered to	Prereq. courses
*142 3	Industrial Education .....	Sr., grad.	1 or 101-102 and 3
	4 MWF	205Ed	Rankin
*146 3	Hist. and Prin. of Religious Education .....	Jr., sr., grad.	Phil. 1-2
	9 TThS	205Ed	Swift

## ENGLISH

Professors RICHARD BURTON,<sup>1</sup> CARLETON BROWN, HARDIN CRAIG,<sup>2</sup> OSCAR W. FIRKINS, FREDERICK KLAEBER, ELMER E. STOLL; Associate Professor JOSEPH W. BEACH; Assistant Professor GEORGE N. NORTHROP;<sup>2</sup> Professorial Lecturer CECIL A. MOORE.

## REQUIREMENTS OF THE DEPARTMENT

For *B.A. with Honors*, the general requirements (page 13), twenty-four 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 a Teacher's Certificate*

a. English as the major subject of teaching:

English 1-2, 3, 5 or 7, and 28; Rhetoric 1-2, either 11-12 or 15-16, and 41-42.

b. English as the minor subject of teaching:

English 1-2, and 3; Rhetoric 1-2, and either 11-12 or 15-16.

In order to be recommended, a student must secure an average of at least one and one-half honor points for each credit hour of all the work taken in the departments of English and Rhetoric.

## COURSES

No. Credits	Title	Offered to	Prereq. courses
1-2 6	General Survey Eng. Lit...	Soph., jr., sr.	Rhet. 1-2
	11 MWF	204F	¶
	11 MWF	212F	¶
	11 MWF	205F	¶
	11 MWF	110F	¶
	3 MWF	301F	¶
	3 MWF	204F	¶
	3 MWF	205F	¶
3 3	Old English .....	Soph., jr., sr.	1-2‡
	9 TThS	205F	Klaeber
	10 TThS	110F	Firkins
5a 3	Chaucer .....	Soph., jr., sr.	1-2‡
	9 TThS	204F	Brown

‡ This course may be taken at the same time with English 1.

<sup>1</sup> Absent on leave during second semester.

<sup>2</sup> Absent on leave.

No.	Credits	Title	Offered to	Prereq. courses
5b	3	Chaucer .....	Soph., jr., sr.	1-2†
		10 TThS	110F	Firkins
7	3	Shakespeare .....	Soph., jr., sr.	1-2†
		10 TThS	301F	Stoll
26	3	Advanced Old English....	Soph., jr., sr.	3
		9 TThS	205F	Klaeber
28	1	Hist. of English Language.	Jr., sr.	3
		3 T	206F	Klaeber
*51	3	Spenser .....	Jr., sr.	1-2
		2 MWF	110F	Firkins
*54	3	American Literature .....	Jr., sr.	1-2
		9 MWF	204F	Moore
*58	3	Nineteenth Century Prose.	Jr., sr.	1-2
		Not given in 1917-18.		
*67	3	English Novel .....	Jr., sr.	1-2
		10 MWF	301F	Burton
*80a	3††	Teachers' Course .....	Jr., sr.	See statement
		3:30-5 TTh	206Ed	Inglis
*80b	3††	Teachers' Course .....	Jr., sr.	See statement
		3:30-5 TTh	206Ed	Inglis
*107	3	Eighteenth Century Prose.	Jr., sr., grad.	1-2 and 6 credits in courses below 10
		9 MWF	204F	Moore
*113-114	6	Drama .....	Sr., grad.	1-2, 7, and 3 credits in courses below 10
		3 MWF	206F	Firkins
*118a	2	Bible as Literature.....	Jr., sr., grad.	1-2 and 6 credits in courses below 10
		11 TTh	107F	Burton
*119-120	6	Prin. of Literary Criticism	Jr., sr., grad.	1-2 and 6 credits in courses below 10
		11 TThS	204F	Firkins
*123-124	4	Seminary in Novelists....	Sr., grad.	1-2 and 6 credits in courses below 10
		1:30-3:30 T	2F	Beach
*129	3	Modern Drama .....	Sr., grad.	1-2, 7, and 3 credits in courses below 10
		11 MWF	301F	Burton
*136	3	Advanced Shakespeare ...	Jr., sr., grad.	1-2, 7, and 3 credits in courses below 10
		10 TThS	304F	Stoll
*140	2	Advanced Chaucer .....	Jr., sr., grad.	1-2, 5a or 5b, and 3 cr. in courses below 10
		9 TTh	204F	Brown
*143b	3	Recent English Poetry....	Jr., sr., grad.	1-2 and 6 credits in courses below 10
		10 MWF	204F	Beach
*146	3	Metrical Romances .....	Jr., sr., grad.	1-2, 5a or 5b, and 3 cr. in courses below 10
		Ar Ar	Ar	Brown

† This course may be taken at the same time with English 2.

†† Carries credit only in Department of Education.

## GEOLOGY AND MINERALOGY

Professors WILLIAM H. EMMONS, CLINTON R. STAUFFER; Associate Professor FRANK F. GROUT; Assistant Professors A. WALFRED JOHNSTON, CHESSELY J. POSEY, TERENCE T. QUIRKE; Instructor THOMAS M. BRODERICK; in the General Extension Division, Assistant Professor EDWARD M. LEHNERTS.

## REQUIREMENTS OF THE DEPARTMENT

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

- 57, 58, 108, 109 in Paleontology
- 106, 131, 132, 140 in Petrology
- 112, 124, 137, 140, 144 in Economic Geology
- 106, 112, 124 in Structural Geology
- 36, 39, 116, 118 in Geography

For a *Teacher's Certificate in Geography*, eighteen credits, five of which shall be from starred courses; Course 55 required and the remaining credits from Courses 1 or 29, 30, 34, 35, 36, 39, 116, 118, and 188, with an average of at least one and one-half honor points for each credit hour.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1	3†	General Geology .....	Soph., jr., sr.	None
	8	MWF	105P	Johnston
	10	TThS	110P	Emmons
	11	MWF	110P	Johnston
	3	MWF	110P	Johnston
3	1	General Geology Lab. ....	Soph., jr., sr.	Supports 1
	Ar	Ar	112P	Johnston
4	3	Geology of Minnesota...	Soph., jr., sr.	Course 1
	11	MWF	110P	Johnston
*5	3	Economic Geology .....	Jr., sr.	1 and 6
	9	MWF	104P	Quirke
6	3†	Historical Geology .....	Soph., jr., sr.	Course 1
	8	MWF	105P	Johnston
	10	TThS	110P	Emmons
	11	TThS	105P	Quirke
	3	MWF	105P	Quirke
8	1	Historical Geology Lab....	Soph., jr., sr.	Supports 4 and 6
	Ar	Ar	112P	Johnston
10	3	Elements of Paleontology.	Soph., jr., sr.	Course 1
	10	MWF	104P	Stauffer
11	3	Paleontology .....	Jr., sr.	Course 6
	Lect. 9	M	104P	Stauffer
	Lab. 2-4	WF	104P	Stauffer
12	3	Paleontology .....	Jr., sr.	Course 11
	Lect. 9	M	104P	Stauffer
	Lab. 2-4	WF	104P	Stauffer
14	3	Applied Geol. for Civ. Eng.	Soph., jr., sr.	Course 1
	8	TThS	110P	Quirke

† Geology 1 and 6 constitute a year's course; both semesters must be completed before credit is given for the first semester.

No.	Credits	Title	Offered to	Prereq. courses
15a or 15b	1	Minerals and Rocks..... Ar Ar	Jr., sr. 100P	1 Grout
21	3	Elements of Mineralogy.. Lect. 11 TThS Lab. 8 TThS Lab. 10 TThS Lab. 2-5 W	Soph., jr., sr. 110P 100P 100P 100P	See bulletin statement Broderick Broderick Broderick Broderick
22	3	Descriptive Mineralogy.. Lect. 11 TThS Lab. 10 TThS	Soph., jr., sr. 110P 100P	21 Broderick Broderick
27a or 27b	1	Outlines of Mineralogy.. Ar Ar	Jr., sr. 100P	None Grout
29	3	General Physiography .... 10 TThS	Soph., jr., sr. 105P	None Posey
§30	3	Principles of Geography.. 10 MWF	Soph., jr., sr. 105P	None; 29 desirable Posey
34	3	Meteorology .....	Soph., jr., sr. 105P	None Posey
35	1	Laboratory work .....	Soph., jr., sr. 104P	See bulletin statement Posey
*36	3	Geog. of North America.. 10 TThS	Jr., sr., grad. 105P	1 or 29 and 3 credits from 5, 6, 30, 34, 39 Posey
37	3	Physical & Com. Geog.... 9 MWF	Fr. 204P	None Posey
*39	3	Geographic Influences.... 10 MWF	Jr., sr., grad. 105P	3 cred. from 1, 29, 30, and History 5 or its equivalent Posey
*55	3	Teachers' Course in Geog. 8 TThS	Jr., sr., grad. 105P	Any one of 36, 39, 116, or 118 Posey
*57	3	Paleontology .....	Jr., sr. 104P	6 Stauffer
*58	3	Paleontology .....	Jr., sr. 104P	57 Stauffer
*61	3	Physical Mineralogy .....	Jr., sr. Ar.P	22 Grout
*65	3	Morphology of Minerals.. Ar Ar	Jr., sr. Ar.P	22 Grout
*105	3	Elements of Rock Study. 2-4 TTh	Jr., sr., grad. 200P	See bulletin statement Grout
*106	3	Petrology .....	Jr., sr., grad. 200P	105 Grout
*108	3	Paleontologic Practice ... 2-4 MWF	Jr., sr., grad. 107P	58 Stauffer
*109	3	Advanced Paleontology .. 8-10 MWF	Jr., sr., grad. 107P	58 Stauffer
*110	3	Advanced Paleontology .. 8-10 MWF	Jr., sr., grad. 107P	109 Stauffer
*111	4	Ore Deposits .....	Sr., grad. 110P	6, 22, 105 Emmons
*112	4	Problems in Ore Deposits 2-6 W	Sr., grad. 104P	111 Emmons
*116	3	Geog. of Latin America.. 9 MWF	Jr., sr., grad. 105P	6 cred. from 1, 6, 29, 30, 34, 36, 39 Posey

No.	Credits	Title	Offered to	Prereq. courses
*124	3	Structural & Metam. Geol. 10 TThS	Sr., grad. 112P	6, 22, 105 Johnston
*131.*132	6	Advanced Petrology . . . . . Ar Ar	Jr., sr., grad. 200P	106 Grout
*137	3	Testing Econ. Minerals.. Lect. 11 MW Lab. 2-4 W	Jr., sr., grad. 200P 200P	6, 22, 105 Grout Grout
*140	3	Applied Petrology . . . . . Ar Ar	Jr., sr., grad. 200P	See bulletin statement Grout
*144	3	Construction of Geol. Maps Ar Ar	Jr., sr., grad. 112P	1, 6 Quirke
§*150	8	Field Geol. (Black Hills) Spring of 1918	Jr., sr., grad.	See members of dept. Johnston, Emmons
*151	3	Advanced General Geol.. 11 MWF	Jr., sr., grad. 104P	6 Stauffer
*152	3	Advanced General Geol.. 11 MWF	Jr., sr., grad. 104P	151 Stauffer
*160	6	Field Geology . . . . .	Jr., sr., grad.	See bulletin statement
*188	6	Field Work in Geography	Jr., sr., grad.	See bulletin statement

### GERMAN

Professor CARL SCHLENKER; Assistant Professors OSCAR C. BURKHARD, JAMES DAVIES, ALFRED E. KOENIG, SAMUEL KROESCH, WALTER R. MYERS; Instructors ELISE DEXTER, ARTHUR R. GRAVES, RICHARD JENTE, EDWIN H. ZEYDEL.

#### REQUIREMENTS OF THE DEPARTMENT

For *B.A. with Honors*, the general requirements (page 13), and fifteen credits during the junior year in courses numbered between 51 and 100, of which Courses 53-54 and 55-56 are required; eight credits during the senior year, including at least one course numbered between 101 and 200, and one course numbered above 200; and the special thesis, to be completed under the direction of the instructor in charge of the latter course.

*Teacher's Certificate in German.* For a minor recommendation, a minimum of fourteen credits; required courses are German 29-30, 31-32 and 59-60. For a major recommendation, a minimum of twenty-eight credits; required courses are German 29-30, 31-32, 53-54, 55-56 and 59-60. German 57-58 is strongly recommended. German 1 and 3 shall not be counted toward either a minor or a major recommendation. To obtain either a minor or a major recommendation the student must obtain an average of one and one-half honor points for each credit hour for all German courses taken.

For courses in Germanic Philology see the statement of the Department of Comparative Philology.

#### COURSES

a. Only students who are taking or who have taken Course 5-6 or Course 16 may elect the supplementary courses 25-26 and 27-28, either



one or both. But students electing Course 11-12 or Course 14 may elect Course 25-26. No credit will be granted for Course 25-26 or Course 27-28 if students elect them when taking or when they have taken courses numbered above 50.

b. Only students who are taking or who have taken Courses 7-8 or Course 9-10 or Course 11-12 or Course 14 or Course 21-22 or Course 23-24 may elect the supplementary courses 29-30 and 31-32, either one or both together. Students electing Course 11-12 or Course 14 or Course 21-22 should take Courses 29-30 and 31-32 only after consultation with the instructor in charge.

c. Credit for only one of the following courses will be granted: Courses 5-6, 16, 21-22.

d. Credit for only one of the following courses will be granted: Courses 7-8, 9-10, 11-12, 14, 21-22, 23-24.

e. Freshmen must complete intermediate course before credit is given for beginning course.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1a	6	Beginning .....	All	None
	8	MTWThFS	207F	†
	9	MTWThFS	207F	†
	10	MTWThFS	207F	†
	11	MTWThFS	207F	†
1b	6	Beginning .....	All	None
	9	MTWThFS	101F	†
3a	6	Intermediate .....	All	1a or 1b
	11	MTWThFS	209F	†
3b	6	Intermediate .....	All	1a or 1b
	8	MTWThFS	207F	†
	9	MTWThFS	207F	†
	10	MTWThFS	207F	†
	11	MTWThFS	207F	†
5-6	6†	Prose and Poetry.....	Fr., soph.	2 yrs. prep. German
	8	TThS	209½F	†
	9	MWF	212F	†
	10	TThS	213F	†
	10	TThS (Chemists)	204F	†
	11	TThS	110F	†
	2	MWF	213F	†
6a	3	Prose and Poetry.....	Fr., soph.	5a or 5b
	2	MWF	209F	Graves
7-8	6	Drama .....	All	5-6 or 4 yrs. prep. German
	9	TThS	212F	Burkhard
	10	MWF	212F	Schlenker
	11	TThS	212F	Kroesch
11-12	6†	Rapid Reading .....	Soph., jr., sr.	3a or 3b
	9	TThS	213F	Davies
	10	MWF	213F	Graves
§14	6	Rapid Reading .....	Soph., jr., sr.	3a or 3b
	11	MTWThFS	209F	Zeydel

† Both semesters must be completed before credit is given for either semester.

No.	Credits	Title	Offered to	Prereq. courses
§16	6	Prose and Poetry.....	All	2 yrs. prep. German
		11 MTWThFS	114F	Dexter
21-22	6†	Scientific Intermediate ...	Soph., jr.	3a or 3b
		11 TThS	213F	Graves
23-24	6†	Scientific Advanced .....	Soph., jr.	5-6 or 16 or 21-22
		10 MWF	206F	Jente
25-26	2†	Elementary Composition..	Fr., soph., jr.	See note a
		9 S	209½F	Graves
		10 S	209½F	Graves
27-28	2†	Elementary Conversation.	Fr., soph., jr.	See note a
		9 TTh	209½F	Graves
		10 TTh	209½F	Zeydel
29-30	2†	Advanced Conversation...	Soph., jr., sr.	See note b
		9 WF	209½F	Zeydel
		10 TTh	209F	Dexter
31-32	2†	Intermediate Composition.	Soph., jr., sr.	See note b
		9 M	209½F	Graves
		10 S	209F	Davies
*51	2	Faust, Part I.....	Soph., jr., sr.	7-8 or 9-10 or 11-12 or 14 or 23-24
		11 WF	209½F	Schlenker
*53	3	Survey through Classic Period .....	Soph., jr., sr.	7-8 or 9-10 or 11-12 or 14 or 23-24
		9 MWF	209F	Burkhard
		9 TThS	209F	Myers
*54	3	Survey since Classic Period .....	Soph., jr., sr.	53
		9 MWF	209F	Burkhard
		9 TThS	209F	Myers
*55-56	2†	Advanced Composition ..	Jr., sr.	31-32
		3 M	207F	Kroesch
		3 M	209F	Myers
*57-58	4	Oral Diction .....	Jr., sr.	See statement
		10 WF	209½F	Koenig
*59-60	2†	Teachers' Course .....	Jr., sr.	29-30 and 31-32 or 53-54
		4 F	209F	Schlenker
*61	2	Romantic School .....	Jr., sr.	7-8 or 9-10 or 11-12 or 14 or 23-24
		11 TTh	209½F	Schlenker
*62	2	Drama since 1880.....	Jr., sr.	2 cr. in starred courses
		11 TTh	209½F	Schlenker
§*72	2	Lessing as Dramatist....	Jr., sr.	2 cr. in starred courses
		11 WF	209½F	Schlenker
*107-108	4†	Middle High German...	Jr., sr., grad.	4 cr. in starred courses
		3 WF	207F	Kroesch
*109-110	4†	Hist. of German Language	Jr., sr., grad.	4 cr. in starred courses
		2 WF	205F	Klaeber
*119-120	4†	Drama of Schiller.....	Sr., grad.	4 cr. in starred courses
		1:15-3 Th	209½F	Myers
*127-128	4	Eighteenth and Nineteenth Century Lyric .....	Sr., grad.	4 cr. in starred courses
		1, 2 M	302F	Davies
§*137-138	4†	Aspects of Nineteenth Century Literature ....	Sr., grad.	4 cr. in starred courses
		1:15-3 W	209½F	Burkhard

No.	Credits	Title	Offered to	Prereq. courses
*225-226	4†	Literary Problems .....	Honors and grad.	
		2, 3 T	209†F	Schlenker

† Both semesters must be completed before credit is given for either semester.

## GREEK

Professors CHARLES ALBERT SAVAGE, GERTRUDE H. BEGGS.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2	10†	First Year Greek.....	Fr., soph., jr., sr.	None
		9 TWThFS	114F	Savage
3-4	6†	Anabasis-Iliad .....	Fr., soph., jr., sr.	1-2
		10 MWF	114F	Beggs
*51	3	Philosophy .....	Jr., sr.	3-4
		10 TThS	114F	Savage
*52	3	Oratory .....	Jr., sr.	3-4
		10 TThS	114F	Savage
*101	3	Lyric Poetry .....	Sr., grad.	51-52
		11 MWF	113F	Savage
*104	3	New Testament .....	Sr., grad.	51
		11 MWF	113F	Savage
<i>Courses open to all. No knowledge of Greek required.</i>				
58	1	Greek Architecture .....	Jr., sr.	None
		3 M	114F	Beggs
60	1	Sculpture .....	Jr., sr.	None
		2 M	114F	Beggs
61	2	Drama .....	Jr., sr.	None
		2 TTh	114F	Savage
62	2	Literature and Life.....	Jr., sr.	None
		2 TTh	114F	Savage
63a,b	1	Mythology .....	Jr., sr.	None
		3 Th	114F	Savage

† Both semesters must be completed before credit is given for the first semester.

## HISTORY

Professors GUY STANTON FORD,<sup>1</sup> ALBERT BEEBE WHITE, WILLIAM STEARNS DAVIS, WALLACE NOTESTEIN<sup>1</sup>; Associate Professors SOLON JUSTUS BUCK, AUGUST CHARLES KREY; Lecturers ARTHUR H. BASYE,<sup>2</sup> LESTER BURRELL SHIPPEE; Instructors LELAND H. JENKS, GEORGE M. STEPHENSON, MASON W. TYLER; Teaching Assistant WILSON PORTER SHORTRIDGE; Assistants MRS. GLADYS C. BLAKEY, ALICE H. FELT, CECIL W. SHIRK; Teaching Fellow ANNA BOUTELLE.

## REQUIREMENTS OF THE DEPARTMENT

For B.A. with Honors, see general statement (page 13).

<sup>1</sup> Absent on leave.

<sup>2</sup> First semester only.

For a *Teacher's Certificate*, eighteen credits in History, including at least three credits in intensive courses. In addition the student must take History 56-57.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2	6	Med. and Modern Europe.	All	None
	(Lecture)	1 W	Chem. Aud.	Davis
		8 TS	111L	†
		9 MF	111L	†
		9 TS	111L	†
		10 MF	3F	†
		11 MF	15F	†
		11 TS	3F	†
		3 MF	113F	†
2a-1b	6	Med. and Modern Europe.	All	None
		10 TThS	101F	†
3-4	6	English, 1066 to present..	All	None
	(Lecture)	1 M	Law Aud.	White
		9 WF	112L	†
		9 TTh	112L	†
		10 WF	112L	†
		10 TTh	112L	†
		11 WF	112L	†
		11 TTh	112L	†
		2 WF	112L	†
		3 WF	112L	†
5-6	6	American History .....	Soph., jr., sr.	6 credits
	(Lecture)	10 M	110P	Shippee
		10 WF	110P	†
		10 ThS	5F	†
		11 WF	3F	†
10	3	Europe in 19th Century...	Soph., jr., sr.	6 credits
		11 TThS	114F	Tyler
14	3	Renaissance and Reform'n.	Soph., jr., sr.	6 credits
		9 MWF	3F	Krey
15	3	Military History .....	See note†	
		10 TThS	3F	Davis
*21	3	Outlines of Greek History.	Jr., sr.	9 credits
		3 MWF	3F	Davis
*22	3	Outlines of Roman History	Jr., sr.	9 credits
		10 MWF	111L	Davis
*56-57	3	Teachers' Course .....	Jr., sr.	See bulletin
		4 MW	111L	Krey
§*62	3	Recent American History.	Jr., sr.	9 credits (inc. 5-6)
		3 MWF	5F	Shippee
*101	3	French Revolution .....	Jr., sr., grad.	9 credits
		11 MWF	111L	Ford
*102	3	National Movements since 1848 .....	Jr., sr., grad.	9 credits
		11 MWF	111L	Tyler

† Note: Course No. 15 open without prerequisites to students enrolled for the Officers' Reserve Course. Open to juniors and seniors who have had History 1-2 or 3-4.

No. Credits	Title	Offered to	Prereq. courses
*104 3	The Near East..... 10 TThS	Jr., sr., grad. 111L	9 credits Davis
*133-134 6	Ancient Civilization..... 11 TThS	Jr., sr., grad. 111L	See bulletin Davis
*137 3	English Constitutional Hist. 4-5:30 TTh	Jr., sr., grad. 218bL	9 credits White
*141 3	West in American History. 3 MWF	Jr., sr., grad. 218bL	9 credits (inc. 5-6) Buck
*144 3	History of Minnesota..... 3 MWF	Jr., sr., grad. 218bL	9 credits (inc. 5-6) Buck
§*155 3	American Economic and Social History 1860-76.. 2-3:30 TTh	Sr., grad. 112L	12 credits (inc. 5-6) Shippee
*159-160 6	Diplomatic History of Eu- rope since 1815..... 2-3:30 TTh	Sr., grad. 218bL	12 credits Tyler
*162 3	Beginnings of Parliament. 4-5:30 TTh	Jr., sr., grad. 218bL	See bulletin White
*183 3	Stuart Period..... 4-5:30 WF	Sr., grad. 218bL	See bulletin statement Notestein
*191 3	Age of the Crusades..... 1:30-3 TTh	Sr., grad. 218bL	See bulletin statement Krey

HOME ECONOMICS

COLLEGE OF AGRICULTURE

Professor JOSEPHINE T. BERRY;<sup>1</sup> Assistant Professors MILDRED WEIGLEY, HARRIET GOLDSTEIN, AMY P. MORSE, STELLA PALMER, ETHEL RONZONE, FRANCES V. WARD, MARION WELLER, GRACE I. WILLIAMS;<sup>1</sup> Instructors HALLY FISHER, VETTA GOLDSTEIN, ETHEL L. PHELPS, ELIZABETH VERMLY; Lecturer MARTHA B. MOORHEAD.

COURSES

No. Credits	Title	Offered to	Prereq. courses
1a or 1b 2	Textiles..... 8:00-9:40 MW 8:00-9:40 TTh 2:00-3:40 MF	All 307, 211He 307, 211He 307, 211He	None Ronzone Phelps Ronzone
11a or 11b 3	Garment Making..... 8:00-9:40 MWF 8:00-9:40 TThS 2:00-4:30 TTh	All 304He 305He 304He	None Phelps Ronzone Phelps
13a or 13b 3	Dressmaking..... 9:50-11:30 MWF 9:50-11:30 TThS 2:00-4:30 MF	Soph., jr., sr. 304He 304He 304He	1, 11 Phelps Ronzone Phelps
21a 3	Foods and Cookery..... 2:00-4:30 MF	Soph., jr., sr. 209, 309He	Chem. 3, or equiv.; 1 entrance unit Do mestic Sci.; Physi ology 3 parallel Ward
22a 3	Food Economics..... 2:00-4:30 MF	Soph., jr., sr. 207, 205He	21 or 23 Weigley

<sup>1</sup> On leave of absence 1917-18.

No. Credits	Title	Offered to	Prereq. courses
22b 3	Food Economics .....	Soph., jr., sr.	21 or 23
	2:00-4:30 TTh	209, 205, 309He	Ward
	2:00-4:30 TTh	207, 205, 309He	Palmer
	9:50-11:30 MWF	209, 205, 309He	Ward
	9:50-11:30 TThS	207, 205, 309He	Ward
23a or 23b 5	Foods and Cookery.....	Soph., jr., sr.	Chem. 3, or equiv.; Physiol. 3 parallel
	2:00-4:30 MWF	203, 207He	Palmer
33 1	Home Care of the Sick..	Jr.	Chem. 3, 7, or 21; Bacteriol. 58
	8:00-8:55 T	203He	Moorhead
	8:00-8:55	*NW WH	Fisher
51a or 51b 3	Drawing and Design....	All	None
	8:00-9:40 MWF	313He	V. Goldstein
	8:00-9:40 TThS	311He	V. Goldstein
	2:00-4:30 MF	311He	V. Goldstein
53a or 53b 3	Advanced Design .....	Soph., jr., sr.	51
	9:50-11:30 MWF	313He	Morse
	2:00-4:30 MF	313He	H. Goldstein
	2:00-4:30 TTh	313He	H. Goldstein

\* New Wing, Women's Hall.

## HUMAN ANATOMY

### THE MEDICAL SCHOOL

Professors CLARENCE M. JACKSON, JOHN B. JOHNSTON, THOMAS G. LEE,  
RICHARD E. SCAMMON; Associate Professor CHARLES A. ERDMANN;  
Instructors JAY A. MYERS, ANDREW T. RASMUSSEN.

### COURSES

No. Credits	Title	Offered to	Prereq. courses
3-4 10	Gross Human Anatomy.....	Soph., jr., sr.	An. Biol. 1-2
	Lab. 8, 9, 10, 11 TThS	304-308IA	Jackson, et al.
	Lect. I MW	304IA	Jackson
*101 5	Human Histology .....	Jr., sr., grad.	An. Biol. 7-8
	Lab. 8, 9, 10 MWF	106-108IA	Scammon, et al.
	Lect. II WF	102IA	Scammon
*102 3	Human Embryology .....	Jr., sr., grad.	An. Biol. 7-8
	Lect. II MW	102IA	Scammon
	Quiz. 3 Th	106-108IA	Lee, et al.
*103 3	Human Neurology .....	Sr., grad.	Anat. 101 and 102, or An. Biol. 7-8 or 19-20
	Lab. 8, 9, 10 ThS	108-214-215IA	Johnston, Rasmussen, et al.
	111a,b 3 Anatomical Technique .....	Soph., jr., sr.	Histology or Embryol.
*114 3	1, 2, 3 TS	113IA	Lee
	Topographic Anatomy .....	Sr., grad.	3-4
*115 3	Lab. 1, 2, 3 TTh	313IA	Jackson
	Fetal Anatomy .....	Sr., grad.	3-4 and 102 or An. Biol. 137
	Lab. Ar. TTh	20IA	Scammon

NOTE: Since the number of students in anatomy Courses Nos. 3-4, 101, and 102 is limited, students will not be permitted to register for these courses without written permission by the head of the department.

## HUMAN PHYSIOLOGY

## THE MEDICAL SCHOOL

Professor ELIAS P. LYON; Associate Professors RICHARD OLDING BEARD, FREDERICK H. SCOTT; Assistant Professors JOHN F. MCCLENDON, M. RUSSELL WILCOX; Instructors CHAUNCEY J. V. PETTIBONE; Assistant ALBERT M. SNELL.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
3a,b	3†	Elem. Human Physiology. 1:30-4 T 1:30-5 Th	Soph., jr., sr. 214MH	1 yr. Chem., half yr. Biol. Beard, or Lyon, et al.
4	3†	Elementary Physiology .. 9-10 T 9-12 Th 9-10 S	Soph., jr., sr. 214, 301MH	Elem. Chem. and Biol. or Anat. Beard or Lyon, et al.
6	3	Elem. Physiol. Chemistry. 10-12 T 10-12 S	Soph., jr., sr. 214, 310MH	Elem. Chem. and Biol. or Anat. Pettibone, et al.
*102	5	Physiologic Chemistry ... 8-11 MW 8-12 F	Jr., sr., grad. 214, 310MH	Organic Chem. Pettibone, et al.
*103	4	Physiol. Muscle, etc..... 1-3 M 1-4:30 W 1-3:30 F	Jr., sr., grad. 214, 301MH	An. Biol. 1-2 and 7-8 or Anat. 101 Scott, et al.
*104	4	Physiol. Nerv. Sys., etc... 1-3 M 1-4 W 1-4 F	Jr., sr., grad. 214, 301MH	An. Biol. 1-2 and 7-8 or Anat. 101 Lyon, et al.
*111	3	Physical Chem. of Cells.. 2-5 TTh	Jr., sr., grad. 303MH	Organ. Chem. and An. Biol. 1-2 McClendon
*112	3	Electro-Physiology .....	Jr., sr., grad. 303MH	Organ. Chem. and An. Biol. 1-2 McClendon
*113-114	3†	Problems in Physiology.. 1-4 TTh or Ar.	Jr., sr., grad. 301MH	Physiol. 103 Lyon, Scott, or McClendon
*115-116	1½	Conference .....	Jr., sr., grad. 315MH	Physiol. 102, 103, 104 Lyon or Scott
*131	1½	Physiology of the Blood.. 2-5 TTh	Jr., sr., grad. 301MH	Physiol. 102, 103, 104 Scott
*132	¾ or 1½	Physiol. of Circulation.... 2-5 TTh	Jr., sr., grad. 301MH	Physiol. 102, 103, 104 Scott
*137a,b	2	Foods and Pract. Dietetics 2:30-5 Th	Jr., sr. 116MH&UH	Physiol. 3 or equivalent Beard
*138	2	Physiol. of Development. 2:30-3:30 TTh	Jr., sr. 116MH&UH	Physiol. 3 or equivalent Beard
*151-152	6	Physiologic Chemistry ... 1-4 TTh	Jr., sr., grad. 315, 310MH	Organic Chem. Kingsbury, et al.
*153-154	6	Adv. Physiol. Chem..... Ar Ar	Jr., sr., grad. Ar	Physiol. 102 Pettibone or Kingsbury

† Students may not receive credit for any two of Courses 3 and 4.

‡ Or more.

No.	Credits	Title	Offered to	Prereq. courses
*161	1½	Urinalysis .....	Jr., sr., grad.	Physiol. Chem.
		1-4 TTh	310MH	Pettibone, 1st qr.
*163	¾ or 1½	Metabolism .....	Jr., sr., grad.	Physiol. Chem.
		1-4 TTh	310MH	Pettibone, 1st qr.
*164	3	Quantitative Methods ...	Jr., sr., grad.	Physiol. Chem.
		Ar Ar	310MH	Kingsbury

For a full list of courses offered by the department, see the bulletin of the Medical School.

## JOURNALISM

### COLLEGE OF AGRICULTURE

Associate Professor WILLIAM P. KIRKWOOD; Assistant Professor PHIL C. BING.

### COURSES

#### Introductory Courses†

13-14	6	Reporting .....	Soph., jr., sr.	Rhet. 1 yr.
		Ar Ar	200Ad	Bing
7	3	Editorial Administration .....	Sr.	4
		8 MWF	317Ad	Kirkwood
16	3	Copy Reading .....	Jr., sr.	13-14 or parallel
		Ar Ar	200Ad	Bing

† All classes meet in Administration building of the Agricultural College.

## LATIN

Professors JOSEPH B. PIKE, JOHN E. GRANRUD.

### REQUIREMENTS OF THE DEPARTMENT

For a *Teacher's Minor Recommendation*, Courses 5, 6, 57, 58, and 101; for a *Major Recommendation*, these same courses with the addition of Course 102, with an average of at least one and one-half honor points per credit hour.

For *B.A. with Honors*, the general requirements (page 13) and a fair reading knowledge of German or French or Greek. Six credits in Latin a semester during the junior and senior years are to be selected from Courses 57 to 204. (Students who do not desire a recommendation for teaching Latin may, by selecting courses that are given in alternate years, secure enough work for the honors course without being obliged to take Course 101 or 102.) Instead of taking all the work indicated above in Latin, the student may substitute six credits in Greek (third-year Greek or above), or six credits in Greek or Roman History, or six credits in ancient Philosophy.



## COURSES

No.	Credits	Title	Offered to	Prereq. courses
§1	6	Beginning Latin .....	All	None
		9 MTWThFS	107F	¶
§2	6	Selections from Caesar†..	All	1
		9 MTWThFS	107F	¶
3	3	Select. from Latin Authors	All	1-2 or 2 or 3 years prep. Latin
		10 MWF	109F	¶
4	3	Select. from Latin Authors‡	All	1-2 or 2 or 3 yrs. prep. Latin
		10 MWF	109F	¶
5	3	Livy .....	All	3-4 or 4 yrs. prep. Latin
		10 TThS	109F	¶
6	3	Plautus and Terence††...	All	3-4 or 4 yrs. prep. Latin
		10 TThS	109F	¶
*57	3	Horace .....	Soph., jr., sr.	6
		9 MWF	109F	Pike
*58	3	Pliny .....	Soph., jr., sr.	57
		9 MWF	109F	Pike
*101	3	Advanced Caesar .....	Jr., sr.	58
		9 TThS	109F	Pike
*102	3	Advanced Virgil .....	Jr., sr.	101
		9 TThS	109F	Pike
*105	3	Roman Elegy .....	Jr., sr., grad.	58
		10 MWF	107F	Granrud
*108	3	Tacitus .....	Jr., sr., grad.	58
		10 MWF	107F	Granrud
	9	Roman Architecture .....	Jr., sr.	None
		11 S	107F	Granrud
	10	Roman Art .....	Jr., sr.	None
		11 S	107F	Granrud
*201-202	6	Lucretius .....	Grad. & honor	Consult department
		3, 4, 5 T	109F	Pike
§*205-206	6	Roman Comedy .....	Grad. & honor	Consult department
		3, 4, 5 Th	107F	Granrud

† Students entering at midyear with one year of Latin may take Course 2.

‡ Students entering at midyear with two or three years of Latin may take Course 4.

†† Students entering at midyear with four years of Latin may take Course 6.

## MATHEMATICS

Professors GEORGE N. BAUER, FRANCIS P. LEAVENWORTH; Associate Professors WILLIAM H. BUSSEY, ROYAL R. SHUMWAY; Assistant Professors HERMON L. SLOBIN, ANTHONY L. UNDERHILL,<sup>1</sup> WILLIAM D. REEVE; Instructors RALPH M. BARTON, RAYMOND W. BRINK; Assistants ELLA THORP, VERA L. WRIGHT.

## REQUIREMENTS OF THE DEPARTMENT

For *B.A. with Honors*, the general requirements, (page 13). In junior and senior years any courses above 50 may be presented, except

<sup>1</sup> Absent on leave.

Course 54. Astronomy 101-102, Physics 121-122, and with the consent of the Department of Mathematics, other courses in Astronomy and Physics open only to juniors and seniors may be presented.

For a *Teacher's Certificate*, an average of at least one and one-half honor points per credit hour through Course 51; Course 54; and an average of at least one honor point per credit hour in all other courses taken in the department. Course 6 must be included if not offered for admission.

## COURSES

Year courses for freshmen and sophomores. Course 1-2 is a year course open to students who presented for entrance one unit of Elementary Algebra. Course 3a-4b and Course 5-9b are two alternative year-courses open to those who presented for entrance one unit of Elementary Algebra and one-half unit of Higher Algebra. Students who intend to specialize in Mathematics are advised to take Course 5-9b. Course 9a-11b is a year course for sophomores who had Course 1-2 or Course 3a-4b in the freshman year. Course 11a-51b is a year-course for sophomores who had Course 5-9b in the freshman year.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2	10	Algebra I, II, and Pl. Trig...	Fr., soph.	Elem. Algebra
		8 TWThFS	125F	¶
		9 TWThFS	125F	¶
		11 TWThFS	104F	¶
		2 MTWThF	104F	¶
1b	5	Algebra I .....	Fr., soph.	Elem. Algebra
		8 TWThFS	105F	¶
3a	3	Algebra II .....	Fr., soph.	Prep. Higher Algebra
		10 MWF	104F	¶
		10 TThS	104F	¶
		2 MWF	101F	¶
3b	3	Algebra II .....	Fr., soph.	Prep. Higher Algebra
		8 TThS	104F	¶
		3 MWF	104F	¶
4a	3	Trigonometry .....	Fr., soph.	3
		8 TThS	104F	¶
4b	3	Trigonometry .....	Fr., soph.	3
		10 MWF	104F	¶
		10 TThS	104F	¶
		2 MWF	105F	¶
§5	5	Algebra II and Pl. Trig.....	Fr., soph.	Prep. Higher Algebra
		9 TWThFS	104F	¶
		10 TWThFS	105F	¶
6	2	Solid Geometry .....	Soph., jr., sr.	1-2 or 3-4 or 5-9 who have not had Solid Geometry
		11 WF	101F	Bussey
9a	5	Pl. & Sol. Anal. Geom. ....	Soph., jr., sr.	2 or 4 or 5
		9 TWThFS	101F	Slobin
		2 MTWThF	102F	Brink

No.	Credits	Title	Offered to	Prereq. courses
9b	5	Pl. & Sol. Anal. Geom.....	Fr., soph., jr., sr.	2 or 4 or 5
		9 TWThFS	104F	Bussey
		10 TWThFS	105F	Barton
11a	3	Differential Calculus .....	Soph., jr., sr.	7 or 9
		11 TThS	102F	Barton
11b	3	Differential Calculus .....	Soph., jr., sr.	7 or 9
		9 TThS	102F	Bauer
		2 MWF	102F	Brink
51a	3	Integral Calculus .....	Soph., jr., sr.	11
		11 TThS	101F	Bauer
51b	3	Integral Calculus .....	Soph., jr., sr.	11
		11 TThS	105F	Slobin
*54a	2	Teachers' Course .....	Jr., sr.	11
		3 TTh	115Ed	Reeve
*54b	2	Teachers' Course .....	Jr., sr.	11
		3 TTh	115Ed	Reeve
*62	3	Theory of Equations.....	Jr., sr.	11
		2 MWF	125F	Bussey
*71	3	Solid Anal. Geom.....	Jr., sr.	11
		9 MWF	102F	Underhill
*102	3	Adv. Pl. Anal. Geom.....	Jr., sr., grad.	11
		9 MWF	102F	Shumway
*107	3	Adv. Differential Calculus.....	Jr., sr., grad.	51
		11 MWF	102F	Bussey

Any of the following courses for which a sufficient number of students apply will be given in 1917-18:

No.	Credits	Title	Offered to	Prereq. courses
106a or 106b	3	Differential Equations..	Sr., grad.	51 Slobin
119a or 119b	3	Modern Higher Algebra	Sr., grad.	51, 62
127a or 127b	3	Infinite Series .....	Sr., grad.	17 cr. besides Alg. & Trig.
140	2	Meth. of Least Squares	Sr., grad.	51

MILITARY SCIENCE AND TACTICS

Professor STARKEY Y. BRITT (Commandant); Instructors RAY CUNNINGHAM (Assistant Commandant), JOSEPH HAVLICEK.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2	None	Military Drill .....	Fr.	None
		2, 3, 4 Th	A	Captain Britt
3-4	None	Military Drill .....	Soph.	1 year's drill
		2, 3, 4 T	A	Captain Britt
5-6	6	Military Drill and Science....	Jr.	2 years' drill
		2, 3, 4 Th or F	A	Captain Britt
7-8	6	Adv. Military Drill & Science:	Sr.	2 years' drill
		Ar MWF or	A	Captain Britt
		TThS		

## MUSIC

Professor CARLYLE SCOTT; Assistant Professor DONALD FERGUSON; Instructors MAXIMILIAN DICK, GERTRUDE HULL, GERTRUDE REEVES; Special Instructor THADDEUS GIDDINGS.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2	6	Harmony .....	Jr., sr.	None
		11 MWF	Mu	Scott
		11 TThS	Mu	Scott
3-4	4	Counterpoint .....	Jr., sr.	Harmony .....
		11 TTh	Mu	Ferguson
5-6	4	Composition .....	Jr., sr.	.....
		Ar Ar	Mu	Ferguson
7-8	2	Analysis .....	Jr., sr.	Harmony
		12 W	Mu	Scott
9-10	6	History of Music.....	Soph., jr., sr.	None
		9 MWF	Mu	Ferguson
11-12	2	Appreciation of Music.....	Jr., sr.	None
		1 M	Mu	Reeves
13-14	4	Bach-Beethoven .....	Jr., sr.	None
		1, 2 Th	Mu	Ferguson
15-16	4 or 8	Pianoforte .....	Jr., sr.	.....
		Ar Ar	Mu	Scott, Ferguson, Reeves
19-20	4 or 8	Violin .....	Jr., sr.	.....
		Ar Ar	Mu	Dick
21-22	4	Voice .....	Jr., sr.	.....
		Ar Ar	Mu	Hull
27-28	6	Public School Music.....	Jr., sr.	.....
		4, 5 WF	Ed	Giddings
29-30	6	Normal Piano .....	Jr., sr.	.....
		3 TF	Mu	Reeves
31-32	4	Ensemble .....	Jr., sr.	.....
		12 F	Mu	Dick
33-34	2	Ear Training .....	Jr., sr.	None
		2 Th	Mu	Reeves
35-36	2	Orchestra .....	Soph., jr., sr.	.....
		7:30 M	ME	Ferguson
§37-38	6	Advanced Normal Piano.....	Sr., grad.	29-30
		4 TF	Mu	Reeves
§39-40	6	Adv. Public School Music...	Sr., grad.	27-28
		4, 5 WF	Mu	¶

## PHILOSOPHY

Professors NORMAN WILDE, DAVID F. SWENSON; Assistant Professor RUFERT C. LODGE.

## REQUIREMENTS OF THE DEPARTMENT

For *B.A. with Honors*, besides the general requirements, twenty-four credits in starred courses, including one of the following: 124, 125, 136, 138, 141-142.

Six credits in Psychology 1-2 will be accepted as prerequisites in Philosophy, except where otherwise stated.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1	3†	Problems of Philosophy...	Soph., jr., sr.	None
		9 MWF	322F	Swenson
		11 TThS	322F	Lodge
2	3†	Logic .....	Soph., jr., sr.	None
		9 MWF	322F	Swenson
		11 TThS	322F	Lodge
3a	3†	Ethics .....	Soph., jr., sr.	None
		10 TThS	322F	Wilde
3b	3†	Ethics .....	Soph., jr., sr.	None
		9 MWF	304F	Wilde
*20	3	Present Day Philosophy..	Jr., sr.	6 credits
		10 TThS	322F	Wilde
*55	3	Esthetics .....	Jr., sr.	6 credits
		8 TThS	322F	Swenson
*63	3	Development of Religion..	Jr., sr.	6 credits
		9 TThS	322F	Swenson
*64	3	Philosophy of Religion....	Jr., sr.	6 credits
		9 TThS	322F	Swenson
‡*100	3	Critical Idealism .....	Jr., sr., grad.	6 credits in Phil.
		11 MWF	311F	Lodge
*117	3	Advanced Ethics .....	Jr., sr., grad.	6 credits incl. 3
		10 MWF	322F	Wilde
*121-122	6	General History of Philos.	Jr., sr., grad.	6 credits
		11 MWF	322F	Wilde
*124	3	19th Century Philosophy..	Jr., sr., grad.	9 credits incl. 6 in Phil.
		Ar Ar	316F	Lodge
*125	3	Plato .....	Jr., sr., grad.	9 credits incl. 6 in Phil.
		Ar Ar	316F	Lodge
‡*133	3	Ancient Phil. Theories of the State .....	Jr., sr., grad.	6 credits in Phil. or Political Science
		2 MWF	322F	Lodge
*136	3	Scandinavian Philosophy...	Jr., sr., grad.	9 credits
		4-5:30 WF	322F	Swenson
‡*138	3	Advanced Logic .....	Jr., sr., grad.	9 credits incl. 2
		10 MWF	322F	Swenson
*141-142	6	Seminar in Philosophy....	Sr., grad.	12 credits in Phil.

† 1 and 2 or 3 may be combined as a year course.

## PHYSICAL EDUCATION

## FOR MEN

Director LOUIS J. COOKE; Assistant Director WILLIAM K. FOSTER; Instructor JOHN C. WEST.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1	None	Personal Hygiene .....	Fr.	None
		2 MF	201A	Cooke
		3 MF	201A	Cooke
		11 TS	201A	Cooke
		11 WF	201A	Cooke

No. Credits	Title	Offered to	Prereq. courses
3-4	None	Gymnasium	Fr. None
	2	MF	100A Foster-West
	3	MF	100A Foster-West
	11	TS	100A Foster-West
	11	WF	100A Foster-West
5-6	None	Intermediate Gymnastics	Fr. None
	2	MF	100A Foster-West
	3	MF	100A Foster-West
	11	TS	100A Foster-West
	11	WF	100A Foster-West
7-8	2†	Advanced Leaders	Soph., jr., sr. 1, 3-4, 5-6
	2	MF	100A Foster-West
	3	MF	100A Foster-West
	11	TS	100A Foster-West
	11	WF	100A Foster-West
9-10	None	Corrective Gymnastics	All None
	Ar	Ar	100A Ohnstad
11-12	None	Wrestling	Soph., jr., sr. None
	5	MWF	106A Foster-Ohnstad
13-14	None	Advanced Gymnastics	Soph., jr., sr. None
	Ar	Ar	West-Foster
15-16	None	Intermediate Swimming	All None
	Ar	Ar	Ohnstad
17-18	None	Advanced Swimming	All 15-16
	Ar	Ar	Foster-Ohnstad

† Both semesters must be completed before credit is given for the first semester.

## PHYSICAL EDUCATION

### FOR WOMEN

Associate Professor J. ANNA NORRIS; Instructors LILLIAN HANSEN, MAY S. KISSOCK,<sup>1</sup> VALERIA G. LADD, GERTRUDE B. SCHILL, ALICE H. TOLG.

Six credits the maximum number that can be gained by taking courses in exercise (Courses 3-4, 5-6); only one of these courses may be taken for credit in a semester.

### COURSES

No. Credits	Title	Offered to	Prereq. courses
1-2	None	Elem. Physical Training	Required of all new students None
	10	TThS	3, 151, 153WGm ¶
	11	MWF	3, 151, 153WGm ¶
	11	TThS	3, 151, 153WGm ¶
	3	MWF	3, 151, 153WGm ¶
3-4	3	Intermediate Phys. Training	Soph., jr., sr. Equivalent of 1-2
	3	TTh	153WGm Schill
		One other hour to be arranged	
5-6	3	Advanced Phys. Training	Jr., sr. 3-4, permission of director
	4	TTh	153WGm Ladd
		One other hour to be arranged	

<sup>1</sup> On leave of absence 1917-18.

No. Credits	Title	Offered to	Prereq. courses
11	None Preliminary Hygiene .....	Required of all new students	None
	12 M	201WGm	¶
	2 T	201WGm	¶
	11 W	201WGm	¶
	8 S	201WGm	¶
13	3 Personal Hygiene .....	Soph., jr., sr.	An. Biol. 1-2
	9 TThS	201WGm	Norris
14	3 Hygiene of the Family.....	Jr., sr.	13
	9 TThS	201WGm	Norris
15-16	6 Principles of Phys. Educ....	Sr.	1-2, 3-4, 21-22, 31-32, 33-34
	Lect. 10 MWF	201WGm	Ladd, Schill, Tolg
	Lab. 2 MWF	3, 151, 153WGm	Ladd, Schill, Tolg
21-22	None Elem. Dancing .....	All	None
	4 MWF	153WGm	Ladd
31-32	None Folk Dancing & Org. Games	All	None
	10 WF	151WGm	Ladd, Schill
	2 TTh	151WGm	Ladd, Schill
33-34	None Hockey, Basket, & Base Ball	All	Permission of director
	4 MW	151WGm	Schill
	4 TTh	151WGm	Schill
43-44	None Elementary Swimming .....	Required of soph. who need instr. in swimming	None
	2 MF	51WGm	Hansen
	2 TTh	51WGm	Hansen
	3 MF	51WGm	Hansen
	3 TTh	51WGm	Hansen
	4 MF	51WGm	Hansen

The natatorium will be open and instruction will be given to beginners or advanced students at 2:30 MTThF, 3:30 MTThF, 4:30 MThF. General swimming (without instruction) at 12 TTh and 5 MW.

Roller skating at 1:00 MWF.

## PHYSICS

Professors HENRY A. ERICKSON, ANTHONY ZELENY; Associate Professor LOUIS W. MCKEEHAN;<sup>1</sup> Assistant Professor JOHN T. TATE;<sup>1</sup> Instructors ERNEST O. DIETERICH, PAUL E. KLOPSTEG,<sup>1</sup> LOUALLEN F. MILLER; Teaching Fellow JOHN G. FRAYNE.

### REQUIREMENTS OF THE DEPARTMENT

For *B.A. with Honors*, the general requirements (page 13); work chosen from any courses above 40, except 90; and any course in mathematics open only to juniors and seniors if approved by the department. Mathematics 106, 107, 108, 140 have already been thus approved. Thesis in connection with any course in Physics above 150.

For a *Teacher's Certificate*, fourteen credits, including Course 90.

<sup>1</sup> Absent on leave.

Courses 21, 22, 31, 42, 44, 161, 52, 54, with prerequisites in mathematics comprise a three-year course in Physics beginning with the freshman year. It is designed to meet the needs of those who intend to take up the teaching of Physics or who are planning to enter the field of industrial research. It is recommended to those students desiring honors in Physics. Students who have completed courses 1, 2, 3, 4, or Courses 7, 8, 9, 10, may continue with the second year of this course after conference with the department.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1	3	General Physics .....	Soph., jr., sr.	Math. 2 or 4 or reg. in Math. 2 or 4
		1 M	30Ph	Zeleny
		8 TTh	17Ph	Klopsteg
		9 TTh	17Ph	Zeleny
		10 TTh	17Ph	Zeleny
		11 TTh	17Ph	Klopsteg
		11 WF	17Ph	Klopsteg
2	3	General Physics .....	Soph., jr., sr.	1 or 4
		1 M	30Ph	Zeleny
		8 TTh	17Ph	Zeleny
		9 TTh	17Ph	Zeleny
		10 TTh	17Ph	Zeleny
		11 TTh	17Ph	Zeleny
		11 WF	17Ph	Zeleny
3	1	General Lab. Practice.....	Soph., jr., sr.	Registration in 1
		Ar Ar	23Ph	Ar
4	1	General Lab. Practice.....	Soph., jr., sr.	See statement
		Ar Ar	23Ph	Ar
7	4	General Physics .....	Soph., jr., sr.	Math. 2 or 4, see statement
		1 F	30Ph	Erikson
		8 MWF	17Ph	Tate
8	4	General Physics .....	Soph., jr., sr.	7, see statement
		1 F	30Ph	Erikson
		9 MWF	17Ph	Erikson
9	1	General Lab. Practice.....	Soph., jr., sr.	See statement
		Ar Ar	23Ph	Ar
10	1	General Lab. Practice.....	Soph., jr., sr.	See statement
		Ar Ar	23Ph	Ar
21	3	Elements of Mechanics....	Fr., soph.	High School Physics, Math. 2 or 4 or reg. in Math. 2 or 4
		Lect. Ar Ar	Ar	Tate
		Lab. Ar Ar	16Ph	Tate
22	3	Elements of Mechanics...	Fr., soph.	21, Math. 9 or reg. in Math. 9b
		Lect. Ar Ar	Ar	Miller
		Lab. Ar Ar	16Ph	Miller
31	3	Acoustics .....	Soph., jr., sr.	See statement
		9 TThS	30Ph	Erikson
42	3	Heat .....	Soph., jr., sr.	2, 8, or 22, Math. 2 or 4
		Ar Ar	Ar	Miller



Offered to	Prereq. courses	No. Credits	Title
44	1 Experiments in Heat..... Ar Ar	Soph., jr., sr. Ar	Registration in 42 Miller
52	3 Light ..... Not given in 1917-18.	Soph., jr., sr.	2, 8, or 22, Math. 2 or 4
54	1 Experiments in Light..... Not given in 1917-18.	Soph., jr., sr.	Reg. in 52
81	2 Physical Manipulation and Laboratory Technique .. Not given in 1917-18.	Soph., jr., sr.	2 & 4, 8 & 10, or 22
82	2 Physical Instruments of Precision ..... Not given in 1917-18.	Soph., jr., sr.	81
*90	2 Teachers' Course ..... Ar Ar	Sr. Ar	2 & 4, 8 & 10, or 2 years of physics Zeleny
*121-122	6 Dynamics ..... Not given in 1917-18.	Jr., sr., grad.	2 or 8 or (22) and Math. 51
*155	3 Spectrometry ..... Ar Ar	Jr., sr., grad. 4Ph	52 and 82 Erikson
*161	4 Electricity and Magnetism. Ar Ar	Jr., sr., grad. Ar.Ph	2 & 4, 8 & 10, or 22, Math. 51 Zeleny
*162	3 Electrical Measurements .. Ar Ar	Jr., sr., grad. Ar	161, 2 & 4, or 8 & 10 Zeleny
*163	2 Electrical Measurements .. 3, 4 MW 10, 11 TTh	Jr., sr., grad. 31Ph 31Ph	161, 2 & 4, or 8 & 10 Zeleny Zeleny
*166	3 Elec. Meas. of Precision... 3, 4, 5 MF	Jr., sr., grad. 31Ph	162 or 163 Zeleny
*174	3 Radioactivity and Roentgen Rays ..... Not given in 1917-18.	Sr., grad.	2 and 4
*177	3 Radioactivity ..... Not given in 1917-18.	Sr., grad.	8 cred. in Physics and Math. 11
*178	3 Radioact. Measurements .. Not given in 1917-18.	Sr., grad.	177
*181	3 Adv. Phys. Measurements.. 2, 3, 4 MW	Sr., grad. Ar	82 or 155 or 166 or 178 Ar
*182	3 Adv. Phys. Measurements. 2, 3, 4 MW	Sr., grad. Ar	181 Ar
*191a	3 Elem. Phys. Investigation. 2, 3, 4 MW	Sr., grad. Ar	82 or 155 or 166 or 178 Ar
*192a	3 Elem. Phys. Investigation. 2, 3 MWF	Sr., grad. Ar	82 or 155 or 166 or 178 Ar
*191b	3 Elem. Phys. Investigation. 2, 3 MWF	Sr., grad. Ar	191 Ar
*192b	3 Elem. Phys. Investigation. 2, 3, 4 MW	Sr., grad. Ar	191 Ar

## POLITICAL SCIENCE

Professors JEREMIAH S. YOUNG, CEPHAS D. ALLIN; Assistant Professor  
WILLIAM ANDERSON; Instructor PERCIVAL W. VIESSELMAN.<sup>1</sup>

<sup>1</sup> Second semester only.

## REQUIREMENTS OF THE DEPARTMENT

For B.A. with Honors, see general requirements (page 13).

For a Teacher's Certificate in Government, Courses 1, 6, and 7 in Political Science and eighteen credits in History.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1a	3	American Government .....	Soph., jr., sr.	None
		9 MWF	109MA	Swenson
		9 TThS	102MA	Ar
		10 MWF	209MA	Anderson
		11 TThS	202MA	Young
		11 MWF	109MA	Anderson
		2 MWF	102MA	Young
1b	3	American Government .....	Soph., jr., sr.	None
		9 TThS	109MA	Anderson
		10 MWF	202MA	Anderson
<i>General Courses</i>				
3	3	Comparative Government .....	Soph., jr., sr.	1
		10 TThS	102MA	Anderson
5	3	European Municipal Admin....	Soph., jr., sr.	1
		11 MWF	213MA	Ar
6	3	American Municipal Admin...	Soph., jr., sr.	1
		11 MWF	109MA	Anderson
7a	3	State and Local Government..	Soph., jr., sr.	1
		9 TThS	109MA	Anderson
7b	3	State and Local Government..	Soph., jr., sr.	1
		11 TThS	202MA	Young
		2 MWF	202MA	Anderson
*51	3	Business Law, I.....	Jr., sr.	6 cred. in Pol. Sci., or 6 in Econ., or 3 in each
		9 MWF	202MA	Young
*52	3	Business Law, II.....	Jr., sr.	51
		9 MWF	202MA	Young
<i>Special Courses</i>				
25	3	American Govt. (Eng.).....	Jr., sr.	None
		11 TThS	Ar	
26	3	Business Law (Eng.).....	Jr., sr.	25 or 1 Viesselman
		8 TThS	Ar	
28	3	Business Law (Agr.).....	Jr., sr.	1, or 6 cr. in Economics Viesselman
		1 MWF	Ar	
*56-57	3	Teachers' Course .....	Jr., sr.	See statement
		4 MW	111L	Young
<i>Advanced Courses</i>				
*105	3	Comparative Administration....	Jr., sr., grad.	6 credits
		10 MWF	102MA	Young
*106	3	Legislative Power and Methods	Jr., sr., grad.	6 credits
		10 MWF	102MA	Young
*108	3	Police Power .....	Jr., sr., grad.	6 credits
		3 MWF	213MA	Young

No. Credits	Title	Offered to	Prereq. courses
*109 3	Diplomacy .....	Jr., sr., grad.	6 credits or 1 and History 10
	2 MWF	213MA	Allin
*110 3	International Law .....	Jr., sr., grad.	1 and 3 or 58 or 109
	2 MWF	102MA	Allin
*114 3	Govt. of the British Empire..	Jr., sr., grad.	6 credits, or 1 and History 7
	10 TThS	102MA	Allin
§133 3	Anct. Phil. Theories of the State	Jr., sr., grad.	6 credits in either Political Science or Philosophy
	2 MWF	322F	Lodge
*201-202	Seminar .....	Sr., grad.	Major in Political Sci.
	3-4 Th	213MA	Young, et al.

## PSYCHOLOGY

Professors ROBERT M. YERKES,<sup>1</sup> MELVIN E. HAGGERTY; Associate Professor HERBERT WOODROW; Assistant Professors JOSEPH PETERSON, HENRY T. MOORE; Instructor KARL S. LASHLEY; Teaching Fellow J. D. DODSON; Assistant ALICE H. SULLIVAN.

## REQUIREMENTS OF THE DEPARTMENT

For *B.A. with Honors*, besides the general requirements, twenty-four credits in starred courses. Starred courses in Educational Psychology and, to the extent of six hours, in philosophy, may be counted in partial fulfillment of this requirement.

## COURSES

No. Credits	Title	Offered to	Prereq. courses
1-2 6	General Psychology .....	Soph., jr., sr.	None
	Rec. 8 MWF	321F	Peterson
	9 MWF	321F	Peterson
	9 TThS	321F	Moore
	9 TThS	304F	Lashley
	10 MWF	321F	Dodson
	10 MWF	304F	Moore
	10 TThS	321F	Moore
	11 MWF	321F	Dodson
	11 TThS	321F	Peterson
	2 MWF	321F	Lashley
	2 MWF	322F	Lodge
	3 MWF	321F	Lashley
1b 3	General Psychology .....	Soph., jr., sr.	None
11:40	(Farm) TThS	Ar	Woodrow
9	(Music) TThS	311F	Woodrow
*101a 3	Experimental Psychology...	Jr., sr., grad.	1-2
	4 T	316F	Woodrow
	2, 3 TTh	318F	Woodrow
*101b 3	Experimental Psychology ..	Jr., sr., grad.	1-2
	Rec. 4 T	316F	Woodrow
	Lab. 2, 3 TTh	318F	Woodrow

<sup>1</sup> Absent on leave.

No. Credits	Title	Offered to	Prereq. courses
§*103-104	6 Comparative and Genetic Psychology .....	Jr., sr., grad.	1-2
	11 TThS	202AB	Lashley
*105	2 Mental Retardation .....	Jr., sr., grad.	1-2
	4, 5 TTh	321F	Woodrow
*107	3 Social Psychology .....	Jr., sr., grad.	1-2
	3 MWF	322F	Moore
§*108	3 Applied Psychology .....	Jr., sr., grad.	1-2
	3 MWF	322F	Moore
§*109	3 History of Psychology.....	Jr., sr., grad.	9 credits
	8 TThS	321F	Peterson
*110	3 Abnormal Psychology .....	Jr., sr., grad.	1-2
	8 TThS	321F	Peterson
*115-116	6 Seminar in Psychology....	Sr., grad.	12 credits
	Ar Ar	316F	Woodrow

### RHETORIC AND PUBLIC SPEAKING

Professor JOSEPH M. THOMAS; Assistant Professors DANIEL FORD, HALDOR GISLASON, CHARLES W. NICHOLS, SIDNEY F. PATTISON, ANNA H. PHELAN, FRANK M. RARIG,<sup>1</sup> CHARLES E. SKINNER, HELEN A. WHITNEY; Instructors THOMAS E. BREECE, JOHN S. GARNs, ELIZABETH HAWTHORN, CYRIL A. HERRICK, JAMES T. HILLHOUSE, ELIZABETH JACKSON, ERNEST P. KUHl, CHARLES F. LINDSLEY, VERNON G. LOGGINS, MARTIN B. RUUD, ARTHUR J. TIEJE, HOWARD T. VIETS; Assistant RIVERDA D. JORDAN.

#### REQUIREMENTS OF THE DEPARTMENT

*For B.A. with Honors.* The general requirements (page 13). A reading knowledge of either Latin, French, or German. At least fifteen credits in departmental starred courses, four of these credits to be in Course 119-120.

*For a Teacher's Certificate in English,* (a) English as the major subject of teaching: Rhetoric 1-2, either 11-12 or 15-16, and 41-42; English 1-2, 3, 5 or 7, and 28. (b) English as a minor subject of teaching: Rhetoric 1-2, and either 11-12 or 15-16; English 1-2, and 3. In order to be recommended, a student must secure an average of at least one and one-half honor points for each credit hour of all the work taken in the Departments of English and Rhetoric.

*For a Teacher's Certificate in Public Speaking,* a student must satisfy the Department that he is actively interested in some phase of Public Speaking either as a member of a literary or debating society, or as a participant in a contest or dramatic performance, or as a lecturer; must have the approval of the Department of Rhetoric and Public Speaking and must complete the following courses: Rhetoric 1-2, 11-12 or 15-16, 41-42, and six additional hours in Public Speaking.

<sup>1</sup> On leave of absence 1917-18.

COURSES

- 45. Open to those who have completed 1-2 and 41-42, or 1-2 and have had training in debating in preparatory school.
- 47. Open to juniors and seniors who are awarded places on the intercollegiate debating squad.
- 80. Open to juniors, seniors, graduates, qualifying for a major recommendation in English. Credit only in Education.
- 102. Open to those who have taken 11-12 or 15-16, and have taken or are taking 6 hours in the historical study of English poetry.
- 107, 110. Open to students who have received a grade of A or B in either semester of 11-12 or 15-16.
- 115-116. Open to those who have taken 11-12, and who have taken or are taking 113-114 or 129 in English.
- 119-120. Open with special permission to seniors and graduates. Prerequisites: Courses 1-2, 11-12, and at least one other course in Rhetoric. Required of Honors Course students.
- 201-202. Open to graduates and to seniors taking the Honors Course. Prerequisites: Courses 1-2, 11-12 or 15-16, and at least one other course.

COURSES

No.	Credits	Title	Offered to	Prereq. courses
1-2	6	Composition and Rhetoric..	Fr.	None
	8	MWF	To be assigned on registration	
	9	MWF	To be assigned on registration	
	10	MWF	To be assigned on registration	
	11	MWF	To be assigned on registration	
	2	MWF	To be assigned on registration	
	3	MWF	To be assigned on registration	
	8	TThS	To be assigned on registration	
	9	TThS	To be assigned on registration	
	10	TThS	To be assigned on registration	
	11	TThS	To be assigned on registration	
1b	3	Composition and Rhetoric..	Fr.	None
	11	MWF	306F	†
	3	MWF	305F	†
	11	TThS	303F	†
2a	3	Composition and Rhetoric..	Fr.	None
	11	MWF	306F	†
	3	MWF	305F	†
3-4	6	Composition for Engineers.	Fr. Eng.	None
		See program for the College of Engineering.		
11-12	6	Exposition, Description,		
		Narration .....	Soph., jr., sr.	1-2
	9	MWF	311F	Hillhouse
	11	MWF	303F	Skinner
	2	MWF	311F	Ruud
	9	TThS	311½F	Whitney
	10	TThS	306F	Phelan
15-16	6	Exposition and Argument.	Soph., jr., sr.	1-2
	9	MWF	303F	Ford
	11	TThS	305F	Tieje
31	2	Technical Writing .....	Sr. Eng.	3-4
		See program for the College of Engineering.		

No. Credits	Title	Offered to	Prereq. courses
41-42	6 Public Speaking .....	Soph., jr., sr.	1-2
	9 MWF	308F	¶
	2 MWF	308F	Wilcox
	8 TThS	308F	Wilcox
	9 TThS	308F	Gislason
	10 TThS	308F	¶
	11 TThS	308F	¶
41	3 8 MWF	308F	¶
45	3 Argumentation and Debate.	Soph., jr., sr.	See note
	10 MWF	308F	Gislason
47	3 Advanced Debate .....		See note
	Ar Ar	308F	Gislason
*80a	3 Teachers' Course .....	Jr., sr.	See note
	3:30-5 TTh	206Ed	Inglis
*80b	3 Teachers' Course .....	Jr., sr.	See note
	3:30-5 TTh	206Ed	Inglis
*81-82	6 Interpretative Reading ....	Jr., sr.	1-2, 41-42
	11 MWF	308F	Wilcox
*84	3 Advanced Public Speaking.	Jr., sr.	1-2, 41-42
	3 MWF	308F	Gislason
*102	3 Versification .....	Jr., sr., grad.	See note
	10 TThS	302F	Nichols
*103-104	6 Studies in Structure and Style .....	Jr., sr., grad.	1-2, 11-12, or 15-16
	2 MWF	303F	Ford
*107	3 Imitative Writing .....	Jr., sr., grad.	See note
	11 MWF	304F	Thomas
*110	3 Short-story Writing .....	Jr., sr., grad.	See note
	11 MWF	304F	Thomas
*111-112	6 Essay Writing .....	Jr., sr., grad.	1-2, 11-12, or 15-16
	11 TThS	302F	Pattison
*115-116	6 Dramatic Technique .....	Sr., grad.	See note
	Rec. 2 WF		
	Lab. Ar Ar	302F	Skinner
*119-120	4 Seminar in Writing.....	Sr., grad.	See note
	1:30-3:20 T	302F	Thomas
*201-202	6 Seminar in Rhetoric.....	Sr., grad.	See note
	1:30-3:20 Th	302F	Thomas

### ROMANCE LANGUAGES

Professors EVERETT W. OLMSTED, COLBERT SEARLES, IRVILLE C. LECOMPTÉ; Assistant Professors FRANCIS B. BARTON, JULES FRELIN, RUTH S. PHELPS, EDWARD H. SIRICH,<sup>1</sup> Professorial Lecturer BALBINO DÁVALOS; Instructors SOLOMON M. DELSON, PEDRO HENRÍQUEZ UREÑA, ENRIQUE JIMÉNEZ, GUSTAAF VAN ROOSBROECK; Teaching Fellows HERBERT CLEF-TON, AMELIA DOYLE, ANTONIO GERVAZI; Assistants C. J. DE BÈRE, JOSEPHINE DE BOER.

### REQUIREMENTS OF THE DEPARTMENT

For *B.A. with Honors*, general requirements (page 13); a reading knowledge of Latin or German with two years' work in Spanish or Italian.

<sup>1</sup> Absent on leave.

In the Junior year, Courses 61-62, 63-64, 75-76, 101-102; in the Senior year, Courses 103-104, 107-108, 109-110, 115-116 (or 117-118). Substitutions for these courses may be granted by the Department in special cases. Alternation of courses required in the Junior and Senior years is allowable.

*For Major Recommendation for Teacher's Certificate*, in addition to Courses 1a and 3a (or Spanish equivalent), twenty-six credits.

*For Minor Recommendation for Teacher's Certificate*, in addition to Courses 1a and 3a (or Spanish equivalent), twelve credits in one Romance Language.

*Prerequisite for Teachers' Course*, in addition to Course 5-6 (or Spanish equivalent), one Conversation-Composition Course and one Literary Course.

## COURSES

No.	Credits	Title	Offered to	Prereq. courses
1a	6	Beginning French .....	All	None
		8 MTWThFS	201F	¶
		9 MTWThFS	201F	¶
		10 MTWThFS	227F	¶
		11 MTWThFS	226F	¶
1b	6	Beginning French .....	All	None
		9 MTWThFS	227F	¶
2	3	Beginning French (Architects) .....	All	1a or equivalent
		1 MWF	227F	Elliott
3a	6	Intermed. French .....	All	1a or equiv.
		10 MTWThFS	205F	¶
		11 MTWThFS	25F	¶
3b	6	Intermed. French .....	All	1a or equiv.
		8 MTWThFS	201F	¶
		9 MTWThFS	226F	¶
		10 MTWThFS	201F	¶
		11 MTWThFS	226F	¶
4	6	Survey French Lit. ....	All	3a or equiv.
		10 MTWThFS	205F	Scarles
		11 MTWThFS	227F	LeCompte
5-6	6	Survey Fr. Lit. (year course) .....	All	3a or equiv.
		9 TThS	202F	LeCompte
		10 TThS	202F	Phelps
		11 TThS	5F	van Roosbroeck
		2 MWF	201F	Barton
7-8	2	Element. French Convers.	All	3a or equiv.
		9 TTh	15F	Barton
		3 MW	227F	Frelin
9-10	2	Element. French Compos..	All	3a or equiv.
		9 S	15F	Barton
		3 F	227F	Frelin
31a	6	Beginning Spanish .....	All	None
		9 MTWThFS	301F	Ar
		10 MTWThFS	25F	Henriquez
31b	6	Beginning Spanish .....	All	None
		10 MTWThFS	113F	Delson

## SCIENCE, LITERATURE, AND THE ARTS

No. Credits	Title	Offered to	Prereq. courses
33-34 6	Beginning Spanish (year course) .....	All	None
	8 TThS	202F	Jiménez
	11 MWF	201F	Olmsted
	11 TThS	201F	Phelps
35b 6	Intermed. Spanish .....	All	31a or equiv.
	9 MTWThFS	301F	Dávalos
	10 MTWThFS	25F	Henríquez
37-38 6	Intermed. Span. (year course) .....	All	31a or equiv.
	10 TThS	227F	Dávalos
	11 TThS	15F	Jiménez
39-40 6	Survey of Span. Lit. ...	All	35b or equiv.
	9 MWF	15F	Henríquez
41-42 2	Elemen. Spanish Convers.	All	35b or equiv.
	2 MW	226F	Jiménez
43-44 2	Elemen. Spanish Compos.	All	35b or equiv.
	2 F	226F	Jiménez
51-52 6	Beginning Italian .....	All	None
	9 MWF	202F	Phelps
61-62 2	Advanced French Convers.	Jr., sr.	7-8 or equiv.
	11 TTh	202F	Frelin
63-64 2	Advanced Fr. Compos....	Jr., sr.	9-10 or equiv.
	11 S	202F	Frelin
*75-76 6	French Lit.; 19th Century	Soph., †jr., sr.	5-6 or equiv.
	11 TThS	113F	Barton
	11 TThS	125F	Delson
*101-102 6	French Lit.; 18th Century	Jr., sr., grad.	5-6 or equiv.
	11 MWF	202F	Searles
*103-104 6	French Lit.; 17th Century	Jr., sr., grad.	5-6 or equiv.
	10 MWF	227F	Olmsted
*107-108 4	French Oral Diction.....	Jr., sr., grad.	61-62 or equiv.
	10 MW	202F	Frelin
*109-110 2	French Syntax .....	Jr., sr., grad.	63-64 or equiv.
	10 F	202F	LeCompte
*113-114 4	Fr. Literature: Classicism	Sr., grad.	103-104 or equiv.
	11 TTh	Seminar	Searles
*117-118 4	French Dramatic Lit. ....	Sr., grad.	103-104 or equiv.
	10 TTh	Seminar	Olmsted
§*131-132 2	Advanced Span. Convers.	Jr., sr., grad.	41-42 or equiv.
	2 MW	227F	Dávalos
*133-134 2	Adv. Spanish Compos. ...	Jr., sr., grad.	43-44 or equiv.
	2 F	227F	Dávalos
§*147-148 4	Spanish Lectures .....	Jr., sr., grad.	41-42; 43-44; or equiv.
	3 MW	201F	Henríquez
*151-152 4	Dante, Petrarch, Boccaccio	Jr., sr., grad.	51-52 or equiv.; and either 53-54, 5-6 or English 1
	2 MW	202F	Phelps
*153-154 2	Dante, (In English).....	Jr., sr., grad.	Hist. 1-2 and either English 1 or Fr. 5-6. Prereq. for persons taking in addition Course 151-152, same as listed for 151-152
	2 F	202F	Phelps

† Who have had the five years' preparation required.



No. Credits	Title	Offered to	Prereq. courses
*161-162 2	Teachers' Course .....	Jr., sr., grad.	See above
2	Th	201F	de Boer

NOTE: Course 7-8 may be taken only with 9-10. 9-10 may be taken separately. Course 41-42 may be taken only with 43-44. 43-44 may be taken separately. Course 61-62 may be taken only with 63-64. 63-64 may be taken separately. Course 151-152 may be taken only with 153-154. 153-154 may be taken separately. Courses 1, 3, 31, 35, 4, are double courses. Students are advised to take Course 75-76 as a natural preparation for Courses 101-102 and 103-104. Permission to register for courses from 75-76 to 161-162 inclusive may be granted by the department in special cases. Both semesters of any year course must be completed before credit is allowed for the first semester. The preceding statement applies also to Courses 1a and 3b for freshmen and Courses 31a and 35b for freshmen.

## SCANDINAVIAN

Professors GISLE BOTHNE, ANDREW A. STOMBERG.

## REQUIREMENTS OF THE DEPARTMENT

For *B.A. with Honors*, the general requirements (page 13) and thirty credits of Scandinavian.

*Teacher's Certificate in Scandinavian.* For a minor recommendation, a minimum of twelve credits in one of the Scandinavian languages. For a major recommendation, a minimum of twenty-two credits in one of the Scandinavian languages. Courses 1-2 or 5-6 shall not be counted toward either a minor or a major recommendation. To obtain either a minor or a major recommendation the student must obtain an average of one and one-half honor points for each credit hour for all Scandinavian courses taken.

Course 13-14 is especially recommended to all students who intend to take courses in Scandinavian literature.

For the second semester of 1917-18, if sufficient students register, either Course 104 or Course 110 will be given, but not both.

## COURSES

No. Credits	Title	Offered to	Prereq. courses
1	6‡ Beginning Norwegian .....	All	None
	8 MTWThFS	206F	¶
2	6‡ Intermediate Norwegian...	All	1
	8 MTWThFS	206F	¶
3-4	6‡ Advanced Norwegian .....	Soph., jr., sr.	2
	9 TThS	110F	Bothne
5	6‡ Beginning Swedish .....	All	None
	9 MTWThFS	206F	Stomberg
6	6‡ Intermediate Swedish .....	All	5
	9 MTWThFS	206F	Stomberg
7-8	6 Advanced Swedish .....	Soph., jr., sr.	6
	8 MWF	205F	Stomberg

† Both semesters must be completed before credit is given for the first semester.

‡ Freshmen must complete intermediate course before credit is given for beginning course.

No.	Credits	Title	Offered to	Prereq. courses
§13-14	6	History of North. Europe. 11 MWF	Soph., jr., sr. 206F	Consult department Stomberg
*101-102	6	Modern Norwegian Lit.... 10 TThS	Jr., sr., grad. 206F	3-4 Bothne
*103	3	Earlier Norwegian Lit.... 11 TThS	Sr., grad. 206F	101-102 Bothne
*104	2	Henrik Ibsen ..... 11 TTh	Sr., grad. 206F	101-102 Bothne
*107-108	6	Swedish Literature ..... 2 MWF	Jr., sr., grad. 206F	7-8 Stomberg
*109	2	Strindberg ..... Ar Ar	Sr., grad. 206F	107-108 Stomberg
*110	2	Teachers' Course in Nor- wegian ..... 4 & 5 Th	Sr., grad. 206F	3-4 Bothne
*113-114	4	Old Norse (Icelandic).... Ar Ar	Sr., grad. 206F	See statement Bothne
*116	2	Teachers' Course in Swed- ish ..... Ar Ar	Sr., grad. 206F	7-8 Stomberg

### SOCIAL AND CIVIC WORK

(For full details see separate bulletin)

Professor ARTHUR J. TODD; Associate Professor LOUIS L. BERNARD; Instructor LLOYD M. CROSGRAVE; Lecturers CAROL ARONOVICI, FRANK J. BRUNO, OTTO W. DAVIS, ARTHUR H. TAYLOR, EDWARD F. WAITE; Supervisors of Practice Field Work CAROLINE BEDFORD, HENRY F. BURT, MARION E. TEBBETS, ELIZABETH YERXA.

Sociology and Anthropology 1 or 6 is prerequisite to all courses in this department.

### COURSES

No.	Credits	Title	Offered to	Prereq. courses
51	3	Treatment of Dependents and Defectives ..... 8 TThS	Jr., sr. 9F	Soc. & An. 1 or 6 Bruno
*52	3	Child Welfare ..... 8 TThS	Jr., sr. 9F	Social Work 51 Taylor
*53	3	Treatment of Delinquents. 9 MWF	Jr., sr., grad. 9F	Soc. & An. 1 or 6, and Psychol. 1-2 Todd
*55	2	Housing Problems ..... 8 MW	Jr., sr. 9F	Soc. & An. 1 and 6 Davis
*104	2	State Care of Dependents, Defectives, and Delinqts. 3, 4 F	Jr., sr., grad. 9F	Social Work 51 and 52 or 53 Todd and Supts.
*122	2	Social Statistics and Social Surveys ..... 4, 5 W	Sr., grad. 9F	2 courses in this dept. Aronovici

No. Credits	Title	Offered to	Prereq. courses
*162 3	Social and Industrial Legislation .....	Sr., grad.	2 courses in this dept. and 6 cred. in Econ.
	11 MWF	209MA	Crosgrave
*108 2	Methods of Community Organization and Social Work in Small Towns and Country .....	Sr., grad.	2 courses in this dept.
	4, 5 Th	9F	Todd and Bernard
*125-126 4	Settlement and Social Center Work .....	Sr., grad.	2 courses in this dept.
	4, 5 W & app't.	5F	Aronovici, Todd, Burt
*128 1	Charitable Admin., Finance, and Publicity .....	Sr., grad.	2 courses in this dept.
	8 F	9F	Davis
*130 2	Technique of Family Treatment .....	Sr., grad.	Social Work 51 and 52
	4, 5 T	9F	Bruno
*132 2	Juvenile Courts & Probatn. .....	Sr., grad.	Social Work 51 or 52, 53
	8 MW & app't.	9F	Todd, Waite
*133-134 2	Field Work in Hospital Social Service .....	Sr., grad.	Consent of director
	By appointment		Tebbetts, Yerxa

SOCIOLOGY AND ANTHROPOLOGY

Professors ALBERT ERNEST JENKS, ARTHUR J. TODD; Associate Professor LUTHER L. BERNARD; Assistant Professor HENRY T. MOORE; Lecturers FRANK J. BRUNO, OTTO W. DAVIS, ARTHUR H. TAYLOR; Superintendents of State Board of Control Institutions.

REQUIREMENTS OF THE DEPARTMENT

For *B.A. with Honors*, see general requirements (page 13).

For *Recommendation for Teaching*, credits in the following courses: 1, 4, 6, and two advanced courses.

To this end the Department offers elementary courses dealing with peoples, with social forces, institutions, and movements. Its more advanced courses are designed especially for students majoring in the Social Sciences; namely, Sociology and Anthropology, Economics, History, and Political Science.

COURSES

No. Credits	Title	Offered to	Prereq. courses
<i>Introductory Courses</i>			
1a 3	General Introduction .....	Soph., jr., sr.	None
	8 MWF	203He	Bernard
	10 MWF	9F	Jenks
	10 TThS	9F	Todd
	2 MWF	301F	Bernard
1b 3	2 MWF	301F	Bernard

No.	Credits	Title	Offered to	Prereq. courses
4	3	Cultural Anthropology . . . . .	Soph., jr., sr.	1
	10	MWF	9F	Jenks
6	3	Social Reform Movements.	Soph., jr., sr.	1
	10	TThS	9F	Todd
<i>General Courses</i>				
51	3	Treatment of Dependents and Defectives . . . . .	Jr., sr.	1, or 6
	8	TThS	9F	Bruno
*52	3	Child Welfare . . . . .	Jr., sr.	51
	8	TThS	9F	Taylor
*53	3	Treatment of Delinquents.	Jr., sr., grad.	1 or 6 & Psychol. 1-2
	9	MWF	9F	Todd
*55	2	Housing Problems . . . . .	Jr., sr.	1 and 6
	8	MW	9F	Davis
14	3	Rural Community . . . . .	Jr., sr.	1
	8	MWF	203He	Bernard
<i>Advanced Courses</i>				
*102a	3	Social Theory . . . . .	Jr., sr., grad.	1, 9 or 10, & 1 other
	9	TThS	9F	Bernard
*104	2	State Care of Dep., Def., and Delinquents . . . . .	Jr., sr., grad.	51, and 52 or 53
	3, 4	F	9F	Todd and Supts.
*107	3	Social Psychology . . . . .	Jr., sr., grad.	See statement
	3	MWF	322F	Moore
*110a	3	Physical Anthropology . . . . .	Jr., sr., grad.	See bulletin statement
	2	MWF	9F	Jenks
*112	3	American Negro . . . . .	Jr., sr., grad.	1 and two others
	2	MWF	9F	Jenks
*113	3	American People . . . . .	Jr., sr., grad.	1 and two others
	11	MWF	9F	Jenks
*114	3	American People (cont'd.).	Jr., sr., grad.	1, 113, and one other
	11	MWF	9F	Jenks
*119	3	The Family . . . . .	Jr., sr., grad.	9 credits
	11	TThS	9F	Todd
*120	3	Social Progress . . . . .	Sr., grad.	See bulletin statement
	11	TThS	9F	Todd
*123-124	3	Seminar in Anthropology..	Sr., grad.	For sr. four correlated courses
	2, 3	Th	205Lib	Jenks
*140	3	History of Social Theory..	Jr., sr., grad.	1, 9 or 10, & one other
	9	TThS	Ar	Bernard

## A GENERAL COLLEGE COURSE

*Recent European History and Politics.* Open to sophomores, juniors, seniors. No prerequisites. Lectures, required reading, and quizzes. Two credits not to apply in any one department. Lectures open to the public, 4:00 MW, Law Lecture Room. Members of staff in History, Political Science, and other departments.

COURSES IN OTHER DEPARTMENTS OF THE UNIVERSITY  
OPEN TO JUNIORS OR SENIORS OF THIS COLLEGE

## COLLEGE OF AGRICULTURE

*First Semester*

## Agricultural Chemistry

Course 3a (3) 8:55 to 9:40 TThS

## Agricultural Economics

Course 18a (3) 9:50-10:35 MWF

Course 251-2 (6) Ar

## Agricultural Education

Course 151a (3) 10:45-11:30 MWF

## Agronomy (3)

Course 1 Lecture 8:00-8:45 ThS

Course 1 Lab. 8:00-9:40 T

## Animal Husbandry

Course 1a (3) 8:00-9:40 MWF

## Poultry Husbandry

Course 1 (3) 8:00-8:45 MWF

## Dairy Husbandry

Course 7a (3) 8:00-9:40 TThS

## Horticulture

Course 71 (3) 8:55-9:40 MWF

Course 90a (3) 8:55-9:40 MWF

## Plant Pathology and Botany

Course 1 (3) 2:00-4:30 WF or

8:00-9:40 TThS

Course 103 (3) Ar

*Second Semester*

## Agricultural Chemistry

Course 3b (3) 8:55-9:40 TThS

## Agricultural Education

Course 151b (3) 10:45-11:30 MWF

## Agronomy

Course 1b (3) Lec. 8:00-8:45 TThS;

Lab. 8:00-9:40 T

## Animal Husbandry

Course 1b (3) 8:00-9:40 MWF

## Dairy Husbandry

Course 26b (3) 8:00-9:40 TThS

## Poultry Husbandry

Course 30 (2) Ar

## Agricultural Economics

Course 18b (3) 9:50-10:35 MWF

Course 251-2 (6) Ar

## Horticulture

Course 50 (3) 9:50-10:35 TTh; Lab.

2:00-4:30 F

Course 56 (1) 9:50-10:35 MWF

Course 90b (3) 8:55-9:40 MWF

## Plant Pathology and Botany

Course 104 (3) Ar

## LAW SCHOOL

*First Semester*

Contracts (3) 8:00 MWF  
 Carriers (2) 10:00 TTh  
 Personal Property (3) 10:00 MWF

*Second Semester*

\*Contracts  
 \*Agency (3)

## SCHOOL OF MINES

*First Semester*

Metallurgy  
 Course 3 8:00 WThF  
 Course 105 9:00 WThFS  
 Course 153 Ar

*Second Semester*

Metallurgy  
 Course 4 8:00 WThF  
 Course 2 8:00-4:00 M; 11:00 TWThF  
 Course 106 9:00 WThFS  
 Course 154 Ar

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\* Open only to students who have taken Contracts in the first semester.

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*The Bulletin*  
*of the University of*  
**Minnesota**

*The College of Engineering and*  
*Architecture*  
*Announcement for the Year*  
**1917-1918**



*Catalog Series No. 5*  
*Vol. XX No. 31 August 1 1917*

*Entered at the post-office*  
*in Minneapolis as second-class matter*  
*Minneapolis, Minnesota*



1917							1918													
JULY							JANUARY							JULY						
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# UNIVERSITY CALENDAR

1917-1918

1917			
September	26	Wednesday	Registration closes for all students
September	26	Week	Fees payable for all students
October	3	Monday	First semester evening extension classes begin
October	1		
October	2-9	Week	Examinations for removal of conditions (except for Colleges of Agriculture and Forestry), and entrance examinations
October	10	Wednesday	First semester begins
October	15	Monday	Agricultural College, farm experience examinations
October	18	Thursday	Senate meeting, 4:00 p.m.
October	29	Monday	Dairy School opens
November	5	Monday	School of Agriculture, first term begins
November	28	Wednesday	Thanksgiving recess begins 9:00 p.m.
December	1	Saturday	Dairy School closes
December	3	Monday	Thanksgiving recess ends 8:00 a.m.
December	3-8	Week	Second semester condition examinations, Colleges of Agriculture and Forestry
December	3-8	Week	Short course for ice-cream makers
December	5	Wednesday	Medical School second quarter begins
December	20	Thursday	Senate meeting, 4:00 p.m.
December	21	Friday	School of Agriculture, first term closes
December	21	Friday	Christmas vacation begins 9:00 p.m.
1918			
December	31	Week	Farmers' and Home Makers' Week Short Course
January	5		
January	2	Wednesday	Christmas vacation ends 8:00 a.m.
January	2	Wednesday	School of Embalming begins, eight weeks' vacation
January	8	Tuesday	School of Agriculture, second term begins
January	25	Friday	First semester evening extension classes close
February	4	Monday	Second semester registration closes
February	4	Monday	Second semester evening extension classes begin
February	4-9	Week	Merchants' Short Course
February	11	Monday	Final examinations begin

February	11	Monday	Payment of fees for second semester closes
February	12	Tuesday	Lincoln's Birthday; a holiday
February	18	Monday	Second semester begins
February	21	Thursday	Senate meeting, 4:00 p.m.
February	22	Friday	Washington's Birthday; a holiday
March	27	Wednesday	School of Agriculture closes
March	28	Thursday	Easter recess begins 9:00 p.m.
April	1	Monday	Easter recess ends 8:00 a.m.
April	1-6	Week	Boys' and Girls' Week
April	1-6	Week	Condition examinations in certain colleges
April	15	Monday	Medical School fourth quarter begins
April	30	Tuesday	Traction Engineering Short Course begins
May	16	Thursday	Senate meeting, 4:00 p.m.
May	24	Friday	Second semester evening extension classes close
May	30	Thursday	Memorial Day; a holiday
May	31	Friday	Traction Engineering Short Course closes
June	8	Saturday	Final examinations begin 2:00 p.m.
June	15	Saturday	Second semester closes
June	16	Sunday	Baccalaureate service
June	17	Monday	Senior Class Day exercises
June	19	Wednesday	Alumni Day
June	20	Thursday	Forty-sixth Annual Commencement
June	21	Friday	Summer vacation begins
June	24	Monday	Summer Session begins

The University year for 1918-19 probably will begin Tuesday, September 17. Classes will begin September 25.

*Schedule of Condition Examinations for Students of the College of Engineering and Architecture*

October, 1917		April, 1918	
Tuesday,	2, a.m.	Physics .....	a.m. Monday, 8
	p.m.	Chemistry, Geology .....	p.m.
Wednesday,	3, a.m.	Mathematics and Mechanics .....	a.m. Tuesday, 9
	p.m.	Drawing and Descriptive Geometry .....	p.m.
Thursday,	4, a.m.	Civil Engineering.....	a.m. Wednesday, 10
	p.m.	Experimental Engineering, Shop.....	p.m.
Friday	5, a.m.	Mechanical Engineering.	a.m. Thursday, 11
	p.m.	Electrical Engineering, Architecture .....	p.m.
Saturday,	6, a.m.	Rhetoric, Language.....	a.m. Friday, 12

Morning examinations are at nine o'clock, afternoon examinations at two o'clock.

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

## FACULTY

- MARION LEROY BURTON, Ph.D., D.D., LL.D., President 1005 5th St. S. E.  
CYRUS NORTHROP, LL.D., President, Emeritus 519 10th Ave. S. E.  
JOHN ROBINS ALLEN, M.E., Dean, Head of Experimental Engineering Department, and Professor of Mechanical Engineering Minneapolis  
HENRY T. EDDY, C.E., Ph.D., LL.D., D.Sc., Professor of Mathematics and Mechanics, Emeritus 916 6th St. S. E.  
CEPHAS DANIEL ALLIN, M.A., LL.B., Professor of Political Science 721 7th St. S. E.  
WILLIAM R. APPLEBY, M.A., Professor of Metallurgy 928 5th St. S. E.  
FRANCIS B. BARTON, Docteur de l'Université de Paris, Assistant Professor of Romance Languages 507 S. E. Oak St.  
FREDERIC H. BASS, B.S., Professor of Municipal and Sanitary Engineering 515 6th St. S. E.  
WILLIAM E. BROOKE, B.C.E., M.A., Professor of Mathematics and Mechanics 416 Walnut St. S. E.  
ALVIN S. CUTLER, C.E., Assistant Professor of Railway Engineering 39 Barton Ave. S. E.  
HANS H. DALAKER, B.A., Assistant Professor of Mathematics 523 Walnut St. S. E.  
E. DANA DURAND, Ph.D., Professor of Economics, Director of University Bureau of Statistics 915 6th St. S. E.  
WILLIAM H. EMMONS, Ph.D., Professor of Geology  
HENRY A. ERIKSON, B.E.E., Ph.D., Professor of Physics 424 Harvard St. S. E.  
JOHN J. FLATHER, Ph.B., M.M.E., Professor of Mechanical Engineering 315 11th Ave. S. E.  
JAMES H. FORSYTHE, M.A. in Arch., Assistant Professor of Architecture 321 14th Ave. S. E.  
GEORGE B. FRANKFORTER, Ph.D., Professor of Chemistry 525 E. River Road  
JULES T. FRELIN, B.A., Assistant Professor of French 112 Church St. S. E.  
ROBERT W. FRENCH, B.S., Assistant Professor of Drawing and Descriptive Geometry 1018 16th Ave. S. E.  
HALDOR B. GISLASON, B.A., LL.B., Assistant Professor of Rhetoric 217 Harvard St. S. E.  
\*JOHN H. GRAY, Ph.D., Professor of Economics 412 Walnut St. S. E.  
EVERHART P. HARDING, Ph.D., Associate Professor of Chemistry 817 Essex St. S. E.

---

\* Leave of absence, 1917-18.

- WILLIAM F. HOLMAN, Ph.D., Assistant Professor of Mathematics and  
Mechanics 301 Walnut St. S. E.
- SAMUEL L. HOYT, Ph.D., Assistant Professor of Metallurgy  
416 8th Ave. S. E.
- ROY C. JONES, M.S. in Arch., Assistant Professor of Architectural Design  
1203 Yale Pl.
- WILLIAM H. KIRCHNER, B.S., Professor of Drawing and Descriptive  
Geometry 722 10th Ave. S. E.
- LOUIS W. MCKEEHAN, Ph.D., Associate Professor of Physics  
930 17th Ave. S. E.
- FRANKLIN R. McMILLAN, C.E., Assistant Professor of Structural Engi-  
neering 524 8th Ave. S. E.
- FREDERICK M. MANN, C.E., M.S. in Arch., Professor of Architecture  
202 Ridgewood Ave.
- JOHN V. MARTENIS, M.E., Assistant Professor of Mechanical Engineering  
215 Harvard St. S. E.
- OWEN R. MEREDITH, Lieutenant, U. S. Infantry, Assistant Professor of  
Military Science 504 University Ave. S. E.
- ADOLPH F. MEYER, C.E., Associate Professor of Hydraulic Engineering  
1467 Ashland Ave., St. Paul
- THOMAS W. MITCHELL, Ph.D., Assistant Professor of Business Admin-  
istration 2349 Bourne Ave., St. Paul
- GEORGE W. MOSES, Major, 16th U. S. Cavalry, Professor of Military  
Science and Tactics 1308 5th St. S. E.
- BURT L. NEWKIRK, Ph.D., Assistant Professor of Mathematics and Me-  
chanics 519 Essex St. S. E.
- CHARLES W. NICHOLS, M.A., Assistant Professor of Rhetoric  
808 University Ave. S. E.
- EVERETT W. OLMSTED, Ph.D., Professor of Romance Languages  
2727 Lake of the Isles Blvd.
- JOHN I. PARCEL, B.A., B.S. in C.E., Associate Professor of Structural  
Engineering 717 5th St. S. E.
- CHARLES L. PILLSBURY, Professorial Lecturer 2305 Oliver Ave. S.
- GEORGE C. PRIESTER, B.E., M.S., Assistant Professor of Mathematics and  
Mechanics 814 Fulton St. S. E.
- TERENCE T. QUIRKE, Ph.D., Assistant Professor of Geology and Mineral-  
ogy 315 11th Ave. S. E.
- FRANK M. RARIG, M.A., Assistant Professor of Rhetoric and Public  
Speaking 63 Barton Ave. S. E.
- FRANK B. ROWLEY, M.E., Assistant Professor of Experimental Engineer-  
ing 217 Beacon St. S. E.
- WILLIAM T. RYAN, E.E., Assistant Professor of Electrical Engineering  
3228 4th St. S. E.
- WILLIAM A. SCHAPER, Ph.D., Professor of Political Science  
625 Fulton St. S. E.
- GEORGE D. SHEPARDSON, M.E., D.Sc., Professor of Electrical Engineering  
717 E. River Road

- \*S. CARL SHIPLEY, M.E., Assistant Professor of Machine Construction  
1517 E. River Road
- CHARLES F. SHOOP, B.S., Assistant Professor of Experimental Engineering  
811 Fulton St. S. E.
- CHARLES F. SIDENER, B.S., Professor of Chemistry 1320 5th St. S. E.
- EDWARD H. SIRICH, Ph.D., Assistant Professor of Romance Languages  
321 14th Ave. S. E.
- FRANK W. SPRINGER, E.E., Professor of Electrical Engineering  
826 Delaware St. S. E.
- JOHN T. TATE, Ph.D., Assistant Professor of Physics 1316 4th St. S. E.
- THEODORE B. TAYLOR, Captain, U. S. Cavalry, Associate Professor of  
Military Science 1301 5th St. S. E.
- JOSEPH M. THOMAS, Ph.D., Professor of Rhetoric  
818 University Ave. S. E.
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of Military Science and Tactics 712 10th Ave. S. E.
- JEREMIAH S. YOUNG, Ph.D., Professor of Political Science  
1120 6th St. S. E.
- ANTHONY ZELENY, Ph.D., Professor of Physics 613 E. River Road
- C TO S. ZELNER, B.S., Assistant Professor of Surveying  
2265 Carter Ave., St. Paul
- WILLIAM ANDERSON, M.A., Instructor in Political Science  
4219 Colfax Ave. N.
- HARRY E. ATWOOD, M.A., Instructor in French 1317 6th St. S. E.
- GEORGE S. BARNUM, M.A., Instructor in French 310 12th Ave. S. E.
- CECIL C. BEAN, M.A., Instructor in Rhetoric 1318 7th St. S. E.
- FRED W. BENTLEY, B.S. in M.E., Instructor in Drawing  
2801 Grand Ave. S.
- FRANK W. BLISS, M.S., Instructor in Chemistry 1016 17th Ave. S. E.
- SAMUEL C. BURTON, M.A., Instructor in Architecture 321 14th Ave. S. E.
- JOHN O. CEDERBERG, Lecturer in Architecture  
404 Endicott Bldg., St. Paul
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- ERNEST O. DIETERICH, Ph.D., Instructor in Physics 809 Essex St. S. E.
- JENNESS B. FREAR, M.E., Instructor in Mathematics 713 8th Ave. S. E.
- E. DOW GILMAN, B.S. in Chem. Engineering, C.E., Instructor in Experimental Engineering  
602 Essex St. S. E.
- FRANCIS A. HOBART, Instructor in Machine Shop Practice  
512 Delaware St. S. E.
- ALBERT C. HODGE, Ph.B., Instructor in Economics 615 9th Ave. S. E.
- FREDERICK W. HOORN, B.S., E.E., Instructor in Mathematics  
1521 Vine Place
- ALBERT C. JAMES, M.B.A., Instructor in Economics Hotel Maryland
- FRANCIS X. KEALLY, B.S. in Arch., Instructor in Architecture  
321 14th Ave. S. E.

\* On leave of absence first semester, 1917-18.

- EARLE H. KENNARD, Ph.D., Instructor in Physics  
828 University Ave. S. E.
- PAUL E. KLOPSTEG, M.A., Instructor in Physics 1026 15th Ave. S. E.
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- GEORGE A. MANEY, C.E., Instructor in Civil Engineering  
2409 27th Ave. S.
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609 8th Ave. S. E.
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1214 5th St. S. E.
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516 Oak St. S. E.
- EDWARD QUIGLEY, Instructor in Forge Work 2923 Chicago Ave.
- ERNEST A. REID, M.S. in E.E., Instructor in Electrical Engineering  
602 Essex St. S. E.
- WILLIAM R. RICHARDS, Instructor in Carpentry and Pattern Work  
1423 W. 27th St.
- BERT A. ROSE, Instructor of Cadet Band 710 7th St. S. E.
- RÜTCHER SKAGERBERG, B.S., E.E., Instructor in Drawing 1214 5th St. S. E.
- HUBERT M. TURNER, B.S., Instructor in Electrical Engineering  
719 Erie St. S. E.
- HOWARD T. VIETS, M.A., Instructor in Rhetoric 512 Delaware St. S. E.
- HARRY W. DIXON, Engineer, Assistant in Power Plant Operation  
1800 4th St. S. E.
- MAURICE B. LAGAARD, C.E., Assistant in Experimental Engineering  
3308 19th Ave. S.
- RAY M. WILCOX, Assistant in Rhetoric 312 Walnut St. S. E.

## 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"
- L. T. HILL, Plant Engineer, Northwestern Telephone Exchange Company, Minneapolis  
"Telephone Development"



## GENERAL INFORMATION

### THE PURPOSES OF THE COLLEGE

The College of Engineering and Architecture was founded in accordance with the laws of the State of Minnesota and of the Federal Government, its object being "to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." It 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 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 serve to fit men for the particular fields anticipated. 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.

### 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 12 of this Bulletin.

### SPECIAL STUDENTS

In exceptional cases applicants are admitted to the college to pursue, under the direction of the Faculty, one or two lines of study, selected

from some regular course. 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 a 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 class room 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 *semester credit hour* is one credit hour a week extending through a semester.

A *year credit hour* is one credit hour a week extending through the college year.

#### FEES AND EXPENSES

The annual fee for students in this college is sixty dollars. See Bulletin of General Information, page 39 for details. For statements of the cost of living, see page 42.

#### SCHOLARSHIPS AND PRIZES

For scholarships and prizes in this college, see pages 46-50 of the Bulletin of General Information. Special attention is called to the Free and Service Scholarships mentioned on page 49 of the Bulletin of General Information.

#### THESES

Every candidate for 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.

The subject of the thesis and the character of the work to be done will be suggested in a large measure by the course of study pursued by the student. Great emphasis is laid upon the careful and accurate preparation of a thesis, because, more than any other work the student does, this certifies to his ability to undertake the difficult and responsible duties involved in the direction of engineering, architectural, and industrial interests.

## 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 ..... Three units
2. Mathematics ..... Three units
3. Chemistry ..... One unit
4. Enough additional work to make in all fifteen units, of which not more than three acceptable units may be in Group F.

One unit may be accepted in lieu of one unit from the above required subjects, but if this be offered as a substitute for Mathematics or Chemistry the resulting deficiency must be removed as hereinafter provided. Unless a candidate offers two units from Group B he may be required to take language in course. Students looking forward to the study of Architecture will find it to their advantage to take freehand drawing in the 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, 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.

DEFICIENCIES

Students found deficient in Algebra at the end of the first four weeks are separated from the regular freshman mathematics class and given a special course in Algebra, Trigonometry, and Analytics, extending throughout the year, and equivalent to the first semester freshman mathematics.

Should an entrance deficiency occur in Solid Geometry this must be made up prior to the beginning of the second semester; otherwise entrance deficiencies must be removed before entering upon any work of the sophomore year.

## 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 pages 24 and 25.

#### FRESHMAN YEAR\*

##### *First Semester*

Mathematics 71a, Algebra and Trigonometry, 5  
Drawing 1, 3, Engineering Drawing and Descriptive Geometry, 3  
Rhetoric 3, Rhetoric and Composition, 3  
Chemistry 29, Chemistry for Engineers, 3  
Mechanical Engineering 1, Elementary Shop Practice, 2  
Technology, 1  
Military Drill, 1

##### *Second Semester*

Mathematics 72, Analytic Geometry, 5  
Drawing 2, 4, Engineering Drawing and Descriptive Geometry, 3  
Rhetoric 4, Rhetoric and Composition, 3  
Chemistry 30, Chemistry for Engineers, 3  
Mechanical Engineering 2, Elementary Shop Practice, 2  
Technology, 1  
Military Drill, 1  
Summer Reading (optional), 1

All students pursuing the above courses register for Engineering Mathematics 71a in the first semester. At the end of two weeks' trial those who, by reason of inadequate preparation or undeveloped mathematical insight, are judged unable to carry the work successfully, are re-registered in Engineering Mathematics 69-70, in which the intensive work of Engineering Mathematics 71a is expanded into a course covering the full year. The resulting deficiency in Engineering Mathematics 72 must be made up in the Summer School.

### CIVIL ENGINEERING

#### SOPHOMORE YEAR

##### *First Semester*

Engineering Mathematics 73a, Differential Calculus, 5  
Physics 7, General Physics, 4

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\* Students who expect to take the General Course in Engineering and specialize in architectural work, should register for Drawing 9 and 10 instead of Drawing 3 and 4.

Physics 9, General Laboratory Practice, 1  
 Drawing 5, Graphics, 2  
 Civil Engineering 1, Surveying, 3  
 Geology 1, 3  
 Military Drill, 1

*Second Semester*

Engineering Mathematics 74, Integral Calculus, 5  
 Physics 8, General Physics, 4  
 Physics 10, General Laboratory Practice, 1  
 Drawing 6, Graphics, 2  
 Civil Engineering 2, Surveying, 3  
 Approved Elective, 3  
 Military Drill, 1

JUNIOR YEAR

*First Semester*

Engineering Mathematics 75, Technical Mechanics, Statics, 3  
 Engineering Mathematics 151, Mechanics of Materials, 3  
 Experimental Engineering 101, Materials Testing Laboratory, 2  
 Civil Engineering 51, Stresses in Structures, 3  
 Civil Engineering 91, Highways and Pavements, 2  
 Civil Engineering 3, Surveying, 2  
 Approved Elective, 3

*Second Semester*

Engineering Mathematics 76, Technical Mechanics, Dynamics, 3  
 Engineering Mathematics 152, Hydraulics, 3  
 Experimental Engineering 102, Hydraulic and Steam Laboratory, 2  
 Civil Engineering 52, Elementary Structural Design, 2  
 Civil Engineering 92, Municipal Engineering, 3  
 Civil Engineering 4, Surveying, 2  
 Approved Elective, 3

SUMMER CAMP

Civil Engineering 6, Summer Camp in Surveying, 6

Summer Camp in Surveying is held during the vacation period preceding the senior year, and is in session five weeks.

SENIOR YEAR

*First Semester*

Civil Engineering 121, Hydrology, 3  
 Civil Engineering 103, Water Supply, 3  
 Civil Engineering 111, Railway Engineering, 3  
 Civil Engineering 151, Bridge Analysis, 3  
 Civil Engineering 157, Reinforced Concrete, 3  
 Approved Elective, 3

*Second Semester*

Civil Engineering 122, Water Power, 3  
 Civil Engineering 104, Sanitary Engineering, 3  
 Civil Engineering 152, Bridge Design, 3  
 Electrical Engineering 156, Electric Power, 3  
 Approved Technical Elective, 3  
 Approved Elective, 3

## POST-SENIOR YEAR

Thesis required, and additional work each semester to aggregate eighteen credit hours. The electives of the post-senior year must be selected in advance in an approved logical order of groupings which will develop intensively the specialized fields of Engineering studied. The Thesis also should bear on the general field covered by the electives, and extends through the year.

The following arrangements are presented as suggestions, but in no wise limit the combinations which may be chosen.

## GENERAL

*First Semester*

Civil Engineering 155, Structural Design, 3  
 Civil Engineering 223, Hydraulic Design, 3  
 Experimental Engineering 113, Concrete Laboratory, 3  
 Electrical Engineering, 3  
 Rhetoric 31, Technical Writing, 3  
 Thesis, 3

*Second Semester*

Civil Engineering 274, Sanitary Design, 3  
 Civil Engineering 224, Special Hydraulic Problems, 3  
 or  
 Civil Engineering 232, River Improvement, 3  
 Civil Engineering 158, Reinforced Concrete Design, 3  
 or  
 Experimental Engineering 114, Structural and Concrete Laboratory, 3  
 Public Speaking, 3  
 Thesis, 3

## STRUCTURAL

*First Semester*

Civil Engineering 155, Structural Design, 3  
 Civil Engineering 201, Advanced Theory of Structures, 3  
 Experimental Engineering 113, Concrete Laboratory, 3  
 Logic, 3  
 Rhetoric 31, Technical Writing, 3  
 Thesis, 3

*Second Semester*

Civil Engineering 156, Structural Design, 3  
Civil Engineering 202, Advanced Theory of Structures, 4  
Experimental Engineering 114, Structural and Concrete Laboratory, 3  
Public Speaking, 3  
Thesis, 5

## MUNICIPAL

*First Semester*

Civil Engineering 171, City Planning, 3  
Civil Engineering 273, Building Sanitation, 3  
Zoology 1; Biology, 3  
Chemistry 109, Water Analysis, 3  
Engineering Mathematics 153, Thermodynamics, 3  
Thesis, 3

*Second Semester*

Civil Engineering 274, Sanitary Design, 3  
Experimental Engineering 106, Experimental Laboratory, 3  
Bacteriology 58b, General Bacteriology, 4  
Mechanical Engineering 127b, Power Plant Design, 3  
Thesis, 5

## RAILWAYS

*First Semester*

Civil Engineering 213, Railway Engineering, 3  
Civil Engineering 155, Structural Design, 3  
Electrical Engineering, 3  
Mechanical Engineering 129, Steam Engines and Boilers, 3  
Economics 145, Modern Business Corporations, 3  
Thesis, 3

*Second Semester*

Civil Engineering 214, Railway Engineering, 3  
Metallurgy 158, Metallography for Engineers, 3  
Experimental Engineering 114, Structural and Concrete Laboratory, 3  
Mechanical Engineering 138, Contracts and Specifications, 1  
Economics 74, Railway Problems, 3  
Thesis, 5



## MECHANICAL ENGINEERING

For freshman year, see page 14

## SOPHOMORE YEAR

*First Semester*

	Credits	Page	Rec.	Lect.	Lab.	Prep.
Eng. Math. 73a, Differential Calculus...	5	46	5	..	..	10
Physics 7, General Physics.....	4	53	3	1	..	8
Physics 9, General Lab. Practice.....	1	53	..	..	2	1
Drawing 7, Graphics.....	2	36	..	..	6	..
Mech. Eng. 19, Mechanical Technology..	1	48	..	2	..	1
Mech. Eng. 3, Shop.....	3	48	..	1	7	1
Option .....	2	..	..	..	..	..
Military Drill .....	1	52	..	..	3	..

*Second Semester*

Eng. Math. 74, Integral Calculus.....	5	46	5	..	..	10
Physics 8, General Physics.....	4	53	3	1	..	8
Physics 10, General Lab. Practice.....	1	53	..	..	3	..
Drawing 8, Graphics.....	2	36	..	..	6	..
Chemistry 38, Power Plant Chemistry...	3	30	1	1	4	3
Mech. Eng. 6, Shop.....	2	48	..	1	4	1
Option .....	2	..	..	..	..	..
Military Drill .....	1	52	..	..	3	..
Mech. Eng. 5, Summer Shop.....	4	48	..	..	44*	..
Summer Reading (Optional).....	1	..	..	..	3	..

## JUNIOR YEAR

*First Semester*

	Credits	Page	Rec.	Lect.	Lab.	Prep.
Eng. Math. 75, Tech. Mechanics, Statics.	3	46	3	..	..	6
Eng. Math. 151, Mechanics of Materials.	3	46	3	..	..	6
Exp. Eng. 101, Materials.....	2	43	..	..	4	2
Mech. Eng. 15, Mechan. and Kinematics	4	48	3	..	4	5
Economics 11, Problems for Engineers..	3	37	3	..	..	6
Option .....	3	..	..	..	..	..

*Second Semester*

Eng. Math. 76, Tech. Mech., Dynamics.	3	46	3	..	..	6
Eng. Math. 152, Hydraulics.....	3	46	3	..	..	6
Exp. Eng. 102, Hydraulic and Steam Lab.	2	43	..	..	4	2
Mech. Eng. 116, Machine Design.....	4	49	1	1	8	2
Economics 12, Problems for Engineers..	3	37	3	..	..	6
Option .....	3	..	..	..	..	..

## SENIOR YEAR

*First Semester*

	Credits	Page	Rec.	Lect.	Lab.	Prep.
Mech. Eng. 129, St. Engines and Boilers	3	50	3	..	..	6
Exp. Eng. 103, Steam and Power Lab...	2	43	..	..	4	2
Elect. Eng. 157, Electric Power, D. C...	3	40	2	..	3	4
Mech. Eng. 117, Mach. Design, V. Gears	2	49	..	..	6	..
Metallurgy 157, Metallography.....	3	51	1	1	3	1
Political Science 25, Am. Gov't.....	3	54	..	..	..	6
Approved Electives.....	3	..	..	..	..	..

\* The Summer Course in Shop is held during the vacation period following the sophomore year, and is in session for four weeks.

*Second Semester*

	Credits	Page	Rec.	Lect.	Lab.	Prep.
Mech. Eng. 124, Int. Combustion Eng. . . . .	3	49	3	..	..	6
Exp. Eng. 104, Power and Gas Eng. Lab. . . . .	2	43	..	..	4	2
Elect. Eng. 158, Electric Power, A. C. . . . .	3	40	2	..	3	4
Mech. Eng. 132, Meas. of Power. . . . .	2	50	2	..	..	4
Civil Eng. 50, Elements of Structures. . . . .	3	32	..	..	..	..
Political Science 26, Business Law. . . . .	3	54	..	..	..	6
Approved Electives. . . . .	2 or 3	..	..	..	..	..

## POST-SENIOR YEAR

*First Semester*

Required of all	Credits	Page	Rec.	Lect.	Lab.	Prep.
Mech. Eng. 111, Industrial Management. . . . .	2	49	1	1	..	4
Mech. Eng. 115, Power Engineering. . . . .	3	49	2	..	4	3
Mech. Eng. 133, Heating and Ventilating . . . . .	2	50	..	..	..	..
Exp. Eng. Engineering Laboratory. . . . .	3	..	..	..	6	3
Eng. Math. 153, Thermodynamics. . . . .	3	46	3	..	..	6
Approved Elective. . . . .	0-3	..	..	..	..	..
Options . . . . .	3-5	..	..	..	..	..

*Second Semester*

Mech. Eng. 138, Contracts and Specif. . . . .	1	50	1	..	..	2
Exp. Eng., Engineer. Lab. or equivalent. . . . .	3	..	..	..	..	..
Civil Eng. 162, Reinforced Concrete. . . . .	2	33	2	..	..	4
Eng. Math. 154, Turbines. . . . .	3	47	3	..	..	6
Thesis . . . . .	3	..	..	..	9	..
Approved Elective. . . . .	0-3	..	..	..	..	..
Options . . . . .	3-5	..	..	..	..	..

Options must be selected from one of the following groups at the beginning of the fifth year.

Electives may be selected from any optional group, or an approved free elective may be chosen.

Total credits not less than 18 nor more than 20.

## POST-SENIOR OPTIONS IN RAILWAY MECHANICAL ENGINEERING

*First Semester*

	Credits	Page	Rec.	Lect.	Lab.	Prep.
Mech. Eng. 139, Railway Technology. . . . .	2	50	..	..	..	..
Mech. Eng. 141, Railway Design. . . . .	3	50	..	..	8	1
Mech. Eng. 143, Locomotive Construction . . . . .	1	51	1	..	..	2
Elect. Eng. 113, Electric Railways. . . . .	2	40	..	..	..	..
Civil Eng. 213, Railway Engineering. . . . .	3	34	..	..	..	..
Economics 73, Railway Problems. . . . .	3	..	3	..	..	6

*Second Semester*

Mech. Eng. 142, Railway Design. . . . .	3	50	..	..	8	1
Mech. Eng. 144, Locomotive Construction . . . . .	1	51	1	..	..	2
Mech. Eng. 145, Locomotive Road Testing . . . . .	3	51	..	..	9	..
Elect. Eng. 228, Stm. Ry. Electrification . . . . .	2	42	..	..	..	..
Economics 74, Railway Problems. . . . .	2	..	3	..	..	6
Metallurgy 162, Adv. Metallography. . . . .	3	51	1	1	6	1

## POST-SENIOR OPTIONS IN INDUSTRIAL ENGINEERING

*First Semester*

	Credits	Page	Rec.	Lect.	Lab.	Prep.
Mech. Eng. 7a, Industrial Managmt. Lab.	2	48	..	..	4	2
Mech. Eng. 125, Tool Design.....	2	49	..	..	6	3
Civil Eng. 175, Industrial Sanitation....	2	34	..	2	..	4
Economics 34, Business Management....	3	37	1	2	..	6
Economics 35, Accounting.....	3	37	..	..	..	..

*Second Semester*

Mech. Eng. 7b, Industrial Managmt. Lab.	2	48	..	..	4	2
Mech. Eng. 125, Tool Design.....	2	49	..	..	6	3
Mech. Eng. 140, Safety Engineering.....	2	50	..	2	..	4
Elect. Eng. 234, Valuation of Public Utility Properties .....	1	42	..	1	..	..
Economics 161, or 165 Labor Problems..	3	37	..	..	..	..

## POST-SENIOR OPTIONS IN POWER ENGINEERING

*First Semester*

	Credits	Page	Rec.	Lect.	Lab.	Prep.
Mech. Eng. 121, Steam Engine Design..	3	49	..	..	8	1
Mech. Eng. 123, Gas Engine Design.....	3	49	..	..	8	1
Mech. Eng. 113, Power Plant Operation.	1 or 2	49	..	..	3 or 6	..
Civil Eng. 121, Hydrology.....	3	33	..	..	..	..

*Second Semester*

Mech. Eng. 119, Autos and Gas Tractors	3	49	..	2	4	2
Mech. Eng. 127, Power Plant Design...	3	50	1	1	6	1
Mech. Eng. 113, Power Plant Operation.	1 or 2	49	..	..	3 or 6	..
Mech. Eng. 136, Comp. Air. and Refrig.	3	50	3	..	..	6
Mech. Eng. 147, Mech. Equip. of Bldgs.	3	51	..	1	6	1
Civil Eng. 122, Water Power.....	3	33	..	..	..	..

## GENERAL OPTIONS

*First Semester*

Psychology, part of Psychology 5a.....	2
Logic, part of Logic 9a.....	2
Public Speaking .....	3
Technical Writing .....	2
English .....	3
French .....	3
German .....	3
Spanish .....	3
Political Science (Govt.).....	3
Economics 73* .....	3
Economics 161* .....	3

\* Must be preceded by 11 and 12.

*Second Semester*

Logic, part of Logic 9b.....	2
Psychology, part of Psychology 5b.....	2
Public Speaking .....	3
Technical Writing .....	2
English .....	3
French .....	3
German .....	3
Spanish .....	3
Political Science (Bus. Law.).....	3
Economics 74* .....	3
Economics 166* .....	3

\* Must be preceded by 11 and 12.

Students who did not have two years of German or French in high school are urged to begin a foreign language in the junior year.

## ELECTRICAL ENGINEERING

For freshman year, see page 14

## SOPHOMORE YEAR

*First Semester*

Engineering Mathematics 73a, Differential Calculus, 5
Physics 7, General Physics, 4
Physics 9, General Laboratory Practice, 1
Drawing 7, Graphics, 2
Electrical Engineering 51, Applied Electricity, 3
Mechanical Engineering 3a, Shop, 3
Military Drill, 1

*Second Semester*

Engineering Mathematics 74, Integral Calculus, 5
Physics 8, General Physics, 4
Physics 10, General Laboratory Practice, 1
Drawing 8, Graphics, 2
Electrical Engineering 52, Applied Electricity, 3
Mechanical Engineering 4b, Shop, 3
Military Drill, 1

## JUNIOR YEAR

*First Semester*

Engineering Mathematics 75, Technical Mechanics, Statics, 3
Engineering Mathematics 151, Mechanics of Materials, 3
Experimental Engineering 101, Materials Testing Laboratory, 2
Electrical Engineering 101, Electrical Machinery, 3
Electrical Engineering 103, Electrical Machinery Laboratory, 2

Physics 163, Electrical Measurements, 2  
 Approved Elective, 3

*Second Semester*

Engineering Mathematics 76, Technical Mechanics, Dynamics, 3  
 Engineering Mathematics 152, Hydraulics, 3  
 Experimental Engineering 102, Hydraulic and Steam Laboratory, 2  
 Electrical Engineering 102, Electrical Machinery, 3  
 Electrical Engineering 104, Electrical Machinery Laboratory, 2  
 Mechanical Engineering 16, Mechanism and Kinematics, 2  
 Approved Elective, 3

SENIOR YEAR

*First Semester*

Electrical Engineering 105, Alternating Currents, 3  
 Electrical Engineering 117, Electrical Design, 2  
 Electrical Engineering 107, Alternating Current Laboratory, 2  
 Mechanical Engineering 129, Steam Engines and Boilers, 3  
 Experimental Engineering 105, Steam and Power Laboratory, 2  
 Economics 11, Modern Economic Problems for Engineers, 3  
 Approved Elective, 3

*Second Semester*

Electrical Engineering 106, Alternating Currents, 3  
 Electrical Engineering 118, Electrical Design, 2  
 Electrical Engineering 108, Alternating Current Laboratory, 2  
 Mechanical Engineering 116, Machine Design, 4  
 Economics 12, Modern Economic Problems for Engineers, 3  
 Approved Elective, 4

POST-SENIOR YEAR

*First Semester*

Electrical Engineering 213, Transient Electric Phenomena, 2  
 Electrical Engineering 205, Central Stations, 2  
 Electrical Engineering 229, Advanced Electrical Laboratory, 2  
 Electrical Engineering 203, Thesis, 3  
 Electives, 9

*Second Semester*

Electrical Engineering 214, Transient Electric Phenomena, 2  
 Electrical Engineering 206, Electrical Transmission, 2  
 Electrical Engineering 230, Laboratory Special Problems, 2  
 Electrical Engineering 204, Thesis, 3  
 Electives, 9

For students expecting to enter the various fields of Electrical Communication, or any other special field, the curriculum specified for the

post-senior year is subject to modification, after conference and approval by the Department Faculty. Students desiring to specialize in Electro-Chemistry may be allowed substitutions in the senior and post-senior years.

## ELECTIVES

Suggested for juniors: American Government  
 English  
 Foreign Language  
 Psychology (first semester)  
 Logic (second semester)  
 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 in the junior year.

Suggested for seniors: Business Law  
 Electric Lighting  
 Journal Reading  
 Mathematics  
 Power Plant Operation  
 Psychology  
 Public Speaking  
 Railway Electrical Engineering  
 Surveying

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

See also electives suggested for juniors and seniors.

## GENERAL COURSE IN ENGINEERING

For freshman year, see page 14

## SOPHOMORE YEAR\*

*First Semester*

Engineering Mathematics 73a, Differential Calculus, 5  
 Physics 7, General Physics, 4

\* Students pursuing the course in General Engineering are required at the end of the sophomore year to submit to the Dean of the College a list of proposed electives for the junior and senior years.

Physics 9, General Laboratory Practice, 1  
 Drawing 5 or 7, 2  
 Approved Technical Elective, 3  
 Approved Elective, 3  
 Military Drill, 1

*Second Semester*

Engineering Mathematics 74, Integral Calculus, 5  
 Physics 8, General Physics, 4  
 Physics 10, General Laboratory Practice, 1  
 Drawing 6 or 8, 2  
 Approved Technical Elective, 3  
 Approved Elective, 3  
 Military Drill, 1

JUNIOR YEAR

*First Semester*

Engineering Mathematics 75, Technical Mechanics, Statics, 3  
 Engineering Mathematics 151, Mechanics of Materials, 3  
 Experimental Engineering 101, Materials Testing Laboratory, 2  
 Approved Technical Electives, 5  
 Approved Electives, 5

*Second Semester*

Engineering Mathematics 76, Technical Mechanics, Dynamics, 3  
 Engineering Mathematics 152, Hydraulics, 3  
 Experimental Engineering 102, Hydraulic and Steam Laboratory, 2  
 Approved Technical Electives, 5  
 Approved Electives, 5

SENIOR YEAR

*Each Semester*

Approved Technical Electives, 9  
 Approved Electives, 9

ARCHITECTURE

FRESHMAN YEAR

*First Semester*

Mathematics 71a, Algebra and Trigonometry, 5  
 Drawing 9, Graphics, 2  
 Rhetoric 3, Rhetoric and Composition, 3  
 French I, 3  
 Architecture 21, Freehand Drawing, 2  
 Architecture 31, Elements of Architecture, 3  
 Military Drill, 1

*Second Semester*

Mathematics 72, Analytic Geometry, 5  
 Drawing 10, Graphics, 2  
 Rhetoric 4, Rhetoric and Composition, 3  
 French 2, 3  
 Architecture 22, Freehand Drawing, 2  
 Architecture 32, Elements of Architecture, 3  
 Military Drill, 1

All students pursuing the above courses register for Mathematics 71a in the first semester. At the end of two weeks trial those who by reason of inadequate preparation or undeveloped mathematical insight are judged unable to carry the work successfully, are re-registered in Engineering Mathematics 69-70, in which the intensive work of Mathematics 71a is expanded into a course covering the full year. The resulting deficiency in Mathematics 72 must be made up in the Summer School.

## SOPHOMORE YEAR

*First Semester*

Mathematics and Mechanics 91, Mechanics, 4  
 Physics 1, General Physics, 3  
 Physics 3, General Laboratory Practice, 1  
 Architecture 23, Freehand Drawing, 2  
 Architecture 33, Elementary Design, 4  
 Architecture 43, Specifications and Working Drawings, 3  
 Military Drill, 1

*Second Semester*

Mathematics and Mechanics 92, Strength of Materials, 4  
 Physics 2, General Physics, 3  
 Physics 4, General Laboratory Practice, 1  
 Architecture 24, Freehand Drawing, 2  
 Architecture 34, Elementary Design, 4  
 Architecture 44, Specifications and Working Drawings, 3  
 Military Drill, 1

## JUNIOR YEAR

*First Semester*

Architecture 15, Architectural History, Ancient, 2  
 Architecture 25, Freehand Drawing, 3  
 Architecture 35, Architectural Design, 6  
 Architecture 65, Theory of Architecture, 1  
 Civil Engineering 41, Elements of Structures, 3  
 Approved Electives, 3

*Second Semester*

Architecture 16, Architectural History, Renaissance, 2



Architecture 26, Freehand Drawing, 3  
 Architecture 36, Architectural Design, 6  
 Architecture 66, Theory of Architecture, 1  
 Civil Engineering 42, Reinforced Concrete, 3  
 Approved Electives, 3

SENIOR YEAR

*First Semester*

Architecture 17, Architectural History, Medieval, 2  
 Architecture 27, Life Drawing, 2  
 Architecture 57, Decorative Composition, 2  
 Architecture 37, Architectural Design, 8  
 Architecture 67, History of Sculpture and Painting, 2  
 Civil Engineering 21, Building Sanitation, 2

*Second Semester*

Architecture 18, Architectural History, Modern, 2  
 Architecture 28, Life Drawing, 2  
 Architecture 58, Decorative Composition, 2  
 Architecture 38, Architectural Design, 8  
 Architectural Practice, 2  
 Mechanical Engineering 134, Heating and Ventilating, 2

POST-SENIOR YEAR

Work divided into major and minor groups all elective.

Required number of credit hours 18 or 19.

All students required to take one major and at least two minor groups, but may take three minors.

Credit hour value of major group 10, or minor group 4 or 3, making total credit hour program 10, 4, 4; or 10, 3, 3, 3.

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  
     Mechanical Equipment of Buildings  
     Electrical Equipment of Buildings  
 (d) Architectural History Research

## DEPARTMENTAL STATEMENTS\*

### ARCHITECTURE

Professor FREDERICK M. MANN; Assistant Professors JAMES H. FORSYTHE,  
ROY C. JONES; Instructors SAMUEL C. BURTON, FRANCIS X. KEALLY;  
Special Lecturer JOHN O. CEDERBERG.

#### COURSES

No.	Title	Credits	Required of	Prereq. courses
15.	Architectural History.....	2	Jr. Arch.	31, 32
16.	Architectural History.....	2	Jr. Arch.	31, 32
17.	Architectural History.....	2	Sr. Arch.	15
18.	Architectural History.....	2	Sr. Arch.	16
21.	Elementary Freehand Drawing.....	2	Fr. Arch.	..
22.	Elementary Freehand Drawing.....	2	Fr. Arch.	21
23.	Freehand Drawing.....	2	Soph. Arch	22
24.	Freehand Drawing.....	2	Soph. Arch.	23
25.	Freehand Drawing.....	3	Jr. Arch.	24
26.	Freehand Drawing.....	2	Jr. Arch.	25
27.	Life Drawing.....	2	Sr. Arch.	26
28.	Life Drawing.....	2	Sr. Arch.	27
31.	Elements of Architecture.....	3	Fr. Arch.	..
32.	Elements of Architecture.....	3	Fr. Arch.	31
33.	Architectural Design, Elementary....	4	Soph. Arch..	32
34.	Architectural Design, Elementary....	4	Soph. Arch.	33
35.	Architectural Design, Intermediate...	6	Jr. Arch.	34
36.	Architectural Design, Intermediate...	6	Jr. Arch.	35
37.	Architectural Design, Advanced.....	8	Sr. Arch.	36
38.	Architectural Design, Advanced.....	8	Sr. Arch.	37
43.	Specifications and Working Drawings	3	Soph. Arch.	31, 32
44.	Specifications and Working Drawings	3	Soph. Arch.	43
57.	Decorative Composition.....	2	Sr. Arch.	36
58.	Decorative Composition.....	2	Sr. Arch.	26, 36
65.	Theory of Architecture.....	1	Jr. Arch.	34
66.	Theory of Architecture.....	1	Jr. Arch.	65
67.	History of Sculpture and Painting...	2	Jr. Arch.	15, 16
68.	Architectural Practice.....	2	Sr. Arch.	Senior Standing

15. ARCHITECTURAL HISTORY. Technical study of the architecture of Egypt, Assyria, Persia, Greece, and Rome, with emphasis on the latter two. Lectures and library research. FORSYTHE.

16. ARCHITECTURAL HISTORY. Development of the Renaissance movement in the Fine Arts. Technical study of architecture in Italy, particularly in the fifteenth, sixteenth, and seventeenth centuries. Lectures and library research. FORSYTHE.

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\* In the statements of the curriculum which follow, the scheme of numbering the courses indicates the semester in which a course is given. A figure following a specific subject indicates the number of credit hours of work required.

17. ARCHITECTURAL HISTORY. Technical study of architecture during the Middle Ages; the sources and influences in the development of the Romanesque and Gothic styles. Lectures and library research. MANN.
18. ARCHITECTURAL HISTORY. Study of the development of architecture from the seventeenth century to the present time, particularly in France, England, and America. Spirit of Modern and Early Renaissance architecture contrasted. Lectures and library research. MANN.
21. ELEMENTARY FREEHAND DRAWING. Drawing from casts and from memory. Details of the figure and architectural ornament in charcoal, pencil, and pen and ink. BURTON.
22. ELEMENTARY FREEHAND DRAWING. Continuation of Course 21, with the addition of studies executed in monochrome. BURTON.
23. FREEHAND DRAWING. Drawing from head life; advanced figure work from casts and from architectural compositions, in color, pen and ink, charcoal, and pencil. KEALLY.
24. FREEHAND DRAWING. Painting from the head and still life; advanced figure work from casts and from decorative compositions in color, pen and ink, charcoal, and pencil. KEALLY.
25. FREEHAND DRAWING. Continuation of Course 24, with introduction of working drawings for figure compositions, executed in color, charcoal and chalks. BURTON.
26. FREEHAND DRAWING. Same as Course 25, with the addition of landscape painting. BURTON.
- 27-28. LIFE DRAWING. Drawing from life. BURTON.
31. ELEMENTS OF ARCHITECTURE. Lectures on elements of architecture. Exercises in instrumental drawing and wash rendering; architectural lettering; study of walls, doors, windows, mouldings. FORSYTHE.
32. ELEMENTS OF ARCHITECTURE. Lectures on elements of architecture. Study of the classic orders by means of simple problems in design, and composition of architectural fragments, rendered in wash.
- 33-34. ARCHITECTURAL DESIGN.\* Rendered problems, dealing in general with the elements of elevation, and their composition into a simple architectural unit. Sketch problems dealing with elementary plan composition. Individual and general criticism and library research. KEALLY.

\* 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 six courses is three years. To students completing them in less, special advanced work is open.

- 35-36. ARCHITECTURAL DESIGN.\* Rendered problems dealing in general with the elements of plan and their composition into simple complete buildings. Sketch problems dealing with big plan composition, single or group. Individual and general criticism and library research. JONES.
- 37-38. ARCHITECTURAL DESIGN.† Rendered problems dealing with composition of buildings or groups of buildings of more complicated requirements and special character, together with subjects of highly decorative or imaginative interest. Sketch problems dealing with large scale study of architectural and decorative detail. JONES.
43. SPECIFICATIONS AND WORKING DRAWINGS. Wood construction, properties and uses of wood. Preparation of plans and detail working drawings for frame house. Written reports from buildings under construction, with measured drawings of roofs, dormers, cornice, windows, stairs, fireplace, cupboards, etc. CEDERBERG.
44. SPECIFICATIONS AND WORKING DRAWINGS. Masonry construction. Materials, their manufacture and properties. Preparation of plans and detail working drawings for a simple fire-proof building. Written reports from buildings under construction, with measured drawings of important details of construction. Specifications. CEDERBERG.
57. DECORATIVE COMPOSITION. Theories of color, and the application of color to architectural decoration. Architectural rendering. MANN.
58. DECORATIVE COMPOSITION. The design of relief decoration. Manipulation of scale models of architectural subjects. Drawing and clay modeling. BURTON.
- 65-66. THEORY OF ARCHITECTURE. A study of the guiding principles of architectural expression. Program analysis. JONES.
67. HISTORY OF SCULPTURE AND PAINTING. Historical study of ancient and modern sculpture and of the modern schools of painting. BURTON.
68. ARCHITECTURAL PRACTICE. Relations of the architect, owner, and builder; forms of contracts, professional ethics, and office administration. MANN.

\* By special arrangement in cooperation with the Minnesota Chapter of the American Institute of Architects, each junior architect, who has had less than one year of practical office experience, will be assigned to practical work in an architect's office either in Minneapolis or St. Paul. This work will extend over not less than eighteen hours of each week during either the first or second semester and will take the place of one of the junior design courses, either Architecture 35 or 36, and will carry six semester credit hours.

† 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 six courses is three years. To students completing them in less, special advance work is open.

## CHEMISTRY

Professors GEORGE B. FRANKFORTER, CHARLES F. SIDENER; Associate Professor EVERHART P. HARDING; Instructor FRANK W. BLISS.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
19.	General Chem. and Qual. Analysis..	5	Fr.	None
29.	Chemistry for Engineers.....	3	Fr.	One yr. prep. Gen. Chem.
30.	Chemistry for Engineers.....	3	Fr.	23 or 25
38.	Power Plant Chemistry.....	3	Soph., M. E.	26
109.	Water Analysis.....	3	Elective p. sr. C. E.	26

19. GENERAL CHEMISTRY AND QUALITATIVE ANALYSIS. Designed for those who have had no high school chemistry, in preparation for Course 30. See statement under 29. FRANKFORTER, BLISS, and Assistants.

29. CHEMISTRY FOR ENGINEERS. An advanced course for engineers; general chemistry, with an introduction to analytical chemistry and chemical theories. FRANKFORTER, BLISS, and Assistants.

30. CHEMISTRY FOR ENGINEERS. A continuation of Course 29. FRANKFORTER, BLISS, and Assistants.

38. POWER PLANT CHEMISTRY. Methods of sampling and analyzing coal, liquid fuels, and gases, and methods of determining their calorific value for heat efficiencies and control work. Boiler waters—their examination, character, and treatment. Lectures and laboratory work. HARDING and Assistants.

109. WATER ANALYSIS. This course includes an exhaustive discussion of the chemical and sanitary properties of water. FRANKFORTER and Assistants.

## CIVIL ENGINEERING

Professor FREDERIC H. BASS; Associate Professors ADOLPH F. MEYER, JOHN I. PARCEL; Assistant Professors ALVIN S. CUTLER, FRANKLIN R. McMILLAN, OTTO S. ZELNER; Instructor GEORGE A. MANEY.

## COURSES

No.	Title	Credits	Required of	Prereq. courses
1.	Surveying .....	3	Soph. C.E.	Math. 71a, Draw. 1-3
2.	Surveying .....	3	Soph. C.E.	1
3.	Surveying .....	2	Jr. C. E.	2
4.	Surveying .....	2	Jr. C. E.	3
6.	Summer Camp .....	6	Jr. C. E.	4
10.	Surveying .....	1	Elective p. sr. E. E. & M. E.	
21.	Building Sanitation .....	2	Sr. Arch.	..
41.	Elements of Structures.....	3	Jr. Arch.	M. & M. 92

No.	Title	Credits	Offered to	Prereq. Courses
42.	Reinforced Concrete .....	3	Jr. Arch.	M. & M. 92
50.	Elements of Structures .....	3	Sr. M.E.	M. & M. 75
51.	Stresses in Structures .....	3	Jr. C.E.	M. & M. 75
52.	Elementary Structural Design .....	2	Jr. C. E.	C. E. 51; M. & M. 151
91.	Highways and Pavements .....	2	Jr. C. E.	2
92.	Municipal Engineering .....	3	Jr. C.E.	..
103.	Water Supply .....	3	Sr. C. E.	92
104.	Sanitary Engineering .....	3	Sr. C. E.	92
107-8.	Geodesy .....	3	Elective	4, 6
111.	Railway Engineering .....	3	Sr. C. E.	4
112.	Railway Engineering .....	3	Elective sr. C. E.	111
121.	Hydrology .....	3	Sr. C. E.	.....
122.	Water Power .....	3	Sr. C. E.	121; M.&M. 152 Exp. Eng. 102
151.	Bridge Analysis .....	3	Sr. C.E.	52
152.	Bridge Design .....	3	Sr. C.E.	151
155.	Structural Design .....	3	Elective p. sr.	p. sr. standing
156.	Structural Design .....	3	Elective p. sr.	p. sr. standing
157.	Reinforced Concrete .....	3	Sr. C. E.	51-52
158.	Reinforced Concrete Design .....	33	Elective sr. C. E.	157
162.	Reinforced Concrete .....	2	Elective sr. M. E. & E. E.	
171.	City Planning .....	3	Elective p. sr.	..
175.	Industrial Sanitation .....	2	Elective p. sr. M.E. & E. E.	
201.	Advanced Theory of Structures..	3	Elective p. sr.	p. sr. standing
202.	Advanced Theory of Structures...	4	Elective p. sr.	p. sr. standing
203-4.	Theory of Indeterminate Strctrs..	4	Graduate (one or two semesters)	
213.	Railway Engineering .....	3	Elective p. sr. C. E. & M. E.	111
214.	Railway Engineering .....	3	Elective p. sr. C. E.	111
223.	Hydraulic Design .....	3	Elective p. sr. C. E.	122
224.	Special Hydraulic Problems .....	3	Elective p. sr. C. E.	223
232.	River Improvement .....	3	Elective p. sr.	..
241-42.	Reinforced Concrete Analysis... 2 or 3		Graduate and elective	157 or equiva- lent
273.	Building Sanitation .....	3	Elective p. sr.	..
274.	Sanitary Design .....	3	Elective p. sr.	..

1. SURVEYING. Field problems; use of chain, compass, transit and level. Computation and platting of all surveys made in the field. Determination of area—D.M.D.; and methods of platting. Surveys of the U. S. public lands. CUTLER, ZELNER.
2. SURVEYING. Lectures, drawing room and field work, including a study of topographic maps and signs; principles of the stadia, leveling, platting of profiles and grades. CUTLER, ZELNER.
3. SURVEYING. A complete topographical survey, stadia method, is made and platted. CUTLER, ZELNER.
4. SURVEYING. Elements of hydrographic, municipal, and railroad surveying. Use of current meters, plane table, barometer, sextant, the-

- odolite. Meridian by solar observations. Computing and staking railroad curves. Preparatory to the more advanced work carried on in Summer Camp. CUTLER, ZELNER.
6. SUMMER CAMP. Five weeks. Continuation of Course 4, including extended railroad, topographic, hydrographic, and triangulation surveys. CUTLER, ZELNER.
10. SURVEYING. A short course in the use, care, and adjustment of surveying instruments. (Open to post-seniors only.) ZELNER.
21. BUILDING SANITATION. The location and orientation of buildings; lighting, ventilation, water supply, plumbing, sewage, and refuse disposal. BASS.
41. ELEMENTS OF STRUCTURES. Theory and design of beams, columns, roof trusses, plate girders. PARCEL.
42. REINFORCED CONCRETE. Elementary principles and designing methods. PARCEL.
50. ELEMENTS OF STRUCTURES. A brief course for Mechanical and Electrical Engineers. Laws of equilibrium applied to structural frames; design of roof truss and plate girder. MANEY.
51. STRESSES IN STRUCTURES. The fundamental principles of structural mechanics, and their applications to beams and girders, simple trusses, the framed bent, etc. PARCEL.
52. ELEMENTARY STRUCTURAL DESIGN. Proportioning of tension and compression members, riveted joints. Design and detail drawing of roof truss and plate girder. PARCEL.
91. HIGHWAYS AND PAVEMENTS. Lectures, recitations, laboratory work, and field inspection, relating to the economics, location, construction, and maintenance of highways and pavements. BASS.
92. 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.
103. 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.
104. 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.

- 107-8. GEODESY. Methods of conducting a geodetic survey, lectures and assigned readings. ZELNER.
111. RAILWAY ENGINEERING. The mathematics of curves and earthwork; their application to location and construction; switches and crossovers; methods of computing earthwork and haul. Completion of maps and profiles of summer camp work, field and office work. CUTLER.
112. RAILWAY ENGINEERING. Design and construction of railroad buildings and structures; culverts, wooden trestles, switches, crossovers, crossing frogs. The student is familiarized with the principal structures coming under the supervision of the maintenance-of-way department of a modern railroad. CUTLER.
121. 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. MEYER.
122. 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. To be taken with Ex. Eng. 108. MEYER.
151. BRIDGE ANALYSIS. Analysis of various types of railway bridge trusses (including Baltimore and Petit types) under moving loads. MANEY.
152. BRIDGE DESIGN. Complete design and detail of typical railway structure such as plate girder viaduct or riveted truss span. MANEY.
155. STRUCTURAL DESIGN. Complete design and general drawing of railway pin truss span. PARCEL.
156. STRUCTURAL DESIGN. Critical and comparative study of designing principles and methods. Specifications and office methods. PARCEL.
157. REINFORCED CONCRETE. Principles of reinforced concrete. Theory of beams, slabs, and columns, and their application to ordinary structures. Lectures, problems, and design. McMILLAN.
158. REINFORCED CONCRETE DESIGN. Continuation of Course 157 with special emphasis on the practical features of design of buildings, bridges, retaining walls, etc. Problems in design and lectures. McMILLAN.
162. REINFORCED CONCRETE. A short course embracing the principal features of Course 157.
171. CITY PLANNING. The physical elements of the City; topography, drainage, geology. Public works and structures. Street arrangement; rapid transit; railroad terminals. City districting. Sub-sur-



- face structures. Esthetic features of the city; the civic center; parks; boulevards; public buildings. BASS, MANN.
175. 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.
201. ADVANCED THEORY OF STRUCTURES. Fundamental theory of deflections and indeterminate stresses. Applications to the simpler cases of continuous girders, swing bridges, and redundant members. PARCEL, MANEY.
202. ADVANCED THEORY OF STRUCTURES. A continuation of 159. Swing bridges and arches (including the reinforced concrete arch.) Secondary stresses and wind stresses in tall office buildings. PARCEL, McMILLAN, MANEY.
- 203-4. THEORY OF INDETERMINATE STRUCTURES. Critical and detailed study of selected problems in indeterminate structures. PARCEL, MANEY.
213. 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.
214. 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.
223. HYDRAULIC DESIGN. 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. MEYER.
224. SPECIAL HYDRAULIC PROBLEMS. Study of special hydraulic problems in laboratory, drafting room, and field. To be taken parallel with Ex. E. 118. MEYER.
232. RIVER IMPROVEMENT. River hydraulics and the maintenance of regimens. The improvement of rivers for navigation, etc. The economics of water transportation. MEYER.
- 241-42. REINFORCED CONCRETE ANALYSIS. One or two semesters, two meetings per week. Open to those who have completed 157 or its equivalent. Critical review of the literature of reinforced concrete; study of test data and analysis of stresses in reinforced concrete structures. Two or three credits. McMILLAN.

273. BUILDING SANITATION. A design course in the sanitation of buildings. Heating and ventilating, plumbing, lighting. Housing problems. BASS, ROWLEY.
274. SANITARY DESIGN. Continuation of Course C.E. 104. Design of water purification, sewage disposal, and refuse disposal plants. BASS.

## DRAWING AND DESCRIPTIVE GEOMETRY

Professor WILLIAM H. KIRCHNER; Assistant Professors ROBERT W. FRENCH, OTTO S. ZELNER; Instructors FRED W. BENTLEY, HOWARD D. MYERS, LAWRENCE J. MORTENSON, RUTCHER SKAGERBERG.

## COURSES

No.	Title	Credits	Required of	Prereq. courses
1.	Engineering Drawing .....	1½	Fr.	See statement
2.	Engineering Drawing .....	1½	Fr.	See statement
3.	Descriptive Geometry .....	1½	Fr.	See statement
4.	Descriptive Geometry .....	1½	Fr.	See statement
5.	Graphics .....	2	Soph. C. E.	1-2, 3-4
6.	Graphics .....	2	Soph. C. E.	5
7.	Graphics .....	2	Soph. M.E. & E.E.	1-2, 3-4
8.	Graphics .....	2	Soph. M.E. & E.E.	7
9-10.	Graphics .....	4	Fr. Arch.	See statement
51.	Lettering .....	1	Elective sr. & p. sr.	....
111-12.	Advanced Descriptive Geometry...	6	Elective	5, Math. 74
113a,b.	Perspective .....	3	Elective	10, Math. 72

1. ENGINEERING DRAWING. The elements of drafting. Drawing as a language. Lines, views, sections, dimensions, isometric and oblique projection. Sketching and lettering. Details of castings. Interpretation of working drawings. FRENCH, MORTENSON, MYERS
2. ENGINEERING DRAWING. A continuation of Course 1. Details of machine parts and assembly drawings. General conventional signs, abbreviations, standards, and explanatory notes. Tracing and blue printing. FRENCH, BENTLEY, SKAGERBERG.
3. DESCRIPTIVE GEOMETRY. Introductory course in descriptive geometry. Systems of representation, methods, loci, and constructive geometry. Recitations and drawing room exercises. Taken concurrently with Course 1. Open to students who have had Solid Geometry and are in Mathematics 71, or equivalent. KIRCHNER, BENTLEY, MYERS.
4. DESCRIPTIVE GEOMETRY. Central projection and special cases. Representations of lines, planes, and solids, and of their relations; tangencies, intersections, and development. Recitations, lectures, and the solution of problems. Taken concurrently with Course 2, and Mathematics 72.
5. GRAPHICS. For Civil Engineers. Developments and intersections, shades and shadows and stereotomy. Descriptive Geometry applied

to the solution of such problems as oblique structural connections, battered and skewed surfaces in concrete, earthwork, and contours. FRENCH.

- 6. GRAPHICS. For Civil Engineers. Structural Drawing. Details, assembly drawings, bills of material. Drafting room methods and systems. FRENCH.
- 7. GRAPHICS. For Mechanical and Electrical Engineers. Developments and intersections, shades and shadows and perspective. Descriptive Geometry applied to the solution of such problems as occur in sheet metal work, equipment layouts, skew belting, spiral conveyors. FRENCH, BENTLEY, MYERS.
- 8. GRAPHICS. For Mechanical and Electrical Engineers. Working drawings of machinery. Assembly drawings, outline drawings, diagrammatic layout, and detail drawings. Drafting room methods and systems. BENTLEY, SKAGERBERG.
- 9-10. GRAPHICS. For Architects. Lectures and exercises in constructive and descriptive geometry with applications. Shades and shadows. Perspective. KIRCHNER.
- 51. LETTERING. A course in freehand lettering for seniors and post-seniors. ZELNER.
- 111-112. ADVANCED DESCRIPTIVE GEOMETRY. Methods of representation; parallel and central projection. Geometrography, axonometry, and photogrammetry. KIRCHNER.
- 113a,b. PERSPECTIVE. The principles and practice of perspective, including shadows, reflections, distortions, corrections, systems, methods, the practical problem, and inverse constructions. KIRCHNER.

ECONOMICS

Professors JOHN H. GRAY, E. DANA DURAND; Assistant Professor THOMAS W. MITCHELL; Instructors LLOYD M. CROSGRAVE, ALBERT C. HODGE, ALBERT C. JAMES, ROBERT J. MCFALL, .....

COURSES

No.	Title	Credits	Required of	Prereq. courses
11-12.	Modern Economic Problems for Engineers .....	6	Jr. M.E., sr. E.E., and elective	None
34.	Business Organization .....	3	Elective	3 or 11
35-36.	Accounting Principles .....	6*	Elective	None
37.	Marketing .....	3	Elective	3 or 11
131.	Cost Accounting .....	3	Elective	3 or 11, 35-36
145.	The Modern Business Corporation. ....	3	Elective	6 credits incl. 3 or 11
146.	Public Utilities .....	3	Elective	6 credits incl. 3 or 11

\* Both semesters must be completed before credit is given for the first semester.

No.	Title	Credits	Offered to	Prereq. Courses
161.	Labor Problems .....	3	Elective	6 credits incl. 3 or II
173.	Railway Problems .....	3	Elective	6 credits incl. 3 or II
174.	Railway Rate Regulation.....	3	Elective	173

7-8. **GENERAL ECONOMICS FOR BUSINESS STUDENTS.** This course covers somewhat the same general field as Economics II-12 but is designed for students in the business curriculum rather than engineering students. It may be elected by engineering students only in case they are unable to take II-12. See Bulletin of the College of Science, Literature, and the Arts.

11-12. **MODERN ECONOMIC PROBLEMS FOR ENGINEERS.** Effect of industrial development; international commerce; corporation organization and finance, banking and credit; public ownership and public finance; trusts and monopolies; transportation problems, insurance, conservation, and labor problems. Lectures, text-book assignments, and talks by men actively engaged in the various fields studied. CROSGRAVE.

34. **BUSINESS MANAGEMENT.** The principles of efficiency in business operation and forms of organization to apply them, the typical departments of a business; their functions, office organization, and administration. Text-book, assigned readings, and lectures. HODGE.

35-36. **PRINCIPLES OF ACCOUNTING.** Purposes of accounts; principles of account classification, capital and revenue; accruals; principles of valuation; depreciation; preparation and interpretation of balance sheets, income accounts, and other business statements; corporation accounts. A laboratory course with supplementary lectures. HODGE, .....

37. **MARKETING OF PRODUCTS.** Foreign and domestic merchandising methods of manufacturers. Problems of wholesalers and commission men; distributing system and market organization; price policies. Problems of the credit department. JAMES.

131. **COST ACCOUNTING.** Elements and classification of production cost; methods of recording materials, labor and machine costs, and apportioning indirect expenses; relation of cost to general accounts; use of cost data to enforce efficiency of operation. MITCHELL.

145. **THE MODERN BUSINESS CORPORATION.** The organizing, financing, and managing of corporations; the corporation before the law; methods of accounting; the relation of the government to the corporation; the question of trusts in its various phases. DURAND.

146. **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. DURAND.
161. LABOR PROBLEMS. Modern labor problems; woman and child labor, industrial education, unemployment, poverty, industrial hygiene, welfare work, profit-sharing cooperation, labor unions, strikes, boycotts, conciliation, and arbitration; economic causes and effects of immigration. CROSGRAVE.
173. RAILWAY PROBLEMS. Survey of railways and railway policy of the United States and representative foreign countries. Railway organization and finance. Railway discriminations, competition, pooling, combination, and associations. Canal and ocean transportation. Transportation and labor. MCFALL.
174. RAILWAY RATE REGULATION. Rate-making, federal and state legislation, cost and value of service, earnings, valuation, the regulation of particular rates and of entire rate schedules, complications from state and interstate jurisdiction, classification, and representative decisions. MCFALL.

## ELECTRICAL ENGINEERING

Professors GEORGE D. SHEPARDSON, FRANK W. SPRINGER; Assistant Professor WILLIAM T. RYAN; Instructors EDWIN R. MARTIN, ERNEST A. REID, HUBERT M. TURNER.

## COURSES

No.	Title	Credits	Required of	Prereq. courses
51.	Applied Electricity .....	3	Soph. E. E.	See statement
52.	Applied Electricity .....	3	Soph. E. E.	51
101.	Electrical Machinery .....	3	Jr. E. E.	Physics 8
102.	Electrical Machinery .....	3	Jr. E. E.	Physics 8
103.	Electrical Machinery Laboratory.	2	Jr. E. E.	Physics 8
104.	Electrical Machinery Laboratory.	2	Jr. E. E.	Physics 8
105.	Alternating Currents .....	3	Sr. E. E.	101-104
106.	Alternating Currents .....	3	Sr. E. E.	101-104
107.	Alternating Current Laboratory..	2	Sr. E. E.	101-104
108.	Alternating Current Laboratory..	2	Sr. E. E.	101-104
109a,b.	Power Plant Operation.....	1	Elective sr. & p. sr.	101-104
111.	Electric Lighting .....	2	Elective sr. & p. sr.	102 or 158
113.	Electric Railways .....	2	Elective sr. & p. sr.	105, 155, or 158
114.	Electric Railways .....	2	Elective sr. & p. sr.	105, 155, or 158
115.	Journal Reading .....	1	Elective sr. & p. sr.	105
116.	Journal Reading .....	1	Elective sr. & p. sr.	105
117.	Electrical Design .....	2	Sr. E. E.	105-106
118.	Electrical Design .....	2	Sr. E. E.	105-106
152.	Electric Lighting .....	1	Elective Arch.	Physics 1-4
156.	Electric Power .....	3	Sr. C. E.	Physics 8
157.	Electric Power.....	3	Sr. M. E.	Physics 8
158.	Electric Power.....	3	Sr. M. E.	Physics 8
203.	Thesis .....	3	P. sr. E. E.	105-106
204.	Thesis .....	3	P. sr. E. E.	105-106
205.	Central Stations.....	2	Elective p. sr.	105 or 158

No.	Title	Credits	Taken by	Prereq. courses
206.	Electrical Transmission.....	2	Elective p. sr.	106 or 158
207.	Elec. Ignition and Accessories.....	1-2	Elective p. sr.	101-102
208.	Batteries and Elec. Vehicles.....	1	Elective p. sr.	102 or 158
210.	Elec. Equipment of Bldgs.....	1	Elective p. sr.	106 or 158
212.	High Tension Testing.....	1-2	Elective p. sr.	105-106
213-14.	Transient Electric Phenomena.....	2	Elective p. sr.	105-106
215-16.	Radio-Signaling .....	2	Elective p. sr.	105-106
219.	Telegraph and Telephone Apparatus .....	2	Elective p. sr.	106
220.	Telegraph and Telephone Circuits.	2	Elective p. sr.	106
221.	Precise Elec. Measurements.....	1	Elective p. sr.	108
222.	Precise Elec. Measurements.....	1	Elective p. sr.	108
223.	Electrochemical Engineering .....	2	Elective p. sr.	106 or 158
226.	Illuminating Engineering .....	2	Elective p. sr.	111
228.	Steam Railroad Electrification.....	2	Elective p. sr.	114
229.	Laboratory Special Problems.....	2	Elective p. sr.	108
230.	Laboratory Special Problems.....	2	Elective p. sr.	108
232.	Design Special Problems.....	2	Elective p. sr.	202
234.	Valuation of Public Utility Properties .....	1	Elective p. sr.	205

51. APPLIED ELECTRICITY. Introduction to the development, principles, materials, safety, and general application of electrical engineering. Lecture, class, and laboratory. Open to students registered for Physics 7 and 9. SHEPARDSON, SPRINGER, MARTIN, REID, TURNER.

52. APPLIED ELECTRICITY. A continuation of Course 51. SHEPARDSON, SPRINGER, MARTIN, REID, TURNER.

101-102. ELECTRICAL 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.

103-104. ELECTRICAL MACHINERY LABORATORY. To be taken with Course 101-102. Electrical engineering measurements, calibration of instruments, operation and characteristic curves of generator and motor. Lectures and practice. SPRINGER, MARTIN, REID.

105-106. ALTERNATING CURRENTS. Phenomena, measurement, and use of alternating currents, theory of line, transformer, generator and motor, types of apparatus. SHEPARDSON.

107-108. ALTERNATING CURRENT LABORATORY. To be taken with Course 105-106. Experimental study of alternating currents, regulation and efficiency tests of alternators, transformers, motors, and rotaries. SHEPARDSON, SPRINGER.

109a,b. 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.

111. **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, problems, and laboratory practice. SHEPARDSON, REID.
113. **RAILWAY ELECTRICAL ENGINEERING.** History, economics, and application of electric power to railways, principles of mechanics applied to train movement, electric locomotives and motor cars, generation, transmission, and conversion of electric power, and application to railway motors. MARTIN.
114. **RAILWAY ELECTRICAL ENGINEERING.** Lectures and technical reports on the physical advantages of electric traction for train service, economies of electrification, choice and cost of equipment, physical valuations of electric roads, operating data, study of financial results. MARTIN.
- 115-116. **JOURNAL READING.** Weekly discussion of current electrical periodicals. SHEPARDSON.
117. **ELECTRICAL DESIGN.** The design of direct current generators and motors, and alternating current transformers; complete working drawings and specifications to accompany each design. RYAN.
118. **ELECTRICAL DESIGN.** The design of alternating current generators and motors and switch-boards. RYAN.
152. **ELECTRIC LIGHTING.** Comparison of different sources of light, elements of measurement of light, distribution of light, choice of reflectors, elements of calculation of illumination. RYAN.
156. **ELECTRIC POWER.** Elementary principles of continuous currents. Continuous current generators and motors. Elementary principles of alternating currents. Alternating current generators, transformers, and motors. Measurement of power. Elementary principles of transmission and distribution. Lectures, recitations, and laboratory work. RYAN, MARTIN.
- 157-8. **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. RYAN, REID.
- 203-204. **THESIS.** An investigation of some approved problem in electrical engineering. SHEPARDSON, SPRINGER, RYAN, MARTIN, REID, TURNER.
205. **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.

206. 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.
207. 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.
203. 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.
210. ELECTRICAL 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.
212. HIGH TENSION AND HIGH FREQUENCY TESTING. Low frequency pressure up to 350,000 volts and high frequency to several million volts applied to the testing of high tension transmission cables, transformer oil, transmission line insulators of common and experimental types. This course is primarily a laboratory and library reference course with laboratory illustrative lectures. SPRINGER.
- 213-214. TRANSIENT ELECTRIC PHENOMENA. Transient phenomena accompanying a change of circuit conditions, with their differential equations: Abnormal currents, voltages, and frequencies produced by switching, short circuits, and arcing grounds; distributed capacity and inductance, standing waves, traveling waves, phenomena at transition points of complex circuits; power and energy of complex circuits. TURNER.
- 215-216. RADIO-SIGNALING. Maxwell's electromagnetic theory, experimental work of Hertz, phenomena of electric oscillations in simple and coupled circuits, generation and reception of damped and undamped waves, propagation of electro-magnetic waves through space, detectors, measuring instruments, effect of curvature of the earth, absorption by obstacles, attenuation with distance, types of antenna. Lecture and laboratory. TURNER.
219. TELEGRAPH AND TELEPHONE APPARATUS. Theoretical and experimental study of apparatus used for signaling, telegraphy, and telephony. Lecture and laboratory. SHEPARDSON.
220. TELEGRAPH AND TELEPHONE CIRCUITS. Theoretical and experimental study of telephone circuits and the phenomena of telephonic transmis-



- sion, applications of hyperbolic functions to line phenomena. SHEPARDSON.
- 221-222. PRECISE ELECTRICAL ENGINEERING MEASUREMENTS. Lectures and laboratory work. Precise measurements of resistance, voltage, current, self-induction, and capacity, standardization of measuring instruments. SPRINGER.
223. ELECTROCHEMICAL ENGINEERING. Theoretical and experimental study of the engineering problems of electrolytic and electro-thermal processes. SHEPARDSON.
226. ILLUMINATING ENGINEERING. Lectures and laboratory work, investigation of performance of electric and gas lamps, reflectors and diffusers, luminous efficiency, distribution, color characteristics, physiological phenomena, methods of determining location, kind, and quality of lights for obtaining desired illumination. SHEPARDSON.
228. STEAM RAILROAD ELECTRIFICATION. American and European railroad electrification, engineering practice, detailed cost, equipment, electric power generation, purchased power contracts, studies of operating and financial results, technical reports on new projects. Studies of railroad electrification. Estimates and valuations.
- 229-230. ELECTRICAL LABORATORY. Efficiency tests and special problems.
232. ELECTRICAL DESIGN. Special problems. RYAN.
234. 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

Professor JOHN R. ALLEN; Associate Professor ADOLPH F. MEYER; Assistant Professors FRANKLIN R. McMILLAN, FRANK B. ROWLEY, CHARLES F. SHOOP; Instructors E. DOW GILMAN, AMOS F. MOYER.

## COURSES

No.	Title	Credits	Taken by	Prereq. courses
101.	Materials Testing Laboratory.....	2	Jr. engrs.	Math. 151
102.	Hydraulic and Steam Laboratory....	2	Jr. engrs.	Math. 152
103.	Steam and Power Laboratory.....	2	Sr. M. E.	M. E. 130
104.	Power and Gas Engine Laboratory..	2	Sr. M. E.	103
105.	Steam and Power Laboratory.....	2	Sr. E. E.	102
106.	Experimental Laboratory .....	3	Elective sr. & p. sr. C. E.	102
107.	Steam Laboratory .....	2	Jr. E. M. & Met. E.	
108.	Water Power Laboratory.....		Sr. C. E.	102 with C. E. 122
110.	Materials Testing Laboratory.....	2	Jr. E. M. & Met. E.	

No.	Title	Credits	Taken by	Prereq. courses
112.	Experimental Laboratory .....	2	Sr. E. M. & M. & E.	107
113.	Concrete Laboratory .....	3	Elective	
114.	Structural and Concrete Laboratory.	3	Elective	101
116.	Experimental Laboratory .....	3	Elective	103 or 113
118.	Special Hydraulic Problems.....		Elective	108 with C. E. 124
121.	Advanced Experimental Laboratory.	3	Elective	104 or 105
122.	Advanced Experimental Laboratory.	3	Elective	121
123.	Advanced Experimental Laboratory.	3	Elective	104 or 105
124.	Advanced Experimental Laboratory.	3	Elective	123

101. **MATERIALS TESTING LABORATORY.** Investigation of strength and physical properties of various metals and engineering materials, including wood, cement, concrete, ropes, cables, belting, and chains. Supplemented by lectures on the various materials of construction and standard methods of testing. McMILLAN, GILMAN, MOYER.

102. **HYDRAULIC AND STEAM LABORATORY.** Hydraulic measurements. Calibration of weirs, nozzles, orifices, and meters. Tests of water motors, rams; pulsometers; valve setting, indicator practice, calorimetry, study of lubricants, and introductory steam experiments. ROWLEY, GILMAN, MOYER.

103. **STEAM AND POWER LABORATORY.** Calibration of dynamometers and measurement of power, study of lubricants. Tests of injectors, ejectors, steam and power pumps, steam turbines, steam engines, and boilers. SHOOP.

104. **POWER AND GAS ENGINE LABORATORY.** Continuation of Course 103. Tests of complete power and lighting plants. Tests of gas, gasoline, and hot air engines, gas producers, air compressors. Automobile and locomotive testing. SHOOP.

105. **STEAM AND POWER LABORATORY.** Tests of steam and power pumps. Measurement of power, tests of gas and steam engines, boilers, and complete power and lighting plants. SHOOP, ROWLEY.

106. **EXPERIMENTAL LABORATORY.** Course in steam and gas engine laboratory arranged especially for the needs of municipal engineers. ROWLEY.

107. **STEAM LABORATORY.** Valve setting, indicator practice, calibration of gauges, calorimetry, efficiency tests of screws, hoists, and other machines. ROWLEY, MOYER.

108. **WATER POWER LABORATORY.** Consisting principally of experimental and demonstration work on overfall and siphon spillways. To be taken parallel with C. E. 122. MEYER, GILMAN.

110. **MATERIALS TESTING LABORATORY.** Abbreviated course, twelve weeks, special modification of Course 101, for Mining Engineers only. McMILLAN, GILMAN.

- 112. EXPERIMENTAL LABORATORY. (Twelve weeks' course.) Hydraulic measurements. Tests of water motors, rams, steam pumps, steam engines, and boilers. SHOOP, ROWLEY.
- 113. CONCRETE LABORATORY. Aggregates, proportioning, field and laboratory methods of determining choice of materials and mixtures. Tests of plain and reinforced concrete members to determine quality of materials. McMILLAN.
- 114. STRUCTURAL AND CONCRETE LABORATORY. Tests of structural elements of steel and reinforced concrete. Beams, columns, joints, and frame structures. Building and bridge tests. McMILLAN.
- 116. EXPERIMENTAL LABORATORY. Special research work and commercial tests.
- 118. SPECIAL HYDRAULIC PROBLEMS. Continuation of Course 108. Study of special hydraulic problems in the field and laboratory. To be taken parallel with C. E. 224. MEYER.
- 121-122. ADVANCED EXPERIMENTAL LABORATORY. Continuation of Courses 104 or 105. Special problems and tests relative to heating and ventilating. Tests of fans, the movement and conditioning of air, different heating systems, heat transmission lines, etc. ROWLEY.
- 123. ADVANCED EXPERIMENTAL LABORATORY. Continuation of Courses 104 or 105. Special problems, tests, and investigations relating to gas and steam power and allied subjects. SHOOP.
- 124. ADVANCED EXPERIMENTAL LABORATORY. Continuation of Course 123. Special problems, tests, and investigations. SHOOP.

FRENCH

Professors EVERETT W. OLMSTED, COLBERT SEARLES; Assistant Professors FRANCIS B. BARTON, JULES T. FRELIN, RUTH S. PHELPS, EDWARD H. SIRICH; Assistant AMELIA DOYLE.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
1.	Beginning French .....	3	Fr. Architects	None
2.	Beginning French .....	3	Fr. Architects	1
3a,b.	Intermediate French .....	6	Fr. Architects	1-2, or 2 yrs. preparation

- 1-2. BEGINNING FRENCH. Stress on accurate pronunciation, reading vocabulary, and the essentials of grammar. Daily oral and written exercises (dictation and reproduction in French).
- 3a,b. INTERMEDIATE FRENCH. Six hour semester course. Grammar, composition and reading, increased use of French in the classroom. Selections from modern prose and poetry.

## GEOLOGY AND MINERALOGY

Professor WILLIAM H. EMMONS; Assistant Professor TERENCE T. QUIRKE.

## COURSES

No.	Title	Credits	Required of	Prereq. courses
1.	General Geology .....	3	Sophomore C.E.	None
14.	Applied Geology .....	3	Elective	1

1. GENERAL GEOLOGY. Materials of the earth and geologic processes. Application of geology to engineering problems. Lectures, rock study, and field excursions. QUIRKE.

14. 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; Assistant Professors HANS H. DALAKER, WILLIAM F. HOLMAN, BURT L. NEWKIRK, GEORGE C. PRIESTER; Instructors JENNESS B. FREAR, FREDERICK W. HOORN.

## COURSES

No.	Title	Credits	Required of	Prereq. courses
69-70.	Special Course in Alg. and Trig...	5	Fr. not in 71a	..
71a,b.	Algebra and Trigonometry.....	5	Fr.	..
72.	Analytic Geometry .....	5	Fr.	71
73a,b.	Differential Calculus .....	5	Soph.	72
74.	Integral Calculus .....	5	Soph.	73.
75.	Technical Mechanics—Statics.....	3	Jr.	74 and Phys. 7 and 8
76.	Technical Mechanics—Dynamics... 3	Jr.	75	
91.	Mechanics .....	4	Soph. Arch.	72
92.	Strength of Materials.....	4	Soph. Arch.	91
95.	Applications of Calculus.....	3	Elective	74
151.	Mechanics of Materials.....	3	Jr., sr.	75 or with 75
152.	Hydraulics .....	3	Jr., sr.	76 or with 76
153.	Thermodynamics .....	3	Sr. M.E.	152
154.	Steam and Water Turbines.....	3	Elective, sr. M.E.	153

69-70. SPECIAL COURSE IN ALGEBRA AND TRIGONOMETRY. Fundamental rules, fractions, linear simultaneous equations, graphs, theory of exponents, surds, imaginaries, quadratic equations, binomial theorem, graphical solution of numerical equations of higher degree, logarithms, use of slide-rule. Trigonometric functions. PRIESTER, FREAR.

71a,b. ALGEBRA AND TRIGONOMETRY. Graphical solution of numerical equations of higher degree, logarithms, use of slide-rule. Trigonometric functions and tables, addition theorem and relations, plane triangles and their solution by tables and slide-rule. Applications to surveying and statics. DALAKER, PRIESTER, FREAR, HOORN.

72. ANALYTIC GEOMETRY. Rectilinear and polar coordinates, the straight line and circle, transformation of coordinates, conic sections and other loci, slopes, tangents, derivatives, empirical curves, the elements of geometry of three dimensions. PRIESTER, FREAR, HOORN.
- 73a,b. DIFFERENTIAL CALCULUS. Derivatives, maxima and minima, expansion of functions, curvature; with applications to mechanical and physical problems. DALAKER, HOLMAN, NEWKIRK, FREAR, HOORN.
74. INTEGRAL CALCULUS. Integration of standard forms. Integration as a summation. Application to length of curves, areas, volumes. Approximate integration, Simpson's rule. Solution of some differential equations. Application to engineering problems. DALAKER, HOLMAN, NEWKIRK, FREAR, HOORN.
75. TECHNICAL MECHANICS. Statics. Resolution of forces, moments, conditions of equilibrium, free body method, center of gravity, moment of inertia, stresses in framed structures and in machines. DALAKER, NEWKIRK, PRIESTER.
76. TECHNICAL MECHANICS. Dynamics. Dynamics of a particle, including Newton's laws of motion and kinematics of circular, harmonic, and curvilinear motion in general. Theorems of work and energy, impulse and momentum, and d'Alembert's principle. Elementary dynamics of rigid bodies. DALAKER, NEWKIRK, PRIESTER.
91. MECHANICS FOR ARCHITECTS. (Designed for those who have not taken Calculus.) Laws of motion, energy, work, resolution of forces, conditions of equilibrium, center of gravity, moment of inertia of plane sections, stresses in framed structures. HOLMAN.
92. STRENGTH OF MATERIALS. (Designed for those who have not taken Calculus.) Mechanical and elastic properties of materials of construction, design of riveted joints, beam theory, columns. HOLMAN.
95. APPLICATIONS OF CALCULUS. Problems selected from engineering subjects. BROOKE.
151. MECHANICS OF MATERIALS. Mechanical and elastic properties of materials of construction, beams, shafts, columns, combined stresses, hollow cylinders and spheres, rollers, plates, true stresses, theory of internal stress. BROOKE, HOLMAN, NEWKIRK, PRIESTER.
152. 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.
153. THERMODYNAMICS. The mechanical theory of heat as applied to steam, oil, gas and hot-air engines, and to compressors, including use of steam tables and entropy diagrams. BROOKE.

154. STEAM AND WATER TURBINES. Various types of steam turbines; velocity, impulse, and reaction. Nozzles, vanes, discs, bearings, governors. Thermodynamic analysis and efficiency. Theory of the operation, construction, and regulation of water turbines. Selection of turbine for given conditions. BROOKE.

For elective and advanced courses in mathematics and mechanics, see Bulletin of the Graduate School.

## MECHANICAL ENGINEERING

Professors JOHN J. FLATHER, JOHN R. ALLEN; Assistant Professors JOHN V. MARTENIS, FRANK B. ROWLEY, S. CARL SHIPLEY\*; Instructors FRANCIS A. HOBART, EDWARD QUIGLEY, WILLIAM H. RICHARDS.

## COURSES

No.	Title	Credits	Taken by	Prereq. courses
1-2.	Elementary Shop Practice .....	4	Fr. Engrs.	..
3a,b.	Pattern Making and Foundry Practice .....	3	Soph. M. E. & E. E.	1-2
4a,b.	Machine Shop Practice.....	3	Soph. E. E.	3
6.	Machine Shop Practice .....	2	Soph. M. E.	3
5.	Advanced Machine Shop Practice.	4	Jr. M. E.	4
7a,b.	Industrial Management Laboratory	2	P. sr. elective	111
8.	Industrial Education .....	3	Schl. of Ed.	
15.	Mechanism and Kinematics.....	4	Jr. M. E.	Math. 74
16.	Mechanism and Kinematics.....	2	Jr. E.E.	Math. 74
19.	Mechanical Technology .....	1	Soph. M. F.	Tech. 1-2
111a,b.	Industrial Management .....	2	P. sr. M. E.	..
113a,b.	Power Plant Operation.....	1 or 2	P. sr. elective	..
115.	Power Engineering .....	3	P. sr. M. E.	129, 132
116.	Machine Design .....	4	Jr. M. E. & sr. E. E.	Math. 76
117.	Machine Design, valve gears.....	2	Sr. M. E.	Math. 76
119.	Automobiles and Gas Tractors....	3	P. sr. elective	124
121.	Steam Engine Design.....	3	P. sr. elective	..
123.	Gas Engine Design.....	3	P. sr. elective	19
124.	Internal Combustion Engines and Gas Producers .....	3	Sr. M. E.	Chem. 38
125a,b.	Tool Design .....	3	P. sr. elective	5
126.	Adv. Machine Design.....	3	P. sr. M. E.	116
127a,b.	Power Plant Design.....	3	P. sr. elective	116, 129 E. E. 158
129.	Steam Engines and Boilers.....	3	Sr. M. E. & E. E.	Math. 151
131a,b.	Steam Engines and Boilers.....	2	Elective	Math. 151
132.	Measurement of Power.....	2	Sr. M. E.	Math. 152
133.	Heating and Ventilating.....	2	P. sr. M. E.	Physics 8
134.	Heating and Ventilating.....	2	Sr. Arch.	Physics 2
136.	Compressed Air and Refrigerating Machinery .....	2	P. sr. elective	Math. 153
138.	Contracts and Specifications.....	1	P. sr. M. E.	..
139.	Railway Technology .....	2	P. sr. elective	..
140.	Safety Engineering .....	2	P. sr. elective	111
141.	Railway Design .....	3	P. sr. elective	139
142.	Railway Design .....	3	P. sr. elective	141

\* Absent on leave first semester, 1917-18.

No.	Title	Credits	Offered to	Prereq. courses
143.	Locomotive Construction .....	1	P. sr. elective	139
144.	Locomotive Construction .....	1	P. sr. elective	139
145.	Locomotive Road Testing .....	3	P. sr. elective	Regis. in 141
147a,b.	Mechanical Equipment of Build-ings .....	3	P. sr. elective	Physics 8
149.	Seminar .....	1	Sr. or p. sr. elective	..
150.	Seminar .....	1	Sr. or p. sr. elective	..

1 ELEMENTARY SHOP PRACTICE. A general course in shop practice, which includes pattern making, foundry, forge, and machine work. SHIPLEY, HOBART, QUIGLEY, RICHARDS.

2. ELEMENTARY SHOP PRACTICE. Continuation of Course 1.

3a,b. 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. RICHARDS, .....

4a,b. MACHINE SHOP PRACTICE. Machine operations, Manufacturing methods. Shop practice, lectures, and recitations. SHIPLEY, HOBART, and Assistants.

5. ADVANCED MACHINE SHOP PRACTICE. Machine and tool construction, jigs, fixtures, and special problems. Summer course of four weeks, during the vacation period following the sophomore year. SHIPLEY, HOBART, and Assistants.

6. MACHINE SHOP PRACTICE. Course 4a condensed. SHIPLEY, HOBART, and Assistants.

7a,b. 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, HOBART.

8. INDUSTRIAL EDUCATION. Special course in shop work including sloyd. For teachers in College of Education. RICHARDS.

15. MECHANISM AND KINEMATICS. Transmission of motion. Levers, gearing, linkwork, belts, screws, epicyclic trains, parallel motions, quick-return movements. The paths, speeds, and accelerations of important mechanisms; centroids, analysis of mechanisms; cams; roulettes, tooth profiles; kinematic pairs; machine parts. MARTENIS.

16. 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. A short course arranged for electrical engineers. MARTENIS.

19. MECHANICAL TECHNOLOGY. A study of mechanical processes involved (a) In various manufacturing industries; (b) In the production of

materials of construction, including the metallurgy of iron and steel; and (c) In the development and utilization of power. Lectures by members of the department and others.

- 111a,b. INDUSTRIAL MANAGEMENT. Shop and factory organization and management; cost and wage systems. Depreciation of equipment. Machine burden. Time studies. FLATHER.
- 113a,b. POWER PLANT OPERATION. Operation and maintenance of boilers, engines, gas producers, gas engines, steam turbines, and accessory apparatus. Smoke prevention. Flue gas analysis. Power costs. . . . ., RYAN, and Assistants.
115. 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.
116. 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, and drawing room practice. FLATHER, MARTENIS, and Assistants.
117. MACHINE DESIGN. Application of graphical methods to the design of valve gears and link motions. MARTENIS.
119. AUTOMOBILES AND GAS TRACTORS. A study of mechanical problems involved in automobiles, trucks, and tractors with particular attention to starting and ignition devices, carbureters, lubrication, cooling, and transmissions. Laboratory experiments will be made in connection with the course. SHIPLEY.
121. STEAM ENGINE DESIGN. Calculations and working drawings for a high speed automatic or Corliss steam engine. Theoretical diagrams and determination of details. FLATHER, . . . . .
123. GAS ENGINE DESIGN. Calculations and working drawings for a single cylinder stationary gas engine. Theoretical diagrams and details of parts. FLATHER, . . . . .
124. INTERNAL COMBUSTION ENGINES AND GAS PRODUCERS. Principles of two and four cycle operation. Otto, semi-Diesel, and Diesel. Mechanism of stationary, automobile, and tractor engines. Carburation, ignition, governing, starting mechanism, cooling, lubrication, types of transmissions, and differentials. Gas producers, types and principles of operation, suction, pressure, blast furnace. By-product recovery. . . . .
- 125a,b. TOOL DESIGN. Design of tools for manufacturing interchangeable parts; jigs and milling fixtures. HOBART.



126. **ADVANCED MACHINE DESIGN.** Original design, including machinery for changing size and form, cranes, pumping, transmission machinery, and engineering appliances. Lectures, problems, and drawing room practice. FLATHER, .....
- 127a,b. **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.
129. **STEAM ENGINES AND BOILERS.** Steam boilers, settings, furnaces, stokers, smoke prevention, chimneys, evaporation. Mechanics of steam engine; work in cylinder; reciprocating parts; steam distribution; indicator cards, mechanism of steam engine; slide valve, Zeuner diagram, Corliss valves; governors; compounding, steam turbines. FLATHER, .....
- 131a,b. **STEAM ENGINES AND BOILERS.** Course 129 condensed.
132. **MEASUREMENT OF POWER.** A study of the methods employed in measuring power. Dynamometers; railway dynamometer cars, friction brakes; power required to drive machine tools and shafting; ship dynamometers. FLATHER.
133. **HEATING AND VENTILATING.** Principles of heating and ventilating. Construction and operating of heating apparatus. Steam, hot water, exhaust, vacuum, and fan systems. Lectures, recitations, and designs. MARTENIS.
134. **HEATING AND VENTILATING.** A course for architects. MARTENIS.
136. **COMPRESSED AIR AND REFRIGERATING MACHINERY.** (a) Air compressors and motors, and transmission of power by compressed air. (b) Principles of refrigeration. Various types of refrigerating machines, refrigerants, and applications to ice making, cold storage, cooling of air, liquids, and solids. Lectures and recitations. MARTENIS.
138. **CONTRACTS AND SPECIFICATIONS.** A study of engineering specifications. Classes of specifications; essential features; clauses; details. Bids and bidders; engineering contracts. Examples. Lectures, recitations, and practice in writing specifications. FLATHER.
139. **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. ....
140. **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.
- 141-142. **RAILWAY DESIGN.** Locomotive and car details; the locomotive boiler, linkages, and assembled parts. ....

- 143-144. **LOCOMOTIVE CONSTRUCTION.** Design and construction of locomotives. Carriage; frames, springs, equalizing arrangements, running gear, brakes, trucks, lubrications. Boilers; proportions, grates, flues, smokebox, stacks; riveted joints, bracing, staying. Engine details; heat insulation, cylinder proportions. Lectures and assigned reading. ....
145. **LOCOMOTIVE ROAD TESTING.** Tests on locomotives and trains. Dynamometer car and drawbar pull. FLATHER and Assistants.
- 147a,b. **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.
- 149-150. **SEMINAR.** FLATHER, .....

### METALLURGY

Professor WILLIAM R. APPLEBY; Assistant Professor SAMUEL L. HOYT.

#### COURSES

No.	Title	Credits	Offered to	Prereq. courses
157.	Metallography for Engineers.....	3	Sr. M.E. Elective sr. or p. sr.	..
158.	Advanced Metallography .....	2 or 3	Elective	157

157. **METALLOGRAPHY FOR ENGINEERS.** Metallurgy of iron and steel. Microscopic and thermal analysis of steel and cast iron; heat and mechanical treatment. Laboratory work. HOYT.
158. **ADVANCED METALLOGRAPHY.** Continuation of Met. 157. 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.

### MILITARY SCIENCE AND TACTICS

Major GEORGE W. MOSES, U. S. Cavalry, Professor of Military Science and Tactics, Head of the Department.

Assistants, Captain THEODORE B. TAYLOR, U. S. Cavalry, Associate Professor of Military Science and Tactics; Captain JAMES B. WOOLNOUGH, U. S. Infantry, Associate Professor of Military Science and Tactics; First Lieutenant OWEN R. MEREDITH, U. S. Infantry, Assistant Professor of Military Science and Tactics.

BERT A. ROSE, Band 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 juniors and seniors who have completed two years of drill 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. Any student who for satisfactory reasons is permitted to withdraw from this course must reimburse the War Department for all moneys received.

Juniors and seniors who take the course required by General Orders No. 49, which includes two camps of four weeks each, will receive an allowance of thirty 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 drill and three of study 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.

## PHYSICS

Professors HENRY A. ERIKSON, ANTHONY ZELENY; Associate Professor LOUIS W. MCKEEHAN; Assistant Professor JOHN T. TATE; Instructors ERNEST O. DIETERICH, PAUL E. KLOPSTEG.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
1.	General Physics .....	3	Soph. Arch.	Math. 72
2.	General Physics .....	3	Soph. Arch.	1
3.	General Laboratory Practice.....	1	Soph. Arch.	Regis. in 1
4.	General Laboratory Practice.....	1	Soph. Arch.	See statement
7.	General Physics .....	4	Soph. Engrs.	Math. 72
8.	General Physics .....	4	Soph. Engrs.	7 See statement
9.	General Laboratory Practice.....	1	Soph. Engrs.	Regis. 7
10.	General Laboratory Practice.....	1	Soph. Engrs.	Regis. 8
163.	Electrical Measurements .....	2	Jr. E. E.	8, 10

1. GENERAL PHYSICS. Mechanics of solids and fluids, sound, and heat. Treatment experimental rather than mathematical; the fundamental principles. The first part of a general course 1-2. Should be taken in conjunction with Course 3, but may be taken separately. One lecture, two recitations per week. ZELNY, DIETERICH, KLOPSTEG.
2. GENERAL PHYSICS. Electricity, magnetism, and light. Treatment experimental; the fundamental principles, including those of radioactivity, ionization, X-radiation, and the electrical constitution of matter. The second part of a general course 1-2. Should be taken in conjunction with Course 4, but may be taken separately. One lecture, two recitations per week. ZELNY, DIETERICH, KLOPSTEG.
3. GENERAL LABORATORY PRACTICE. Physical measurements in the mechanics of solids and fluids, sound, and heat, giving the student a knowledge of experimental methods, and an acquaintance with the fundamental facts of the subject. MCKEEHAN, DIETERICH.
4. GENERAL LABORATORY PRACTICE. Physical measurements in electricity, magnetism, and light. Open to all who have completed or are taking Course 2, and have attended Course 3 or 9. MCKEEHAN, DIETERICH.
7. GENERAL PHYSICS. Mechanics of solids and fluids, sound, and heat; numerous problems to illustrate the principles. Must be taken in conjunction with Course 9. The first part of a general course 7-8, 9-10. One lecture, three recitations per week. ERIKSON, TATE.
8. GENERAL PHYSICS. Electricity, magnetism, and light. Must be taken in conjunction with Course 10. The second part of a general course 7-8, 9-10. One lecture, three recitations per week. ERIKSON, TATE.
9. GENERAL LABORATORY PRACTICE. Physical measurements in the mechanics of solids and fluids, sound, and heat. Must be taken in conjunction with course 7. MCKEEHAN.
10. GENERAL LABORATORY PRACTICE. Physical measurements in electricity, magnetism, and light. Must be taken in conjunction with Course 8. MCKEEHAN.
163. ELECTRICAL MEASUREMENTS. Devoted mainly to the study of capacity, inductance, and magnetic induction. ZELNY.

For electives in the Department of Physics see Bulletin of the College of Science, Literature, and the Arts.

POLITICAL SCIENCE

Professors WILLIAM A. SCHAPER, CEPHAS D. ALLIN, JEREMIAH S. YOUNG;  
Instructors WILLIAM ANDERSON, .....

COURSES

No.	Title	Credits	Required of	Prereq. courses
25.	American Government .....	3		None
26.	Business Law .....	3		25
25.	AMERICAN GOVERNMENT. An introductory course in Political Science, dealing with forms of government. The development, organization, and actual workings of national, state, and local government in the United States. ....			
26.	BUSINESS LAW. A course in business law, arranged for engineers, including the law of contracts, suretyship, agency, partnership, corporations, negotiable instruments, conveyances, patents, and riparian rights. ....			

RHETORIC AND PUBLIC SPEAKING

Professor JOSEPH M. THOMAS; Assistant Professors HALDOR GISLASON, CHARLES W. NICHOLS, FRANK M. RARIG; Instructors CECIL C. BEAN, HOWARD T. VIETS; Assistant RAY M. WILCOX.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
3.	Rhetoric and Composition.....	3	Fr.	None
4.	Rhetoric and Composition.....	3	Fr.	3
31.	Technical Writing .....	2 or 3	Elective	3-4
41a,b.	Public Speaking .....	3	Elective	3-4
42.	Public Speaking .....	3	Elective	3-4
3.	RHETORIC AND COMPOSITION. Training in writing; study of the work of writers who have handled scientific subjects with clearness and power; outside reading. NICHOLS, BEAN, VIETS.			
4.	RHETORIC AND COMPOSITION. A continuation of Course 3. NICHOLS, BEAN, VIETS.			
31.	TECHNICAL WRITING. A semester course in business letters, reports, etc., planned to meet the professional needs of engineering students. NICHOLS.			
41a,b.	PUBLIC SPEAKING. A general course in public speaking. RARIG, GISLASON, WILCOX.			
42.	PUBLIC SPEAKING. A continuation of Course 41. RARIG, GISLASON, WILCOX.			

## TECHNOLOGY

The Faculty of the College of Engineering and others.

## COURSES

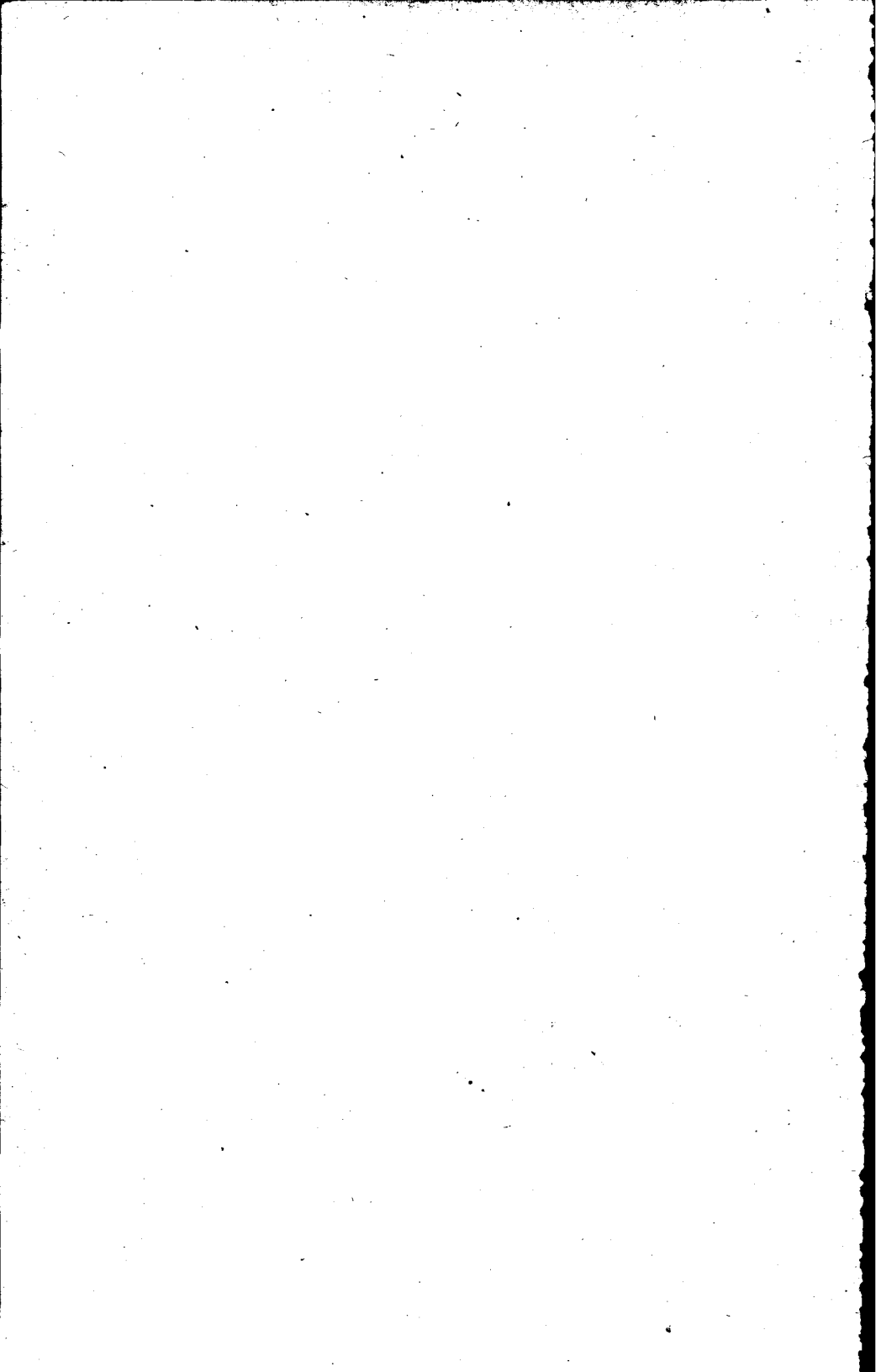
No.	Title	Credits	Offered to	Prereq. courses
1-2.	Technology .....	2	Fr. Eng.	..

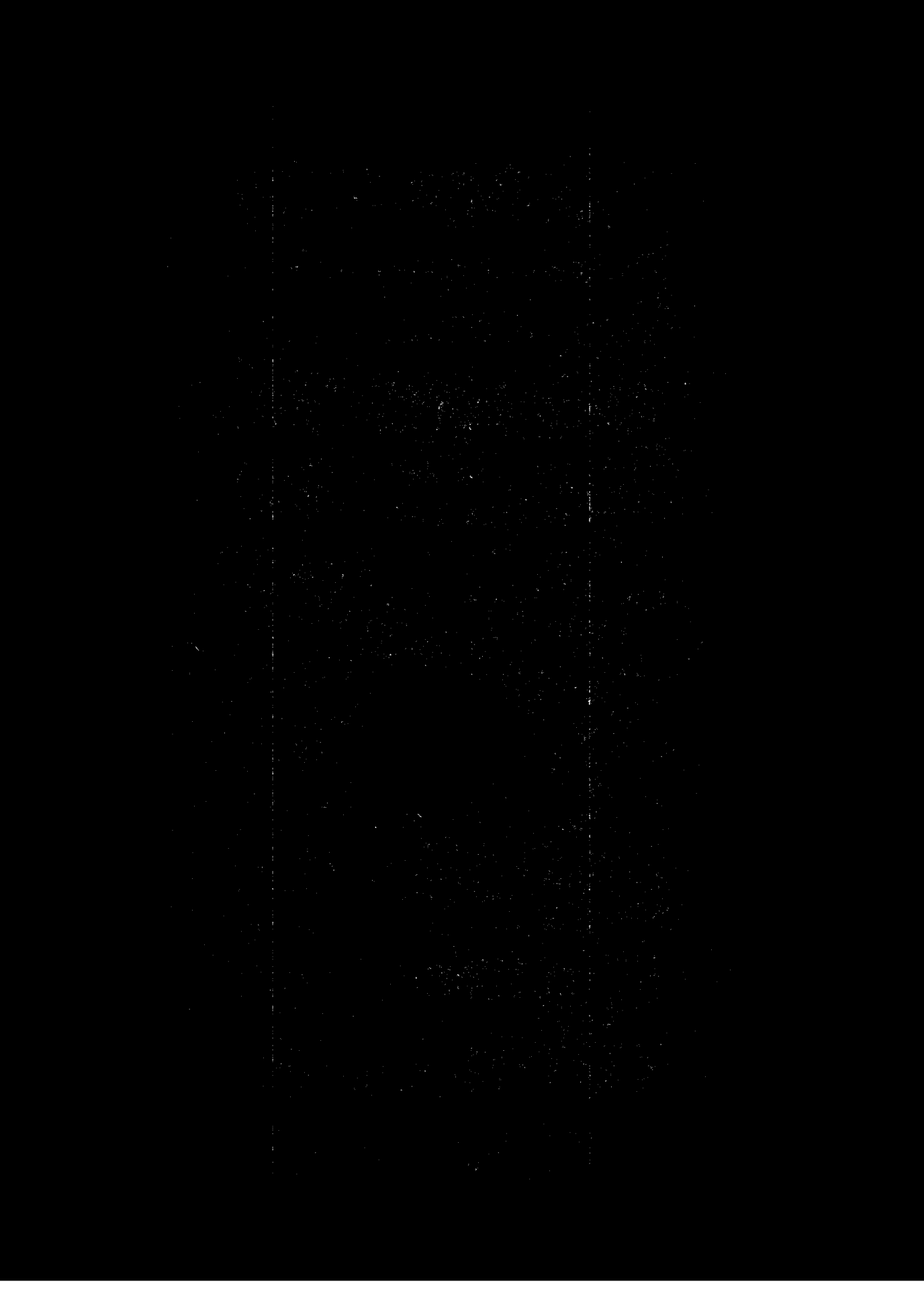
1-2. **TECHNOLOGY.** Lectures covering the various fields of engineering, efficiency in study, hygiene, and on the conduct of life. Visits to factories, machine shops, power plants, existing engineering works, and those under construction. Reports.

## SUMMER READING

All engineering students are advised to take general courses in reading of a non-professional character during the summer vacations following the freshman and sophomore years. The purpose of the summer 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 summer reading has been prepared and will be issued prior to the summer vacation. 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 summer 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 COLLEGE OF  
AGRICULTURE**

**ANNOUNCEMENT OF COURSES IN  
AGRICULTURE**

**1917-1918**

# UNIVERSITY OF MINNESOTA

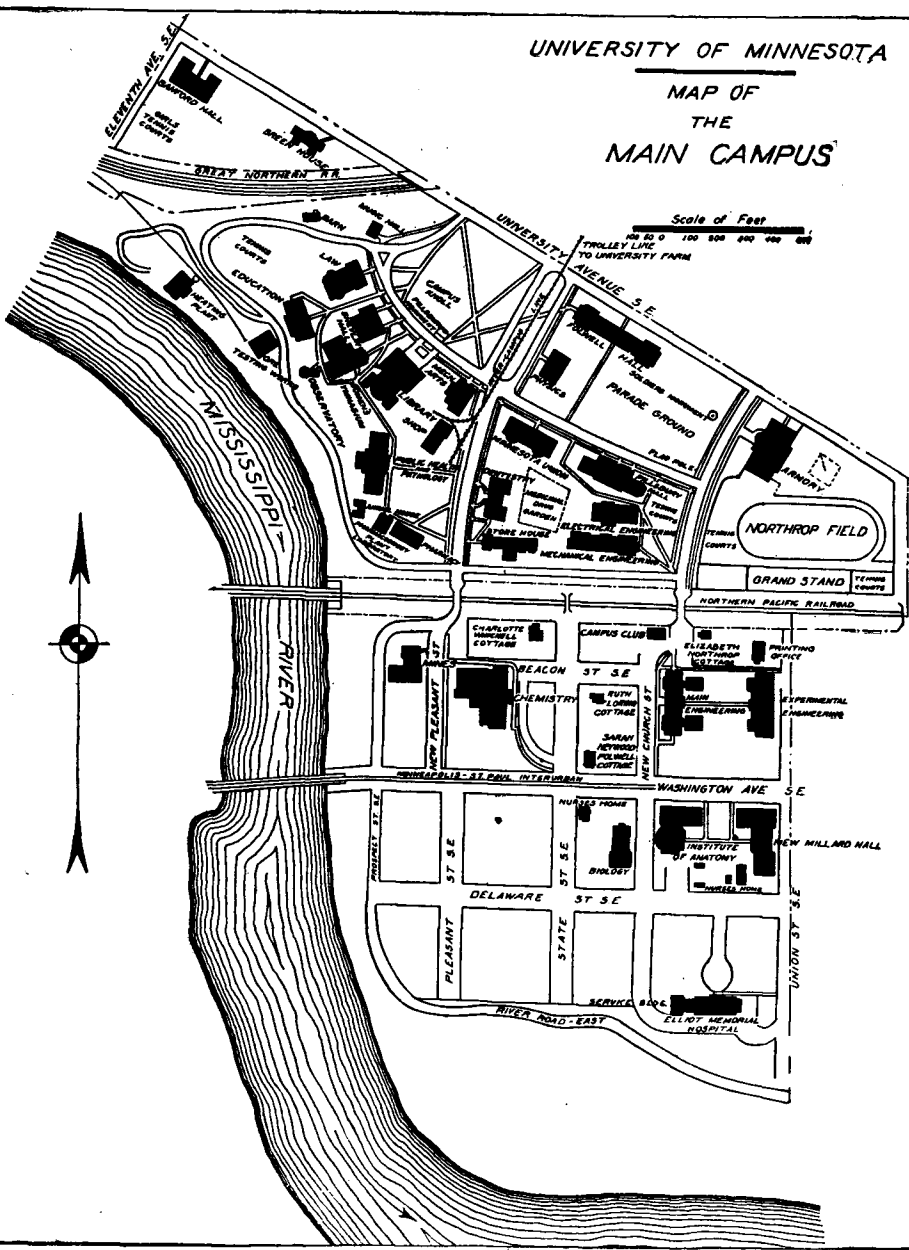
## MAP OF THE MAIN CAMPUS

Scale of Feet

0 100 200 300 400 500

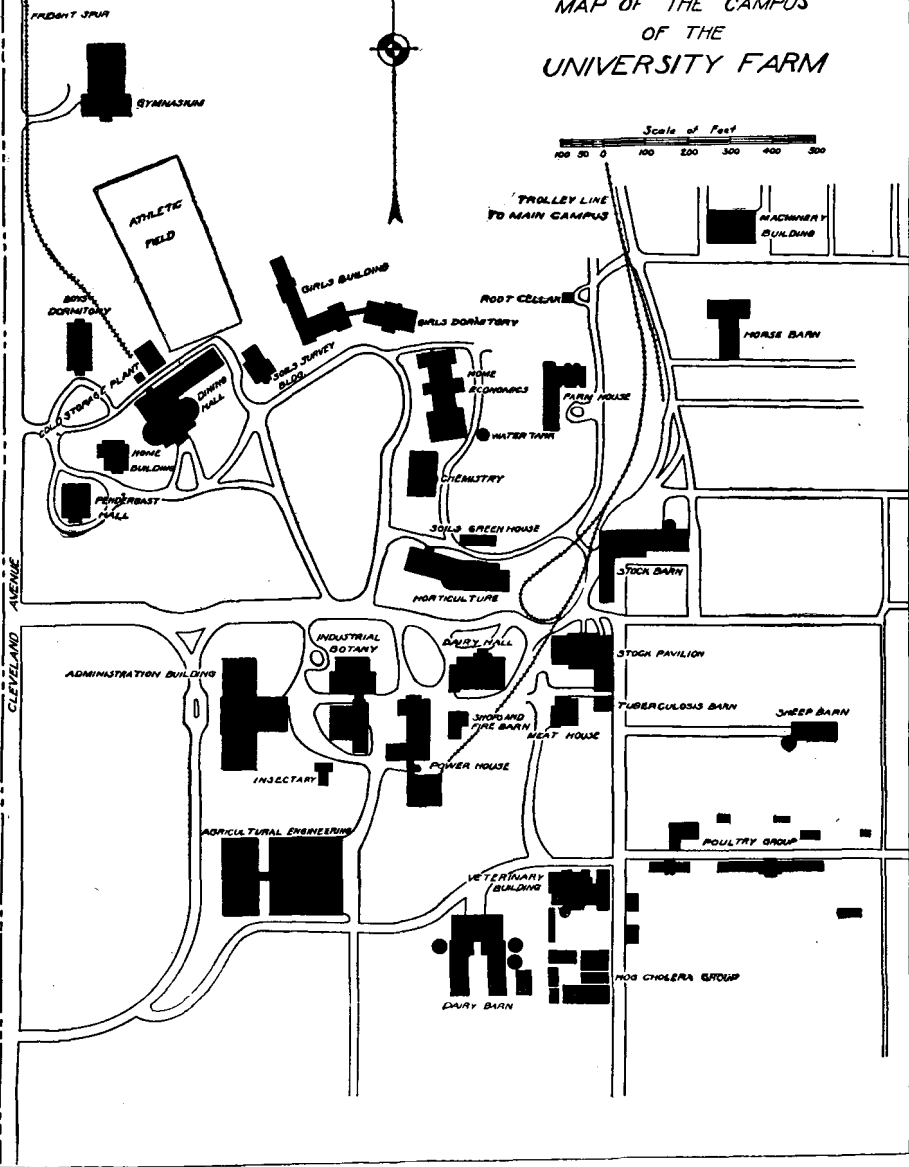
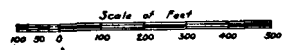
TROLLEY LINC  
TO UNIVERSITY PARK

NORTHERN PACIFIC RAILROAD



Area of Main Campus, 108.5 acres

UNIVERSITY OF MINNESOTA  
 MAP OF THE CAMPUS  
 OF THE  
 UNIVERSITY FARM



Area of University Farm, 422.56 acres

1917							1918													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
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8	9	10	11	12	13	14	6	7	8	9	10	11	12	7	8	9	10	11	12	13
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22	23	24	25	26	27	28	20	21	22	23	24	25	26	21	22	23	24	25	26	27
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AUGUST							FEBRUARY							AUGUST						
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5	6	7	8	9	10	11	3	4	5	6	7	8	9	4	5	6	7	8	9	10
12	13	14	15	16	17	18	10	11	12	13	14	15	16	11	12	13	14	15	16	17
19	20	21	22	23	24	25	17	18	19	20	21	22	23	18	19	20	21	22	23	24
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SEPTEMBER							MARCH							SEPTEMBER						
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2	3	4	5	6	7	8	3	4	5	6	7	8	9	8	9	10	11	12	13	14
9	10	11	12	13	14	15	10	11	12	13	14	15	16	15	16	17	18	19	20	21
16	17	18	19	20	21	22	17	18	19	20	21	22	23	22	23	24	25	26	27	28
23	24	25	26	27	28	29	24	25	26	27	28	29	30	29	30	..	..	..	..	..
30	..	..	..	..	..	..	31	..	..	..	..	..	..	..	..	..	..	..	..	..
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OCTOBER							APRIL							OCTOBER						
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14	15	16	17	18	19	20	14	15	16	17	18	19	20	13	14	15	16	17	18	19
21	22	23	24	25	26	27	21	22	23	24	25	26	27	20	21	22	23	24	25	26
28	29	30	31	..	..	..	28	29	30	..	..	..	..	27	28	29	30	31	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER						
..	..	..	..	1	2	3	..	..	..	1	2	3	4	..	..	..	..	1	2	
4	5	6	7	8	9	10	5	6	7	8	9	10	11	3	4	5	6	7	8	9
11	12	13	14	15	16	17	12	13	14	15	16	17	18	10	11	12	13	14	15	16
18	19	20	21	22	23	24	19	20	21	22	23	24	25	17	18	19	20	21	22	23
25	26	27	28	29	30	..	26	27	28	29	30	31	..	24	25	26	27	28	29	30
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
DECEMBER							JUNE							DECEMBER						
..	..	..	..	..	..	1	..	..	..	..	..	1	1	1	2	3	4	5	6	7
2	3	4	5	6	7	8	2	3	4	5	6	7	8	8	9	10	11	12	13	14
9	10	11	12	13	14	15	9	10	11	12	13	14	15	15	16	17	18	19	20	21
16	17	18	19	20	21	22	16	17	18	19	20	21	22	22	23	24	25	26	27	28
23	24	25	26	27	28	29	23	24	25	26	27	28	29	29	30	31	..	..	..	..
30	31	..	..	..	..	..	30	31	..	..	..	..	..	..	..	..	..	..	..	..
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The calendars appearing on pages 4, 5, and 6 are subject to change because of war conditions. It is entirely possible that the opening of the college year may be changed to October 10 or 17, the spring recess left variable, and the closing of the college year modified accordingly.

Announcements will be made through the newspapers of the state later in the year.

## CALENDAR

### COLLEGE OF AGRICULTURE

1917-1918

The College year covers a period of thirty-eight weeks. Commencement Day is always the second Thursday in June.

The School of Agriculture year covers a period of twenty-four weeks beginning on the first Monday in October. Commencement Day is the last Wednesday in March.

Numerous short courses are held of from one to five weeks' duration.

#### 1917

September	12	Wednesday	Registration closes except for new students
September	18-25	Week	Entrance examinations, registration of new students, and payment of fees
September	26	Wednesday	First semester begins
October	1	Monday	Agricultural College, farm experience examinations
October	1	Monday	School of Agriculture, first term begins
October	12	Friday	Half holiday. Annual freshman-sophomore contest
October	18	Thursday	Senate meeting, 4:00 p.m.
October	20	Saturday	Last day for removal of second semester incompletes
November	5	Monday	Dairy School opens
November	28	Wednesday	Thanksgiving recess begins 9:00 p.m.
December	1	Saturday	Dairy School closes
December	3	Monday	Thanksgiving recess ends 8:00 a.m.
December	3-8	Week	Second semester condition examinations
December	3-8	Week	Short course for ice-cream makers
December	20	Thursday	Senate meeting, 4:00 p.m.
December	21	Friday	Christmas vacation begins 9:00 p.m.
December	21	Friday	School of Agriculture, first term closes

#### 1918

December	31	} Week	Farmers' and Home Makers' Week Short Course
January	5		
January	2	Wednesday	Christmas vacation ends 8:00 a.m.
January	8	Tuesday	School of Agriculture, second term begins
January	23	Wednesday	Second semester registration closes, except for new students
January	28	Monday	Final examinations begin

## COLLEGE OF AGRICULTURE

January	30	Wednesday	Payment of fees for second semester closes, except for new students
February	5	Tuesday	Registration and payment of fees for second semester closes. All grades for first semester due in Secretary's Office
February	6	Wednesday	Second semester begins
February	11	Monday	Editors' Short Course begins
February	12	Tuesday	Lincoln's Birthday; a holiday
February	14	Thursday	Editors' Short Course closes
February	21	Thursday	Senate meeting, 4:00 p.m.
February	22	Friday	Washington's Birthday; a holiday
March	2	Saturday	Last day for removal of first semester incompletes
March	27	Wednesday	School of Agriculture closes
March	28	Thursday	Easter recess begins 9:00 p.m.
April	1-5	Week	Boys' and Girls' Week Short Course
April	3	Wednesday	Easter recess ends 8:00 a.m.
April	8-13	Week	First semester condition examinations
April	30	Tuesday	Traction Engineering Short Course begins
May	16	Thursday	Senate meeting, 4:00 p.m.
May	30	Thursday	Memorial Day; a holiday
May	31	Friday	Traction Engineering Short Course closes
June	1	Saturday	Final examinations begin 2:00 p.m.
June	8	Saturday	Second semester closes
June	9	Sunday	Baccalaureate service
June	10	Monday	Senior Class Day exercises
June	11-18	Week	Military Encampment, Fort Snelling
June	12	Wednesday	Alumni Day
June	13	Thursday	Forty-sixth Annual Commencement
June	14	Friday	Summer vacation begins
June	17	Monday	Summer Session and Teachers' Training School begin
July	4	Thursday	Independence Day; a holiday
July	26	Friday	Summer Session and Teachers' Training School close
July	29}		
August	3}	Week	Rural Life Conference

The University year for 1918-19 will begin Tuesday, September 17.  
Classes will begin Wednesday, September 25.

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\* Term of office ends June 30, 1917.

† Term of office begins July 1, 1917.



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939 14th Ave. S. E., Minneapolis
- ALBERT C. HODGE, Ph.B., Instructor in Economics  
615 9th Ave. S. E., Minneapolis
- KANO IKEDA, M.D., Instructor in Bacteriology St. Barnabas Hospital
- ALBERT C. JAMES, B.A., M.B.A., Instructor in Economics  
Maryland Hotel, Minneapolis
- CHARLES E. JOHNSON, Ph.D., Instructor in Comparative Anatomy of  
Vertebrates 714 16th Ave. S. E., Minneapolis
- A. WOLFRED JOHNSTON, M.A., Instructor in Geology  
803 University Ave. S. E., Minneapolis
- PAUL E. KLOPSTEG, Ph.D., Instructor in Physics  
1026 15th Ave. S. E., Minneapolis
- ALFRED E. KOENIG, M.A., Instructor in German  
602 7th St. S. E., Minneapolis
- ROBERT J. MCFALL, Ph.D., Instructor in Economics  
124 State St. S. E., Minneapolis
- WILLIS J. PLUMMER, B.A., Instructor in Romance Languages  
1329 6th St. S. E., Minneapolis
- TERENCE T. QUIRKE, Ph.D., Instructor in Geology  
315 11th Ave. S. E., Minneapolis
- ADOLPH R. RINGOEN, M.A., Instructor in Animal Biology  
1203 7th St. S. E., Minneapolis
- CARL L. SCHUMANN, Ph.D., Instructor in Chemistry  
317 17th Ave. S. E., Minneapolis
- EDWARD H. SIRICH, Ph.D., Instructor in Romance Languages  
321 14th Ave. S. E., Minneapolis
- HAROLD W. SOULE, M.A., Instructor in German  
1208 4th St. S. E., Minneapolis
- WOLDEMAR M. STERNBERG, B.S. in Chem. Eng., Instructor in Chemistry  
510 Ontario St. S. E., Minneapolis
- H. LEE WARD, Ph.D., Instructor in Chemistry  
425 Walnut St. S. E., Minneapolis
- PERCY A. WARD, M.D., B.S., Instructor in Bacteriology  
1717 1st Ave. S., Minneapolis
- RICHARD WISCHKAEMPER, M.A., Instructor in German  
977 14th Ave. S. E., Minneapolis
- EDWIN H. ZEYDEL, M.A., Instructor in German  
1312 7th St. S. E., Minneapolis
- ROYAL N. CHAPMAN, M.A., Teaching Fellow in Animal Biology  
2316 Pierce Ave., St. Paul
- DONALD FOLSOM, B.A., Assistant in Botany  
1110 5th St. S. E., Minneapolis
- LOUISE G. FRARY, M.A., Teaching Fellow in German  
3108 Garfield Ave., Minneapolis



FRANCES L. LONG, M.A., Assistant in Botany

112 State St. S. E., Minneapolis

FRANK ROBOTKA, B.S.A., Assistant in Accounting

1437 Cleveland Ave., St. Paul

ARNOLD W. SHUTTER, B.A., Assistant in German

2215 Irving Ave. S., Minneapolis

HARVEY STALLARD, Ph.B., Assistant in Botany

805 7th St. S. E., Minneapolis

### FACULTY COMMITTEES

1917-1918

*Executive.*—Dean, Secretary, Heads of Divisions

*Enrollment.*—WEST, MOWRY, BIESTER, WENTLING, BENDER, PIERCE

*Curriculum and Catalog.*—FREEMAN, BOSS, STORM, WEST, THATCHER,  
BERRY, GAY

*Students' Work.*—FREEMAN, WEST, BERRY, CHEYNEY, SWEENEY, RUGGLES

*Student Organizations.*—LANSING, WEIGLEY, CHEYNEY, WELLER, FREEMAN

*Faculty Business.*—CHEYNEY, MOORE, TRILLING, KILDEE

*Appointment.*—STORM, BERRY, GEHRAND, ARNY

*Farm Experience.*—BOSS, KILDEE, BRIERLEY, PATERSON

## GENERAL INFORMATION

### ADMISSION

New students are admitted at the opening of the first semester in September and the second semester in February.

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 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.

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 Colleges of Agriculture and Forestry.

For details of admission requirements and definition of "unit," see the Bulletin of General Information.

Every prospective student for any of the agricultural courses 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.

### FEEES

Incidental semester fee	
Residents of Minnesota	\$20.00
Non-residents	40.00
Deposit (first semester only)	5.00
Military Deposit (freshman or sophomores, first semester in residence only)	
Subject to change to meet contract price of uniform	17.90
Gymnasium suit deposit	4.25
Minnesota Union (per semester)	1.00

## Special fees

Examination for removal of conditions.....	1.00
Examinations for credit (after the first semester 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, one dollar. An additional twenty-five cents 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 semester opens except by special committee action.

## 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 144 credit hours, candidates will be recommended for graduation with the degree of Bachelor of Science. The diploma will indicate that the candidate completed the work for his degree in the College of Agriculture and his major line of work will be designated.

## PROFESSIONAL CERTIFICATES

The University State Teachers' Certificate is granted to graduates of the College of Agriculture who have completed fifteen credit hours in approved professional courses.

The Industrial Certificate, which all Minnesota high-school teachers of agriculture are required to have, is granted by the State Department of Education to graduates of the College of Agriculture who are recommended by the College and who have completed the professional training required by the regulations of the State Department of Education for special teachers in agriculture.

Students desiring this industrial certificate should consult the Chief of the Division of Agricultural Education before registering for the work of the junior year.

## FACULTY REGULATIONS

The regulations of the faculty are published in a separate booklet issued at the time of registration. Students are held responsible for compliance with all of these regulations.

## COURSES OF STUDY

Students are especially urged to read *carefully* the following general instructions and to refer to them frequently during the college course.

Six months' practical farm experience is required of each candidate for graduation unless satisfactory credentials for previous farm experience are presented. Students specializing in Dairy Husbandry must obtain at least three of this six months' experience on an accredited dairy farm.

Students are urged to decide *as early as possible* in what line of work they intend to specialize, and to consult with the faculty of the division in regard to all matters pertaining to their future work, such as electives, farm experience, and the possibilities for preparing especially for distinct fields of work. Students will be called upon to make a decision in regard to their line of specialization about the end of the freshman year. Students in doubt in regard to specialization should consult the Chairman of the Students' Work Committee or the chiefs of various divisions offering special lines.

Two groups of courses of study are offered:

1. General agricultural courses of study, in which students prepare for general agricultural pursuits, as farming, stock-raising, dairying, or teaching agriculture in secondary schools. Specialists who intend to prepare for experiment station or other research work along these lines will find it necessary to pursue graduate work. The following general agricultural courses of study are offered:

- Agricultural Education
- Agricultural Education—Manual Training
- Agronomy and Farm Management
- Animal Husbandry
- Dairy Husbandry
- Horticulture

2. Special agricultural science courses of study, in which students prepare for special purposes, usually scientific research. In all of these courses graduate work is necessary for a thoro preparation. The following special agricultural science courses of study are offered:

- Agricultural Biochemistry
- Agricultural Economics
- Entomology and Economic Zoology
- Plant Pathology
- Soils

The freshman year and half the subjects of the sophomore year are alike in all courses. In the junior year a considerable amount of difference exists, and the senior year is almost entirely devoted to special subjects and electives. The regular amount of work is eighteen credit hours for each semester of all courses and the total amount for graduation is one hundred and forty-four credit hours. Students are requested to

note carefully both (a) *the general requirements for all students* and (b) *the special requirements for the different courses of study.*

## GENERAL REQUIREMENTS FOR ALL STUDENTS IN AGRICULTURE

### EXPLANATION OF COURSE NUMBERS

Odd numbers indicate first-semester courses; even numbers, second-semester courses. A combination of the two (e.g., 5-6) indicates courses continuing through the year. In the case of courses repeated the second semester, the suffix *a* indicates first semester, the suffix *b*, second semester.

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.

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 semester.

### FRESHMAN YEAR

All students must register for group A and enough additional work from group B to make a total of not more than 18 and not less than 15 credit hours each semester. All courses in group B, except such options as are indicated, not completed in the freshman year must be registered for in the sophomore year.

#### GROUP A

*First Semester*  
Bot. 1a, General Botany, 3  
\*Rhet. 1a, Rhetoric, 3  
Phys. Educ. 1, Personal Hygiene  
Phys. Educ. 3a, Gymnasium  
Military Drill  
†Freshman Lectures

*Second Semester*  
Bot. Elective, 3  
Rhet. 2b, Rhetoric, 3  
Chem. 4b, General Chemistry and Qualitative Analysis, 3  
Military Drill

#### GROUP B

Agron. 7, Farm Practices. A no-credit course required of those entering with insufficient farm experience.  
Agr. Eng. 1a,b, Higher Algebra, 3. Required of those who do not present higher algebra for admission.  
Agr. Eng. 3a,b, Plane Trigonometry, 3. Open to those who have completed Course 1 or those who present higher algebra for admission. This course must be taken the first year.

\* Special attention is called to rules on delayed credit and for students with insufficient preparation on page 54.

† A course of lectures intended primarily to familiarize the new student with the college, college customs and methods of procedure is required of all freshmen.

- Chem. 3a,b, Advanced General Chemistry and Qualitative Analysis, 3 or Chem. 33, General Chemistry and Qualitative Analysis, 5. The five credit course is offered the first semester only and must be taken by those who do not present a unit of chemistry for admission. Students may be required to change from 3 to 33 at any time during the course. Those presenting a unit of high school chemistry can obtain not more than three credits for the completion of Course 33.
- Econ. 2a,b, Industries and Commerce of U. S., 3.
- Hort. 90a,b, General Horticulture, 3, or Hort. Elective, 3. Hort. Elective may be taken if additional horticulture is registered for later in the course. Those intending to specialize in horticulture should register for a horticulture elective. Those intending to specialize in Agricultural Education should substitute Hort. 94 and Agr. Educ. 68, Home and School Gardening, 3, in the junior or senior year.
- An. Husb. 1a,b, Types and Breeds of Livestock, 3.
- Dy. Husb. 7a,b, Elements of Dairy Husbandry, 3.
- Agron. 1a,b, Farm Crops I, 3.

## SPECIAL REQUIREMENTS IN THE DIFFERENT COURSES OF STUDY

### COURSE IN AGRICULTURAL BIOCHEMISTRY

#### Graduate Work Advised

#### SOPHOMORE YEAR

##### *First Semester*

- Econ. 3a, Principles of Economics, 3  
Rhet. 11a, Argumentation, 3  
An. Biol. 3, General Zoology, 3  
Chem. 35, Organic Chemistry, 4  
Pol. Sci. 1a, American Government, 3  
Elective, 2  
Military Drill

##### *Second Semester*

- Path. 6b, Elementary Bacteriology, 3  
Rhet. 22b, Public Speaking, 3  
An. Biol. 4, General Zoology, 3  
Chem. 36, Organic Chemistry, 4  
Elective, 5  
Military Drill

#### JUNIOR YEAR

##### *First Semester*

- Agr. Biochem. 9, Quantitative Analysis, 5  
Phys. 1, General Physics, 3  
Phys. 3, General Laboratory Practice, 1  
Pl. Path. and Bot. 1, Plant Pathology, 3  
Soils 3, Soil Physics and Management, 3  
Elective, 3

##### *Second Semester*

- Agr. Biochem. 10, Agricultural Quantitative Analysis, 5  
Phys. 2, General Physics, 3  
Phys. 4, General Laboratory Practice, 1  
Soils 4, Soil Fertility, 3  
Elective, 6

#### SENIOR YEAR

##### *First Semester*

- Chem. 121, Physical, 2  
Chem. 123, Physico-Chemical Laboratory, 1  
Agr. Biochem. 111, Phytochemistry, 3  
Agr. Biochem. 113, Biochemical Laboratory Methods, 2  
Electives, 10  
Public Health Lectures

##### *Second Semester*

- Chem. 122, Physical, 2  
Chem. 124, Physico-Chemical Laboratory, 1  
Soils 108, Chemical Analysis of Soils, 3  
Electives, 12

## COLLEGE OF AGRICULTURE

## COURSE IN AGRICULTURAL ECONOMICS

## Graduate Work Advised

## SOPHOMORE YEAR

Students specializing in this course will be required to take Phys. 5-6, General Physics, 6 credits, except when they present high school physics for admission or complete the equivalent of high school or college physics prior to registration for the work of the sophomore year.

*First Semester*

Econ. 3a, Principles of Economics, 3  
Rhet. 11a, Argumentation, 3  
An. Biol. 3, General Zoology, 3  
Pol. Sci. 1a, American Government, 3  
Agr. Eng. 3a, Mechanical Drawing, 3  
Elective, 3  
Military Drill

*Second Semester*

Path. 6b, Elementary Bacteriology, 3  
Rhet. 22b, Public Speaking, 3  
An. Biol. 4, General Zoology, 3  
Agr. Biochem. 4, Plant and Animal Life, 3  
Elective, 3  
Econ. 18, Problems in Agricultural Economics, 3  
Military Drill

## JUNIOR YEAR

*First Semester*

Agron. 5, Farm Crops II, 3  
Econ. 19, Marketing of Farm Products, 3  
Econ. Zool. 3, Economic Entomology, 3  
An. Nutr. 1, Principles of Nutrition, 3  
Pl. Path. and Bot. 1, Plant Pathology, 3  
Soils 3, Soil Physics and Management, 3

*Second Semester*

Agr. Eng. 10, Farm Engineering, 3  
Soils 4, Soil Fertility, 3  
Agron. 101b, Farm Management I, 3  
Econ. Elective, 6  
Elective, 3

## SENIOR YEAR

*First Semester*

An. Husb. 11, Elements of Feeding, 3  
Econ. Electives, 6  
Electives, 9  
Public Health Lectures

*Second Semester*

Agron. 102b, Farm Management II, 3  
Agron. Elective, 3  
Econ. Elective, 3  
Farm Mgt. Elective, 3  
Electives, 6

## COURSE IN AGRICULTURAL EDUCATION

## SOPHOMORE YEAR

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.

Those specializing in this course will be required to take Phys. 5-6, General Physics, 6 credits, except when they present high school physics for admission or complete the equivalent of high school or college physics prior to registration for the work of the sophomore year.

*First Semester*

Econ. 3a, Principles of Economics, 3  
Rhet. 11a, Argumentation, 3  
An. Biol. 3, General Zoology, 3  
Path. 6a, Elementary Bacteriology, 3  
Agr. Educ. 21, Industrial Education, 3  
An. Husb. 3, Market Classes, 3  
Military Drill

*Second Semester*

Pol. Sci. 1b, American Government, 3  
Rhet. 22b, Public Speaking, 3  
An. Biol. 4, General Zoology, 3  
Agr. Educ. 11b, Principles of Industrial Education, 3  
Agr. Biochem. 4, Plant and Animal Life, 3  
Agr. Eng. 3b, Mechanical Drawing, 3  
Military Drill

## JUNIOR YEAR

By permission of Chief of Division a limited number may take Agr. Educ. 131b, Methods, in the second semester of the junior year, to prepare for Course 141a, Teaching, first semester, senior year. Those who do will postpone some 3-credit course until the second semester, senior year.

*First Semester*

Econ. Zool. 3, Economic Entomology, 3  
Pl. Path. and Bot. 1, Plant Pathology, 3  
Soils 3, Soil Physics and Management, 3  
Agron. 5, Farm Crops II, 3  
An. Nutr. 1, Principles of Nutrition, 3  
An. Husb. 11, Elements of Feeding, 3

*Second Semester*

Agron. 104, Grain and Corn Judging, 3  
Vet. Sci. 6, Veterinary Medicine, 3  
Soils 4, Soil Fertility, 3  
An. Husb. 4, Livestock Judging, 1½  
Dy. Husb. 4, Dairy Stock Judging, 1½  
Agr. Educ. 68 and Hort. 94, Home and School Gardening, 3  
Agron. 3b, Farm Machinery, 3

## SENIOR YEAR

Agr. Educ. 141a, Teaching, is offered the first semester for as many of those, who have completed Agr. Educ. 131, Methods, as can be accommodated.

Agr. Educ. 151a,b, Organization and Management, may be taken either semester.

*First Semester*

Agr. Eng. 7, Farm Structures, 3  
P. Husb. 1, Poultry, 3  
Pl. Path. and Bot. 9, Weeds and Seed Testing, 3  
Agr. Educ. 151a, Organization and Management, 3  
Agr. Educ. 131a, Methods, 3  
Elective, 3  
Public Health Lectures

*Second Semester*

Agron. 102b, Farm Management II, 3  
Econ. Zool. 16 and Pl. Path. and Bot. 6, Plant Pest Control, 3  
Agr. Educ. 141b, Teaching, 3  
Electives, 9

## COURSE IN AGRICULTURAL EDUCATION—MANUAL TRAINING

## SOPHOMORE YEAR

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.

Those specializing in this course will be required to take Phys. 5-6, General Physics, 6 credits, except when they present high school physics for admission or complete the equivalent of high school or college physics prior to registration for the work of the sophomore year.

*First Semester*

Path. 6a, Elementary Bacteriology, 3  
Econ. 3a, Principles of Economics, 3  
Rhet. 11a, Argumentation, 3  
An. Biol. 3, General Zoology, 3  
Agr. Educ. 21, Industrial Education, 3  
An. Husb. 3, Market Classes, 3  
Military Drill

*Second Semester*

Pol. Sci. 1b, American Government, 3  
Rhet. 22b, Public Speaking, 3  
An. Biol. 4, General Zoology, 3  
Agr. Biochem. 4, Plant and Animal Life, 3  
Agr. Educ. 11b, Principles of Industrial Education, 3  
Agr. Eng. 3b, Mechanical Drawing, 3  
Military Drill



## JUNIOR YEAR

By permission of Chief of Division a limited number may take Agr. Educ. 131b, Methods, in the second semester of the junior year, to prepare for Course 141a, Teaching, first semester, senior year. Those who do will postpone some 3-credit course until the second semester, senior year.

*First Semester*

Pl. Path. and Bot. 1, Plant Pathology, 3  
Econ. Zool. 3, Economic Entomology, 3  
Soils 3, Soil Physics and Management, 3  
Nutr. 1, Principles of Nutrition, 3  
Agron. 5, Farm Crops II, 3  
An. Husb. 11, Elements of Feeding, 3

*Second Semester*

Vet. Sci. 6, Veterinary Medicine, 3  
Soils 4, Soil Fertility, 3  
An. Husb. 4, Livestock Judging, 1½  
Dy. Husb. 4, Dairy Stock Judging, 1½  
Agron. 104, Grain and Corn Judging, 3  
Agr. Educ. 68 and Hort. 94, Home and School Gardening, 3  
Agron. 3b, Farm Machinery, 3

## SENIOR YEAR

Students majoring in this course must select their electives from the following courses: Agr. Eng. 4, Blacksmithing, 3; Agr. Eng. 16, Farm Power Machinery, 3; Advanced Drawing, 3; Advanced Wood Work, 3. At least one of the last two courses must be completed.

*First Semester*

Agr. Eng. 5, Carpentry, 3  
P. Husb. 1, Poultry, 3  
Agr. Eng. 7, Farm Structures, 3  
Agr. Educ. 133, Administration of Manual Training, 3  
Agr. Educ. 131a, Methods, 3  
Agr. Educ. 151b, Organization and Management, 3  
Public Health Lectures

*Second Semester*

Pol. Sci. 1b, American Government, 3  
Agron. 102b, Farm Management II, 3  
Econ. Zool. 16 and Pl. Path. and Bot. 6, Plant Pest Control, 3  
Agr. Educ. 141b, Teaching, 3  
Elective, 6

## COURSE IN AGRONOMY AND FARM MANAGEMENT

## Graduate Work Advised for Plant Breeding Specialists

## SOPHOMORE YEAR

Students specializing in this course will be required to take Phys. 5-6, General Physics, 6 credits, except when they present high school physics for admission or complete the equivalent of high school or college physics prior to registration for the work of the sophomore year.

*First Semester*

Econ. 3a, Principles of Economics, 3  
Rhet. 11a, Argumentation, 3  
An. Biol. 3, General Zoology, 3  
Agr. Eng. 3a, Mechanical Drawing, 3  
Agr. Biochem. 7, General Agricultural Biochemistry, 3  
Bot. Elective, 3  
Military Drill

*Second Semester*

Path. 6b, Elementary Bacteriology, 3  
Rhet. 22b, Public Speaking, 3  
An. Biol. 4, General Zoology, 3  
Bot. Elective, 3  
or  
\*Econ. 18, Problems in Agricultural Economics, 3  
Agr. Biochem. 8, General Agricultural Biochemistry, 3  
Pol. Sci. 1b, American Government, 3  
Military Drill

## JUNIOR YEAR

*First Semester*

Agron. 5, Farm Crops II, 3  
 Econ. Zool. 3, Economic Entomology, 3  
 An. Nutr. 1, Principles of Nutrition, 3  
 Pl. Path. and Bot. 1, Plant Pathology, 3  
 Soils 3, Soil Physics and Management, 3  
 Elective, 3

*Second Semester*

Agron. 101b, Farm Management I, 3  
 Dy. Husb. 2, Dairy Stock Feeding and  
 Management, 3  
 Vet. Sci. 6, Veterinary Medicine, 3  
 Soils 4, Soil Fertility, 3  
 Elective, 6

## SENIOR YEAR

*First Semester*

Agron. 102a, Farm Management II, 3  
 Agron. 103 and Hort. 109, Principles of  
 Genetics, 3  
 or  
 \*Elective, 3  
 Agr. Eng. 7, Farm Structures, 3  
 Pl. Path. and Bot. 9, Weeds and Seed  
 Testing, 3  
 An. Husb. 7, Livestock Feeding and Man-  
 agement, 4  
 Elective, 2  
 Public Health Lectures

*Second Semester*

Agron. 108, Farm Management III, 3  
 Agron. 104, Grain and Corn Judging, 3  
 Agron. 106 and Hort. 110, Plant Breed-  
 ing, 3  
 or  
 \*Econ. Elective, 3  
 Agron. or \*Farm Mgt. Elective, 3  
 Electives, 6

\* For those specializing in Farm Management.

## COURSE IN ANIMAL HUSBANDRY

Students majoring in Animal Husbandry are advised to select at least a portion of their electives from the following list:

Dy. Husb. 2, Dairy Stock Feeding and Management, 3; Eco. Zool. 9, Animal Parasites, 3; Agron. 103 and Hort. 109, Principles of Genetics, 3; Econ. 18, Problems in Agricultural Economics, 3; Rur. and Agr. Jour. 11-12, Agricultural Journalism, 6.

## SOPHOMORE YEAR

Students specializing in this course will be required to take Phys. 5-6, General Physics, 6 credits, except when they present high school physics for admission or complete the equivalent of high school or college physics prior to registration for the work of the sophomore year.

*First Semester*

Path. 6a, Elementary Bacteriology, 3  
 Econ. 3a, Principles of Economics, 3  
 Rhet. 11a, Argumentation, 3  
 An. Biol. 3, General Zoology, 3  
 Agr. Biochem. 7, General Agricultural  
 Biochemistry, 3  
 Pol. Sci. 1a, American Government, 3  
 Military Drill

*Second Semester*

Dy. Husb. 4, Dairy Stock Judging, 1½  
 Rhet. 22b, Public Speaking, 3  
 An. Biol. 4, General Zoology, 3  
 Agr. Eng. 3b, Mechanical Drawing, 3  
 Agr. Biochem. 8, General Agricultural  
 Biochemistry, 3  
 Vet. Sci. 24, The Animal Body, 3  
 Elective, 1½  
 Military Drill

## JUNIOR YEAR

*First Semester*

An. Nutr. 1, Principles of Nutrition, 3  
 Vet. Sci. 27, Physiology of Domestic  
 Animals, 3  
 An. Husb. 3, Market Classes of Live-  
 stock, 3

*Second Semester*

Vet. Sci. 28, Physiology of Domestic  
 Animals, 3  
 Dy. Husb. 12, Dairy Cattle Feeding, 3  
 Soils 4, Soil Fertility, 3  
 An. Husb. 4, Livestock Judging, 1½

Soils 3, Soil Physics and Management, 3  
Agr. Eng. 7, Farm Structures, 3  
Agron. Elective, 3

Vet. Sci. 4, Livestock Breeding I, 2  
\*Vet. Sci. 12, Common Diseases, 3  
Elective, 4½

## SENIOR YEAR

*First Semester*

P. Husb. 1, Poultry, 3  
An. Husb. 7, Livestock Feeding and  
Management, 4  
An. Husb. 9, Meats, 3  
An. Husb. 5, Livestock Breeding II, 2  
An. Husb. 101, Advanced Stock Judging, 3  
Electives, 3  
Public Health Lectures

*Second Semester*

Agron. 102b, Farm Management II, 3  
Agron. Elective, 3  
†Dy. and An. Husb. Elective, 6  
Elective, 6

\* If desired, this may be postponed until the senior year.

† At least one of the Advanced Courses 104, 106, 108, or 110 must be elected.

## COURSE IN DAIRY HUSBANDRY

*General Statement.*—Students specializing in this division are required to obtain at least three of the six months of approved farm experience required for graduation on an accredited dairy farm.

The following electives are recommended: An. Husb. 7, Livestock Feeding and Management, 4; Econ. Zool. 9, Animal Parasites, 3; Agron. 103 and Hort. 109, Principles of Genetics, 3; Econ. 18, Problems in Agricultural Economics, 3; Rur. and Agr. Jour. 11-12, Agricultural Journalism, 6; Pol. Sci. 1a,b, American Government, 3 (required for graduation).

## SOPHOMORE YEAR

Students specializing in this course will be required to take Phys. 5-6, General Physics, 6 credits, except when they present high school physics for admission or complete the equivalent of high school or college physics prior to registration for the work of the sophomore year.

*First Semester*

Econ. 3a, Principles of Economics, 3  
Rhet. 11a, Argumentation, 3  
An. Biol. 3, General Zoology, 3  
Path. 6a, Elementary Bacteriology, 3  
Dy. Husb. 11, Milk and Its Products, 3  
Agr. Biochem. 7, General Agricultural  
Biochemistry, 3  
Military Drill

*Second Semester*

Dy. Husb. 4, Dairy Stock Judging, 1½  
Rhet. 22b, Public Speaking, 3  
An. Biol. 4, General Zoology, 3  
Agr. Eng. 3b, Mechanical Drawing, 3  
Agr. Biochem. 8, General Agricultural  
Biochemistry, 3  
Vet. Sci. 24, The Animal Body, 3  
\*Elective, 1½  
Military Drill

## JUNIOR YEAR

*First Semester*

An. Nutr. 1, Principles of Nutrition, 3  
Vet. Sci. 27, Physiology of Domestic  
Animals, 3  
An. Husb. 3, Market Classes of Live-  
stock, 3  
Soils 3, Soil Physics and Management, 3

*Second Semester*

Dy. Husb. 2, Dairy Stock Feeding and  
Management, 3  
Vet. Sci. 28, Physiology of Domestic  
Animals, 3  
An. Husb. 4, Livestock Judging, 1½  
Soils 4, Soil Fertility, 3

\* Pol. Sci. 1a,b, American Government, 3, must be elected at some time during the course.

†Dy. Husb. 9, Cheese Making Practice, 3  
or  
Elective, 3  
Agron. Elective, 3

Vet. Sci. 4, Livestock Breeding I, 2  
‡Dy. Husb. 102, Advanced Study of  
Dairy Breeds, 3  
or  
†Dy. Husb. 10, Creamery Practice, 3  
Elective, 2½

## SENIOR YEAR

*First Semester*

P. Husb. 1, Poultry, 3  
An. Husb. 7, Livestock Feeding and  
Management, 4  
An. Husb. 5, Livestock Breeding II, 2  
Agr. Eng. 7, Farm Structures, 3  
Dy. Husb. 101, Seminar, 2  
Electives, 4  
Public Health Lectures

*Second Semester*

Agron. 102b, Farm Management II, 3  
Agron. Elective, 3  
Agr. Biochem. 12, Dairy Chemistry, 5  
• Vet. Sci. 12, Common Diseases, 3  
Elective, 4

† Required of those specializing in Dairy Manufactures.

‡ Required of those specializing in Dairy Production.

## COURSE IN ENTOMOLOGY AND ECONOMIC ZOOLOGY

## Graduate Work Advised

## SOPHOMORE YEAR

Students specializing in this course will be required to take Phys. 5-6, General Physics, 6 credits, except when they present high school physics for admission or complete the equivalent of high school or college physics prior to registration for the work of the sophomore year.

*First Semester*

Econ. 3a, Principles of Economics, 3  
Rhet. 11a, Argumentation, 3  
An. Biol. 3, General Zoology, 3  
Agr. Eng. 3a, Mechanical Drawing, 3  
Agr. Biochem. 7, General Agricultural  
Biochemistry, 3  
Bot. or Econ. Zool. Elective, 3  
Military Drill

*Second Semester*

Path. 6b, Elementary Bacteriology, 3  
Rhet. 22b, Public Speaking, 3  
An. Biol. 4, General Zoology, 3  
Bot. or Econ. Zool. Elective, 3  
Agr. Biochem. 8, General Agricultural  
Biochemistry, 3  
Pol. Sci. 1b, American Government, 3  
Military Drill

## JUNIOR YEAR

*First Semester*

Econ. Zool. 3, Economic Entomology, 3  
Pl. Path. and Bot. 1, Plant Pathology, 3  
Soils 3, Soil Physics and Management, 3  
Hort. Elective, 3  
Agron. Elective, 3  
Elective, 3

*Second Semester*

Vet. Sci. 6, Veterinary Medicine, 3  
Agr. Eng. 10, Farm Engineering, 3  
Soils 4, Soil Fertility, 3  
Econ. Zool. Elective, 3  
Elective, 6

## SENIOR YEAR

*First Semester*

Pl. Path. and Bot. 103, Bacterial Dis-  
eases, 3  
Econ. Zool. Elective, 3  
Econ. Zool. or An. Biol. Elective, 3  
Electives, 9  
Public Health Lectures

*Second Semester*

Pl. Path. and Bot. 104, Principles of  
Pathology, 3  
Pl. Path. and Bot. 14, Plant Disease  
Control, 3  
Econ. Zool. Elective, 3  
Econ. Zool. or An. Biol. Elective, 3  
Electives, 6

## COLLEGE OF AGRICULTURE

## COURSE IN HORTICULTURE

Students majoring in Horticulture are required (1) to complete the following courses: 4, 32, 71, 105, 109, and 110; (2) to elect three from the following list of courses, 19, 21, 33, 34, 50, 54 and 56, 101, 107. General electives should include work in botany, plant pathology, meteorology, economic zoology, and economics.

## SOPHOMORE YEAR

Students specializing in this course will be required to take Phys. 5-6, General Physics, 6 credits, except when they present high school physics for admission or complete the equivalent of high school or college physics prior to registration for the work of the sophomore year.

*First Semester*

Econ. 3a, Principles of Economics, 3  
Rhet. 11a, Argumentation, 3  
An. Biol. 3, General Zoology, 3  
Agr. Eng. 3a, Mechanical Drawing, 3  
Agr. Biochem. 7, General Agricultural  
Biochemistry, 3  
Bot. Elective, 3  
Military Drill

*Second Semester*

Path. 6b, Elementary Bacteriology, 3  
Rhet. 22b, Public Speaking, 3  
An. Biol. 4, General Zoology, 3  
Agr. Biochem. 8, General Agricultural  
Biochemistry, 3  
Pol. Sci. 1b, American Government, 3  
Bot. Elective, 3  
Military Drill

## JUNIOR YEAR

*First Semester*

Econ. Zool. 3, Economic Entomology, 3  
For. 21, Farm Forestry, 3  
Pl. Path. and Bot. 1, Plant Pathology, 3  
Soils 3, Soil Physics and Management, 3  
Hort. Elective, 3  
Elective, 3

*Second Semester*

Econ. Zool. 18, Control of Insect  
Pests, 3  
Pl. Path. and Bot. 14, Plant Disease  
Control, 3  
Soils 4, Soil Fertility, 3  
Hort. Elective, 3  
Elective, 6

## SENIOR YEAR

*First Semester*

Agron. 103 and Hort. 109, Principles of  
Genetics, 3  
Hort. Electives, 9  
Elective, 6  
Public Health Lectures

*Second Semester*

Agron. 106 and Hort. 110, Plant Breed-  
ing, 3  
Hort. Elective, 9  
Elective, 6

## COURSE IN PLANT PATHOLOGY

## Graduate Work Advised

## SOPHOMORE YEAR

*First Semester*

Econ. 3a, Principles of Economics, 3  
Rhet. 11a, Argumentation, 3  
An. Biol. 3, General Zoology, 3  
Agr. Biochem. 7, General Agricultural  
Biochemistry, 3  
Bot. Elective, 3  
Pol. Sci. 1a, American Government, 3  
Military Drill

*Second Semester*

Path. 6b, Elementary Bacteriology, 3  
Rhet. 22b, Public Speaking, 3  
An. Biol. 4, General Zoology, 3  
Agr. Biochem. 8, General Agricultural  
Biochemistry, 3  
Bot. Elective, 3  
Elective, 3  
Military Drill

## JUNIOR YEAR

*First Semester*

†Phys. 1, General Physics, 3  
 Econ. Zool. 3, Economic Entomology, 3  
 Pl. Path. and Bot. 1, Plant Pathology, 3  
 Soils 3, Soil Physics and Management, 3  
 Bot. Elective, 3  
 Elective, 3

*Second Semester*

‡Phys. 2, General Physics, 3  
 Soils 4, Soil Fertility, 3  
 Pl. Path. and Bot. 14, Plant Disease Control, 3  
 Econ. Zool. 18, Control of Insect Pests, 3  
 Bot. Elective, 3  
 Electives, 3

## SENIOR YEAR

*First Semester*

Pl. Path. and Bot. 103, Bacterial Diseases, 3  
 Agr. Biochem. 111, Phytochemistry, 3  
 Agron. 103 and Hort. 109, Principles of Genetics, 3  
 Bot. or Econ. Zool. Elective, 3  
 Elective, 6  
 Public Health Lectures

*Second Semester*

Pl. Path. and Bot. 104, Principles of Pathology, 3  
 Bot. or Econ. Zool. Elective, 3  
 Hort. Elective, 3  
 Elective, 9

† Phys. 3, General Laboratory Practice 1, should be taken at the same time.

‡ Phys. 4, General Laboratory Practice 1, should be taken at the same time.

## COURSE IN SOILS

## Graduate Work Advised

## SOPHOMORE YEAR

*First Semester*

Econ. 3a, Principles of Economics, 3  
 Rhet. 11a, Argumentation, 3  
 An. Biol. 3, General Zoology, 3  
 Chem. 11, Quantitative Analysis, 4  
 Geol. 1, General, 3  
 Elective, 2  
 Military Drill

*Second Semester*

Path. 6b, Elementary Bacteriology, 3  
 Rhet. 22b, Public Speaking, 3  
 An. Biol. 4, General Zoology, 3  
 Chem. 12, Quantitative Analysis, 4  
 Agr. Eng. 3b, Mechanical Drawing, 3  
 Elective, 2  
 Military Drill

## JUNIOR YEAR

*First Semester*

Agr. Biochem. 3a, Types of Carbon Compounds, 3  
 Phys. 1, General Physics, 3  
 Phys. 3, General Laboratory Practice, 1  
 Pl. Path. and Bot. 1, Plant Pathology, 3  
 Soils 3, Soil Physics and Management, 3  
 Soils 107a, Mechanical Analysis of Soils, 2  
 Pol. Sci. 1a, American Government, 3

*Second Semester*

Soils 108, Chemical Analysis of Soils, 3  
 Phys. 2, General Physics, 3  
 Phys. 4, General Laboratory Practice, 1  
 Agr. Eng. 10, Farm Engineering, 3  
 Soils 4, Soil Fertility, 3  
 Elective, 5

## SENIOR YEAR

*First Semester*

Agr. Biochem. 111, Phytochemistry, 3  
 Geol. 21, Elements of Mineralogy, 3  
 Econ. Zool. 3, Economic Entomology, 3  
 Electives, 9  
 Public Health Lectures

*Second Semester*

Soils 102, Soil Chemistry, 5  
 Agron. 102b, Farm Management II, 3  
 Electives, 10

## ELECTIVES

The following electives are suggested, but students are not confined to these courses. Courses required in curricula other than that in which student is specializing may be selected.

These electives are open as indicated below subject to the satisfaction of the prerequisites for which see the departmental statement in each case.

## FRESHMAN YEAR

*First Semester*

- Agr. Eng. 5, Carpentry, 3
- Agr. Eng. 17, Advanced Blacksmithing, 3
- P. Husb. 1, Poultry, 3
- Econ. 2a, Industries and Commerce of U. S., 3
- German, (See dept. statement)
- Romance Languages, (See dept. statement)
- Scandinavian, (See dept. statement)
- For. 1, General Forestry, 3

*Second Semester*

- Agr. Eng. 4, Blacksmithing, 3
- P. Husb. 4, Incubating and Brooding, 2
- P. Husb. 2, Poultry Judging, 3
- Econ. 2b, Industries and Commerce of U. S., 3
- German (See dept. statement)
- Romance Languages, (See dept. statement)
- Scandinavian, (See dept. statement)
- H. E. 24, Camp Cookery, 2

## SOPHOMORE YEAR

*First Semester*

- An. Husb. 3, Market Classes of Livestock, 3
- Dy. Husb. 11, Milk and Its Products, 3
- Hort. 71, Landscape Gardening, 3
- Hort. 73, Nursery Practice, 1½
- Pl. Path. and Bot. 7, Weeds and Grasses, 3
- Pl. Path. and Bot. 9, Weeds and Seed Testing, 3
- Rhet. 24a, Advanced Public Speaking, 3
- Rhet. 25a, Fundamentals of Vocal Expression, 2
- An. Biol. 7, Histology and Embryology, 3
- An. Biol. 19, Comparative Gross Anatomy of Vertebrates, 3
- An. Biol. 23, Entomology, 3
- Bot. 5, Plant Morphology, 3
- Bot. 7, Taxonomy, 3
- Bot. 9, Physiology and Ecology, 3
- Bot. 11, Industrial Botany, 3
- Bot. 13, Mycology, 3
- Chem. 35, Organic Chemistry, 4
- Econ. 4a, Economic Problems, 3
- Econ. 13, Economic Geography of Foreign Countries, 3
- Rur. and Agr. Jour. 1, Rural Press and Rural Life, 1
- Econ. 35, Accounting Principles, 3
- Econ. 43a, Banking, 3
- Geol. 1, General Geology, 3
- Geol. 3, Laboratory, 1
- Geol. 5, Economic Geology, 3
- Geol. 21, Elements of Mineralogy, 3
- Geol. 29, General Physiography, 3

*Second Semester*

- An. Hub. 4, Livestock Judging, 1½
- An. Hub. 6, Horse Power, 1
- Dy. Husb. 4, Dairy Stock Judging, 1½
- Hort. 4, Commercial Fruit Growing, 4
- Hort. 21b, Small Fruits and Viticulture, 3
- Hort. 32, Market Gardening, 3
- Hort. 50, Floriculture, 3
- Hort. 56, Plant Propagation, 1
- Rhet. 24b, Advanced Public Speaking, 3
- Rhet. 25b, Fundamentals of Vocal Expression, 3
- Vet. Sci. 24, The Animal Body, 3
- An. Biol. 8, Histology and Embryology, 3
- An. Biol. 20, Comparative Gross Anatomy of Vertebrates, 3
- An. Biol. 24, Entomology, 3
- An. Biol. 28, Ornithology, 3
- Bot. 6, Plant Morphology, 3
- Bot. 8, Taxonomy, 3
- Bot. 10, Physiology and Ecology, 3
- Bot. 12, Industrial Botany, 3
- Bot. 14, Mycology, 3
- Chem. 36, Organic Chemistry, 4
- Econ. 4b, Economic Problems, 3
- Econ. 18, Problems in Agricultural Economics, 3
- Econ. 34, Business Management, 3
- Rur. and Agr. Jour. 2, Reporting, 3
- Econ. 36, Accounting Principles, 3
- Econ. 43b, Banking, 3
- Econ. 46, Property Insurance, 3
- Geol. 4, Geology of Minnesota, 3

Geol. 35, Laboratory, 1  
Phil. 1, General Psychology, 3  
Pol. Sci. 5, European Municipal Administration, 3  
Pol. Sci. 7a, State and Local Government, 3

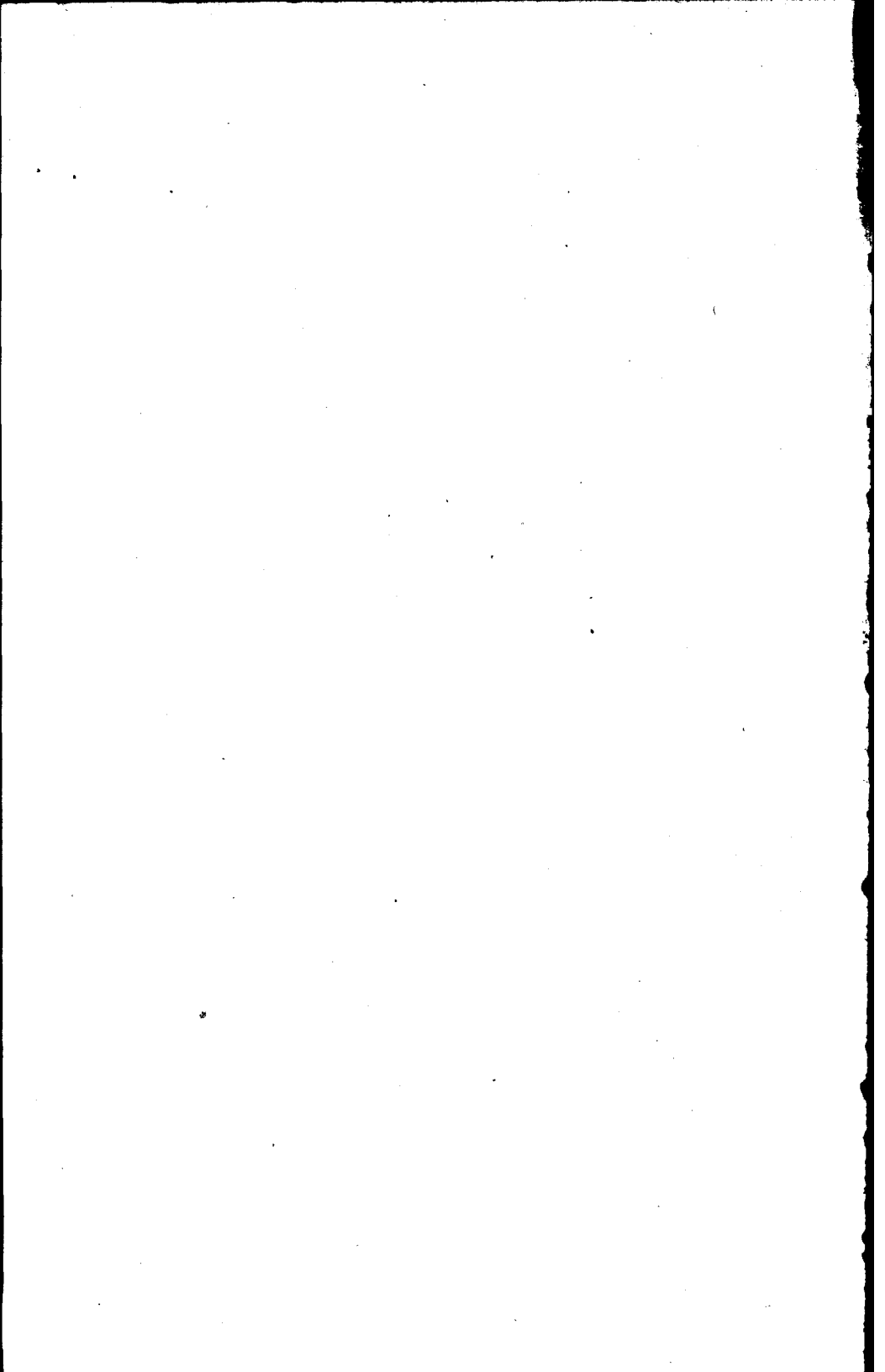
Phil. 2, General Psychology, 3  
Pol. Sci. 6, American Municipal Administration, 3  
Pol. Sci. 7b, State and Local Government, 3

JUNIOR AND SENIOR YEARS

Electives for the junior and senior years will be found under Description of Courses. See also Bulletin of the College of Agriculture, Home Economics Courses and bulletins of other colleges of the University.

Elective studies may be chosen from the work offered in any of the schools or colleges of the University, except that the selection shall be subject to the rules of the school or college concerned and to such other restrictions as may be imposed by the Students' Work Committee.





## DESCRIPTION OF COURSES

For explanation of course numbers and credits see page 20.

### AGRICULTURAL BIOCHEMISTRY

Professor ROSCOE W. THATCHER; Associate Professor ROSS AIKEN GORTNER; Assistant Professors CLYDE H. BAILEY, JOHN J. WILLAMAN; Instructor CORNELIA KENNEDY.

*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>				
3a,b.	Types of Carbon Compounds.....	3	Soph., jr.	Chem. 1 yr.
4.	Chem. of Plant and An. Life.....	3	Soph.	Chem. 1 yr.
7-8.	General Agricultural Biochemistry...	6	Soph., jr., sr.	Chem. 1 yr.
9.	Quantitative Analysis .....	5	Jr., sr.	Chem. 2 yrs.
10.	Agr. Quant. Analysis .....	5	Jr., sr.	9
12.	Dairy Chemistry .....	5	Jr., sr.	7-8
<i>Advanced Courses</i>				
105.	Detection of Adulteration.....	5	Sr.	10
106.	Agr. Products and By-Products.....	3	Sr.	10
108.	Chem. of Wheat and Its Products...	2	Sr.	3
110.	Flour Laboratory Methods.....	3	Sr.	10; parallel 108
111.	Phytochemistry .....	3	Sr.	Biol. 2 yrs., Org. Chem.
113.	Biochemical Lab. Methods.....	2	Sr.	10; Biol. 2 yrs., Org. Chem.
114.	Laboratory Problems .....	3 or 5	Sr.	111, 113

#### INTRODUCTORY COURSES

- 3a,b. **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. THATCHER, KENNEDY.
4. **THE CHEMISTRY OF PLANT AND ANIMAL LIFE.** The organic compounds commonly found in plant and animal tissues. The chemical changes during growth, harvesting, storage, and preparation for market. Factors affecting composition and changes therein. Utilization of farm by-products. WILLAMAN.
- 7-8. **GENERAL AGRICULTURAL BIOCHEMISTRY.** A qualitative and quantitative study of the types of organic compounds found in plants and

animals, and of the chemical changes which occur during the growth and utilization of plant and animal products. WILLAMAN.

9. **QUANTITATIVE ANALYSIS.** The principles involved in gravimetric and volumetric analyses. The course includes the gravimetric determination of iron, sulphur, phosphorus, magnesium, and chlorine; acidimetry, alkalimetry; the volumetric determination of iron and calcium; and iodimetry. WILLAMAN.
10. **AGRICULTURAL QUANTITATIVE ANALYSIS.** Methods of proximate analysis of agricultural products, including the determination of moisture, ash, fats, starch, sugars, fiber, proteins, and the different nitrogenous constituents of foods and feeding stuffs. WILLAMAN.
12. **DAIRY CHEMISTRY.** The chemistry of milk and its products. Preliminary practice in quantitative methods followed by laboratory work in the analysis of milk, butter, and cheese, and the detection of adulterants in them. WILLAMAN.

#### ADVANCED COURSES

105. **DETECTION OF ADULTERANTS OF FOODS AND FEEDING STUFFS.** The use of proximate analyses and special tests for the determination of quality and the detection of adulteration of foods and feeds. Includes chemical and microscopical examinations. WILLAMAN.
106. **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.
108. **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.
110. **FLOUR LABORATORY METHODS.** A laboratory course in the methods of analyses of wheat and its products; milling tests of wheat; and baking and special tests of flour. BAILEY.
111. **PHYTOCHEMISTRY.** An advanced course in the chemistry of fats, carbohydrates, tannins, proteins, enzymes, and colloids and their relation to the vital processes involved in plant and animal growth and nutrition. THATCHER.
113. **BIOCHEMICAL LABORATORY METHODS.** Special methods of examination of plant and animal tissues for particular fats, carbohydrates, proteins, and enzymes. KENNEDY.
114. **LABORATORY PROBLEMS IN BIOCHEMISTRY.** Special laboratory work in the preparation and isolation of pure compounds which occur in living

cells, in the study of biochemical reactions, and in special methods of identification or determination of biochemical products. GORTNER.

AGRICULTURAL ECONOMICS

See Department of Economics (page 64).

AGRICULTURAL EDUCATION

Professors ASHLEY V. STORM, DEXTER D. MAYNE; Associate Professor WILBUR H. BENDER; Assistant Professor WILLIAM F. LUSK; 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>				
*11a,b.	Principles of Industrial Education	3	Soph., jr., sr.	None
*21.	Industrial Education .....	3	Soph., jr., sr.	None
63.	General Agriculture .....	3	All	None
64.	General Agriculture .....	3	All	None
68.	Home and School Gardening.....	3	Jr., sr.	None
<i>Advanced Courses</i>				
*131a,b.	Methods in Teaching High School Agriculture .....	3	Sr.	11
*141a,b.	Teaching .....	3	Sr.	131, Agron. 5, 104, See statement
*151a,b.	Organization and Management....	3	Sr.	68
161.	Fundamentals of Agriculture.....	3	Jr., sr.	None
162.	Fundamentals of Agriculture.....	3	Jr., sr.	None
171.	Extension Work .....	3	Sr.	None
* College of Education.				

INTRODUCTORY COURSES

- 11a,b. PRINCIPLES OF INDUSTRIAL EDUCATION. The fundamental principles upon which education is based. Emphasis is placed on those phases which are most closely related to industrial education. LUSK.
- 21. INDUSTRIAL EDUCATION. A short history of industrial 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.
- 63. GENERAL AGRICULTURE. For students specializing in such divisions as Agricultural Biochemistry, Economic Zoology, Plant Pathology, and in other colleges. A series of units by division chiefs and other agricultural specialists. Not offered in 1917-18. STORM, MAYNE.
- 64. GENERAL AGRICULTURE. Continuation of Course 63. Credit is given for either course separately but there is no duplication of subject

matter and both should be taken to obtain a general knowledge of agriculture. Not offered in 1917-18. STORM, MAYNE.

68. 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 Hort. 94. LUSK, BRIERLEY.

#### ADVANCED COURSES

- 131a,b. 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. BENDER.
- 141a,b. \*TEACHING. 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. BENDER, LUSK, STORM.
- 151a,b. 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, LUSK.
161. 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. Not offered in 1917-18. BENDER.
162. FUNDAMENTALS OF AGRICULTURE. Continuation of Course 161. Credit is given for either course separately, but there is no duplication of subject matter and both should be taken to obtain a fundamental knowledge of agriculture. Not offered in 1917-18. LUSK.
171. 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. Not offered in 1917-18. STORM.

\* Students who are prepared may be required to do their teaching in manual training.

AGRICULTURAL ENGINEERING

Professor JOHN T. STEWART; Assistant Professors JASON L. MOWRY, HARRY B. ROE; Instructors ALLEN D. JOHNSTON, HALL B. WHITE, LLOYD R. WHITSON.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1a,b.	Higher Algebra .....	3	Fr.	None
2a,b.	Plane Trigonometry .....	3	Fr.	Higher Algebra
3a,b.	Mechanical Drawing .....	3	Fr., soph.	None
4.	Blacksmithing .....	3	All	None
5.	Carpentry .....	3	All	None
7.	Farm Structures .....	3	Sr.	2, 3
8.	Agricultural Physics .....	3	Jr.	2, 3
10.	Farm Engineering .....	3	Jr.	2, 3
16.	Farm Power Machinery .....	3	Sr.	8
17.	Advanced Blacksmithing .....	3	All	4
18.	Surveying .....	3	Sr.	2, 3

INTRODUCTORY COURSES

- 1a,b. HIGHER ALGEBRA. Special attention is given to practical problems, the methods of computation and a foundation for Plane Trigonometry. ROE.
- 2a,b. PLANE TRIGONOMETRY. Theory and use of logarithms and a study of the functions of plane trigonometry with numerous practical applications. ROE.
- 3a,b. 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. WHITSON.
- 4. BLACKSMITHING. The management of forge and fire and in bending, shaping, and welding iron. JOHNSTON.
- 5. CARPENTRY. The use of common carpentry tools and the methods of farm building construction. WHITE.
- 7. FARM STRUCTURES. The planning, designing, and location of farm buildings, including specifications and estimates of cost. MOWRY.
- 8. AGRICULTURAL PHYSICS. The principles of physics as applied to agriculture including ventilation, heating, lighting, water supply, and electricity. MOWRY.
- 10. FARM ENGINEERING. The principles of land surveys, the improvement of farm lands by drainage, explosives and their use, and a brief summary of road construction in agricultural districts. STEWART.
- 16. FARM POWER MACHINERY. Flexible connectors, pulleys, shafting, gear wheels, bearings, oils, lubrication, and engines. Special emphasis placed on laboratory work. MOWRY.

17. **ADVANCED BLACKSMITHING.** Bending, shaping, and welding steel and the tempering of steel tools. JOHNSTON.
18. **SURVEYING.** Theory and practice of plane surveying applied to farm management. Mensuration, leveling, and farm mapping. STEWART.

### AGRONOMY AND FARM MANAGEMENT

Professors ANDREW BOSS, COATES P. BULL; Associate Professors ALBERT C. ARNY, HERBERT K. HAYES; Assistant Professors LOUIS B. BASSETT, ALVA H. BENTON, PETER J. OLSON, FRANCIS W. PECK; Extension Specialists GEORGE J. BAKER, FRANK J. BROWN, 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>				
1a,b.	Farm Crops I.....	3	Fr.	None
3b.	Farm Machinery .....	3	Sr.	None
5.	Farm Crops II.....	3	Jr.	1, Bot. 1 yr.
7.	Farm Practices .....	None	Fr.	None
<i>Advanced Courses</i>				
101b.	Farm Management I.....	3	Jr., sr.	1, Econ. 3
102a,b.	Farm Management II.....	3	Sr.	1, Econ. 3; An. Hdsb. 7 or 11; Soils, 4
*103.	Principles of Genetics.....	3	Sr.	Bot. 1 yr., An. Biol. 1 yr.
104.	Grain and Corn Judging.....	3	Jr., sr.	1, Bot. 1 yr.
*106.	Plant Breeding .....	3	Sr.	103
108.	Farm Management III.....	3	Sr.	101, 102

\* Open to any student of the University having the required prerequisites.

#### INTRODUCTORY COURSES

- 1a,b. **FARM CROPS I.** An elementary study of the important field crops of the United States, with emphasis upon those of local importance; distribution, economic importance, agricultural classifications, cultural methods, and principles of improvement. OLSON.
- 3b. **FARM MACHINERY.** Lectures, practical discussions and practice work in the best methods of adjustment, handling, and adapting various kinds of machinery to the soils, weeds, and seasons. BASSETT.
5. **FARM CROPS II.** A systematic study of the form and structure of the entire plants of the cereal, forage, fiber, and root crops adapted to the north central states. ARNY.
7. **FARM PRACTICES.** A laboratory course designed to give training and experience in the elementary farm operations. ....

ADVANCED COURSES

- 101b. FARM MANAGEMENT I. Textbook and practice work in the art of record keeping, accounting, and kindred subjects. Designed especially for students expecting to become farm managers or farm-management field men. PECK.
- 102a,b. FARM MANAGEMENT II. A course in which the business side of farming is emphasized. Special attention is given to farm organization, equipment, and operation. BOSS.
103. PRINCIPLES OF GENETICS. Given jointly by the Division of Agronomy and Farm Management and the Division of Horticulture. Same as Hort. 109. Lectures and laboratory work designed to familiarize the student with the underlying principles of breeding. Heredity, variation, biometry, and evolution are emphasized. HAYES, DORSEY.
104. GRAIN AND CORN JUDGING. A study in detail of representative samples of the leading varieties of grains and corn and grass seeds, with score card practice in comparative judging of grain, corn, and grass seed. ARMY.
105. PLANT BREEDING. Given jointly by the Division of Agronomy and Farm Management and the Division of Horticulture. Same as Hort. 110. Applied genetics is emphasized. The method 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, DORSEY.
108. FARM MANAGEMENT III. An advanced seminar course including farm practices, farm equipment, cost of production, and efficiency of labor. BOSS, PECK.

ANIMAL HUSBANDRY

ANIMAL INDUSTRY GROUP

Professor CARL W. GAY; Assistant Professors ROBERT G. ASHBY, JOSEPH S. MONTGOMERY, THOMAS G. PATERSON; Instructors PHILIP A. ANDERSON, JAY J. VIETS; Assistant ALDEN W. MALCOMSON.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1a,b.	Types and Breeds of Livestock.....	3	Fr., soph.	None
3.	Market Classes of Livestock.....	3	Soph., jr.	1
4.	Livestock Judging.....	1½	Soph., jr.	3
5.	Livestock Breeding II.....	2	Sr.	Vet. Sci. 4
6.	Horse Power .....	1	Soph.	1
7.	Livestock Feeding and Management.	4	Sr.	An. Nutr. 1
9.	Meats .....	3	Sr.	4, An. Nutr. 1
11.	Elements of Feeding.....	3	Jr.	None



*Advanced Courses*

101. Advanced Stock Judging.....	3	Sr.	4
104. Horse Husbandry .....	2	Sr.	4, 5, 7
106. Beef Cattle Husbandry.....	2	Sr.	4, 5, 7
108. Sheep Husbandry .....	2	Sr.	4, 5, 7
110. Swine Husbandry .....	2	Sr.	4, 5, 7
112. Advanced Meats .....	5	Sr.	9
114. Feeding Seminar .....	3	Sr.	7
116. Applied Swine Husbandry.....	1-3	Sr.	7, see statement

## INTRODUCTORY COURSES

- 1a,b. 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.
3. MARKET CLASSES OF LIVESTOCK. The market classes of cattle, sheep, and swine, and practice work in judging market classes. PATERSON.
4. LIVESTOCK JUDGING. Practice in judging breeding classes of horses, beef cattle, sheep, and swine. Placings and reasons are submitted, followed by a general discussion with the instructor. MONTGOMERY.
5. LIVESTOCK BREEDING II. The application of the principles of genetics to the breeding of livestock, a consideration of practical breeder's problems concluded by general pedigree work in the stud, herd, and flock books. GAY.
6. HORSE POWER. The horse as a motor; mechanics of locomotion; the types and classes of horses adapted to the different kinds of horse labor. GAY.
7. LIVESTOCK FEEDING AND MANAGEMENT. Feeding livestock under farm conditions; equipment; management. 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 partial credit allowed to those who have completed Course II. ASHBY.
9. MEATS. General course in the dressing of animals and the cutting of carcasses. Lectures and laboratory work. PATERSON.
- II. 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 7. ASHBY, KILDEE.

## ADVANCED COURSES

101. ADVANCED STOCK JUDGING. Continuation of Course 4. The selection of breeding horses, beef cattle, sheep and swine. Stock farms in the vicinity of the Twin Cities visited in connection with this course. ASHBY, MONTGOMERY.

- 104. HORSE HUSBANDRY. The feeding, breeding, management, and marketing of horses. Studbook registration, pedigrees, and blood-lines with relation to breed improvement. Practicums dealing with breaking colts, stable management, and fitting for show purposes. MONTGOMERY.
- 106. BEEF CATTLE HUSBANDRY. The management of pure-bred herds of beef cattle, building equipment, food stuffs suitable, selection of foundation stock, methods of improvement, and marketing. Pedigrees, herd book registrations, and practicums. PATERSON.
- 108. SHEEP HUSBANDRY. The care and management of pure-bred sheep, study of pedigrees, registrations, fitting for show purposes, marketing. Practicums in feeding, shearing, blocking, and caring for young lambs. PATERSON.
- 110. SWINE HUSBANDRY. Cost of producing pork; equipment; swine types; purebred vs. market hogs; building a breeding herd; feeding; marketing breeding stock; herd management; pedigree studies; fitting and showing. Barn work and feeding practice. ASHBY.
- 112. ADVANCED MEATS. Continuation of Course 9. More attention is given the more important details concerning meat, its physical and chemical composition. PATERSON.
- 114. FEEDING SEMINAR. Review of recent bulletins, dealing with the results of experiments in feeding horses, beef cattle, sheep, and swine, as published by the various experiment stations. MONTGOMERY.
- 116. APPLIED SWINE HUSBANDRY. Individual problems offering to those most interested in this phase of animal production, opportunity for additional and specialized work. Admission only upon approval of instructor. ASHBY.

ANIMAL NUTRITION

ANIMAL INDUSTRY GROUP

Professor THEOPHILUS L. HAECKER; Assistant Professor GUSTAV W. GEHRAND.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Course</i>				
1.	Principles of Nutrition.....	3	Jr.	Vet. Sci. 24
<i>Advanced Course</i>				
101.	Studies in Animal Nutrition.....	3	Sr.	1

INTRODUCTORY COURSE

- 1. PRINCIPLES OF NUTRITION. The principles of animal nutrition, their relation to the economic production of animal products, and the re-

lation of the constituents in feed consumed to amount and character of products yielded. HAECKER, GEHRAND.

#### ADVANCED COURSE

101. STUDIES IN ANIMAL NUTRITION. Analysis of the problem of animal nutrition; the relationship of food consumed to milk production; utilization of nutrients in beef and pork production; and the distribution in the body. HAECKER.

#### 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>				
6.	Elements of Beekeeping.....	3	Jr., sr.	None
7.	Advanced Beekeeping .....	3	Jr., sr.	6

#### INTRODUCTORY COURSES

6. ELEMENTS OF BEEKEEPING. Elementary study of queens, drones, and workers, hives and appliances, handling of bees, spring, summer, winter management, swarming and increase, honey and wax production, feeding and bee diseases. JAGER, FRANCE.
7. ADVANCED BEEKEEPING. Anatomy of the bee, queen rearing, commercial production of honey, out apiaries, accounting and marketing. JAGER, FRANCE.

#### DAIRY HUSBANDRY

##### ANIMAL INDUSTRY GROUP

Professors HENRY H. KILDEE, ROBERT M. WASHBURN; Assistant Professor GUSTAV W. GEHRAND; Instructors EDWIN O. HANSON, .....; Extension Specialists ARTHUR J. MCGUIRE, WILLIAM A. MCKERROW.

#### COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
2.	Dairy Stock Feeding and Management .....	3	Jr., sr.	Nutr. I
4.	Dairy Stock Judging.....	1½	Soph.	7
5.	Factory Management .....	3	Jr., sr.	11

6. Factory Butter-Making .....	3	Jr., sr.	11
7a,b. Elements of Dairy Husbandry.....	3	Fr.	None
9. Cheese Making Practice .....	3	Jr., sr.	11
10. Creamery Practice .....	3	Jr., sr.	11
11. Milk and Its Products.....	3	Soph., jr.	7
12. Dairy Cattle Feeding.....	1	Jr., sr.	Nutr. 1, or parallel

*Advanced Courses*

101. Seminar .....	2	Sr.	2, 4, 11
102. Advanced Study of Dairy Breeds...	3	Jr., sr.	4
104. Special Problems .....	3	Jr., sr.	2, 4, 11

INTRODUCTORY COURSES

2. DAIRY STOCK FEEDING AND MANAGEMENT. Characteristics and values of concentrates, roughages and succulent feeds for efficient and economical milk production. Also shelter, care and management of different classes of dairy stock. Barn plan. Only partial credit allowed to those who have completed Course 12. KILDEE.
4. DAIRY STOCK JUDGING. Relation of form to function. Practice work in comparative judging of dairy cattle of different breeds and ages. Herds in the vicinity of the Twin Cities are visited. KILDEE.
5. FACTORY MANAGEMENT. Organization of Creamery Associations, the construction and equipment of factories, with lectures on calculating dividends, sinking fund, locating financial leaks and marketing. WASHBURN.
6. FACTORY BUTTER MAKING. The separation of milk, preparation of pure culture starters, cream ripening, churning, controlling composition of butter, market requirements and scoring of butter. WASHBURN.
- 7a,b. ELEMENTS OF DAIRY HUSBANDRY. Origin, characteristics and adaptations of the dairy breeds of cattle. Beginning judging. Milk, its composition and testing. Cream separation and buttermaking. GEHRAND, WASHBURN, HANSON.
9. CHEESE MAKING PRACTICE. A minimum of one month's experience in an approved practical cheese factory is advised of all students specializing in dairy manufacture. Records are kept and reports made of work. WASHBURN.
10. CREAMERY PRACTICE. One month's experience in an approved practical creamery is required of all students specializing in dairy manufacture. Records are kept and reports made of the work. WASHBURN.
11. MILK AND ITS PRODUCTS. Milk secretion, composition, properties, variation and testing. Cream separation, testing, care, methods of marketing. Butter, cheese and ice cream making. Market milk handling, standardizing, clarifying, pasteurizing, bottling and marketing. WASHBURN.

12. DAIRY CATTLE FEEDING. Characteristics and relative merits of concentrates, roughages and succulent feeds for efficient and economical production. Not open to those who have completed Course 2. GEHRAND.

## ADVANCED COURSES

101. SEMINAR. Survey of the recent developments in the field of dairy husbandry. Papers and discussion. KILDEE.
102. ADVANCED STUDY OF DAIRY BREEDS. Origin, history and characteristics of the more important strains and families of the leading breeds of dairy cattle. Judging and pedigree work. Herds near the Twin Cities are visited. KILDEE.
104. SPECIAL PROBLEMS. Individual studies and reports upon definite problems connected with dairy husbandry either in the field of production or manufacture. KILDEE, WASHBURN.

## ECONOMIC ZOOLOGY

Professor FREDERIC L. WASHBURN; Associate Professor ARTHUR G. RUGGLES; Assistant Professors CHARLES W. HOWARD, WILLIAM MOORE.

*General statement.*—For specialization in this department, see special requirements in Course of Study.

Courses in this division are closely correlated with those offered by the Department of Animal Biology of the College of Science, Literature, and the Arts. For courses of that department see page 58.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
3.	Economic Entomology .....	3	Jr.	An. Biol. 3-4
4.	Economic Vertebrate Zoology.....	2	Jr., sr.	An. Biol. 3-4
5.	Forest Entomology .....	3	Jr.	An. Biol. 3-4
9.	Animal Parasites .....	3	Jr., sr.	An. Biol. 3-4
11.	Nursery Inspection .....	2	Jr., sr.	*18
12.	Forest Zoology .....	2	Jr.	An. Biol. 3-4
14.	Insects and Public Health.....	2	Jr., sr.	An. Biol. 3-4
16.	Plant Pest Control.....	3	Jr., sr.	3, Pl. Path. I
18.	Control of Insect Pests.....	3	Jr., sr.	3, Pl. Path. 14, Hort. 1 sem.
<i>Advanced Courses</i>				
104.	Methods in Econ. Ent. ....	3	Jr., sr.	3
105-106.	Special Problems .....	6	Jr., sr.	104
107-108.	Immature Stages of Insects.....	3 or 6	Jr., sr.	3
109-110.	Action of Insecticides.....	3 or 6	Jr., sr.	3

\* This may be taken parallel with course 11.

## INTRODUCTORY COURSES

3. **ECONOMIC ENTOMOLOGY.** The most important insect pests; methods of control; insecticides and insecticidal apparatus; beneficial insects. Each student makes a collection of insects. WASHBURN, RUGGLES, HOWARD, MOORE.
4. **ECONOMIC VERTEBRATE ZOOLOGY.** The relation of birds and four-footed wild animals to agriculture. Laboratory and field work. Identification of Minnesota birds affecting the horticulturist and agriculturist; also of vertebrate farm pests, habits, methods of combating. WASHBURN.
5. **FOREST ENTOMOLOGY.** A special study is made of insects effecting shade and forest trees and the best means of controlling them. RUGGLES.
9. **ANIMAL PARASITES.** Parasitism and the more common animal parasites of man and domestic animals. HOWARD, BOYD.
11. **NURSERY INSPECTION.** Practical work in inspection of nurseries and imported nursery stock. State laws; of quarantine rulings and reasons therefor; study of methods in field and office. WASHBURN.
12. **FOREST ZOOLOGY.** Forest animals. Relations 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, birds; fish culture. WASHBURN.
14. **INSECTS AND PUBLIC HEALTH.** The agency of insects and insect-like animals in the transmission of diseases; methods of sanitation related to their control and disease transmission. HOWARD.
16. **PLANT PEST CONTROL.** Given jointly by the Division of Economic Zoology and the Division of Plant Pathology and Botany. Same as Pl. Path. and Bot. 6. The theory and practice of control of insect and fungous pests of crop plants. Practical applications. Not open to those who have completed course 18 or Pl. Path. and Bot. 14. Given in alternate years. Not offered in 1917-18. RUGGLES, STAKMAN, BISBY.
18. **CONTROL OF INSECT PESTS.** The principal insects of the orchard and garden are studied in detail. The last part of the course deals with spray materials and their method of application. Not open to those who have completed course 16. Given in alternate years. Offered in 1917-18. RUGGLES, MOORE.

## ADVANCED COURSES

104. **METHODS IN ECONOMIC ENTOMOLOGY.** Methods of breeding insects; identification of insects in various stages; photography of insects; general field work. MOORE.

- 105-106. **SPECIAL PROBLEMS.** Special problems for those intending to specialize in entomology or economic zoology. Problems may be chosen in any section of the Division. Attendance is expected during the Summer Session. WASHBURN, RUGGLES, HOWARD, MOORE.
- 107-103. **IMMATURE STAGES OF INSECTS.** Immature forms of economic insects. Laboratory work. RUGGLES.
- 109-110. **ACTION OF INSECTICIDES.** The common insecticides and their action on insects and their hosts. Laboratory and conference work. MOORE.

### HOME ECONOMICS

Professor JOSEPHINE T. BERRY; Instructor BESSIE E. BEMIS.

#### COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Course</i>				
24.	Camp Cookery .....	2	Fr.	None

For additional courses see the bulletin of the College of Agriculture, Courses in Home Economics.

#### INTRODUCTORY COURSE

24. **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. BEMIS.

### HORTICULTURE

Associate Professors LE ROY CADY, MAXWELL J. DORSEY; Assistant Professors WILFRID G. BRIERLEY (Chairman), RICHARD WELLINGTON; Instructor WILLIAM T. TAPLEY; 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>				
4.	Commercial Fruit Growing.....	4	Soph., jr., sr.	Bot. 1 yr., Hort. 1 sem.
19.	Fruit Handling .....	4	Jr., sr.	4, 21, Econ. 3
21b.	Small Fruits and Viticulture.....	3	Soph., jr., sr.	Bot. 1 yr.
32.	Market Gardening .....	3	Soph., jr., sr.	Bot. 1 yr.
33.	Vegetable Forcing .....	3	Jr., sr.	32
34.	Commercial Potato Growing.....	3	Jr., sr.	Bot. 1 yr.
50.	Floriculture .....	3	Soph., jr., sr.	None
54.	Greenhouse Construction and Management .....	1½	Jr., sr.	None

56. Plant Propagation .....	1	Soph., jr., sr.	None
71. Landscape Gardening .....	3	Soph., jr., sr.	None
73. Nursery Practice .....	1½	Soph., jr., sr.	None
90a,b. General Horticulture .....	3	All	None
94. Home and School Gardening.....	3	Jr., sr.	None

*Advanced Courses*

101. Advanced Fruit Growing.....	3	Jr., sr.	4, 21
103. Tropical Fruits .....	3	Sr.	4, 21
105. Systematic Pomology .....	3	Jr., sr.	4, 21
107. Orchard Management .....	3	Sr.	19
109. Principles of Genetics.....	3	Sr.	Bot. 1 yr., An. Biol. 1 yr.
110. Plant Breeding .....	3	Sr.	109
131. Advanced Market Gardening....	3	Sr.	32
151-152. Advanced Floriculture .....	6	Sr.	50, 54
191. Hort. Literature .....	3	Sr.	4
193-194. Hort. Seminar .....	2	Sr.	12 cred. excl. of 90 and 94

INTRODUCTORY COURSES

4. COMMERCIAL 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.
19. FRUIT HANDLING. Lectures on early development, packages, harvesting, packing, by-products, coöperation, marketing, and storage. Laboratory in picking and packing of fruits, reference work on marketing and storage. Alternates with 107. Not offered in 1917-18. BRIERLEY.
- 21b. SMALL FRUITS AND VITICULTURE. Lectures, references, and laboratory. 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.
32. MARKET-GARDENING. The principles of vegetable-growing for market, including all important vegetable crops from seed to harvest. Lectures, recitations, references, laboratory work, and excursions. TAPLEY.
33. VEGETABLE FORCING. The growing and handling of the vegetable forcing crops; types and management of houses. Lectures, reference reading, field trips, and laboratory. TAPLEY.
34. COMMERCIAL POTATO GROWING. Lectures, references, field and laboratory practices. Preparation of the soil, planting, cultivating, harvesting, storing, classifying varieties, treating and selecting seed, exhibiting, judging, and scoring. WELLINGTON.



50. **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.
54. **GREENHOUSE CONSTRUCTION AND MANAGEMENT.** The evolution of the greenhouse, types of houses, materials, and methods of construction. Lectures, field trips, and laboratory work. CADY.
56. **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.
71. **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.
73. **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.
- \*90a,b. **GENERAL HORTICULTURE.** A general survey of horticulture including the elementary principles of fruit-growing, vegetable gardening, floriculture, landscape gardening, and plant propagation. BRIERLEY, TAPLEY.
94. **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. BRIERLEY, LUSK, CADY, WELLINGTON, TAPLEY.

#### ADVANCED COURSES

101. **ADVANCED FRUIT-GROWING.** Lectures, laboratory, and special problems. The tree fruits. Similar in outline to course 21b. BRIERLEY.
103. **TROPICAL FRUITS.** Lectures, references, and special problems. The tropical and citrus fruits. Similar in outline to course 21b. Not offered in 1917-18. BRIERLEY.
105. **SYSTEMATIC POMOLOGY.** The classification and distribution of temperate, sub-tropical, and tropical fruits; technical description, identification, and general study of the more important varieties; judging of fruits; fruit literature. Lectures, laboratory work, references. WELLINGTON.

\* 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. 4, 21, 32, 34, 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.

107. ORCHARD MANAGEMENT. Lectures, references, laboratory, and special problems. The principal problems connected with the management of orchard and small fruit tracts. Alternates with 19. Offered in 1917-18. BRIERLEY.
109. PRINCIPLES OF GENETICS. Given jointly by the Division of Horticulture and the Division of Agronomy and Farm Management. Same as Agron. 103. Lectures and laboratory work designed to familiarize the student with the underlying principles of breeding. Heredity, variation, biometry, and evolution are emphasized. DORSEY, HAYES.
110. PLANT BREEDING. Given jointly by the Division of Horticulture and the Division of Agronomy and Farm Management. Same as Agron. 106. Applied genetics is emphasized. The method 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. DORSEY, HAYES.
131. ADVANCED MARKET-GARDENING. Lectures, references, and special problems. A study in detail of the various vegetables. WELLINGTON.
- 151-152. 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.
191. HORTICULTURE LITERATURE. A critical study of foreign and native horticultural literature, and the methods used in the preparation of fruit monographs and bulletins. A knowledge of French and German will be a valuable asset. Lectures. WELLINGTON.
- 193-194. HORTICULTURAL SEMINAR. Required of all graduate students and of seniors electing special problem work. Reports and discussion of problems and investigational work. BRIERLEY, WELLINGTON.

#### MILITARY SCIENCE AND TACTICS

Professors GEORGE W. MOSES (Commandant), THEODORE B. TAYLOR, JAMES B. WOOLNOUGH, OWEN R. MEREDITH; Brigade Adjutant WALTER F. RHINOW; Band Instructor BERT ROSE.

*General statement.*—All students are required to take military drill and instruction during the first two years of attendance unless they have previously attended a school in which a senior unit of the Reserve Officers Training Corps has been established. No credits are allowed for this work.

All juniors and seniors who have completed two years of drill may register for the course required by General Order 49 War Department for members of the Reserve Officers Training Corps. When this course is entered upon it must be carried to completion as a prerequisite for promotion or graduation.

Juniors and seniors who take the course required by General Order 49, which includes two camps of four weeks each, will receive an allowance of thirty 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 a commission in the Reserve Corps. The Reserve Corps furnishes officers for Citizens' Training Camps in time of peace and commissioned officers 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 drill per week and three lecture periods per week in the Military Department and a course in Military History and International Law in the proper departments of the University. It carries three credits in each semester in the department of Military Science and Tactics, and three additional credits in each of the extra studies—18 credits in all.

## MUSIC

Professor CARLYLE SCOTT; Assistant Professor DONALD FERGUSON; Instructors MAXIMILIAN DICK, ABE PEPINSKY.

*General statement.*—Credit is offered to seniors and juniors in the College of Agriculture who may wish to elect work in the Department of Music. Six credits may be obtained. The following courses are recommended:

### COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
15-16.	Violin .....	4	Jr., sr.	See statement
23-24.	Chorus .....	1	Jr., sr.	None
25-26.	Orchestra .....	1	Jr., sr.	None

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

### INTRODUCTORY COURSES

- 15-16. VIOLIN. Candidate must be able to play the first ten of Kruetzer's forty etudes, and the easier Handel and Mozart sonatas. DICK, PEPINSKY.
- 23-24. CHORUS. A popular course in choral practice for four-part mixed voices. SCOTT.
- 25-26. ORCHESTRA. FERGUSON, PEPINSKY.

PHYSICAL EDUCATION

FOR MEN

Director LOUIS J. COOKE; Assistant Director WILLIAM K. FOSTER; Instructors D. C. MITCHELL, JOHN C. WEST; Assistant BOTTLF M. OHNSTAD.

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 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
1.	Personal Hygiene .....	None	Fr.	None
*3a,b.	Gymnasium .....	None	Fr.	None
5-6.	Intermediate Gymnastics .....	None	Fr.	None
†7-8.	Advanced Leaders .....	2	Soph., jr., sr.	1, 3-4, 5-6
9-10.	Corrective Gymnastics .....	None	All	None
11-12.	Wrestling .....	None	Soph., jr., sr.	None
13-14.	Advanced Gymnastics .....	None	Soph., jr., sr.	None
15-16.	Intermediate Swimming .....	None	All	None
17-18.	Advanced Swimming .....	None	All	15-16

\* Given at the University Farm.

† Both semesters must be completed before credit is given for the first semester.

I. PERSONAL HYGIENE. Two hours per week; first six weeks of first semester. Examination at close of course. COOKE.

*A special lecture* on sex hygiene is given sometime during the first ten days of the autumn semester, with required attendance on the part of all freshmen.

3a,b. GYMNASTICS. Two hours a week, last twelve weeks of first semester or first twelve weeks of second semester. Required qualifications

- in swimming, life-saving, bar-vaulting, jumping, sprinting, running, and on heavy apparatus. MITCHELL.
- 5-6. INTERMEDIATE GYMNASTICS. Elective for freshmen showing exceptional ability in elementary apparatus work. FOSTER, WEST.
- 7-8. CLASS LEADERS (ADVANCED). Three hours a week. FOSTER, WEST.
- 9-10. CORRECTIVE GYMNASTICS. Three hours a week. Special individual courses for students physically defective. OHNSTAD.
- 11-12. WRESTLING. Course in competitive wrestling. Most promising candidates chosen to represent Minnesota at the Western Intercollegiate Gymnastic and Wrestling Meet. (Optional.) FOSTER, OHNSTAD.
- 13-14. ADVANCED GYMNASTICS. Same as Course 11 and 12 except that it is in gymnastics instead of wrestling. Includes course in ground tumbling, horizontal bar, parallel bars, side horse, and flying rings. FOSTER, WEST.
- 15-16, 17-18. SWIMMING, INTERMEDIATE AND ADVANCED. Life saving, efficiency swimming, and fancy diving. Instruction is given in rescuing and restoring the apparently drowned and other useful swimming accomplishments. FOSTER, OHNSTAD.

### PLANT PATHOLOGY AND BOTANY

Professor EDWARD M. FREEMAN; Associate Professor ELVIN C. STAKMAN; Assistant Professor WIELAND L. OSWALD; Instructors GUY R. BISBY, ROBERT C. DAHLBERG, ESTELLE LOUISE JENSEN; 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>				
1.	Plant Pathology .....	3	Jr.	Bot. 1 yr.
6.	Plant Pest Control.....	3	Jr., sr.	1, Econ. Zool. 3
7.	Weeds and Grasses.....	3	Soph., jr., sr.	Bot. 1 yr.
9.	Weeds and Seed Testing.....	3	Soph., jr., sr.	Bot. 1 yr.
10.	Forest Pathology .....	3	Soph.	Bot. 1 yr.
12.	Seed Problems .....	3	Jr., sr.	9
14.	Plant Disease Control.....	3	Jr., sr.	1, Econ. Zool. 3
<i>Advanced Courses</i>				
103.	Bacterial Diseases .....	3	Jr., sr.	1, Path. 6
104.	Principles of Pathology.....	3	Jr., sr.	1, Path. 6

#### INTRODUCTORY COURSES

1. PLANT PATHOLOGY. Elementary study of plant diseases due to fungi bacteria and slime molds; life-histories and preventive methods. Lec-

ture, laboratory, and reference. Not open to those who have completed course 10. FREEMAN, JENSEN.

6. PLANT PEST CONTROL. Given jointly by the Division of Plant Pathology and Botany and the Division of Economic Zoology. Same as Econ. Zool. 16. The theory and practice of control of insect and fungous pests of crop plants. Practical applications. Not open to those who have completed course 14 or Econ. Zool. 18. Given in alternate years; not offered in 1917-18. STAKMAN, RUGGLES, BISBY.
7. WEEDS AND GRASSES. Agricultural and applied botanical study of weeds and grasses with special reference to agricultural importance. OSWALD.
9. 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. OSWALD, DAHLBERG.
10. 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 course 1. FREEMAN, STAKMAN.
12. SEED PROBLEMS. Special seed problems are assigned. Advanced work in seed testing methods. OSWALD, DAHLBERG.
14. 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 course 6. Given in alternate years; offered in 1917-18. STAKMAN, BISBY.

ADVANCED COURSES

103. BACTERIAL DISEASES. Morphology, classification, and physiology of phytopathogenic bacteria; general phenomena of bacterial infection and host reaction; detailed study of plant diseases caused by bacteria and filterable viruses. STAKMAN.
104. PRINCIPLES OF PATHOLOGY. Comparative biology of plant pathogens; pathological plant anatomy, parasitism, biologic specialization, resistance, and immunity. STAKMAN.

POULTRY HUSBANDRY

ANIMAL INDUSTRY GROUP

Professor ARTHUR C. SMITH; Instructor DWIGHT J. LANE.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1.	Poultry .....	3	All	None
2.	Poultry Judging .....	3	All	1
4.	Incubating and Brooding.....	2	All	None

## INTRODUCTORY COURSES

1. **POULTRY.** The poultry industry; best methods of care and management of fowls, turkeys, ducks, and geese, and the most important breeds of same. SMITH.
2. **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.
4. **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, LANE.

## 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 first semester of the senior year.

At least one quiz paper will be selected at random each semester from other than rhetoric classes and read by the Rhetoric section. In addition any instructor may nominate and submit papers for any junior or senior who in his opinion requires special consideration.

The Rhetoric section may require upper-class students to take, without credit, additional courses in rhetoric in order to validate their freshman and sophomore rhetoric credits.

Until June, 1918, students registered previous to September, 1915, may be required to take a supplementary three-credit course in rhetoric in place of three of the elective credits required for the degree.

Students whose work in Rhetoric 1 shows at any time an inadequate knowledge of the conventions of English will be required to drop the course and enter Rhet. 3. These students will be required to complete fifteen credit hours of work in rhetoric.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1a,b.	Rhetoric .....	3	Fr.	None
2a,b.	Rhetoric .....	3	Fr.	1
3a,b.	Elementary Rhetoric .....	3	Fr.	None
11a,b.	Argumentation .....	3	Soph., jr.	2
22a,b.	Public Speaking .....	3	Soph., jr.	11
24a,b.	Adv. Public Speaking.....	3	Soph., jr., sr.	22 or 25
25a,b.	Fundamentals of Vocal Expression..	2	Soph., jr., sr.	2

INTRODUCTORY COURSES

- 1a,b. RHETORIC. Note taking, thesis writing, oral and written exposition, sentence and paragraph structure, analysis of prose models, book reviews. LANSING, GLICK, MOHL.
- 2a,b. RHETORIC. Description, narration, diction, argumentation, oral composition, book reviews. LANSING, GLICK, MOHL.
- 3a,b. ELEMENTARY RHETORIC. Elementary grammatical and rhetorical principles. MOHL.
- 11a,b. ARGUMENTATION. Evidence, reasoning, briefing, debating. LANSING, GLICK, MOHL.
- 22a,b. PUBLIC SPEAKING. The fundamentals of effective public speech and practice in organizing and delivering short occasional addresses. GLICK.
- 24a,b. ADVANCED PUBLIC SPEAKING. The preparation and delivery of the informal lecture. A study of the rules of order and practice in conducting assemblies. GLICK.
- 25a,b. FUNDAMENTALS OF VOCAL EXPRESSION. The fundamental principles of voice production, articulation, gesture, platform deportment, and expression. COOK.

RURAL AND AGRICULTURAL JOURNALISM

Associate Professor WILLIAM P. KIRKWOOD; Instructor L. GERALD HOOD.

*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 management 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>				
1.	Rural Press and Rural Life.....	1	Soph., jr., sr.	Rhet. 1 yr.
*2.	Reporting .....	3	Soph., jr., sr.	Rhet. 1 yr.
*3.	Advanced Reporting .....	3	Jr., sr.	2
*4.	News Editing .....	3	Jr., sr.	3 and 5
*5.	Copy-Reading .....	3	Jr., sr.	3 or parallel 3
6.	Business Administration .....	3	Sr.	4
7.	Editorial Administration .....	3	Sr.	4
9.	Bulletin Writing .....	3	Sr.	11-12
10.	Agricultural Publicity .....	1	Sr.	11-12
11-12.	Agricultural Journalism .....	6	Jr., sr.	Rhet. 2 yrs. or Rhet. 1 yr., Eng. 1 yr.†

\* Courses 2, 3, 4, and 5 will be given by this Division in case they are not offered in the College of Science, Literature, and the Arts.

† Rur. and Agr. Jour. 2 also advised as a prerequisite.



## INTRODUCTORY COURSES

1. RURAL PRESS AND RURAL LIFE. The relations of the rural press to rural and community life; rural problems and how the rural press may be influenced by and assist in their solution. KIRKWOOD.
2. 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. ....
3. ADVANCED REPORTING. More extended practice in actual work on University publications. ....
4. NEWS EDITING. Continuation of course 5 with special attention to the subject of type, make up and printing. Laboratory practice on University publications. ....
5. COPY READING. Study and practice in editing copy for the newspaper and in writing headlines. ....
- \*6. BUSINESS ADMINISTRATION. The business problems of the rural weekly including general accounting, job cost accounting, circulation building and advertising problems. HOOD.
7. 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.
9. BULLETIN WRITING. The application of the rules of writing for the press to the preparation of popular and technical bulletins with some attention to style in articles for scientific papers. KIRKWOOD.
10. AGRICULTURAL PUBLICITY. Mediums and methods through and by which useful and valuable information may be brought to the attention of communities and the people of the open country. KIRKWOOD.
- 11-12. 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. HOOD.

## SOILS

Professor FREDERICK J. ALWAY; Associate Professor .....;  
 Instructors PAUL R. McMILLER, CLAYTON O. ROST; Extension Specialist GEORGE H. NESOM.

*General statement.*—For specialization in this department see special requirements in Course of Study.

\* Special courses in advertising will be provided as soon as demanded.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
3.	Soil Physics and Management.....	3	Jr.	Chem. 1 yr.
4.	Soil Fertility and Fertilizers.....	3	Jr.	3
<i>Advanced Courses</i>				
102.	Soil Chemistry .....	5	Sr.	108
105-106.	Special Problems in Soils.....	†	Sr.	102
107a,b.	Mechanical Analysis of Soils.....	2	Jr., sr.	3 or parallel 3
108.	Chemical Analysis of Soils.....	3	Sr.	4, Quant. Anal.

† Credit according to the amount of work.

INTRODUCTORY COURSES

3. SOIL PHYSICS AND MANAGEMENT. Origin, mechanical composition, classification, and physical properties of soils; tillage operations in relation to moisture supply; micro-organisms of the soil. Lecture, laboratory, and field work. ALWAY, McMILLER.
4. SOIL FERTILITY AND FERTILIZERS. Chemical composition of soils; farm manures; green manures; commercial fertilizers, composition and use; soil amendments; unproductive soils and their reclamation. Lecture and laboratory work. ALWAY, McMILLER.

ADVANCED COURSES

102. SOIL CHEMISTRY. A laboratory course on the chemical examination of soils including peat and alkali soils. A more advanced course than 108. ....
- 105-106. SPECIAL PROBLEMS IN SOILS. Individual laboratory or field work upon some special soil problem in soil physics or soil management. Arrangements must be made in advance. ALWAY.
- 107a,b. MECHANICAL ANALYSIS OF SOILS. A laboratory course on the beaker, centrifuge, and elutriator methods of mechanical analysis. McMILLER.
108. CHEMICAL ANALYSIS OF SOILS. A laboratory course on the quantitative determination of the most important soil constituents. ....

VETERINARY SCIENCE

ANIMAL INDUSTRY GROUP

Professor MYRON H. REYNOLDS; Assistant Professors WILLARD L. BOYD, HOWARD C. H. KERNKAMP, CHARLES C. PALMER; Assistant ARTHUR L. ANDERSON.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
4.	Livestock Breeding I.....	2	Jr.	24
6.	Veterinary Medicine .....	3	Jr.	None
12.	Common Diseases of Domestic Animals .....	3	Sr.	24
14.	Hog Cholera .....	1	Jr., sr.	None
24.	The Animal Body.....	3	Soph.	None
27-28.	Physiology of Domestic Animals...	6	Jr.	24
<i>Advanced Courses</i>				
122.	Advanced Anatomy of Locomotion and Conformation .....	3	Jr., sr.	24

## INTRODUCTORY COURSES

4. **LIVESTOCK BREEDING I.** Anatomy and physiology of reproduction. Embryology, heredity, and hygiene of breeding animals. Obstetrics, sterility and common diseases of breeding animals. PALMER.
6. **VETERINARY MEDICINE.** Planned for students who can take only one semester of veterinary work. Includes preparatory work for the study of diseases, causes, prevention, diagnosis and treatment of the common diseases including lameness, unsoundness, and common medicines. REYNOLDS.
12. **COMMON DISEASES OF DOMESTIC ANIMALS.** Cause, diagnosis, prevention, and treatment of common diseases capable of easy diagnosis and either prevention or simple treatment. General principles of diagnosis, preparation and administration of common medicines. BOYD.
14. **HOG CHOLERA.** A detailed study of various phases of hog cholera and the use of serum. Lectures and laboratory work. Course intended especially for students specializing in Animal Husbandry and Agricultural Education. KERNKAMP.
24. **THE ANIMAL BODY.** Anatomy of the common farm animals including bones, muscles, and viscera. Lecture and demonstration. PALMER.
- 27-28. **PHYSIOLOGY OF DOMESTIC ANIMALS.** A lecture and laboratory course in the physiology of the common farm animals. Special emphasis is given to digestion and metabolism. PALMER, ANDERSON.

## ADVANCED COURSES

122. **ADVANCED ANATOMY OF LOCOMOTION AND CONFORMATION.** A laboratory course including the bones, articulations, muscles, and viscera involved in locomotion and conformation. PALMER.

## COURSES IN OTHER SCHOOLS AND COLLEGES

The following courses are offered to students in the College of Agriculture by departments of other schools and colleges of the University. For complete lists and descriptions of courses offered by these departments, see the bulletins of the several schools and colleges.

## ANIMAL BIOLOGY

## COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors HENRY F. NACHTRIEB, THOMAS S. ROBERTS, CHARLES P. SIGERFOOS; Associate Professor HAL DOWNEY; Assistant Professors CHARLES W. HOWARD, ELMER LUND, OSCAR W. OESTLUND; Instructors GEORGE D. ALLEN, CHARLES E. JOHNSON, ADOLPH R. RINGOEN; Teaching Fellow ROYAL N. CHAPMAN.

*General statement.*—Courses in this Department are closely correlated with those offered by the Division of Economic Zoology of the College of Agriculture. For courses of that Division see page 44.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
3-4.	General Zoology .....	6*	All	None
7-8.	Histology and Embryology.....	6*	Soph., jr., sr.	3-4
15-16.	General Physiology .....	6*	Soph., jr., sr.	12 cred. incl. 3-4, Chem. 3
19-20.	Comparative Gross Anatomy of Vertebrates .....	6*	Soph., jr., sr.	3-4
23-24.	Entomology .....	6*	Soph., jr., sr.	3-4
26.	Medical Entomology .....	3	Jr., sr.	3-4 or equivalent
28.	Ornithology .....	3	Soph., jr., sr.	3-4
51.	Protozoology .....	3	Jr., sr.	9 cred. incl. 3-4
<i>Advanced Courses</i>				
101-102.	Advanced Entomology .....	6	Jr., sr.	23-24 or equivalent
115-116.	Mammalogy .....	6	Jr., sr.	3-4, and 19-20 or equivalent
131-132.	Embryology .....	6	Jr., sr.	7-8
143-144.	Genetics and Eugenics .....	6	Sr.	7-8, 15-16

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

\* Both semesters must be completed before credit is given.

## INTRODUCTORY COURSES

- 3-4. 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, ALLEN, RINGOEN.
- 7-8. 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.
- 15-16. GENERAL PHYSIOLOGY. Characteristic properties of living substance as shown by preparation and properties of typical biological compounds, colloids, enzyme action, growth, inanition, production of movements, heat, electricity, and light. Mechanisms and conditions of excitation and response. LUND.
- 19-20. COMPARATIVE GROSS ANATOMY OF VERTEBRATES. Lower vertebrates. Dissection and study of selected types, cyclostomes to reptiles or birds inclusive; special consideration of history of organ systems. Mammalian anatomy. An intensive study of the cat. Textbook, laboratory guide. Lectures, laboratory, quizzes. JOHNSON.
- 23-24. ENTOMOLOGY. Elements of entomology leading up to discussion of the principles of taxonomy and their application to the classification of insects. Textbook, lectures, quizzes, and laboratory work. OESTLUND.
26. MEDICAL ENTOMOLOGY. Study of insects and their near relatives which are disease-bearers or are parasites on man. Special emphasis is placed upon life-history habits, and methods of control. A course for students in medicine; elective to others. HOWARD.
28. ORNITHOLOGY. The study of the structure, classification and habits; 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.
51. PROTOZOLOGY. Lectures, reference and laboratory work on the structure and life-histories of Protozoa, with special reference to the relations of the Protozoa to diseases of animals. SIGERFOOS.

#### ADVANCED COURSES

- 101-102. ADVANCED ENTOMOLOGY. Advanced work in the ecology and taxonomy of insects. Lectures, laboratory, and field work. OESTLUND.
- 115-116. MAMMALOLOGY. Structure and classification of North American mammals. The mammalian skeleton; its modifications, with consideration of our domestic animals; dissection of a typical mammal. Classification, natural history and geographic distribution with special reference to Minnesota mammals. JOHNSON.
- 131-132. EMBRYOLOGY. A brief survey of general embryology, and the organogeny of the vertebrates with special reference to the circulatory system. Conference, reference and laboratory work with Kellicott's *General Embryology* and *Outlines of Chordate Development* as text. NACHTRIEB.
- 143-144. GENETICS AND EUGENICS. Facts and theories of heredity and the

application of the laws governing natural inheritances for the improvement of a race. Lectures, reference, conference, and laboratory work. NACHTRIEB.

## BOTANY

### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors FREDERIC E. CLEMENTS, CARL OTTO ROSENDAHL, JOSEPHINE E. TILDEN; Assistant Professors HERBERT F. BERGMAN, FREDERICK K. BUTTERS, NED L. HUFF; Instructor WILLIAM S. COOPER; Assistants DONALD FOLSOM, FRANCES L. LONG, HARVEY STALLARD.

### COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1a,b.	General Botany .....	3	All	None
2.	Structural Botany .....	3	All	1 or 3
3a,b.	Evolution of Plants.....	3	All	1 or equiv.
4.	Field and Garden Botany.....	3	All	1 or 3
<i>Intermediate Courses</i>				
5-6.	Plant Morphology .....	3 or 6	Soph., jr., sr.	6 cred.: see note under course
7-8.	Taxonomy .....	3 or 6	Soph., jr., sr.	6 cred.: see note under course
9-10.	Physiology and Ecology .....	3 or 6	Soph., jr., sr.	6 cred.
11-12.	Industrial Botany .....	3 or 6	Soph., jr., sr.	6 cred. incl. 2 or 3
13-14.	Mycology .....	3 or 6	Soph., jr., sr.	6 cred.
<i>Advanced Courses</i>				
101-102.	Applied Ecology .....	3 or 6	Jr., sr.	9 cred.
103.	Foodstuffs and Textiles.....	3	Jr., sr.	9 cred.
111-112.	Advanced Taxonomy .....	6	Jr., sr.	7-8
113-114.	Advanced Ecology .....	6	Jr., sr.	9-10
115-116.	Advanced Physiology .....	6	Jr., sr.	9-10
117-118.	Cytology .....	6	Jr., sr.	18 cred.
119-120.	Advanced Industrial Botany.....	6	Jr., sr.	11-12
121-122.	Plant Studies and Methods.....	6	Jr., sr.	12 cred.

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

### INTRODUCTORY COURSES

- 1a,b. GENERAL BOTANY. A study of the external form and organs of flowering plants, root, stem, leaf, fruit and seed, and of their relations to each other, together with simple greenhouse experiments to illustrate the various functions. CLEMENTS, BUTTERS, HUFF, BERGMAN, COOPER, FOLSOM, LONG, STALLARD.
2. STRUCTURAL BOTANY. A study of the microscopic structure of flowering plants, the cell, tissues and tissue systems, as seen in the root, stem, leaf, etc. BUTTERS, HUFF, STALLARD.

- 3a,b. **EVOLUTION OF PLANTS.** A comparative study of selected types of plants, illustrating the evolution of land plants from the simplest forms. BUTTERS, HUFF.
4. **FIELD AND GARDEN BOTANY.** Greenhouse, garden, and field study of the form, behavior, naming, and relationships of flowering plants, together with individual problems in the pollination, reproduction and propagation of common flower types. CLEMENTS, BERGMAN, COOPER, FOLSOM, LONG, STALLARD.

#### INTERMEDIATE COURSES

Either semester in the following courses open to students with the proper requisites:

- 5-6. **PLANT MORPHOLOGY.** A comparative study of the form, structure, and life history of typical algae, fungi, liverworts, mosses, ferns, and seed plants. Course 6 but not 5, open to those who have taken Course 3. BUTTERS.
- 7-8. **TAXONOMY.** General study of classification and relationships of flowering plants. Laboratory and field practice in determination of species, together with lectures and quizzes. Course 8 but not 7 open to those who have taken Course 4. ROSENDAHL.
- 9-10. **PHYSIOLOGY AND ECOLOGY.** Greenhouse and field study of physical factors and plant responses, absorption, transport, water loss, nutrition, growth, fertilization, reproduction, and adaptation; field study of habitat, migration, competition, invasion, and succession. CLEMENTS, COOPER.
- 11-12. **INDUSTRIAL BOTANY.** Laboratory study of the plants which are useful to man, including those which furnish food, shelter, fuel, clothing, etc. TILDEN.
- 13-14. **MYCOLOGY.** The classification and life history of the various groups of fungi, based on identification, field work, and cultures. CLEMENTS, BERGMAN.

#### ADVANCED COURSES

- 101-102. **APPLIED ECOLOGY.** A study of the physiological processes and the ecological principles and methods involved in the production of field, garden and forest crops. Either semester open to students who have had introductory botany, physiology, and ecology. CLEMENTS.
103. **PLANT FOODSTUFFS AND TEXTILES.** A special study of the botany of foods, textile fibers and fabrics, together with an inquiry into the relation of plants to household processes and problems. For young women. TILDEN.
- 111-112. **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. Laboratory, field work, lectures, and quizzes. ROSENDAHL.

113-114. ADVANCED ECOLOGY. A critical study of plant habitats by means of instruments and the adaptations produced by water and by light, together with careful examination of the causes and reactions of plant formations. CLEMENTS, COOPER.

115-116. ADVANCED PLANT PHYSIOLOGY. A study of the relations of factor, function, and structure in the various organs of plants, with special reference to absorption, transpiration, photosynthesis, respiration, irritability, and reproduction. Class discussions and quizzes, greenhouse and field work. CLEMENTS, BERGMAN.

117-118. 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.

119-120. ADVANCED INDUSTRIAL BOTANY. A study of the origin, distribution and cultivation of plants yielding products of economic value, the nature and uses of these products and the processes by which they are obtained from the plants. TILDEN.

121-122. PLANT STUDIES AND METHODS. Nature study and high-school botany presented as they are to be taught; the material is taken up in detail in proper sequence. Training in method is afforded by practice in the University High School. CLEMENTS.

## CHEMISTRY

### SCHOOL OF ANALYTICAL AND APPLIED CHEMISTRY

Professors GEORGE B. FRANKFORTER, CHARLES F. SIDENER; Assistant Professor IRA H. DERBY; Instructors ROSS A. BAKER, ISAAC W. GEIGER, CARL L. SCHUMANN, WOLDEMAR M. STERNBERG, H. LEE WARD.

#### COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
3a-4b, 3b-4a.	Adv. General Chem. and Qualitative Analysis .....	6*	Fr., soph., jr.	Entrance cred. in Chem.
11-12.	Quantitative Analysis .....	8*	Soph., jr., sr.	3-4 or 7-8
33.	General Chem. and Qualitative Analysis .....	5†	Fr., soph., jr.	None
35-36.	Organic Chemistry .....	8*	Soph., jr., sr.	3-4 or 7-8



*Advanced Courses*

121-122. Physical Chemistry .....	4* Jr., sr.	36, Phys. 2 and 4
123-124. Physico-Chemical Laboratory..	2* Jr., sr.	See statement

For additional courses see the bulletin of the School of Chemistry.

\* Both semesters must be completed before credit is given for the first semester.

† Course 4b must be completed before credit is given.

## INTRODUCTORY COURSES

- 3a-4b, 3b-4a. **ADVANCED GENERAL CHEMISTRY AND QUALITATIVE ANALYSIS.** Lectures, recitations, and laboratory work. General descriptive chemistry, including the fundamental theories and laws, and qualitative analysis. FRANKFORTER, BAKER, WARD.
- 11-12. **QUANTITATIVE ANALYSIS.** General discussion of quantitative methods, with laboratory work in gravimetric analysis, first semester, followed by a discussion of standard solutions and the necessary stoichiometric calculations, with laboratory work in volumetric analysis, second semester. SIDENER, STERNBERG, GEIGER.
33. **GENERAL CHEMISTRY AND QUALITATIVE ANALYSIS.** Designed for those who have had no high school chemistry; in preparation for Course 4b. See statement under 3a-4b. FRANKFORTER, BAKER.
- 35-36. **ORGANIC CHEMISTRY.** This course includes the aliphatic and the aromatic series with the preparation of the more important compounds. FRANKFORTER, SCHUMANN.

## ADVANCED COURSES

- 121-122. **PHYSICAL CHEMISTRY.** A consideration of the theories and laws, phenomena and processes which form the basis of chemical science. Charts, models, and experiments are employed to supplement and illustrate the discussions. DERBY.
- 123-124. **PHYSICO-CHEMICAL LABORATORY PRACTICE.** Open only to students pursuing Course 121-122 or who have had it or its equivalent. Physico-chemical methods and measurements. DERBY.

## ECONOMICS

## COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors JOHN H. GRAY, E. DANA DURAND; Assistant Professors ROY G. BLAKEY, J. FRANKLIN EBERSOLE, THOMAS W. MITCHELL; Instructors LLOYD M. CROSGRAVE, WILLIAM W. CUMBERLAND, ALBERT C. HODGE, ALBERT C. JAMES, ROBERT J. McFALL; Assistant FRANK ROBOTKA.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
†2a,b.	Indust. and Commerce of U. S. . . . .	3	All	None
†3a,b.	Principles of Economics. . . . .	3	Soph., jr., sr.	2
4a,b.	Economic Problems . . . . .	3	Soph., jr., sr.	3
9.	Indust. Hist. since 1750. . . . .	3	Soph., jr., sr.	3
13.	Econ. Geog. of For. Countries. . . . .	3	Soph., jr., sr.	2
†18.	Problems in Agricultural Econ. . . . .	3	Soph., jr., sr.	3
†19.	Marketing of Farm Products. . . . .	3	Jr., sr.	3
34.	Business Management . . . . .	3	Soph., jr., sr.	3
35-36.	Accounting Principles . . . . .	6*	Soph., jr., sr.	None
37.	Marketing of Products. . . . .	3	Jr., sr.	3
43a,b.	Banking . . . . .	3	Soph., jr., sr.	3
46.	Property Insurance . . . . .	3	Soph., jr., sr.	3

*Advanced Courses*

101.	Statistics . . . . .	3	Jr., sr.	6 cred. incl. 3
135.	Accounting for Marketing Enterprises . . . . .	3	Jr., sr.	19
141.	Money and Prices. . . . .	3	Jr., sr.	3 and 43
145.	The Modern Business Corporation . . . . .	3	Jr., sr.	6 cred. incl. 3
161.	Labor Problems . . . . .	3	Jr., sr.	3 and 4
164.	Econ. Functions of the State. . . . .	3	Jr., sr.	6 cred. incl. 3
173.	Econ. of Transportation. . . . .	3	Jr., sr.	6 cred. incl. 3
191.	Public Finance . . . . .	3	Jr., sr.	6 cred. incl. 3
192.	State and Local Taxation. . . . .	3	Jr., sr.	191
251-252.	Sem. in Agric. Economics. . . . .	6*	Sr.	18, 19

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

\* Both semesters must be completed before credit is given for the first semester.

† Given at University Farm.

## INTRODUCTORY COURSES

- 2a,b. **INDUSTRIES AND COMMERCE OF THE UNITED STATES.** Agricultural, mining, manufacturing industries and commerce. Characteristics of the several sections of the country. Leading individual industries: geographical distribution, methods of organization, production, and marketing, and relationships to one another. MCFALL.
- 3a,b. **PRINCIPLES OF ECONOMICS.** Fundamentals of economic theory with special reference to agriculture. CUMBERLAND.
- 4a,b. **ECONOMIC PROBLEMS.** A survey of the fundamentals in the problems of labor, social insurance, socialism, government ownership, corporations, trusts, monopolies, transportation, banking, protection, free trade, public revenues and expenditures. BLAKEY.
9. **INDUSTRIAL HISTORY SINCE 1750.** Economic effects of inventions, wars, political changes, increased supply of precious metals, improved transportation, and modifications of business organization in chief European countries and the United States. GRAY.

13. **ECONOMIC GEOGRAPHY OF FOREIGN COUNTRIES.** Economic basis of modern civilization; localization of industries; trade routes, principal extractive, manufacturing and distributive industries of leading foreign countries, especially markets for American trade. Special emphasis will be laid on South America. MCFALL.
18. **PROBLEMS IN AGRICULTURAL ECONOMICS.** The practical economic problems which confront the farmer as a producer, consumer, and citizen; land settlement; size of farms; intensity of cultivation; tenancy; credit; marketing; coöperation; taxation; protective duties; foreign markets; money and prices; transportation. DURAND.
19. **MARKETING OF FARM PRODUCTS.** The organization and methods of marketing; the functions of middlemen; the costs of marketing various products; coöperative marketing. DURAND.
34. **BUSINESS MANAGEMENT.** The principles of efficiency in business operation and forms of organization to apply them; the typical departments of a business; their functions, office organization and administration. Textbook, assigned readings, and lectures. MITCHELL, HODGE.
- 35-36. **PRINCIPLES OF ACCOUNTING.** Purposes of accounts and principles of account classification; capital and revenue; accruals; principles of valuation; depreciation; preparation and interpretation of balance sheets, income accounts, and other business statements; corporation accounts. Laboratory course with supplementary lectures. MITCHELL, HODGE.
37. **MARKETING OF PRODUCTS.** Merchandising problems of manufacturers, wholesalers, and retailers; distributing system and market organization; price policies. JAMES.
- 43a,b. **PRINCIPLES AND PRACTICE OF BANKING.** Contemporary banking institutions, both national and state; their incorporation, organization, administration; reserves, note issues, clearing houses, domestic and foreign exchange; the banking systems of foreign countries; and the Federal Reserve Banks of the United States. EBERSOLE.
46. **PROPERTY INSURANCE.** Basic theory and critical examination of policy contracts of fire, marine, other casualty, title, and credit insurance. JAMES.

#### ADVANCED COURSES

101. **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. DURAND.
135. **ACCOUNTING FOR MARKETING ENTERPRISES.** Principles of business practice and accounting for coöperative and other establishments and

organizations engaged in marketing of farm products, such as elevators, creameries, livestock shipping concerns, etc. Text book, lectures, and practice work. **ROBOTKA.**

141. **MONEY AND PRICES.** The functions of money; the nature and effects of credit; changes in prices as shown by index numbers; international movements of gold; monetary standards and currency systems; the problem of securing an ideal money. **EBERSOLE.**
145. **THE MODERN BUSINESS CORPORATION.** The organizing, financing, and managing of corporations; the position of the corporation before the law; methods of accounting; the relation of the government to the corporation; the question of trusts in its various phases. **GRAY.**
161. **LABOR PROBLEMS.** Modern labor problems; woman and child labor, industrial education, unemployment, poverty, industrial hygiene, welfare work, profit sharing, coöperation, labor unions, strikes, boycotts, conciliation and arbitration; economic causes and effects of immigration. **CROSGRAVE.**
164. **THE ECONOMIC FUNCTIONS OF THE STATE.** The proper limits of state interference with private property, freedom of contract and individual liberty. Police powers of the state. Legislation concerning factories, female and child labor, minimum wage, social insurance, etc. **CROSGRAVE.**
173. **ECONOMICS OF TRANSPORTATION.** Survey of railways and railway policy of the United States and representative foreign countries; canal and ocean transportation; railway organization and finance; railway discriminations, competition, pooling and combination; the railways and labor. **McFALL.**
191. **PUBLIC FINANCE.** Public expenditures; public debt; budgetary legislation; tax systems. **BLAKEY.**
192. **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.**
- 251-252. **SEMINAR IN AGRICULTURAL ECONOMICS.** Research problems in the marketing and distribution of farm products, agricultural credit, farm ownership and tenancy, and agricultural organizations. **DURAND.**

## FORESTRY

### COLLEGE OF FORESTRY

Professor EDWARD G. CHEYNEY; Associate Professor JOHN P. WENTLING.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1.	General Forestry .....	3	All	None
21.	Farm Forestry .....	3	Jr.	None

For additional courses see the bulletin of the College of Forestry.

## INTRODUCTORY COURSES

1. **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.
21. **FARM FORESTRY.** A study of the establishment, care, maintenance, and utilization of the farm woodlot and windbreaks. A sketch of the forestry work in Minnesota and the United States. CHEYNEY, WENTLING.

## GEOLOGY AND MINERALOGY

## COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor WILLIAM H. EMMONS; Assistant Professors FRANK F. GROUT, CHESLEY J. POSEY; Instructors A. WALFRED JOHNSTON, TERENCE T. QUIRKE.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1.	General Geology .....	3	Soph., jr., sr.	None
3.	Laboratory Work .....	1	Soph., jr., sr.	Supports 1
4.	Geology of Minnesota.....	3	Soph., jr., sr.	1
5.	Economic Geology .....	3	Soph., jr., sr.	1
21.	Elements of Mineralogy.....	3	Soph., jr., sr.	See statement
29.	General Physiography .....	3	Soph., jr., sr.	None
35.	Laboratory Work .....	1	Soph., jr., sr.	Supports 29

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

## INTRODUCTORY COURSES

1. **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.
3. **LABORATORY WORK.** Open only to students taking Course 1. Supplements Course 1 with study of rocks and ores, topographic and geologic maps and reference reading. JOHNSTON.

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. JOHNSTON.
5. 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.
21. 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.
29. GENERAL PHYSIOGRAPHY. Principles of earth sculpture; physiographic changes in progress, and agencies causing them; hydrography and oceanography; planetary relations; climatology; field excursions. POSEY.
35. LABORATORY WORK. A course in the interpretation of topographic maps. Supplements and should accompany Course 29, tho not required in connection with it. Should be taken by those who expect to teach Physiography. POSEY.

## GERMAN

## COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor CARL SCHLENKER; Assistant Professors OSCAR C. BURKHARD, SAMUEL KROESCH, WALTER R. MYERS; Instructors JAMES DAVIES, LYNWOOD G. DOWNS, J. THEODORE GEISSENDORFER, ALFRED E. KOENIG, HAROLD W. SOULE, RICHARD WISCHKAEMPER, EDWIN H. ZEYDEL; Teaching Fellows LOUISE G. FRARY, ARNOLD W. SHUTTER.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1a,b.	Beginning .....	6	All	None
3a,b.	Intermediate .....	6	All	1
5-6.	Prose and Poetry.....	*6	All	2 yrs. preparatory
7-8.	Drama .....	*6	All	5-6 or 4 yrs. preparatory
11-12.	Rapid Reading .....	*6	All	3
21-22.	Scientific Intermediate .....	*6	All	1, or 2 yrs. preparatory
23-24.	Scientific Advanced .....	*6	All	22, 5-6 or 4 yrs. preparatory

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

\* Both semesters must be completed before credit is given for the first semester.

## INTRODUCTORY COURSES

- 1a,b. BEGINNING. Double course given each semester as a six-hour course. Pronunciation, grammar, conversation, and composition; selected reading in easy prose and verse. KROESCH, MYERS, DAVIES, DOWNS, GRAVES, KOENIG, SOULE, ZEYDEL, SHUTTER.
- 2a,b. INTERMEDIATE. Double course given each semester as six-hour course. Selected texts in modern narrative and descriptive prose; selected lyrics and ballads; a drama of Lessing, Goethe, or Schiller. Assigned readings of texts outside of class. KROESCH, MYERS, DAVIES, DOWNS, GRAVES, KOENIG, SOULE, ZEYDEL, SHUTTER.
- 5-6. PROSE AND POETRY. Geography, history, and legend. Review of German grammar throughout the year. BURKHARD, DOWNS, GEISSENDOERFER, GRAVES, WISCHKAEMPER, FRARY.
- 7-8. DRAMA. First semester: classic drama; plays of Lessing, Goethe, Schiller. Second semester: modern drama; plays of Hebbel, Sudermann, Hauptmann and others. Assigned readings and reports throughout the year. SCHLENKER, BURKHARD, KROESCH, DAVIES.
- 11-12. RAPID READING. First semester: narrative prose; Hauff, Storm, Sudermann, Goethe's *Hermann and Dorothea*. Second semester: plays of Lessing, Goethe, Schiller, Hebbel. Assigned readings and reports. DAVIES, GRAVES, KOENIG, SOULE.
- 21-22. SCIENTIFIC INTERMEDIATE. This course aims to give students a reading knowledge of German for use in scientific studies. Not open to those who have obtained credit for either Course 3-4 or 5-6. GEISSENDOERFER, GRAVES, WISCHKAEMPER.
- 23-24. SCIENTIFIC ADVANCED. Reading of monographs and periodicals. Not open to those who have obtained credit for Course 7-8. WISCHKAEMPER.

## PATHOLOGY, BACTERIOLOGY, AND PUBLIC HEALTH

## MEDICAL SCHOOL

Professor HAROLD E. ROBERTSON; Associate Professor WINFORD P. LARSON; Instructors HAROLD S. DIEHL, ARTHUR T. HENRICI, PERCY A. WARD, KANO IKEDA.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
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*Introductory Course*

6a,b.	Elementary Bacteriology .....	3	Soph.	None
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For additional courses see the bulletin of the Medical School.

INTRODUCTORY COURSE

6a,b. **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, HENRICI, DIEHL, WARD, IKEDA.

PHYSICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors HENRY A. ERIKSON, ANTHONY ZELENY; Assistant Professor LOUIS W. MCKEEHAN; Instructors ERNEST O. DIETERICH, PAUL E. KLOPSTEG.

COURSES

No.	Title	Credits	Offered to	Prereq. courses
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*Introductory Courses*

1.	General Physics .....	3	Soph., jr., sr.	Agr. Eng. 1, 2, or parallel Agr. Eng. 1 or 2
2.	General Physics .....	3	Soph., jr., sr.	1
3.	General Laboratory Practice.....	1	Soph., jr., sr.	See statement
4.	General Laboratory Practice .....	1	Soph., jr., sr.	See statement
5-6.	General Physics (Col. of Agr.).....	6*	Soph., jr., sr.	None

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

\* Both semesters must be completed before credit is given.

INTRODUCTORY COURSES

- 1. GENERAL PHYSICS.** Mechanics of solids and fluids, sound, heat. Treatment experimental rather than mathematical; the fundamental principles. First part of a general course 1-2. Should be taken in conjunction with Course 3. ZELENY, KLOPSTEG, DIETERICH.
- 2. GENERAL PHYSICS.** Light, electricity, magnetism. Treatment experimental; fundamental principles, including radioactivity, ionization, X-radiation, and electrical constitution of matter. Second part of general course 1-2. Should be taken in conjunction with Course 4. ZELENY, KLOPSTEG, DIETERICH.
- 3. GENERAL LABORATORY PRACTICE.** Physical measurements in the mechanics of solids, fluids, sound, heat, giving students knowledge of



- experimental methods, and acquaintance with the fundamental facts. Open to all who have completed or are taking Course I. MCKEEHAN, DIETERICH.
4. GENERAL LABORATORY PRACTICE. Physical measurements in light, electricity, and magnetism. Open to all who have completed or are taking Course 2, and have completed Course 3. MCKEEHAN, DIETERICH.
- 5-6. GENERAL PHYSICS. Mechanics of solids and fluids, sound, heat, light, electricity, and magnetism. Treatment experimental; the fundamental principles. Open to students registered in the College of Agriculture. ZELENY, KLOPSTEG, DIETERICH.

### POLITICAL SCIENCE

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors WILLIAM A. SCHAPER, JEREMIAH S. YOUNG.

#### COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1a,b.	American Government .....	3	Soph., jr., sr.	None
5.	European Municipal Administration..	3	Soph., jr., sr.	None
6.	American Municipal Administration..	3	Soph., jr., sr.	1
7a,b.	State and Local Government.....	3	Soph., jr., sr.	1
*28.	Business Law .....	3	Jr., sr.	1 or Econ. 6 cred.
51.	Business Law, Part I.....	3	Jr., sr.	1 or Econ. 6 cred.
52.	Business Law, Part II.....	3	Jr., sr.	51

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

\* Given at the University Farm.

#### INTRODUCTORY COURSES

- 1a,b. AMERICAN GOVERNMENT. Organization and actual workings of the national government; nature and origin of the American governmental system. SCHAPER, YOUNG.
5. EUROPEAN MUNICIPAL ADMINISTRATION. A study of French, German, Austrian, and English cities; the forms of government, parties, and elections; achievements in finance, police, sanitation, city planning and other public services undertaken. SCHAPER.
6. AMERICAN MUNICIPAL ADMINISTRATION. 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. SCHAPER.
- 7a,b. STATE AND LOCAL GOVERNMENT. Comparison of American state gov-

ernments, 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. YOUNG.

28. BUSINESS LAW. A course in Business Law (arranged for students in Agriculture) including contracts, agency, mortgages, conveyances, and negotiable instruments. ....
51. BUSINESS LAW, PART I. The principles of law governing ordinary business transactions, including the general law of contracts, sales, mortgages, bankruptcy, and agency. YOUNG.
52. BUSINESS LAW, PART II. The law of partnerships, corporations, and negotiable instruments. YOUNG.

## ROMANCE LANGUAGES

### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors EVERETT WARD OLMSTED, COLBERT SEARLES; Assistant Professors JULES T. FRELIN, RUTH S. PHELPS; Professorial Lecturers BALBINO DÁVALOS, PEDRO HENRÍQUEZ UREÑA, PAUL H. MORIN; Instructors HARRY E. ATWOOD, GEORGE S. BARNUM, FRANCIS H. BARTON, NELSON F. COBURN, WILLIS J. PLUMMER, EDWARD H. SIRICH.

#### COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1a,b.	Beginning French .....	6	All	None
2a.	Beginning French .....	3	All	Prep. French 1 yr.
3a,b.	Intermediate French .....	6	All	1 or equiv.
4.	Survey of French Literature.....	6	All	1 or equiv.
5-6.	Survey of French Literature.....	6	All	3 or equiv.
7-8.	Elemen. French Conversation.....	2	All	3 or equiv.
9-10.	Elemen. French Composition.....	1	All	3 or equiv.
31a,b.	Beginning Spanish .....	6	All	None
33-34.	Beginning Spanish .....	6	All	None
35a,b.	Intermediate Spanish .....	6	All	31 or equiv.
37-38.	Intermediate Spanish .....	6	All	31 or equiv.
39-40.	Spanish Literature of the Nineteenth Century .....	6	All	35 or equiv.
41-42.	Elementary Spanish Conversation..	2	All	35 or equiv.
43-44.	Elementary Spanish Composition..	2	All	35 or equiv.

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

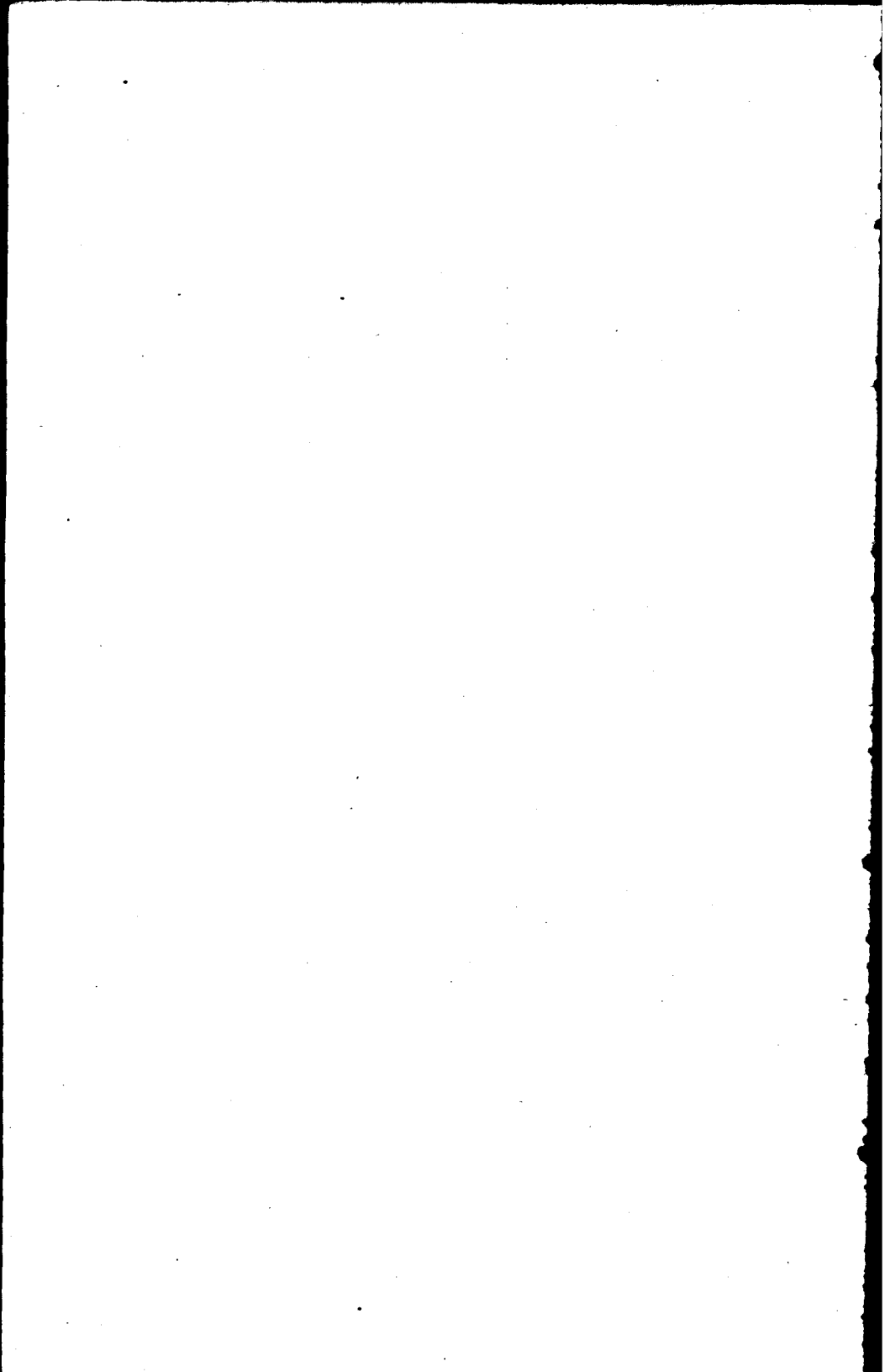
#### INTRODUCTORY COURSES

- 1a,b. BEGINNING FRENCH. Double course. This course will complete in one semester the work heretofore done in two. Pronunciation, grammar, drill, oral exercises and translation. SEARLES, FRELIN, ATWOOD, BARNUM, BARTON, COBURN, SIRICH.

- 2a. BEGINNING FRENCH. For those who have completed one year of preparatory French. BARTON.
- 3a,b. INTERMEDIATE FRENCH. Double course. This course will complete in one semester the work heretofore done in two. Review of grammar, composition, conversation, and reading, representative authors of the Nineteenth Century. FRELIN, ATWOOD, BARNUM.
4. SURVEY OF FRENCH LITERATURE. Double course. Same as 5-6. BARTON.
- 5-6. GENERAL SURVEY OF FRENCH LITERATURE. Lectures, recitations, and assigned readings. Designed to cover the whole period in historical outline, and to prepare for a more minute study of special periods. Selections from representative authors. PHELPS, ATWOOD, SIRICH.
- 7-8. ELEMENTARY FRENCH CONVERSATION. Small amount of outside preparation will be required. The section meeting at nine o'clock on Monday, Wednesday, and Friday is limited to students taking Course 5-6 and is based on the work of that course. FRELIN, BARTON, SIRICH.
- 9-10. ELEMENTARY FRENCH COMPOSITION. FRELIN, BARTON.
- 31a,b. BEGINNING SPANISH. Double course. This course will complete in one semester the work heretofore done in two. Pronunciation, grammar drill, oral exercises, and translation. HENRÍQUEZ, PLUMMER, BARNUM.
- 33-34. BEGINNING SPANISH. This course is the same as Course 31 except that it is a year-course. OLMSTED, COBURN, PLUMMER.
- 35a,b. INTERMEDIATE SPANISH. Double course. This course will complete in one semester the work heretofore done in two. Review of grammar, composition, conversation, and readings. HENRÍQUEZ, PLUMMER.
- 37-38. INTERMEDIATE SPANISH. This course is the same as course 35a,b, except that it is a year-course. HENRÍQUEZ, COBURN.
- 39-40. SPANISH LITERATURE OF THE NINETEENTH CENTURY. Lectures, recitations, and assigned readings. HENRÍQUEZ.
- 41-42. ELEMENTARY SPANISH CONVERSATION. A small amount of outside preparation required. The life and customs of modern Spain; accompanied by illustrative material. PLUMMER.
- 43-44. ELEMENTARY SPANISH COMPOSITION. Special attention given to social and commercial correspondence. PLUMMER.

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*The Bulletin*  
*of the University of*  
**Minnesota**

*The College of Agriculture*  
*Announcement of Courses*  
*in Home Economics for the Year*  
**1917-1918**



*Catalog Series No. 6b*  
*Vol. XX No. 32 August 8 1917*

*Entered at the post-office*  
*in Minneapolis as second-class matter*  
*Minneapolis, Minnesota*

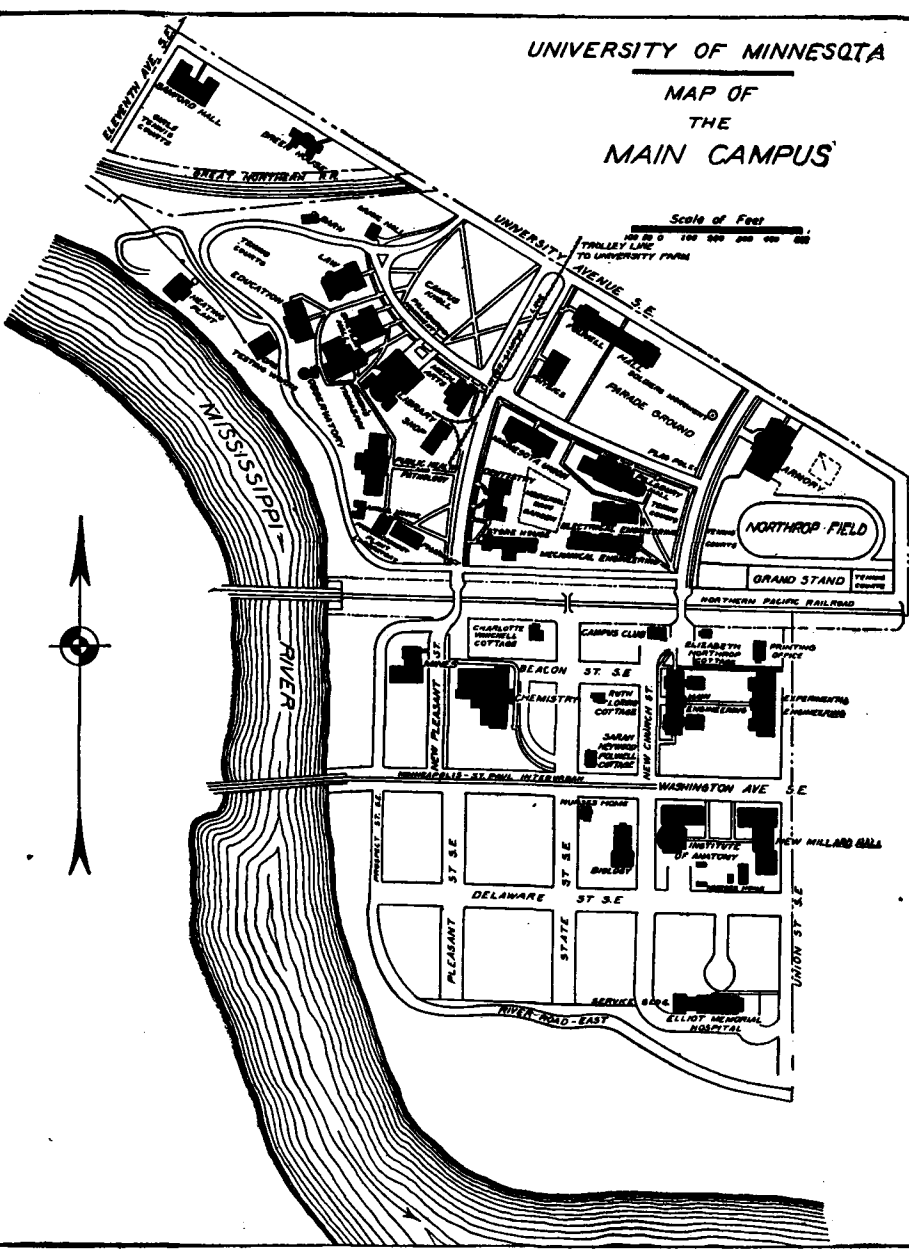
UNIVERSITY OF MINNESOTA

MAP OF  
THE  
MAIN CAMPUS

Scale of Feet

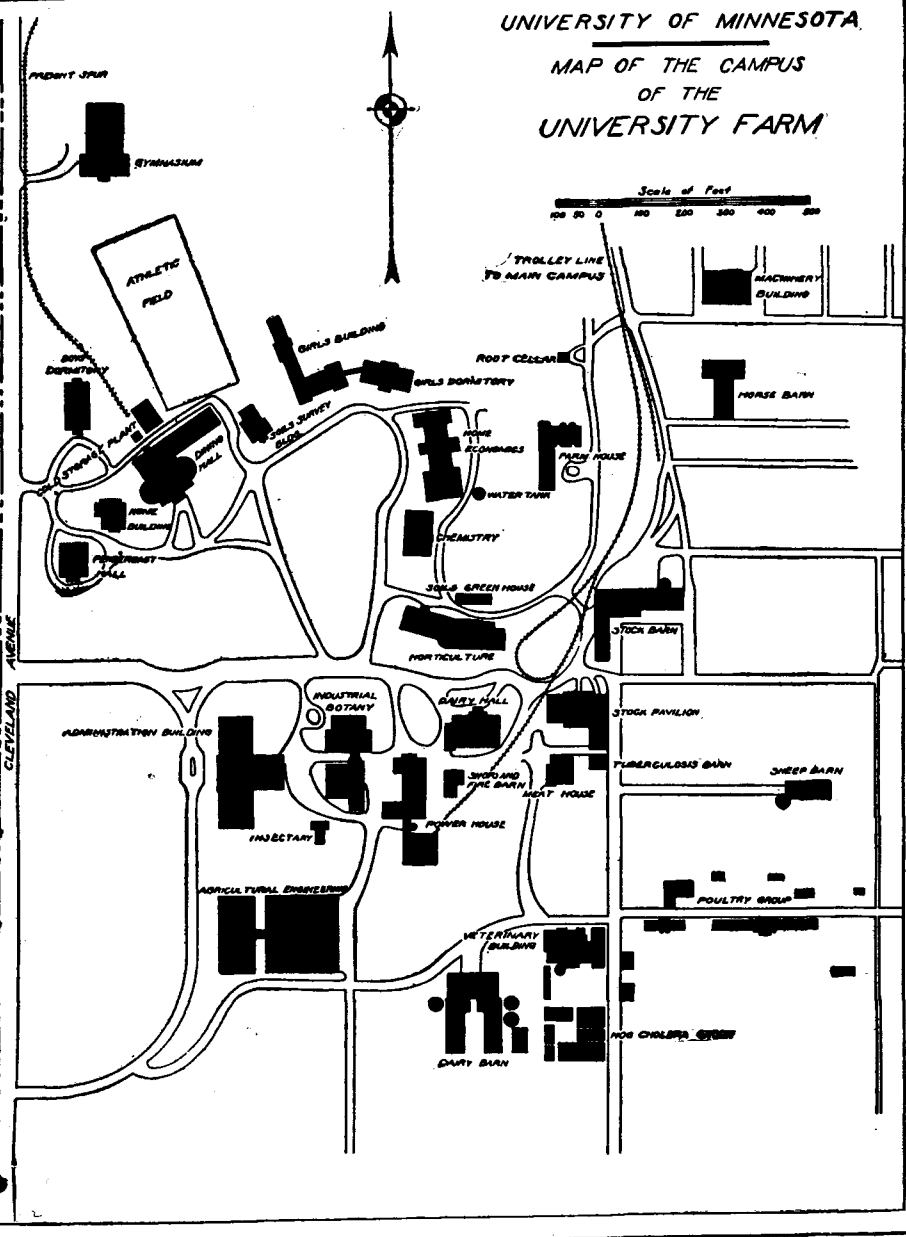
100 200 300 400 500

TROLLEY LINE  
TO UNIVERSITY PARK



Area of Main Campus, 108.5 acres

UNIVERSITY OF MINNESOTA  
 MAP OF THE CAMPUS  
 OF THE  
 UNIVERSITY FARM



Area of University Farm, 422.56 acres



1917							1918													
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	6	7	..	..	1	2	3	4	5	..	1	2	3	4	5	6
8	9	10	11	12	13	14	6	7	8	9	10	11	12	7	8	9	10	11	12	13
15	16	17	18	19	20	21	13	14	15	16	17	18	19	14	15	16	17	18	19	20
22	23	24	25	26	27	28	20	21	22	23	24	25	26	21	22	23	24	25	26	27
29	30	31	..	..	..	..	27	28	29	30	31	..	..	28	29	30	31	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
AUGUST							FEBRUARY							AUGUST						
..	..	..	1	2	3	4	..	..	..	..	..	1	2	..	..	..	..	1	2	3
5	6	7	8	9	10	11	3	4	5	6	7	8	9	4	5	6	7	8	9	10
12	13	14	15	16	17	18	10	11	12	13	14	15	16	11	12	13	14	15	16	17
19	20	21	22	23	24	25	17	18	19	20	21	22	23	18	19	20	21	22	23	24
26	27	28	29	30	31	..	24	25	26	27	28	..	..	25	26	27	28	29	30	31
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
SEPTEMBER							MARCH							SEPTEMBER						
..	..	..	..	..	..	1	..	..	..	..	..	1	2	1	2	3	4	5	6	7
2	3	4	5	6	7	8	3	4	5	6	7	8	9	8	9	10	11	12	13	14
9	10	11	12	13	14	15	10	11	12	13	14	15	16	15	16	17	18	19	20	21
16	17	18	19	20	21	22	17	18	19	20	21	22	23	22	23	24	25	26	27	28
23	24	25	26	27	28	29	24	25	26	27	28	29	30	29	30	..	..	..	..	..
30	..	..	..	..	..	..	31	..	..	..	..	..	..	..	..	..	..	..	..	..
OCTOBER							APRIL							OCTOBER						
..	1	2	3	4	5	6	..	1	2	3	4	5	6	..	..	1	2	3	4	5
7	8	9	10	11	12	13	7	8	9	10	11	12	13	6	7	8	9	10	11	12
14	15	16	17	18	19	20	14	15	16	17	18	19	20	13	14	15	16	17	18	19
21	22	23	24	25	26	27	21	22	23	24	25	26	27	20	21	22	23	24	25	26
28	29	30	31	..	..	..	28	29	30	..	..	..	..	27	28	29	30	31	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER						
..	..	..	1	2	3	..	..	..	..	1	2	3	4	..	..	..	..	..	1	2
4	5	6	7	8	9	10	5	6	7	8	9	10	11	3	4	5	6	7	8	9
11	12	13	14	15	16	17	12	13	14	15	16	17	18	10	11	12	13	14	15	16
18	19	20	21	22	23	24	19	20	21	22	23	24	25	17	18	19	20	21	22	23
25	26	27	28	29	30	..	26	27	28	29	30	31	..	24	25	26	27	28	29	30
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
DECEMBER							JUNE							DECEMBER						
..	..	..	..	..	..	1	..	..	..	..	..	..	1	1	2	3	4	5	6	7
2	3	4	5	6	7	8	2	3	4	5	6	7	8	8	9	10	11	12	13	14
9	10	11	12	13	14	15	9	10	11	12	13	14	15	15	16	17	18	19	20	21
16	17	18	19	20	21	22	16	17	18	19	20	21	22	22	23	24	25	26	27	28
23	24	25	26	27	28	29	23	24	25	26	27	28	29	29	30	31	..	..	..	..
30	31	..	..	..	..	..	30	..	..	..	..	..	..	..	..	..	..	..	..	..

# UNIVERSITY CALENDAR

## COLLEGE OF AGRICULTURE

1917-1918

1917		
Registration closes except for new students	26	Wednesday
Entrance examinations, registration of new students and payment of fees	2-9	Week
First semester begins	October 10	Wednesday
Agricultural College, farm experience examinations	October 15	Monday
Senate meeting, 4:00 p.m.	October 18	Thursday
School of Agriculture, first term begins	October 29	Monday
Last day for removal of second semester incompletes	November 3	Saturday
Dairy School opens	November 5	Monday
Thanksgiving recess begins 9:00 p.m.	November 28	Wednesday
Dairy School closes	December 1	Saturday
Thanksgiving recess ends 8:00 a.m.	December 3	Monday
Second semester condition examinations	December 3-8	Week
Short course for ice-cream makers	December 3-8	Week
Senate meeting, 4:00 p.m.	December 20	Thursday
School of Agriculture, first term closes	December 21	Friday
Christmas vacation begins 9:00 p.m.	December 21	Friday
1918		
December 31	} Week	Farmers' and Home Makers' Week
January 5		
January 2	Wednesday	Short Course
January 8	Tuesday	Christmas vacation ends 8:00 a.m.
February 4	Monday	School of Agriculture, second term begins
February 11	Monday	Second semester registration closes except for new students
February 11	Monday	Final examinations begin
February 12	Tuesday	Payment of fees for second semester closes, except for new students
February 17	Saturday	Lincoln's Birthday; a holiday
February 18	Monday	Registration and payment of fees for second semester closes. All grades for first semester due in Secretary's Office
February 21	Thursday	Second semester begins
February 22	Friday	Senate meeting, 4:00 p.m.
March 27	Wednesday	Washington's Birthday; a holiday
		School of Agriculture closes

March	28	Thursday	Easter recess begins 9:00 p.m.
April	1	Monday	Easter recess ends 8:00 a.m.
April	1-6	Week	Boys' and Girls' Week
April	1-6	Week	First semester condition examinations
April	30	Tuesday	Traction Engineering Short Course begins
May	16	Thursday	Senate meeting, 4:00 p.m.
May	30	Thursday	Memorial Day; a holiday
May	31	Friday	Traction Engineering Short Course closes
June	8	Saturday	Final examinations begin 2:00 p.m.
June	15	Saturday	Second semester closes
June	16	Sunday	Baccalaureate service
June	17	Monday	Senior Class Day exercises
June	19	Wednesday	Alumni Day
June	20	Thursday	Forty-sixth Annual Commencement
June	21	Friday	Summer vacation begins
June	24	Monday	Summer Session begins

The University year for 1918-19 probably will begin Tuesday, September 17. Classes will begin September 25.

# HOME ECONOMICS

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#### MEMBERS OF OTHER FACULTIES GIVING INSTRUCTION IN THE COLLEGE OF AGRICULTURE

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905 6th St. S. E., Minneapolis
- GEORGE NORTON NORTHROP, M.A., Assistant Professor of English  
2213 Grand Ave., Minneapolis
- EVERETT WARD OLMSTED, Ph.D., Professor of Romance Languages  
2727 Lake of the Isles Blvd., Minneapolis

- JOSEPH PETERSON, Ph.D., Assistant Professor of Psychology  
311 9th Ave. S. E., Minneapolis
- RUTH S. PHELPS, M.A., Assistant Professor of Romance Languages  
East Sanford Hall, Minneapolis
- ALBERT W. RANKIN, B.A., Professor of Education  
916 5th St. S. E., Minneapolis
- HAROLD E. ROBERTSON, B.A., M.D., Professor of Pathology  
507 Essex St. S. E., Minneapolis
- WILLIAM A. SCHAPER, Ph.D., Professor of Political Science  
625 Fulton St. S. E., Minneapolis
- CARL SCHLENKER, B.A., Professor of German  
514 11th Ave. S. E., Minneapolis
- COLBERT SEARLES, Ph.D., Professor of Romance Languages  
1941 Fremont Ave. S., Minneapolis
- CHARLES C. STILLMAN, B.A., Secretary St. Paul United Charities, Lec-  
turer on Charitable Administration 809 Laurel Ave., St. Paul
- ELMER E. STOLL, Ph.D., Professor of English  
504 5th St. S. E., Minneapolis
- DAVID FERDINAND SWENSON, B.S., Associate Professor of Philosophy  
1011 14th Ave. S. E., Minneapolis
- FLETCHER HARPER SWIFT, Ph.D., Professor of Education  
1910 4th St. S. E., Minneapolis
- ARTHUR H. TAYLOR, M.A., Secretary Children's Protective Society, Lec-  
turer on Child Welfare 2433 5th Ave. S., Minneapolis
- ARTHUR J. TODD, Ph.D., Professor of Sociology  
721 7th St. S. E., Minneapolis
- EDWARD F. WAITE, B.A., LL.M., Judge of the Hennepin County Juvenile  
Court, Lecturer on Juvenile Courts 2009 Queen Ave. S., Minneapolis
- NORMAN WILDE, Ph.D., Professor of Philosophy and Psychology  
901 6th St. S. E., Minneapolis
- HERBERT WOODROW, Ph.D., Assistant Professor of Psychology  
215 Walnut St. S. E., Minneapolis
- JEREMIAH S. YOUNG, Ph.D., Professor of Political Science  
1120 6th St. S. E., Minneapolis
- JEAN ALEXANDER, M.A., Instructor in Education  
721 7th St. S. E., Minneapolis
- GEORGE D. ALLEN, M.S., Instructor in Animal Biology  
1203 7th St. S. E., Minneapolis
- HARRY E. ATWOOD, M.A., Instructor in French  
1317 6th St. S. E., Minneapolis
- ROSS A. BAKER, Ph.D., Instructor in Chemistry  
130 E. 18th St., Minneapolis
- GEORGE S. BARNUM, M.A., Instructor in Romance Languages  
310 12th Ave. S. E., Minneapolis
- FRANCIS B. BARTON, Docteur de l'Université de Paris, Instructor in  
Romance Languages 507 Oak St. S. E., Minneapolis

- HENRY F. BURT, B.A., B.D., Supervisor of Settlement Practice Work  
Unity House, Minneapolis
- NELSON F. COBURN, M.A., Instructor in Romance Languages  
617 14th Ave. S. E., Minneapolis
- WILLIAM S. COOPER, Ph.D., Instructor in Botany  
1523 W. Lake St., Minneapolis
- HAROLD R. CROSLAND, Ph.D., Instructor in Psychology  
318 18th Ave. S. E., Minneapolis
- WILLIAM W. CUMBERLAND, Ph.D., Instructor in Economics  
941 14th Ave. S. E., Minneapolis
- JOHN F. DASHIELL, Ph.D., Instructor in Psychology  
707 8th Ave. S. E., Minneapolis
- JAMES DAVIES, Ph.D., Instructor in German  
3230 3rd Ave. S., Minneapolis
- HAROLD S. DIEHL, B.A., Instructor in Bacteriology  
429 Union St. S. E., Minneapolis
- LYNWOOD G. DOWNS, M.A., Instructor in German  
1312 7th St. S. E., Minneapolis
- J. THEODORE GEISSENDOERFER, Ph.D., Instructor in German  
967 14th Ave. S. E., Minneapolis
- ARTHUR T. HENRICI, M.D., Instructor in Pathology and Bacteriology  
939 14th Ave. S. E., Minneapolis
- JACOB KANTOR, Ph.B., Instructor in Psychology  
1110 5th St. S. E., Minneapolis
- PAUL E. KLOPSTEG, Ph.D., Instructor in Physics  
1026 15th Ave. S. E., Minneapolis
- ALFRED E. KOENIG, M.A., Instructor in German  
602 7th St. S. E., Minneapolis
- ROBERT J. MCFALL, Ph.D., Instructor in Economics  
124 State St. S. E., Minneapolis
- PAUL I. NEERGAARD, B.A., Instructor in Sociology  
421 Walnut St. S. E., Minneapolis
- WILLIS J. PLUMMER, B.A., Instructor in Romance Languages  
1329 6th St. S. E., Minneapolis
- ADOLPH R. RINGOEN, M.A., Instructor in Animal Biology  
1203 7th St. S. E., Minneapolis
- EDWARD H. SIRICH, Ph.D., Instructor in Romance Languages  
321 14th Ave. S. E., Minneapolis
- HAROLD W. SOULE, M.A., Instructor in German  
1208 4th St. S. E., Minneapolis
- MARION E. TEBBETTS, B.A., Supervisor of Hospital Social Service Work  
University Hospital
- H. LEE WARD, Ph.D., Instructor in Chemistry  
425 Walnut St. S. E., Minneapolis
- PERCY A. WARD, B.S., M.D., Instructor in Bacteriology  
1717 1st Ave. S., Minneapolis

- RICHARD WISCHKAEMPER, M.A., Instructor in German  
977 14th Ave. S. E., Minneapolis
- ELIZABETH YERXA, B.A., Supervisor of Hospital Social Service Work  
City Hospital, Minneapolis
- EDWIN H. ZEYDEL, M.A., Instructor in German  
1312 7th St. S. E., Minneapolis
- DONALD FOLSOM, Ph.D., Assistant in Botany  
1110 5th St. S. E., Minneapolis
- LOUISE G. FRARY, M.A., Teaching Fellow in German  
3108 Garfield Ave., Minneapolis
- KANO IKEDA, M.D., Assistant in Bacteriology  
St. Barnabas Hospital, Minneapolis
- FRANCES L. LONG, Ph.D., Assistant in Botany  
112 State St. S. E., Minneapolis
- ARNOLD W. SHUTTER, B.A., Assistant in German  
2215 Irving Ave. S., Minneapolis
- HARVEY STALLARD, Ph.D., Assistant in Botany  
805 7th St. S. E., Minneapolis

## FACULTY COMMITTEES

1917-1918

*Executive.*—Dean, Secretary, Heads of Divisions*Enrollment.*—WEST, MOWRY, BIESTER, WENTLING, BENDER, PIERCE*Curriculum and Catalog.*—FREEMAN, BOSS, STORM, WEST, THATCHER,  
BERRY, GAY*Students' Work.*—FREEMAN, WEST, BERRY, CHEYNEY, NICHOLSON, RUGGLES*Student Organizations.*—LANSING, WEIGLEY, CHEYNEY, WELLER, FREEMAN*Faculty Business.*—CHEYNEY, MOORE, TRILLING, KILDEE*Appointment.*—STORM, BERRY, GEHRAND, ARNY

## GENERAL INFORMATION

### ADMISSION

New students are admitted at the opening of the first semester in September and the second semester in February.

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 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.

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 Colleges of Agriculture and Forestry.

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

Incidental semester fee,	
Residents of Minnesota.....	\$20.00
Non-residents .....	40.00
Deposit (first semester only).....	5.00
Physical Training .....	4.00
Special fees,	
Examination for removal of conditions.....	1.00
Examinations for credit (after the first semester 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, one dollar. An additional twenty-five cents 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 semester 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 132 credit hours (136 for those graduating in 1918), candidates will be recommended for graduation with the degree of Bachelor of Science. The diploma will designate the College and major line of work.

#### PROFESSIONAL CERTIFICATES

The University State Teachers' Certificate is granted to graduates of the College of Agriculture who have completed fifteen credit hours in approved professional courses.

The Industrial Certificate—the special state certificate for high school teachers of home economics—is granted by the State Department of Education to graduates of the College of Agriculture who have completed a four-year course in Home Economics, including the professional training required by the regulations of the State Department of Education for special teachers of Home Economics, and who are recommended for certification by the College of Agriculture and the College of Education.

#### 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 \$225 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 Agricultural College campus, are maintained by the Division of Home Economics, furnishing accommodations for a small number of students. The charge is \$225 for the university year. Applications should be sent to the Chief of the Division of Home Economics, University Farm, St. Paul.

*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. They are planned to meet the needs of three 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., Textiles and Clothing.

The College of Agriculture and the College of Education cooperate in the preparation of teachers of home economics as outlined in the Teachers' Course in Home Economics and the Teachers' Course in Textiles and Clothing.

The required work of the freshman and 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 the head of the section of Textiles and Clothing.

Home practice in foods and cookery is required of students who have completed H.E. 21 or 23 and H.E. 22, as a prerequisite to H.E. 35. The character and amount of the home practice work will be arranged with the head of the section of Foods and Cookery.

## GENERAL REQUIREMENTS FOR ALL STUDENTS IN HOME ECONOMICS

### EXPLANATION OF COURSE NUMBERS

Odd numbers indicate first-semester courses; even numbers, second-semester courses. A combination of the two (e.g., 5-6) indicates courses continuing through the year. In the case of courses repeated the second semester, the suffix *a* indicates first semester; the suffix *b*, second semester.

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.

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 semester.

#### FRESHMAN YEAR

All students must register for Group A and enough additional work from Group B to make a total of not more than 15 credit hours and not less than 12 credit hours each semester.

#### GROUP A

##### *First Semester*

\*Rhet. 1, Rhetoric, 3  
An. Biol. 9, General Zoology, 3  
Phys. Ed. 1, Elementary Physical Training  
†Phys. Ed. 11, Preliminary Hygiene  
‡Freshman Lectures

##### *Second Semester*

Rhet. 2, Rhetoric, 3  
An. Biol. 10, General Zoology, 3  
Chem. 4b, Advanced General Chemistry and Qualitative Analysis, 3  
Phys. Ed. 2, Elementary Physical Training  
‡Survey Talks

#### GROUP B

Chem. 3a,b, Advanced General Chemistry and Qualitative Analysis, 3 or Chem. 33, General Chemistry and Qualitative Analysis, 5. The five credit course is offered the first semester only and must be taken by those who do not present a unit of chemistry for admission. Students may be required to change from 3 to 33 at any time during the course. Those presenting a unit of high school chemistry can obtain not more than three credits for the completion of Course 33.  
Phys. 17-18, General Physics, 6. Required of all who enter without a unit in high school physics.  
H.E. 1a,b, Textiles, 2.  
H.E. 51a,b, Drawing and Design, 3.  
H.E. 11a,b, Garment Making, 3. Those offering approved domestic art for entrance may omit this course.  
Econ. 2a,b, Industries and Commerce of the United States, 3. This course may be omitted if Physics 17-18 is registered for.  
Agr. Eng. 3a,b, Mechanical Drawing, 3. This course may be omitted if Physics 17-18 is registered for.

#### SOPHOMORE YEAR

All of the following are single semester courses and may be taken either semester. Foods and Cookery, however, must precede Food Economics, Argumentation must precede Public Speaking, and Physiology must precede or accompany Foods and Cookery.

Students offering domestic science (one unit) for entrance should register for H.E. 21, Foods and Cookery, 3, and Elective, 2, instead of H.E. 23.

Students intending to specialize in Textiles and Clothing may substitute Elective, 3, for Agr. Biochem. 3, Types of Carbon Compounds, 3.

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\* Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 32.

† All freshmen are required to attend a course of lectures on Hygiene and a course of general Survey Talks on aims and methods in Home Economics.

‡ A course of lectures intended primarily to familiarize the new student with the college, college customs, and methods of procedure is required of all freshmen.

*First Semester*

H.E. 23a, Foods and Cookery, 5  
 Rhet. 11a, Argumentation, 3  
 \*Agr. Biochem. 2b, Quantitative Methods, 3  
 Physiol. 3a, Elementary Human Physiology, 3  
 Sociol. 1a, General Introduction, 3

*Second Semester*

H.E. 22b, Food Economics, 3  
 Rhet. 22b, Public Speaking, 3  
 Path. 6b, Elementary Bacteriology, 3  
 Psych. 1b, General Psychology, 3  
 Agr. Biochem. 3a, Types of Carbon Compounds, 3  
 H.E. 13a, Dressmaking, 3

\* Not to be given after 1917-18. Unless registered for Nutrition, students should substitute Elective 3.

## SOPHOMORE ELECTIVES

The following courses, open to sophomores, are recommended as electives. For fuller statement and prerequisites consult course descriptions.

*First Semester*

Bot. 1a, General Botany, 3  
 Bot. 3a, Evolution of Plants, 3  
 Econ. 13, Economic Geography of Foreign Countries, 3  
 German, see department statement  
 Scandinavian, see department statement  
 Romance Languages, see department statement  
 Music 9, History of Music, 3  
 Pol. Sci. 1a, American Government, 3  
 Hort. 71, Landscape Gardening, 3  
 Hort. 90a, General Horticulture, 3  
 Phys. Tr. 3, Intermediate Physical Training, 1½  
 Engl. 1, General Survey, 3

*Second Semester*

Botany 1b, General Botany, 3  
 Bot. 3b, Evolution of Plants, 3  
 Rur. and Agr. Jour. 2, Reporting, 3  
 German, see department statement  
 Scandinavian, see department statement  
 Romance Languages, see department statement  
 Music 10, History of Music, 3  
 Pol. Sci. 1b, American Government, 3  
 Pol. Sci. 6, American Municipal Administration, 3  
 Econ. Zool. 20, Home Economics Entomology, 3  
 Hort. 50, Floriculture, 3  
 Hort. 90b, General Horticulture  
 Phys. Tr. 4, Intermediate Physical Training, 1½  
 Engl. 2, General Survey, 3  
 Social 6, Social Reform Movement, 3

## SPECIAL REQUIREMENTS FOR THE DIFFERENT COURSES OF STUDY

## GENERAL COURSE IN HOME ECONOMICS

## JUNIOR YEAR

H.E. 53a,b, Historic Ornament and Advanced Design and Econ. 3a,b, Principles of Economics may be taken either semester.

For the year 1917-18, H.E. 101, Nutrition, must be preceded or accompanied by Agr. Biochem. 2, Quantitative Methods.

*First Semester*

H.E. 101, Nutrition, 5  
 H.E. 33, Home Care of the Sick, 1  
 H.E. 53a, Historic Ornament and Advanced Design, 3  
 Elective, 8

*Second Semester*

H.E. 102, Nutrition, 5  
 Econ. 3b, Principles of Economics, 3  
 Elective, 9

## SENIOR YEAR

All of the following, with the exception of Public Health Lectures, are single semester courses and may be taken either semester.

*First Semester*

H.E. 103a, Dietetics, 3  
 H.E. 32a, Home Management: House  
 Planning and Equipment, 3  
 Elective, 11  
 Public Health Lectures

*Second Semester*

H.E. 17b, Clothing Economics, 3  
 H.E. 34b, Home Management: Operation  
 and Maintenance, Lectures, 2  
 H.E. 35b, Home Management: Operation  
 and Maintenance, Laboratory, 3  
 Elective, 8

## TEACHERS' COURSE IN HOME ECONOMICS

## JUNIOR YEAR

H.E. 53a,b, Historic Ornament and Advanced Design; Agr. Educ. 11a,b, Principles of Industrial Education; and Econ. 3a,b, Principles of Economics may be taken either semester.

For the year 1917-18, H.E. 101, Nutrition, must be preceded or accompanied by Agr. Biochem. 2, Quantitative Methods.

*First Semester*

H.E. 101, Nutrition, 5  
 H.E. 33, Home Care of the Sick, 1  
 H.E. 53a, Historic Ornament and Ad-  
 vanced Design, 3  
 Agr. Educ. 11a, Principles of Indus-  
 trial Education, 3  
 Elective, 5

*Second Semester*

H.E. 102, Nutrition, 5  
 Econ. 3b, Principles of Economics, 3  
 Educ. 5b, The American School, 3  
 H.E. 42, Home Economics Education, 3  
 Elective, 3

## SENIOR YEAR

All of the following, with the exception of Public Health Lectures, H.E. 45-46 and H.E. 47-48a are single semester courses and may be taken either semester.

Special attention is called to the prerequisites for H.E. 47-48a. See pages 25, 26.

*First Semester*

H.E. 103a, Dietetics, 3  
 H.E. 32a, Home Management: House  
 Planning and Equipment, 3  
 H.E. 47, Observation and Teaching, 3  
 H.E. 48a, Observation and Teach-  
 ing, 3  
 H.E. 45, Home Economics Education, 1  
 Elective, 5  
 Public Health Lectures

*Second Semester*

H.E. 17b, Clothing Economics, 3  
 H.E. 34b, Home Management: Operation  
 and Maintenance, Lectures, 2  
 H.E. 35b, Home Management: Operation  
 and Maintenance, Laboratory, 3  
 H.E. 46, Home Economics Education, 1  
 Elective, 7

## TEACHERS' COURSE IN TEXTILES AND CLOTHING

## JUNIOR YEAR

H.E. 53a,b, Historic Ornament and Advanced Design; Agr. Educ. 11a,b, Principles of Industrial Education; Econ. 3a,b, Principles of Economics; H.E. 55a,b, Decorative Needlework and Crafts; and H.E. 4a,b, Advanced Textiles, may be taken either semester.

*First Semester*

Econ. 3a, Principles of Economics, 3  
 H.E. 55a, Decorative Needlework and  
 Crafts, 2  
 H.E. 33, Home Care of the Sick, 1  
 Agr. Educ. 11a, Principles of Indus-  
 trial Education, 3  
 Elective, 8

*Second Semester*

H.E. 53b, Historic Ornament and Ad-  
 vanced Design, 3  
 H.E. 4b, Advanced Textiles, 3  
 H.E. 44, Organization and Methods for  
 Textiles and Clothing, 3  
 H.E. 16, Tailoring, 2  
 Educ. 5b, The American School, 3  
 Elective, 3

## SENIOR YEAR

H.E. 17a,b, Clothing Economics; and H.E. 32a,b, Home Management: House Planning and Equipment; may be taken either semester.

Special attention is called to the prerequisites for H.E. 48a. See pages 25, 26.

*First Semester*

H.E. 17a, Clothing Economics, 3  
 H.E. 45, Home Economics Education, 1  
 H.E. 48a, Observation and Teaching, 3  
 Elective, 10  
 Public Health Lectures

*Second Semester*

H.E. 18, Commercial Clothing Manufac-  
 ture, 3  
 H.E. 32b, Home Management: House  
 Planning and Equipment, 3  
 Elective, 10

## COURSES OF STUDY FOR TEACHERS OF VOCATIONAL COURSES IN HOME ECONOMICS

Courses of study, designed to prepare for the teaching of vocational courses in home economics, will be arranged in accordance with the provisions of the Smith-Hughes act, and will be offered in 1917-18.

## 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

Electives for the junior and senior years will be found under Description of Courses. See also Bulletin of the College of Agriculture, Agricultural Courses and bulletins of other colleges of the University.

Elective studies may be chosen from the work offered in any of the schools or colleges of the University, except that the selection shall be subject to the rules of the school or college concerned and to such other restrictions as may be imposed by the Students' Work Committee.

## DESCRIPTION OF COURSES

For explanation of course numbers and credits see page 17.

### AGRICULTURAL BIOCHEMISTRY

Professor ROSCOE W. THATCHER; Associate Professor ROSS AIKEN GORTNER; Assistant Professors CLYDE H. BAILEY, JOHN J. WILLAMAN; Instructor CORNELIA KENNEDY.

#### COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
2a.	Quantitative Methods .....	3	Soph., jr.	Chem. 1 yr.
3a,b.	Types of Carbon Compounds.....	3	Soph., jr.	Chem. 1 yr.
<i>Advanced Courses</i>				
108.	Chem. of Wheat and Its Products..	2	Sr.	3
111.	Phytochemistry .....	3	Sr.	Biol. 2 yrs., Org. Chem.
113.	Biochemical Lab. Methods.....	2	Sr.	10, Biol. 2 yrs., Org. Chem.
114.	Laboratory Problems .....	3 or 5	Sr.	111, 113

For additional courses see the bulletin of the College of Agriculture, Courses in Agriculture.

#### INTRODUCTORY COURSES

- 2a. **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 a few of the simpler gravimetric and volumetric processes. Not offered after 1917-18. WILLAMAN.
- 3a,b. **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. THATCHER, KENNEDY.

#### ADVANCED COURSES

108. **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.
111. **PHYTOCHEMISTRY.** An advanced course in the chemistry of fats, carbohydrates, tannins, proteins, enzymes, and colloids and their relation to the vital processes involved in plant and animal growth and nutrition. THATCHER.

113. **BIOCHEMICAL LABORATORY METHODS.** Special methods of examination of plant and animal tissues for particular fats, carbohydrates, proteins, and enzymes. KENNEDY.
114. **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.

### AGRICULTURAL EDUCATION

Professors ASHLEY V. STORM, DEXTER D. MAYNE; Assistant Professor WILLIAM F. LUSK.

#### COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
*11a,b.	Principles of Industrial Education .....	3	All	None
*21.	Industrial Education .....	3	All	None

For additional courses see the bulletin of the College of Agriculture, Courses in Agriculture.

\* College of Education.

#### INTRODUCTORY COURSES

- 11a,b. **PRINCIPLES OF INDUSTRIAL 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 industrial education. LUSK.
21. **INDUSTRIAL EDUCATION.** A short history of industrial 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.

### AGRICULTURAL ENGINEERING

Professor JOHN T. STEWART; Instructor LLOYD R. WHITSON.

#### COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Course</i>				
3a,b.	Mechanical Drawing .....	3	Fr., soph.	None

For additional courses see the bulletin of the College of Agriculture, Courses in Agriculture.

#### INTRODUCTORY COURSE

- 3a,b. **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. WHITSON.

## 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>				
6.	Elements of Beekeeping.....	3	Jr., sr.	None
7.	Advanced Beekeeping .....	3	Jr., sr.	6

## INTRODUCTORY COURSES

6. ELEMENTS OF BEEKEEPING. Elementary study of queens, drones, and workers, hives and appliances, handling of bees, spring, summer, winter management, swarming and increase, honey and wax production, feeding, and bee diseases. JAGER, FRANCE.
7. ADVANCED BEEKEEPING. Anatomy of the bee, queen rearing, commercial production of honey, out-apiaries, accounting, and marketing. JAGER, FRANCE.

## ECONOMIC ZOOLOGY

Professor FREDERIC L. WASHBURN; Assistant Professor CHARLES W. HOWARD.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Course</i>				
20.	Home Economics Entomology.....	2	Soph., jr., sr.	An. Biol. 9-10

For additional courses see the bulletin of the College of Agriculture, Courses in Agriculture.

## INTRODUCTORY COURSE

20. HOME ECONOMICS ENTOMOLOGY. A course designed for students in home economics. Insects as related to public health problems, insects of the household and those attacking foods will be discussed. HOWARD.

## HOME ECONOMICS

Professor JOSEPHINE T. BERRY; Assistant Professors ALICE BIESTER, HARRIET GOLDSTEIN, MABEL BARBARA TRILLING, MILDRED WEIGLEY, MARION WELLER, GRACE I. WILLIAMS; Instructors ANNA E. BAYHA, BESSIE E. BEMIS, CARLOTTA BROWN, HALLY J. FISHER, VETTA GOLDSTEIN, AMY

P. MORSE, ETHEL L. PHELPS, ELIZABETH VERMILYE; Lecturer MARTHA B. MOORHEAD; Extension Specialists MARY L. BULL, JUNIATA L. SHEPPERD, MARY WETMORE.

*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, see schedule, pages 17 to 21. They are open for election to students in other courses who offer the prerequisites as stated below.

Requirements for the Industrial Certificate.—The Industrial Certificate is granted to graduates of the Teachers' Courses in Home Economics and Textiles and Clothing who have completed the prescribed professional courses, and who are recommended for the certificate by the Division of Home Economics and the College of Education.

Special attention is called to the prerequisites for courses 47 and 48a required for the professional certificate. No student is admitted to course 47 who has a grade below C (81-87) in courses 21, 23, 22, 42, or 101. No student is admitted to course 48a who has a grade below C in courses 1, 11, 13, 42, or 44.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1a,b.	Textiles .....	2	Fr.	None
4a,b.	Advanced Textiles .....	3	Jr.	1, 51
11a,b.	Garment Making .....	3	Fr.	None
13a,b.	Dressmaking .....	3	Jr.	1, 11, Home Practice in Garment Making
16.	Tailoring .....	2	Jr.	13
17a,b.	Clothing Economics .....	3	Sr.	13, 53
18.	Commercial Clothing Manufacture	3	Sr.	17
19a,b.	Millinery .....	1	Soph., jr., sr.	11, 51
21a,b.	Foods and Cookery.....	3	Soph.	H. S. Do. Sci. 1 unit; Chem. 3 or 33; Physiol. 3, parallel
22a,b.	Food Economics .....	3	Soph.	21
23a,b.	Foods and Cookery.....	5	Soph.	Chem. 3 or 33; Physiol. 3, parallel
24.	Camp Cookery .....	3‡	Fr.	None
32a,b.	Home Management: House Plan- ning and Equipment.....	3	Sr.	51
33.	Home Care of the Sick.....	1	Jr.	Chem. 3 or 33; Path. 6
34a,b.	Home Management: Operation and Maintenance, Lectures....	2	Sr.	22
35a,b.	Home Management: Operation and Maintenance, Laboratory..	3	Sr.	22, Home Practice in Foods and Cookery
‡42.	Home Economics Education.....	3	Jr.	22, Psychol. 1
‡44.	Organization and Methods for Textiles and Clothing.....	3	Jr.	13, Psychol. 1

† College of Education.

‡ Two credits are allowed for the completion of the first 12 weeks of the course.



No.	Title	Credits	Offered to	Prereq. Courses
†45.	Home Economics Education.....	1	Sr.	42
†46.	Home Economics Education.....	1	Sr.	45
†47.	Observation and Teaching.....	3*	Sr.	42; see general statement above
†48a.	Observation and Teaching.....	3*	Sr.	42; see general statement above
51a,b.	Drawing and Design.....	3	Fr.	None
53a,b.	Historic Ornament and Advanced Design .....	3	Jr.	51
55a,b.	Decorative Needlework and Crafts .....	2	Jr.	1, 11, 51
<i>Advanced Courses</i>				
101.	Nutrition .....	5	Jr.	22, Agr. Biochem. 2, Path. 6; parallel Agr. Biochem. 3
102.	Nutrition .....	5	Jr.	101
103a,b.	Dietetics .....	3	Sr.	102
105b.	Experimental Cookery .....	3	Jr., sr.	101

\* Students completing both 47 and 48a are entitled to not more than five credits.

† College of Education.

#### INTRODUCTORY COURSES

- 1a,b. **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. WELER, TRILLING, PHELPS.
- 4a,b. **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. WELER.
- 11a,b. **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, BAYHA.
- 13a,b. **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. TRILLING.
16. **TAILORING.** The technique and methods of construction employed in the making of tailored suits and wraps. Not offered in 1917-18.
- 17a,b. **CLOTHING ECONOMICS.** General consideration of economic function of woman; history of woman's place in home and industry with reference to clothing and textiles; study of clothing budgets, hygiene and standardization of dress. Laboratory problem in costume modeling. WELER.

18. **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. Not offered in 1917-18. WELLER.
- 19a,b. **MILLINERY.** A study of the processes and materials used in millinery; designing, making, and trimming hats. BROWN.
- 21a,b. **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. THOMAS, WILLIAMS, BEMIS, VERMILYE.
- 22a,b. **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. THOMAS, WILLIAMS, BEMIS, VERMILYE.
- 23a,b. **FOODS AND COOKERY.** A course following the same general outline as 21a, but including a more detailed study of each topic. WHEELER, WILLIAMS, BEMIS, VERMILYE.
24. **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. BEMIS.
- 32a,b. **HOME MANAGEMENT: HOUSE PLANNING AND 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.
33. **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.
- 34a,b. **HOME MANAGEMENT: OPERATION AND MAINTENANCE, LECTURES.** The family budget for varying incomes, and for the "Home Management House"; household accounts. BERRY, WILLIAMS, BEMIS.
- 35a,b. **HOME MANAGEMENT: OPERATION AND MAINTENANCE, LABORATORY PRACTICE.** (a) Nine 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. BERRY, WILLIAMS, BEMIS.
42. **HOME ECONOMICS EDUCATION.** Curricula, equipment, methods of teaching for Home Economics. BERRY.

44. ORGANIZATION AND METHODS. Organization of subject content, and methods of teaching for Textiles and Clothing. Students who have completed Course 42 may register for this course and receive one credit. BERRY, WELLER.
45. HOME ECONOMICS EDUCATION. Continuation of Course 42. BERRY.
46. HOME ECONOMICS EDUCATION. Continuation of Course 45. BERRY.
47. OBSERVATION AND TEACHING. 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. WILLIAMS.
- 48a. OBSERVATION AND TEACHING. A course similar to Course 47, but dealing with the teaching of textiles and clothing. TRILLING.
- 51a,b. DRAWING AND DESIGN. Composition, perspective, color, theory, and color harmonies applied to costume design and interiors; harmony, balance, rhythm, in line and area design. GOLDSTEIN.
- 53a,b. HISTORIC ORNAMENT AND ADVANCED DESIGN. The historical development of art, architecture, ornament, and furniture, studied with reference to their influence upon modern styles. Problems in decorative design for articles of clothing and for house furnishing. GOLDSTEIN, MORSE.
- 55a,b. DECORATIVE NEEDLEWORK AND CRAFTS. Applied design in embroidery, lace, stencils, block-printing, applique, as adapted to materials for articles of dress and house furnishings. MORSE.

## ADVANCED COURSES

101. NUTRITION. 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. BERRY, BIESTER.
102. NUTRITION. A continuation of Course 101, including the qualitative examination of blood, bile, milk; urine analysis; metabolism experiments. BERRY, BIESTER.
- 103a,b. 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. WILLIAMS.
- 105b. EXPERIMENTAL COOKERY. An experimental study of special problems in foods and food preparation. WEIGLEY.

## HORTICULTURE

Associate Professor LEROY CADY; Assistant Professor WILFRED G. BRIERLEY (Chairman).

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
50.	Floriculture .....	3	Soph., jr., sr.	None
71.	Landscape Gardening .....	3	Soph., jr., sr.	None
90a,b.	General Horticulture .....	3	All	None

For additional courses see the bulletin of the College of Agriculture, Courses in Agriculture.

## INTRODUCTORY COURSES

50. 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.
71. 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.
- 90a,b. 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 MAXIMILIAN DICK, THADDEUS P. GIDDINGS, ABE PEPINSKY, GERTRUDE REEVES.

*General statement.*—Credit is offered to seniors and juniors in the College of Agriculture who may wish to elect work in the Department of Music. Six credits may be obtained. The following courses are recommended:

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1-2.	Harmony .....	3	Jr., sr.	None
9-10.	History of Music.....	6	Soph., jr., sr.	None
11-12.	Appreciation of Music.....	1	Jr., sr.	None
13-14.	Pianoforte .....	4	Jr., sr.	See statement
15-16.	Violin .....	4	Jr., sr.	See statement
25-26.	Orchestra .....	1	Jr., sr.	None
27-28.	Public School Music.....	6	Jr., sr.	None

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

## INTRODUCTORY COURSES

- 1-2. HARMONY. The study of chords, their construction, relations, and progressions. Written exercises on basses, the harmonization of given melodies. SCOTT.
- 9-10. 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.
- 11-12. APPRECIATION OF MUSIC. A non-technical course. No prerequisite. REEVES.
- 13-14. 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.
- 15-16. VIOLIN. Candidate must be able to play the first ten of Kreutzer's forty etudes, and the easier Handel and Mozart sonatas. DICK, PEPINSKY.
- 25-26. ORCHESTRA. FERGUSON, PEPINSKY.
- 27-28. 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.

## PHYSICAL EDUCATION FOR WOMEN

Assistant Professor J. ANNA NORRIS; Instructors MAY S. KISSOCK, VALERIA LADD, ALICE H. TOLG.

*General statement.*—This department aims 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; and investigates cases of illness which come to its attention.

Work in this department is required of all newly entering students (see courses 1-2 and 11), 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 work without credit arranged in social dancing, gymnastic dancing, swimming, fencing, basketball, baseball, and other activities.

A professional course 15-16 is offered for those who desire to teach Physical Education in addition to their major subjects. All senior students who desire a recommendation for teaching must take a three hour course in exercise to be recommended by the department.

A fee of \$4.00 is charged against each newly entering undergraduate woman student to cover the cost of her gymnasium bloomers, blouse, and cap.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1-2.	Elementary Physical Training....		Required of all new students*	None
3-4.	Intermediate Physical Training....	3	Soph., jr., sr.	1-2 or equiv.
5-6.	Advanced Physical Training.....	3	Jr., sr.	3-4
11.	Preliminary Hygiene .....		Required of all new students	None
13.	Personal Hygiene .....	3	Soph., jr., sr.	An. Biol. 1-2
14.	Hygiene of the Family.....	3	Jr., sr.	13
15-16.	Principles of Physical Education..	6	Jr., sr.	3-4, 21-22, 31-32
21-22.	Elem. Esthetic Dancing.....	None	All	None
23-24.	Intermed. Esthetic Dancing.....	None	All	21-22 or equiv.
25-26.	Advanced Esthetic Dancing.....	None	Soph., jr., sr.	23-24
31-32.	Folk Dancing and Org. Games....	None	All	None
33-34.	Hockey, Basketball and Baseball..	None	All	Permission of director
41-42.	Fencing .....	None	All	None
43-44.	Elem. Swimming .....	None	All	None

\* Students entering with advanced standing may postpone this course in case of conflict. It must be completed, however, before graduation.

Six credits is the maximum number that can be gained by taking courses in exercise in this department (courses 3-4, 5-6). Only one of these courses may be taken for credit in a semester.

Students who know how to swim are admitted to the natatorium at 12 TTh, at 4:30 MThF, and at 5:00 TTh. All students are admitted to roller skating at 1:00 MWF.

## INTRODUCTORY COURSES

1-2. **ELEMENTARY PHYSICAL TRAINING.** Lighter forms gymnastics; gymnastic dances; indoor and outdoor games; swimming. Study of habits of daily living. Divided into sections according to physical capacity. Girls who can not swim at end of freshman year are given "incomplete" and are required to learn to swim during the sophomore year. KISSOCK, TOLG, LADD.

3-4. **INTERMEDIATE PHYSICAL TRAINING.** Gymnastics, and an election of dancing, fencing, swimming, or a sport. Includes study of daily habits of living and written abstract of one book each semester. If taken for no credit no reading or written work is required. KISSOCK.

- 5-6. **ADVANCED PHYSICAL TRAINING.** Advanced gymnastics and an election of dancing, fencing, swimming, or a sport. Includes a study of the daily habits of living and a written abstract of one book a semester. If taken for no credit no written work or reading will be required. LADD.
11. **PRELIMINARY HYGIENE.** Twelve lectures. The most essential aspects of the care of the body. NORRIS.
13. **PERSONAL HYGIENE.** The essential knowledge of the care of the body, including a brief consideration of its anatomy and a study of its physiology, the prevention of contagious diseases, and first aid to the injured. NORRIS.
14. **HYGIENE OF THE FAMILY.** A study of maternity and infancy and the essentials of home nursing. NORRIS.
- 15-16. **PRINCIPLES OF PHYSICAL EDUCATION.** A study of the character, purpose, arrangement, and progression of developmental and corrective gymnastics, games and dancing; physical examinations and first aid to the injured. Includes practice teaching within the class group. Intended for students preparing to teach physical education. KISSOCK, TOLG, LADD.
- 21-22. **ELEMENTARY ESTHETIC DANCING.** Two hours a week. LADD.
- 31-32. **FOLK DANCING AND ORGANIZED GAMES.** Graded games for the school and playground. Two hours a week. KISSOCK.

### 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 first semester of the senior year.

At least one quiz paper will be selected at random each semester from other than rhetoric classes and read by the Rhetoric section. In addition any instructor may nominate and submit papers for any junior or senior who in his opinion requires special consideration.

The Rhetoric section may require upper-class students to take, without credit, additional courses in rhetoric in order to validate their freshman and sophomore rhetoric credits.

Until June, 1918, students registered previous to September, 1915, may be required to take a supplementary three-credit course in rhetoric in place of three of the elective credits required for the degree.

Students whose work in Rhetoric 1 shows at any time an inadequate knowledge of the conventions of English will be required to drop the course and enter Rhet. 3. These students will be required to complete fifteen credit hours of work in rhetoric.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1a,b.	Rhetoric .....	3	Fr.	None
2a,b.	Rhetoric .....	3	Fr.	1
3a,b.	Elementary Rhetoric .....	3	Fr.	None
11a,b.	Argumentation .....	3	Soph., jr.	2
22a,b.	Public Speaking .....	3	Soph., jr.	11
24a,b.	Adv. Public Speaking.....	3	Soph., jr., sr.	22 or 25
25a,b.	Fundamentals of Vocal Expression	2	Soph., jr., sr.	2

## INTRODUCTORY COURSES

- 1a,b. RHETORIC. Note taking, thesis writing, oral and written exposition, sentence and paragraph structure, analysis of prose models, book reviews. LANSING, GLICK, MOHL.
- 2a,b. RHETORIC. Description, narration, diction, argumentation, oral composition, book reviews. LANSING, GLICK, MOHL.
- 3a,b. ELEMENTARY RHETORIC. Elementary grammatical and rhetorical principles. MOHL.
- 11a,b. ARGUMENTATION. Evidence, reasoning, briefing, debating. LANSING, GLICK, MOHL.
- 22a,b. PUBLIC SPEAKING. The fundamentals of effective public speech and practice in organizing and delivering short occasional addresses. GLICK.
- 24a,b. ADVANCED PUBLIC SPEAKING. The preparation and delivery of the informal lecture. A study of the rules of order and practice in conducting assemblies. GLICK.
- 25a,b. FUNDAMENTALS OF VOCAL EXPRESSION. The fundamental principles of voice production, articulation, gesture, platform deportment, and expression. COOK.

## RURAL AND AGRICULTURAL JOURNALISM

Associate Professor WILLIAM P. KIRKWOOD; Instructor L. GERALD HOOD.

*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 management 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>				
*2.	Reporting .....	3	Soph., jr., sr.	Rhet. 1 yr.
*3.	Advanced Reporting .....	3	Jr., sr.	2
*5.	Copy Reading .....	3	Jr., sr.	3 or parallel 3

For additional courses see the bulletin of the College of Agriculture, Courses in Agriculture.

\* Courses 2, 3, and 5 will be given by this Division in case they are not offered in the College of Science, Literature, and the Arts.

## INTRODUCTORY COURSES

2. 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. ....
3. ADVANCED REPORTING. More extended practice in actual work on University publications. ....
5. COPY READING. Study and practice in editing copy for the newspaper and in writing headlines. ....

## COURSES IN OTHER SCHOOLS AND COLLEGES

The following courses are offered to students in the College of Agriculture by departments of other schools and colleges of the University. For complete lists and descriptions of courses offered by these departments, see the bulletins of the several schools and colleges.

## ANIMAL BIOLOGY

## COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor HENRY F. NACHTRIEB; Instructors GEORGE D. ALLEN, ADOLPH RINGOEN.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Course</i>				
9-10.	General Zoology. ....	6*	Fr. H.E.	None

\* Both semesters must be completed before credit is given.

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

## INTRODUCTORY COURSE

- 9-10. GENERAL ZOOLOGY. A course in general zoology for the students in Home Economics. Emphasis will be given to the classes having a more direct bearing on home economics. Lectures, quizzes, and laboratory work. NACHTRIEB, ALLEN, RINGOEN.

## BOTANY

## COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors.....; Assistant Professors HERBERT F. BERGMAN, FREDERIC K. BUTTERS, NED L. HUFF; Instructor WILLIAM S. COOPER; Assistants DONALD FOLSOM, FRANCES L. LONG, HARVEY STALLARD.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1a,b.	General Botany .....	3	All	None
2.	Structural Botany .....	3	All	1 or 3
4.	Field and Garden Botany .....	3	All	1 or 3

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

## INTRODUCTORY COURSES

- 1a,b. GENERAL BOTANY. A study of the external form and organs of flowering plants, root, stem, leaf, fruit and seed, and of their relations to each other, together with simple greenhouse experiments to illustrate the various functions. ...., BUTTERS, HUFF, BERGMAN, COOPER, FOLSOM, LONG, STALLARD.
2. STRUCTURAL BOTANY. A study of the microscopic structure of flowering plants, the cell, tissues and tissue systems, as seen in the root, stem, leaf, etc. BUTTERS, HUFF, STALLARD.
4. FIELD AND GARDEN BOTANY. Greenhouse, garden, and field study of the form, behavior, naming, and relationships of flowering plants, together with individual problems in the pollination, reproduction, and propagation of common flower types. ...., BERGMAN, COOPER, FOLSOM, LONG, STALLARD.

## CHEMISTRY

## SCHOOL OF ANALYTICAL AND APPLIED CHEMISTRY

Professor GEORGE B. FRANKFORTER; Instructors ROSS A. BAKER, H. LEE WARD.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
3a-4b, 3b-4a.	Adv. General Chem. and Qualitative Analysis ....	6*	Fr., soph., jr.	Entrance cred. in Chem.
33.	General Chem. and Qual. Analysis .....	5†	Fr., soph., jr.	None

For additional courses see the bulletin of the School of Chemistry.

\* Both semesters must be completed before credit is given for the first semester.

† Course 4b must be completed before credit is given.

## INTRODUCTORY COURSES

- 3a-4b, 3b-4a. **ADVANCED GENERAL CHEMISTRY AND QUALITATIVE ANALYSIS.** Lectures, recitations, and laboratory work. General descriptive chemistry, including the fundamental theories and laws, and qualitative analysis. FRANKFORTER, BAKER, WARD.
33. **GENERAL CHEMISTRY AND QUALITATIVE ANALYSIS.** Designed for those who have had no high school chemistry; in preparation for Course 4b. See statement under 3a-4b. FRANKFORTER, BAKER.

## ECONOMICS

## COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor JOHN H. GRAY; Instructors WILLIAM W. CUMBERLAND, ROBERT J. McFALL.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
‡2a.	Indust. and Commerce of U. S...	3	All	None
†3a,b.	Principles of Economics.....	3	Soph., jr., sr.	1 or 2
13.	Economic Geography of Foreign Countries .....	3	Soph., jr., sr.	3 cred.

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

\* Both semesters must be completed before credit is given for the first semester.

† Given at University Farm.

## INTRODUCTORY COURSES

- 2a. **INDUSTRIES AND COMMERCE OF THE UNITED STATES.** Agricultural, mining, manufacturing industries and commerce. Characteristics of the several sections of the country. Leading individual industries: geographical distribution, methods of organization, production, and marketing, and relationships to one another. McFALL.
- 3a,b. **PRINCIPLES OF ECONOMICS.** Fundamentals of economic theory with special reference to agriculture. CUMBERLAND.
13. **ECONOMIC GEOGRAPHY OF FOREIGN COUNTRIES.** Economic basis of modern civilization; localization of industries; principal extractive, manufacturing, and distributive industries of leading foreign countries, especially markets for American products. Textbook with lectures and special reports. McFALL.

## EDUCATION

Professors LOTUS D. COFFMAN, MELVIN E. HAGGERTY, ALBERT W. RANKIN, FLETCHER H. SWIFT; Instructor JEAN ALEXANDER.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1a,b.	Brief Course in the Hist. of Educ..	3	Jr., sr.	Phil. 1-2
3a,b.	Social Aspects of Education.....	3	Sr.	1 or 101-102, 11
*5b.	The American School.....	3	Jr., sr.	Phil. 1-2
<i>Advanced Courses</i>				
101.	Foundations of Modern Education..	3	Jr., sr.	Phil. 1-2, Hist. 6 cred.
102.	History of Educ. since Reformation	3	Jr., sr.	Phil. 1-2, Hist. 6 cred.
105.	Educational Psychology .....	3	Sr.	Phil. 1-2
106.	Educational Psychology .....	3	Sr.	Phil. 1-2
109.	Educational Diagnosis .....	2	Sr.	1 or 101-102, 3
119.	School Curricula .....	3	Sr.	1 or 101-102, 3
141.	School Sanitation and Public Health	3	Sr.	3
146.	History and Principles of Religious Education .....	3	Jr., sr.	Phil. 1-2

\* Given at the University Farm.

For additional courses see the bulletin of the College of Education.

## INTRODUCTORY COURSES

- 1a,b. 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. SWIFT, ALEXANDER.
- 3a,b. 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.
- 5b. THE AMERICAN SCHOOL. A general survey of the American school system with special reference to its relation to political and social movements and ideals. Not open to those who have credit in Course 1. Given only at the College of Agriculture. SWIFT.

## ADVANCED COURSES

101. FOUNDATIONS OF MODERN EDUCATION. An interpretative historical study of educational institutions and ideals, designed for those who wish a more comprehensive historical view than can be gained in Education 1. The foundations of modern education—Hebrew, Greek, Roman, Medieval. SWIFT.
- 102 HISTORY OF EDUCATION SINCE THE REFORMATION. Modern education movements, current theories, and standards in the light of their history. For fuller description of general character of course, see course 101. SWIFT.
105. EDUCATIONAL PSYCHOLOGY. Advanced work in genetic psychology, original nature of the human organism, the origin, development and

- control of instincts, the relation of instincts to formation of habits, introductory to the psychology of learning, and individual differences. HAGGERTY.
106. EDUCATIONAL PSYCHOLOGY. The 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 the psychology of school subjects. HAGGERTY.
109. 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. HAGGERTY.
119. 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.
141. 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.
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. SWIFT.

## ENGLISH

Professors RICHARD BURTON, HARDIN CRAIG, CARLETON BROWN, ELMER E. STOLL; Assistant Professors JOSEPH W. BEACH, OSCAR W. FIRKINS, GEORGE N. NORTHPRO.

*General statement.*—The following courses are recommended for election by the students of the College of Agriculture.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1-2	General Survey Engl. Literature	6	Soph., jr., sr.	Rhet. 1-2
5a,b	Chaucer .....	3	Soph., jr., sr.	1-2
6	Spenser .....	3	Soph., jr., sr.	1-2
55a,b	Shakespeare .....	3	Jr., sr.	1-2
62	Milton .....	3	Jr., sr.	1-2
66	Browning and Tennyson.....	3	Jr., sr.	1-2
67	English Novel .....	3	Jr., sr.	1-2
76	Recent English Poetry.....	3	Jr., sr.	1-2
77	Nineteenth Century Prose.....	3	Jr., sr.	1-2

No.	Title	Credits	Offered to	Prereq. Courses
<i>Advanced Courses</i>				
107.	Eighteenth Century Prose.....	3	Jr., sr.	1-2
115.	English Idiom .....	3	Jr., sr.,	1-2, 3
119-120.	Principles of Literary Criticism.	6*	Jr., sr.	1-2
122.	American Literature .....	3	Jr., sr.	1-2
136.	Advanced Shakespeare .....	3	Jr., sr.	55
140.	Advanced Chaucer .....	3	Jr., sr.	See statement

\* Both semesters must be completed before credit is given for the first semester.

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

#### INTRODUCTORY COURSES

- 1-2. GENERAL SURVEY OF ENGLISH LITERATURE from the beginning to Swinburne. Lectures, recitations, and assigned readings. Designed to prepare for more minute study of special periods. These courses may be taken in either order and credited independently of each other. CRAIG, BROWN, STOLL, BEACH, NORTHROP.
- 5a,b. CHAUCER. The grammar and literary forms of fourteenth century English with selected readings from Chaucer's works. Special attention to *The Canterbury Tales*. Open to students who have taken or are taking Course 1-2. First semester, BROWN; second semester, FIRKINS.
6. 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*. Open to students who have taken or are taking Course 1-2. FIRKINS.
- 55a,b. SHAKESPEARE. An introductory study of Shakespeare's development as a poet and dramatist up to *King Lear*, with reading of representative plays. First semester, NORTHROP; second semester, BROWN.
62. MILTON. The principal poets of the time of Charles I and the Protectorate with special emphasis upon Milton. NORTHROP.
66. 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. BURTON.
67. THE ENGLISH NOVEL. Principles and personalities in the evolution of the English novel. Written reports on the selected novels. BURTON.
76. RECENT ENGLISH POETRY. Poetry in England and America since 1870. The main poetic traditions and tendencies now prevailing. BEACH.
77. NINETEENTH CENTURY PROSE. Studies in the more important prose writers of the nineteenth century, with reference to their style, personalities, opinions, and relations to their periods. Readings by students and essays on approved topics. BEACH.

## ADVANCED COURSES

107. 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. CRAIG.
115. ENGLISH IDIOM. A discussion of current idiom with the purpose of relating it to the underlying principles of historic development. BURTON.
- 119-120. PRINCIPLES OF LITERARY CRITICISM. A brief treatment of elements or forces in literature; an exposition of literary types in relation to the standards and methods of judging each. Instructor's permission to take the course must be obtained before registration. FIRKINS.
122. AMERICAN LITERATURE. Lectures on American literature, with extensive readings from the principal poets and prose writers of the United States. CRAIG.
136. ADVANCED SHAKESPEARE. Shakespeare's development traced to the end. A careful analysis of a number of the later plays. Problems in the interpretation of Shakespeare's dramatic methods. STOLL.
140. ADVANCED STUDY OF CHAUCER. Further study of *The Canterbury Tales* and of the Minor Poems. Open upon approval of the instructor to juniors and seniors. BROWN.

## GERMAN

## COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor CARL SCHLENKER; Assistant Professors OSCAR C. BURKHARD, SAMUEL KROESCH, WALTER R. MYERS; Instructors JAMES DAVIES, LYNWOOD G. DOWNS, J. THEODORE GEISSENDOERFER, ALFRED E. KOENIG, HAROLD W. SOULE, RICHARD WISCHKAEMPER, EDWIN H. ZEYDEL; Teaching Fellows LOUISE G. FRARY, ARNOLD W. SHUTTER.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1a,b.	Beginning .....	6	All	None
3a,b.	Intermediate .....	6	All	1
5-6.	Prose and Poetry.....	6*	All	2 yrs. preparatory
7-8.	Drama .....	6*	All	5-6 or 4 yrs. preparatory
11-12.	Rapid Reading .....	6*	All	3
21-22.	Scientific Intermediate .....	6*	All	1, or 2 yrs. preparatory
23-24.	Scientific Advanced .....	6*	All	22, 5-6 or 4 yrs. preparatory

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

\* Both semesters must be completed before credit is given for the first semester.

## INTRODUCTORY COURSES

- 1a,b. BEGINNING. Double course given each semester as a six-hour course. Pronunciation, grammar, conversation, and composition; selected reading in easy prose and verse. KROESCH, MYERS, DAVIES, DOWNS, GRAVES, KOENIG, SOULE, ZEYDEL, SHUTTER.
- 2a,b. INTERMEDIATE. Double course given each semester as six-hour course. Selected texts in modern narrative and descriptive prose; selected lyrics and ballads; a drama of Lessing, Goethe, or Schiller. Assigned readings of texts outside of class. KROESCH, MYERS, DAVIES, DOWNS, GRAVES, KOENIG, SOULE, ZEYDEL, SHUTTER.
- 5-6. PROSE AND POETRY. Geography, history, and legend. Review of German grammar throughout the year. BURKHARD, DOWNS, GEISSENDOERFER, GRAVES, WISCHKAEMPER, FRARY.
- 7-8. DRAMA. First semester: classic drama; plays of Lessing, Goethe, Schiller. Second semester: modern drama; plays of Hebbel, Sudermann, Hauptmann and others. Assigned readings and reports throughout the year. SCHLENKER, BURKHARD, KROESCH, DAVIES.
- 11-12. RAPID READING. First semester: narrative prose; Hauff, Storm, Sudermann, Goethe's *Hermann und Dorothea*. Second semester: plays of Lessing, Goethe, Schiller, Hebbel. Assigned readings and reports. DAVIES, GRAVES, KOENIG, SOULE.
- 21-22. SCIENTIFIC INTERMEDIATE. This course aims to give students a reading knowledge of German for use in scientific studies. Not open to those who have obtained credit for either Course 3-4 or 5-6. GEISSENDOERFER, GRAVES, WISCHKAEMPER.
- 23-24. SCIENTIFIC ADVANCED. Reading of monographs and periodicals. Not open to those who have obtained credit for Course 7-8. WISCHKAEMPER.

## HUMAN PHYSIOLOGY

## MEDICAL SCHOOL

Professor ELIAS P. LYON; Associate Professor RICHARD O. BEARD.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Course</i>				
3a,b.	Elem. Human Physiology.....	3	All	Chem. 1 yr., Biol. ½ yr.

For additional courses see the bulletin of the Medical School and the College of Science, Literature, and the Arts.

## INTRODUCTORY COURSE

- 3a,b. ELEMENTARY HUMAN PHYSIOLOGY. Primarily for Home Economics students and nurses; open to others. Lectures and laboratory work. LYON, BEARD.



## PATHOLOGY, BACTERIOLOGY, AND PUBLIC HEALTH

## MEDICAL SCHOOL

Professor HAROLD E. ROBERTSON; Associate Professor WINFORD P. LARSON; Instructors HAROLD S. DIEHL, ARTHUR T. HENRICI, PERCY A. WARD; Assistant KANO IKEDA.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Course</i>				
6a,b.	Elementary Bacteriology .....	3	Soph.	None

For additional courses see the bulletin of the Medical School.

## INTRODUCTORY COURSE

6a,b. 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, HENRICI, DIEHL, WARD, IKEDA.

## PHILOSOPHY AND PSYCHOLOGY

## COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor NORMAN WILDE; Associate Professor DAVID F. SWENSON; Assistant Professors RUPERT C. LODGE, JOSEPH PETERSON, HERBERT WOODROW; Instructors HAROLD R. CROSLAND, JOHN F. DASHIELL, JACOB KANTOR.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1-2.	General Psychology .....	6	Soph., jr., sr.	None
13.	Introduction to Philosophy.....	3	Jr., sr.	3 cred.
<i>Continuation Courses</i>				
18.	Child Development .....	3	Jr., sr.	3 cred.
51a,b.	Ethics .....	3	Jr., sr.	6 cred.
56.	Aesthetics .....	3	Jr., sr.	6 cred.
60.	Child Development .....	3	Jr., sr.	3 cred.
64.	Philosophy of Religion.....	3	Jr., sr.	6 cred.

*Advanced Course*

107.	Social Psychology .....	3	Jr., sr.	6 cred. incl. 1-2
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For additional courses see the bulletin of the College of Science, Literature, and the Arts.

## INTRODUCTORY COURSES

1-2. GENERAL PSYCHOLOGY. The aims and methods of psychology; the facts, laws and functions of mental life; development and learning in relation to training and instinct. Required for a teacher's certificate. PETERSON, DASHIELL, CROSLAND, KANTOR, HAGGERTY.

13. INTRODUCTION TO PHILOSOPHY. The aim, method, and chief problems of philosophy. LODGE.

## CONTINUATION COURSES

18. CHILD DEVELOPMENT. A study of the stages of development from infancy through adolescence for those interested in parenthood and education. DASHIELL.
- 51a,b. 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.
56. ESTHETICS. An introduction to the history and theory of esthetics, psychological analysis of beauty, and a discussion of the arts. SWENSON.
64. PHILOSOPHY OF RELIGION. The development of the idea of God from its simplest beginnings, the changes undergone in Greek, Jewish, and Christian thought; its validity in view of modern scientific theories. SWENSON.

## ADVANCED COURSE

107. SOCIAL PSYCHOLOGY. The instinctive and acquired factors in the behavior of the individual toward society in its various forms and groupings, and in the growth of ideas of self and of social attitudes. PETERSON.

## PHYSICS

## COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor HENRY A. ERICSON; Instructor PAUL E. KLOPSTEG.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Course</i>				
17-18.	General Physics (Home Econ.)...	6*	Fr.	None

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

\* Both semesters must be completed before credit is given.

## INTRODUCTORY COURSE

- 17-18. GENERAL PHYSICS. Mechanics of solids and fluids, sound, heat, light, electricity, and magnetism. Treatment experimental with special emphasis on applications to the household. KLOPSTEG.

## POLITICAL SCIENCE

## COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors WILLIAM A. SCHAPER, JEREMIAH S. YOUNG.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1a,b.	American Government .....	3	Soph., jr., sr.	None
6.	American Municipal Administration	3	Soph., jr., sr.	1

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

## INTRODUCTORY COURSES

- 1a,b. AMERICAN GOVERNMENT. Organization and actual workings of the national government; nature and origin of the American governmental system. SCHAFER, YOUNG.
6. AMERICAN MUNICIPAL ADMINISTRATION. 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. SCHAFER.

## ROMANCE LANGUAGES

## COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors EVERETT WARD OLMSTED, COLBERT SEARLES; Assistant Professors JULES T. FRELIN, RUTH S. PHELPS; Professorial Lecturers BALBINO DÁVALOS, PEDRO HENRÍQUEZ UREÑA, PAUL H. MORIN; Instructors HARRY E. ATWOOD, GEORGE S. BARNUM, FRANCIS H. BARTON, NELSON F. COBURN, WILLIS J. PLUMMER, EDWARD H. SIRICH.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1a,b.	Beginning French .....	6	All	None
2a.	Beginning French .....	3	All	Prep. French 1 yr.
3a,b.	Intermediate French .....	6	All	1 or equiv.
4.	Survey of French Literature.....	6	All	1 or equiv.
5-6.	Survey of French Literature.....	6	All	3 or equiv.
7-8.	Elemen. French Conversation.....	2	All	3 or equiv.
9-10.	Elemen. French Composition.....	1	All	3 or equiv.
31a,b.	Beginning Spanish .....	6	All	None
33-34.	Beginning Spanish .....	6	All	None
35a,b.	Intermediate Spanish .....	6	All	31 or equiv.
37-38.	Intermediate Spanish .....	6	All	31 or equiv.
39-40.	Spanish Literature of the Nineteenth Century .....	6	All	35 or equiv.
41-42.	Elementary Spanish Conversation.	2	All	35 or equiv.
43-44.	Elementary Spanish Composition...	2	All	35 or equiv.

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

## INTRODUCTORY COURSES

- 1a,b. BEGINNING FRENCH. Double course. This course will complete in one semester the work heretofore done in two. Pronunciation, gram-

- mar, drill, oral exercises, and translation. SEARLES, FRELIN, ATWOOD, BARNUM, BARTON, COBURN, SIRICH.
- 2a. BEGINNING FRENCH. For those who have completed one year of preparatory French. BARTON.
- 3a,b. INTERMEDIATE FRENCH. Double course. This course will complete in one semester the work heretofore done in two. Review of grammar, composition, conversation, and reading, representative authors of the Nineteenth Century. FRELIN, ATWOOD, BARNUM.
4. SURVEY OF FRENCH LITERATURE. Double course. Same as 5-6. BARTON.
- 5-6. GENERAL SURVEY OF FRENCH LITERATURE. Lectures, recitations, and assigned readings. Designed to cover the whole period in historical outline, and to prepare for a more minute study of special periods. Selections from representative authors. PHELPS, ATWOOD, SIRICH.
- 7-8. ELEMENTARY FRENCH CONVERSATION. Small amount of outside preparation will be required. The section meeting at nine o'clock on Monday, Wednesday, and Friday is limited to students taking Course 5-6 and is based on the work of that course. FRELIN, BARTON, SIRICH.
- 9-10. ELEMENTARY FRENCH COMPOSITION. FRELIN, BARTON.
- 31a,b. BEGINNING SPANISH. Double course. This course will complete in one semester the work heretofore done in two. Pronunciation, grammar, drill, oral exercises, and translation. HENRÍQUEZ, PLUMMER, BARNUM.
- 33-34. BEGINNING SPANISH. This course is the same as Course 31 except that it is a year-course. OLMSTED, COBURN, PLUMMER.
- 35a,b. INTERMEDIATE SPANISH. Double course. This course will complete in one semester the work heretofore done in two. Review of grammar, composition, conversation, and readings. HENRÍQUEZ, PLUMMER.
- 37-38. INTERMEDIATE SPANISH. This course is the same as course 35a,b, except that it is a year-course. HENRÍQUEZ, COBURN.
- 39-40. SPANISH. LITERATURE OF THE NINETEENTH CENTURY. Lectures, recitations, and assigned readings. HENRÍQUEZ.
- 41-42. ELEMENTARY SPANISH CONVERSATION. A small amount of outside preparation required. The life and customs of modern Spain; accompanied by illustrative material. PLUMMER.
- 43-44. ELEMENTARY SPANISH COMPOSITION. Special attention given to social and commercial correspondence. PLUMMER.

## SOCIAL AND CIVIC WORK

## COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor ARTHUR J. TODD; Associate Professor LOUIS L. BERNARD; Lecturers CAROL ARONOVICI, FRANK J. BRUNO, OTTO W. DAVIS, CHARLES C. STILLMAN, ARTHUR H. TAYLOR, EDWARD F. WAITE; Supervisors of Practice Field Work HENRY F. BURT, MARION E. TEBBETS, ELIZABETH YERXA.

## COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
51.	Treatment of Dependents and Defectives .....	3	Jr., sr.	Sociol. 1 or 6
52.	Child Welfare .....	3	Jr., sr.	51
55.	Housing Problems .....	2	Jr., sr.	Sociol. 1 or 6
<i>Advanced Courses</i>				
122.	Social Statistics and Social Surveys .....	2	Sr.	2 courses
124.	Methods of Community Org. and Social Work .....	2	Sr.	2 courses
125-126.	Settlement and Social Center Work .....	4	Sr.	2 courses
128.	Charitable Administration .....	1	Sr.	2 courses
130.	Technique of Family Treatment .....	2	Sr.	51, 52
132.	Juvenile Courts and Probation .....	2	Sr.	51 or 52, 53
133-134.	Field Work in Hospital Social Service .....	2	Sr.	See statement

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

## INTRODUCTORY COURSES

51. TREATMENT OF DEPENDENTS AND DEFECTIVES. The extent and nature of poverty and mental defectiveness; efforts made for their amelioration and prevention. Same as Sociol. 9. BRUNO.
52. 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. Same as Sociol. 10. 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. Same as Sociol. 11. DAVIS.

## ADVANCED COURSES

122. SOCIAL STATISTICS AND SOCIAL SURVEYS. Methods of gathering and presenting community facts. Lectures, problems, and field work. ARONOVICI.
124. METHODS OF COMMUNITY ORGANIZATION AND SOCIAL WORK IN SMALL TOWNS AND COUNTRY. TODD, BERNARD.

- 125-126. SETTLEMENT AND SOCIAL CENTER WORK. The history and function of leisure. Neighborhood organization, private and public, for meeting neighborhood recreational needs. Lectures and practice work in local settlements. ARONOVICI, BURT.
128. CHARITABLE ADMINISTRATION, FINANCE AND ADMINISTRATION. 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, STILLMAN.
130. TECHNIQUE OF FAMILY TREATMENT. An intensive study of 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. TODD, WAITE.
- 133-134. FIELD WORK IN HOSPITAL SOCIAL SERVICE. A course open to students who are properly grounded in case work and who wish to specialize in this field. TEBBETS, YERXA.

## SOCIOLOGY AND ANTHROPOLOGY

### COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors ALBERT ERNEST JENKS, ARTHUR J. TODD; Instructor PAUL I. NEERGAARD.

*General statement.*—Modern university education is not complete unless the graduate has obtained the social point of view. To this end the department offers elementary courses dealing with peoples, with social forces, institutions, and movements. Its more advanced courses are designed especially for students majoring in the social sciences, namely: sociology and anthropology, economics, history, and political science.

#### COURSES

No.	Title	Credits	Offered to	Prereq. courses
<i>Introductory Courses</i>				
1a,b.	General Introduction .....	3	Soph., jr., sr.	None
6.	Social Reform Movements.....	3	Soph., jr., sr.	1
14.	The Rural Community.....	3	Jr., sr.	1
<i>Advanced Courses</i>				
113.	The American People .....	3	Jr., sr.	3 courses, incl. 1
114.	The American People (continued)..	3	Jr., sr.	113
119.	The Family .....	3	Jr., sr.	9 cred.

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

#### INTRODUCTORY COURSES

1a,b. GENERAL INTRODUCTION. Elemental activities, institutions, laws, and

theories. Especial emphasis is placed on descriptive data. Text book and lectures. JENKS,\* NEERGAARD, TODD.\*

6. MODERN SOCIAL REFORM MOVEMENTS. A survey of the attempts to overcome certain social maladjustments: child labor, the city, the tenement, poverty, degeneracy; movements for public health, old age pensions, social insurance, the protection of infancy and youth, public recreation, etc. TODD.
14. THE RURAL COMMUNITY. A survey of the field of Rural Sociology; description of rural social interests; analysis of fundamental problems of rural life; nature and influence of rural environment; characteristics of rural mind. NEERGAARD.

#### ADVANCED COURSES

113. THE AMERICAN PEOPLE. Dominant characteristics of the diverse foreign peoples now in the United States; their modification in America; the importance of these peoples to the American nation. Lectures, readings, and essay. JENKS.
114. THE AMERICAN PEOPLE (continued). A continuation of course 113. Essential and unique historical Americanisms, and their value and virility for the future; facts and forces of amalgamation and assimilation in America; America's ethnic problems. Lectures, readings, and essay. JENKS.
119. THE FAMILY. A study of the historical development of forms of the family, and their relation to other social institutions. The modern family, its functions, and its problems. TODD.

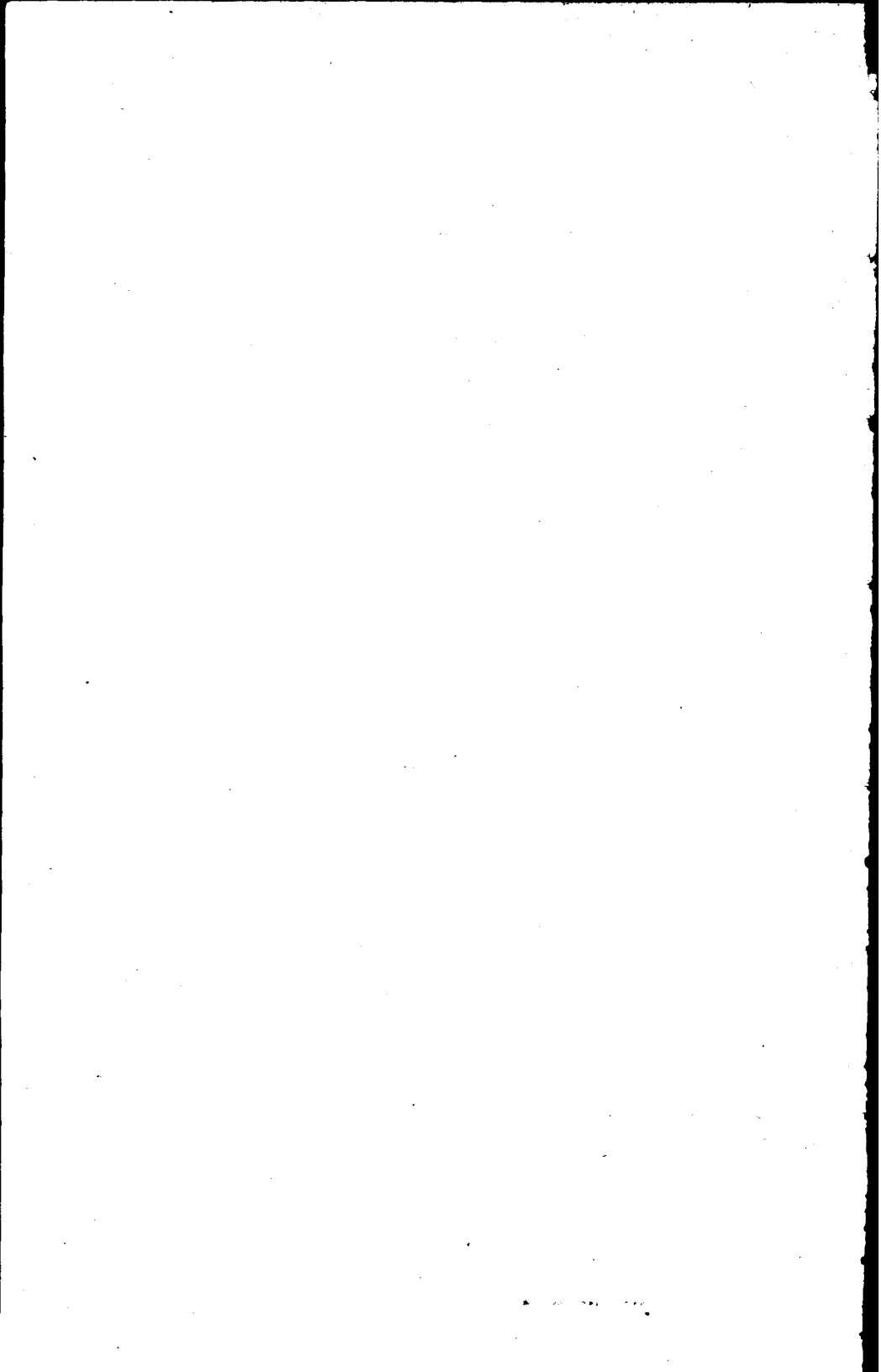
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\* First semester only.

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*The Bulletin*  
*of the University of*  
**Minnesota**

*The Law School*  
*Announcement for the Year*  
**1917-1918**



*Catalog Series No. 7*  
**Vol. XX No. 34 August 15 1917**

*Entered at the post-office*  
*in Minneapolis as second-class matter*  
*Minneapolis, Minnesota*



# UNIVERSITY CALENDAR

1917-1918

1917			
September	26	Wednesday	Registration closes for all students
September	26	} Week	Fees payable for all students
October	3		
October	1	Monday	First semester evening extension classes begin
October	2-9	Week	Examinations for removal of conditions (except for Colleges of Agriculture and Forestry), and entrance examinations
October	10	Wednesday	First semester begins
October	15	Monday	Agricultural College, farm experience examinations
October	18	Thursday	Senate meeting, 4:00 p.m.
October	29	Monday	School of Agriculture, first term begins
November	5	Monday	Dairy School opens
November	28	Wednesday	Thanksgiving recess begins 9:00 p.m.
December	1	Saturday	Dairy School closes
December	3	Monday	Thanksgiving recess ends 8:00 a.m.
December	3-8	Week	Second semester condition examinations, Colleges of Agriculture and Forestry
December	3-8	Week	Short course for ice-cream makers
December	5	Wednesday	Medical School second quarter begins
December	20	Thursday	Senate meeting, 4:00 p.m.
December	21	Friday	School of Agriculture, first term closes
December	21	Friday	Christmas vacation begins 9:00 p.m.
1918			
December	31	} Week	Farmers' and Home Makers' Week
January	5		Short Course
January	2	Wednesday	Christmas vacation ends 8:00 a.m.
January	2	Wednesday	School of Embalming begins, eight weeks' session
January	8	Tuesday	School of Agriculture, second term begins
January	25	Friday	First semester evening extension classes close
February	4	Monday	Second semester registration closes
February	4	Monday	Second semester evening extension classes begin
February	4-9	Week	Merchants' Short Course
February	11	Monday	Final examinations begin

## THE LAW SCHOOL

February	11	Monday	Payment of fees for second semester closes
February	12	Tuesday	Lincoln's Birthday; a holiday
February	18	Monday	Second semester begins
February	21	Thursday	Senate meeting, 4:00 p.m.
February	22	Friday	Washington's Birthday; a holiday
March	27	Wednesday	School of Agriculture closes
March	28	Thursday	Easter recess begins 9:00 p.m.
April	1	Monday	Easter recess ends 8:00 a.m.
April	1-6	Week	Boys' and Girls' Week
April	1-6	Week	Condition examinations in certain colleges
April	15	Monday	Medical School fourth quarter begins
April	30	Tuesday	Traction Engineering Short Course begins
May	16	Thursday	Senate meeting, 4:00 p.m.
May	24	Friday	Second semester evening extension classes close
May	30	Thursday	Memorial Day; a holiday
May	31	Friday	Traction Engineering Short Course closes
June	8	Saturday	Final examinations begin 2:00 p.m.
June	15	Saturday	Second semester closes
June	16	Sunday	Baccalaureate service
June	17	Monday	Senior Class Day exercises
June	19	Wednesday	Alumni Day
June	20	Thursday	Forty-sixth Annual Commencement
June	21	Friday	Summer vacation begins
June	24	Monday	Summer Session begins

# THE LAW SCHOOL

## FACULTY

MARION LEROY BURTON, Ph.D., D.D., LL.D., President 1005 5th St. S. E.  
CYRUS NORTROP, LL.D., President Emeritus 519 10th Ave. S. E.  
WILLIAM REYNOLDS VANCE, Ph.D., LL.D., Dean and Professor of Law  
525 10th Ave. S. E.  
CEPHAS D. ALLIN, M.A., LL.B., Professor of Law 509 6th St. S. E.  
WILBUR H. CHERRY, B.A., LL.B., Professor of Law McKnight Building  
HENRY J. FLETCHER, LL.M., Professor of Law 317 17th Ave. S. E.  
EVERETT FRASER, B.A., LL.B., Professor of Law 911 5th St. S. E.  
JAMES PAIGE, M.A., LL.M., Professor of Law 420 Oak Grove St.  
EDWARD SAMPSON THURSTON, M.A., LL.B., Professor of Law  
911 5th St. S. E.

## PROFESSORIAL LECTURERS

HOWARD S. ABBOTT, B.L., Minneapolis  
HON. HOMER B. DIBELL, B.A., LL.B., Commissioner of the Supreme Court  
of Minnesota  
WALDRON M. JEROME, B.S., LL.B., Minneapolis

## SPECIAL LECTURERS

HON. CALVIN L. BROWN, Chief Justice of the Supreme Court of Minnesota  
ROME G. BROWN, B.A., Minneapolis  
CHARLES W. BUNN, B.S., St. Paul  
ARTHUR L. HELLIWELL, LL.M., Minneapolis  
HON. CHARLES S. JELLEY, Judge of the District Court, Hennepin County  
HON. FRANK B. KELLOGG, St. Paul, United States Senator  
HUGH V. MERCER, LL.M., D.C.L., Minneapolis  
CHRISTOPHER D. O'BRIEN, St. Paul  
HON. THOMAS D. O'BRIEN, St. Paul, formerly Justice of the Supreme  
Court of Minnesota

## GENERAL INFORMATION

### OBJECT AND METHOD OF INSTRUCTION

The Law School of the University of Minnesota was established in 1888.

The object of the Law School is to provide a thoro and scientific legal education, and to prepare students for the actual practice of law in any jurisdiction where the English and American legal system prevails. Particular emphasis is laid upon the Minnesota Statutes, the special doctrines of law, and the rules of practice that obtain in this State.

In teaching the various branches of law, the so-called "case system" is employed. This method of teaching law, which has been approved by experience and which is now employed in the leading law schools of the country, has the two-fold merit of enabling the student to acquire a thoro and practical knowledge of legal principles, and to become familiar with those processes of legal reasoning which have determined the form and character of our jurisprudence, and will govern its future development.

The faculty is composed primarily of resident professional law teachers who devote their entire time and energy to teaching. The courses in practice are taught by men experienced in practice at the Minnesota bar. In addition, courses of lectures on special topics are given by distinguished lawyers and judges, selected primarily from the bar of Minnesota.

### ADMISSION

#### REGULAR STUDENTS

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 some other college or university of equal grade.\* Such candidates may be admitted upon presenting their diplomas or other credentials showing the completion of such college work, to the Registrar of the University.

#### SPECIAL STUDENTS

Applicants who are twenty-one years of age and have preliminary education sufficient to entitle them to admission to the College of Science, Literature, and the Arts,† may be admitted to the Law School as special students. Such special students are not candidates for a degree, but in case a special student succeeds in maintaining throughout his course

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\* This requirement calls for a minimum of fifty-eight credits.

† These requirements are stated in full in the current bulletin of the College of Science, Literature, and the Arts.

an average grade of *B* or better, the Faculty may by special action recommend him for graduation.

Special students entering with fifty-two academic 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.

### ADVANCED STANDING

No credit is given for time spent in private reading. The candidate for graduation must spend all three years in residence, either at this law school or at some other accredited law school. A student coming from such other law school must possess the preliminary education required for admission to this school and must spend at least one year in attendance at this law school before he can qualify for a degree. Attorneys-at-law, however, who have been admitted to practice in the State of Minnesota and who have had two years of academic work in college, may enter the third-year law class without examination upon presentation to the Registrar of their certificates of admission to the bar, and shall be entitled to the degree of Bachelor of Laws upon satisfactorily completing such courses, aggregating 24 credits (one year's work), as the Law Faculty may designate.

### REGISTRATION

Students should register on or before the opening of the first semester.\* Lectures in all subjects scheduled for the first semester begin promptly on the opening day of the semester, and those who join their classes later will necessarily be seriously handicapped in their work. No student will be admitted to the Law School unless he registers within ten days after the opening of the first semester, except by special action of the faculty and for good cause shown.

No new student will be admitted to the work of the second semester unless he brings from another law school a certificate of advanced standing, showing his qualifications to continue the second semester's work, and unless he registers before the opening of the semester. This is because the more important first-year subjects begin in the fall and are continued throughout the year, and the whole first-year work should be taken as a unit.

### COMBINED SIX-YEAR COURSE LEADING TO DEGREES OF BACHELOR OF ARTS AND BACHELOR OF LAWS

Academic students who have by the end of their junior year completed one major and two minors and have completed courses aggregating 90 credits, may take during their senior year, the first-year law course, and

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\* See page 11 for the provisions as to penalty for late registration.



upon completion of the same will be given the B.A. degree, provided they have attained a total of 118 honor points. Upon completion of the work of the remaining two years in Law, such students will receive the degree of Bachelor of Laws, thus obtaining both degrees in six years.

### PRE-LEGAL COURSES

Students who contemplate studying law are strongly urged to take the combined six-year course described above and thus devote at least three years to collegiate work before entering the Law School. In the opinion of the Law Faculty, it is desirable that a prospective law student, devoting three or more years to collegiate work before undertaking the study of law, should take in his undergraduate years, courses aggregating at least two years of work in each of the following subjects: English Composition (Rhetoric), Latin, a modern language, History (particularly English and American Constitutional History), Mathematics, Economics and Political Science, and courses aggregating at least one year's work in Science, Sociology, Psychology and Logic, and Public Speaking.

### SPECIAL TWO-YEAR PRE-LEGAL COURSE

For those who can not devote more than two years to collegiate work before entering the Law School, the College of Science, Literature, and the Arts offers a special pre-legal course designed to afford special preparation for the study of law. This course is fully set forth in the bulletin of that College.

While students who have completed two years of the regular Academic course offered by the College of Science, Literature, and the Arts in accordance with the regulations of that college, are eligible to enter the Law School, the Law Faculty strongly advises those who enter the College of Science, Literature, and the Arts with the purpose of qualifying for admission to the Law School after two years, to take this special pre-legal course.

### REGULATIONS GOVERNING CLASS WORK, EXAMINATIONS, GRADES, AND PROMOTIONS

Every student registered in the Law School is required to attend with regularity all lectures, whether special or in course, that may be prescribed for his class, to prepare all papers and other class exercises that may be assigned, and to perform all services in connection with the practice court that may be required of him. These requirements apply to all special students as well as to candidates for graduation. Gross delinquency in discharging these requirements may be regarded by the faculty as sufficient reason for requiring the delinquent student to withdraw from the school.

Examinations are held at the end of each semester.

*A, B, C,* and *D* signify passing grades of varying degrees of merit, *A* being the honor mark. *E* signifies a condition and *F* a failure. *I* signifies that the course has not been completed because of illness or a similar reason.

A student who, for any reason, is absent from as many as twenty per cent of the lectures in any course will not receive credit in such course.

A student who fails in a subject must repeat the subject in course.

A student who receives a condition in a subject is entitled to one examination only to remove such condition; and such examination must be taken within one year from the imposition of such condition. On failure to remove a condition, the student must repeat the subject in course.

A student with delinquencies in more than one of the courses required for the preceding year, must register in all subjects in which he is delinquent.

Examinations for the removal of conditions are held during registration week in the fall of each year.

A student having conditions or incompletes in first semester subjects may take an examination in *one* such subject on the day following the Easter recess, *provided* that, prior to the beginning of the Easter recess, he shall have given to the Dean, written notice of his intention to take such examination (stating the subject in question); and, subject to the same requirement as to notice, any candidate for graduation in law or arts in the following June may take two such examinations. Special examinations at any other time will be allowed only upon permission of the faculty and for good cause shown.

A student who is deficient in subjects aggregating eight or more credits (semester hours) will not be promoted to the next higher class. If, in the opinion of the faculty, such student is not qualified either (1) to continue as a student of law, or (2) to take any more advanced work, he may, by vote of the faculty, either (1) be denied the privilege of continuing in the Law School, or (2) be required to repeat the entire work of the preceding year.

A student, who at the end of any semester, fails in two or more subjects taken in that semester may by vote of the faculty be denied the privilege of continuing in the Law School.

Except by special action of the faculty no student will be allowed to enter upon the work of the second semester of his third year as a candidate for a degree at the forthcoming commencement if he lacks more than sixteen credits of the total amount of work required for graduation.

## ELECTIVES IN OTHER DEPARTMENTS OF THE UNIVERSITY

Students in the Law School may be permitted, after completion of the work of the first year, and under proper regulations to elect, without extra charge, courses offered in other departments of the University, provided that such election does not interfere with their law studies; but such election of courses in other departments may be made only with

permission of the Law Faculty. Among the subjects which may be profitably selected are English Composition, English and American Constitutional History, International Law, Public Speaking and Debating, Political Science, Economics, and Sociology. Students who elect such work must complete it in a satisfactory manner or withdraw in good standing before they can obtain the law degree.

### LIBRARIES

The library of the Law School contains more than twenty-six thousand volumes, including all the American Reports, State and Federal (excepting a few reports of inferior state courts), nearly all the English and Canadian Reports, the English, Federal, and State Statutes (with a few exceptions), the standard digests, encyclopedias, legal periodicals and text-books. To this collection substantial additions, particularly in foreign law, are constantly being made. Further library facilities are afforded by the generous action of the Bar Association of Minneapolis in granting to the students the free use of its library located in the Court House. Besides the University and Bar Association libraries, the State Law Library, located at the Capitol in St. Paul, is accessible to students.

### STATE AND UNITED STATES COURTS

The University is located within easy reach of both the Federal and State Courts. The United States Courts are in session in St. Paul and Minneapolis during the greater part of the school year. The Supreme Court of Minnesota, sitting at St. Paul, the District Courts of Ramsey and Hennepin Counties, and the Municipal Courts of St. Paul and Minneapolis are open and in session almost constantly, and afford the student abundant opportunity for witnessing the trial of actual cases and the argument of appeals.

### CASE-BOOKS

The case-books used by the student in his course in the Law School, especially when containing his own annotations, should prove highly valuable to him in after years at the bar. Students are therefore earnestly advised to purchase their own case-books. It has heretofore been the practice, however, for the Law Library to lend case-books for the use of students. This practice is discontinued as the supply of case-books now on hand becomes exhausted.

### TUITION AND OTHER FEES

The tuition fee is sixty-five dollars (\$65.00) a year, payable in two equal installments at the beginning of the first and second semesters, respectively.

All students are required to indicate registration on proper blanks

not later than September 26. Fees must be paid in full on or before October 3.

For the second semester, registration must be indicated on or before February 4, and fees must be paid on or before February 11.

A penalty fee of one dollar (\$1.00) will be charged all students who do not register or pay fees within the time specified, and, after one week, a fee of twenty-five cents per day for each day's delay will be added. The Registrar will send proper blanks to all students who were in attendance the previous year, on or before September 15. Students who fail to receive blanks at that date should call for them.

The regular University fee of \$1.00 will be charged to each student taking an examination for the removal of a condition. No other fee will be charged in the Law School for any special examination.

A deposit of five dollars is required of students making use of the case-books belonging to the Law School.

In accordance with a regulation of the Board of Regents, students of all schools and colleges of the University are required to have a box in the University Post-Office, for which a rental charge of fifty cents a year is made.

#### EXPENSES

The expenses of a student at the University depend largely upon the tastes and habits of the individual. Students can without difficulty obtain board and lodging near the University. Good board can be had for \$5.00 per week, and students by clubbing together can usually get board at considerably less expense.

#### INQUIRIES

Further particulars as to any phase of the work of the Law School not given herein, or in the Bulletin of General Information, will be cheerfully given upon request. Communications addressed at any time to the Dean of the Law School, the University of Minnesota, Minneapolis, Minnesota, will receive prompt attention.

## COURSE OF STUDY

The curriculum leading to the degree of Bachelor of Laws covers a period of three academic years. To qualify for graduation, a student must complete the entire work of the first and second years and the required work of the third year, together with a sufficient number of electives to aggregate twelve hours of work during each semester of the third year.

Students, unless they be of exceptional ability and industry, who find it necessary to devote a considerable portion of their time and energy to work not connected with their law studies are strongly advised to limit their work in the law school to not more than ten hours in the class room per week, and thus extend the period of their study of law over four years.

Each regular student, unless excused by special action of the faculty, will be required to take courses aggregating not less than twelve nor more than sixteen hours' work a week during each semester of his first two years, and courses aggregating not less than ten nor more than fifteen hours during each semester of the third year.

Attendance upon all special lectures scheduled is required of second- and third-year students; and all students in the Law School may be required to serve as jurors or witnesses in any proceedings before the practice court.

All the courses offered by the Law School are given in the day time between the hours of 8 a.m. and 5 p.m.

### FIRST-YEAR COURSES

- 1-2. **CONTRACTS.** Offer and acceptance; consideration; contracts under seal; the Statute of Frauds; rights of beneficiaries and assignees; joint and several contracts; conditions; illegality; impossibility; and discharge of contracts. Williston, *Cases on Contracts*, Vols. I and II. First semester, three hours; second semester, three hours. CHERRY.
- 3-4. **TORTS.** The general principles underlying the law of civil liability for wrongful conduct, and the specific wrongs of deceit, defamation, malicious prosecution, interference with contracts and trade, etc. Ames and Smith, *Cases on Torts* (edition of 1909-10), Vols. I and II. First semester, three hours; second semester, three hours. THURSTON.
5. **CRIMINAL LAW AND PROCEDURE.** The common and statutory law of crimes; criminal procedure. Mikell, *Cases on Criminal Law and Criminal Procedure*. First semester, three hours. PAIGE.

6. DOMESTIC RELATIONS. Marriage and divorce; parent and child; guardian and ward; property law peculiar to the marriage relation; rights and liabilities of persons under the disabilities of coverture, infancy, insanity, etc. Paige, *Cases on Domestic Relations*. Second semester, two hours. PAIGE.
- 7-8. I PROPERTY (1). Real and personal property distinguished; possessory rights in personalty, liens and pledges; acquisition of title to personal property by accession, confusion, gift and finding; fixtures and emblements. Bigelow, *Cases on Personal Property*. First semester, three hours. VANCE.
- I PROPERTY (2). Rights in the land of another; profits; easements; covenants running with the land; licenses; natural rights; public ways, and rents. Gray, *Cases on Property* (second edition), Vol. II. Second semester, three hours. FRASER.
9. CARRIERS AND PUBLIC SERVICE COMPANIES. Origin and development of the law of public callings; common carriers of goods and passengers; telephone, telegraph, gas, electric companies; limitation of liability; state and federal regulation. Green, *Cases on Carriers*. First semester, two hours. ALLIN.
10. AGENCY. Principal and agent, master and servant—their rights and obligations, mutually and as to third persons. Wambaugh, *Cases on Agency*. Second semester, three hours. FLETCHER.

## SECOND-YEAR COURSES

- 11-12. PLEADING AND PRACTICE. (1) COMMON LAW PLEADING: Scope of the action, necessary allegations in declaration, and defenses in each form of action at common law; rules governing pleadings in all forms of action at common law. (2) CODE PLEADING: Relation of code pleading to common law pleading; requisites of complaint; answer, demurrer, reply; motions respecting pleadings; amendment; aider; bills of particulars; parties; joinder of causes of action; construction of pleadings. (3) PRACTICE: Requisites, service, and return of summons; appearance; change of venue; continuance; the jury; right to open and close; opening statement of counsel; dismissal and directed verdict. Whittier, *Cases on Common Law Pleading*. Sunderland, *Cases on Trial Practice*. First semester, two hours; second semester, three hours. FLETCHER.
- 13-14. II EQUITY. Nature of equity jurisdiction; injunctions; bills of peace; interpleader; specific performance; bills for account. Ames, *Cases on Equity*, Vols. I and II. First semester, two hours; second semester, three hours. THURSTON.
- 15-16. EVIDENCE. Nature of evidence; judicial notice; burden of proof; presumptions; admissions; character evidence, confessions, hearsay;

- opinion evidence; real evidence; writings; parol evidence rule; competency, privilege, and examination of witnesses. Thayer, *Cases on Evidence* (second edition). First semester, two hours; second semester, two hours. JEROME.
- 17-18. II PROPERTY. Rights with reference to waters; public ways; rents. Titles and conveyancing, including the modes of conveyance at common law, under the statute of uses, and by statutory grant; the execution of deeds and estates created thereby; covenants for title, and priorities among titles. Gray, *Cases on Property* (second edition) Vol. II. Aigler, *Cases on Property*. First semester, two hours; second semester, two hours. PAIGE, ROME G. BROWN.
19. SALES. Contracts resulting in the transfer of title to personal property, and the special rights and remedies of the buyer and seller. Williston, *Cases on Sales* (second edition). First semester, three hours. FRASER.
20. NEGOTIABLE INSTRUMENTS. Formal and essential requirements of negotiable instruments, and the nature of the liability of the respective parties thereto; acceptance; endorsement; transfer; presentment; notice of dishonor; the Negotiable Instruments Law. Colson's Huffcutt, *Cases on Negotiable Instruments*. First semester, two hours. PAIGE.
21. WILLS AND ADMINISTRATION. Historical originals of the law of succession; testamentary capacity; execution, revocation, and republication of wills; descent; probate of wills and administration of estates. Costigan, *Cases on Wills*. Second semester, two hours. PAIGE.
38. INSURANCE. Nature and requisites of the contract; premiums and assessments; insurable interest; concealment; representations and warranties; waiver and estoppel; rights under the policy; beneficiaries, assignees, and creditors; construction of the policy. Vance, *Cases on Insurance*. Second semester, two hours. VANCE.

#### THIRD-YEAR COURSES\*

- 25-26. III PRACTICE AND PRACTICE COURT (required). This course deals with the various proceedings in an action from the commencement thereof, through trial and appellate courts, to final satisfaction of judgment, including work in the practice court. Sunderland, *Cases on Trial Practice*. First semester, three hours; second semester, two hours. CHERRY.

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\* Third-year students are required to complete the courses in Practice, Private Corporations, and such other of the third-year courses as will aggregate with the above required courses not fewer than twenty-four credit hours, provided that no student may take less than ten nor more than fifteen hours in either semester of the third year.

27. III PROPERTY. Conditional and future interests in land: reversions and remainders; executory limitations by way of use and devise; powers; rule against perpetuities; conditions in restraint of alienation. Gray, *Cases on Property* (second edition), Vol. III. First semester, three hours. FRASER.
- 28-29. PRIVATE CORPORATIONS (required). The nature, creation, and citizenship of corporations; *ultra vires* contracts and acts; stock issues; rights and liabilities of stockholders; officers and agents of corporations; rights of creditors. Richards, *Cases on Private Corporations*. First semester, two hours; second semester, two hours. FRASER.
31. CONSTITUTIONAL LAW. The nature of the American constitutional system; legislative, executive, and judicial departments; interstate commerce; constitutional limitations; police power; due process of law; taxation; eminent domain, etc. McClain, *Cases on Constitutional Law* (second edition). First semester, three hours. FLETCHER, KELLOGG.
32. PARTNERSHIP. The nature and formation of the partnership relation; the rights and liabilities of the partners, both *inter se* and as to third parties. Gilmore, *Cases on Partnership*. Second semester, two hours. PAIGE. (Omitted, 1917-18.)
33. TRUSTS. Nature and incidents of the trust relationship; methods of creating trusts; rights and obligations of trustee and beneficiary; constructive trusts; charitable trusts. Kenneson, *Cases on Trusts*. First semester, three hours. THURSTON.
34. CONFLICT OF LAWS. The rules applied by courts in enforcing rights acquired under the law of a sister state or a foreign country. Lorenzen, *Conflict of Laws*. Second semester, three hours. FRASER.
35. MORTGAGES. Legal and equitable mortgages of realty and chattels; rights of mortgagor and mortgagee at law and in equity; foreclosure, redemption, extension, assignment, and discharge of mortgages. Dibell, *Cases on Mortgages*. First semester, two hours. DIBELL.
36. EXTRAORDINARY LEGAL REMEDIES. Mandamus; habeas corpus; certiorari; quo warranto; prohibition. Second semester, two hours. Dibell, *Cases on Extraordinary Legal Remedies*. DIBELL.
38. SURETYSHIP. The surety distinguished from the guarantor, the guaranty insurer, and the endorser; surety's defenses against creditor; surety's rights to subrogation, indemnity, contribution, and exoneration; creditor's rights to surety's securities. Ames, *Cases on Suretyship*. Second semester, two hours. VANCE.
22. QUASI CONTRACTS. Nature and scope of quasi contracts, benefits voluntarily conferred by mistake, in partial performance of a contract, in the absence of a contract; benefits conferred under duress;



- waiver of tort. Thurston, *Cases in Quasi Contract*. Second semester, three hours. THURSTON.
40. DAMAGES. Exemplary damages; nominal damages; direct and consequential damages; elements of injury; functions of court and jury; liquidated damages; entire and prospective damages; limitations of interest; aggravation and mitigation. Special applications. Beale, *Cases on Damages*. First semester, one hour. (Not given in 1917-18.)
41. BANKRUPTCY. Origin, history, and nature of the bankruptcy law; jurisdiction of the courts; acts of bankruptcy; practice; receivers; claims, preferences; assets, trustees; liens; adverse claimants; summary jurisdiction; crimes, composition, discharge. Selected cases. First semester, one hour. FLETCHER.
42. TAXATION. This course deals only with the legal questions arising in connection with the assessment of property and the levying and collection of taxes. Selected cases. Second semester, one hour. FLETCHER.
43. MUNICIPAL CORPORATIONS. Legislative control; officers and agents; power to incur indebtedness, to pass ordinances, to grant franchises, to levy taxes, to issue securities, to own and operate public utilities; municipal liability for torts. First semester, two hours. ABBOTT.
45. INTERNATIONAL LAW. (1) INTERNATIONAL RELATIONS IN TIME OF PEACE; territorial jurisdiction; jurisdiction on the high seas; nationality. (2) INTERNATIONAL RELATIONS AS MODIFIED BY WAR; measures short of actual war; effects of war as between enemies; relations between belligerents and neutrals. Scott, *Cases on International Law*. First semester, two hours. ALLIN.
46. ADMINISTRATIVE LAW. Administrative power and action; discretion; form and proof of official acts; notice; hearing and evidence; execution. Relief against administrative action: action to recover damages; specific relief (extraordinary legal remedies); jurisdiction, conclusiveness, and judicial control. Freund, *Cases on Administrative Law*. Second semester, two hours. ALLIN.

#### WORK IN PRACTICE

Work in practice begins with the first-year class. Its members, in order to acquire facility in looking up authorities and in legal reasoning, are required to brief and argue certain assigned legal questions. Second-year students in connection with the class-work in practice must prepare pleadings and other papers, while members of the third-year class, in addition to class-room instruction in practice, engage in the exercises of the practice court.

The practice court has divisions corresponding to the District Court and Supreme Court of Minnesota. Each student is assigned a number of

cases in which he is required to draw all necessary pleadings, to see to the service of process and pleadings, to conduct the trial, to perfect an appeal, and to prepare all papers in the appellate court. In at least one of the cases so assigned, the student must take steps to secure a provisional or extraordinary remedy.

Members of the third-year class are required to serve as assistants in the office of the Legal Aid Bureau, and to be in the office of the Bureau from 1:30 to 5:30 p.m. daily during the periods assigned for such service.

In connection with the Practice Course, examinations will be given at the end of the first and second semesters. The final examination will cover the work of both semesters.

## STUDENTS

1916-17

### THIRD YEAR

#### REGULAR—40

Acton, Harry J., Madison  
Alley, Raymond C., Buffalo  
Anderson, C. Gustaf, Winthrop  
Baston, Albert P., St. Louis Park  
Chapman, Edwin H., Minneapolis  
Cohen, Edward, Minneapolis  
Cohen, Joseph, Minneapolis  
Costello, Harold C., Minneapolis  
Dahlberg, Andrew H., Hopkins  
Dale, Charles M., B.A. '15, Minneapolis  
Erlandson, Edwin G., Detroit  
Frenzel, Paul W., St. Paul  
Gausewitz, Alfred L., B.A. '15, St. Paul  
Godfrey, Otis H., B.A. '15, St. Paul  
Grogan, Bernard D., B.A. '15 Carleton, Mankato  
Hauge, Norman J., B.A. '15, Minneapolis  
Hicks, George M., B.A. '14, Thief River Falls  
Johnson, William C., Hallock  
Kramer, Arnold O., B.A. '06, Preston  
London, David, Minneapolis

Lowell, Clarence T., B.A. '16, St. Paul  
Lundquist, Harold L., Minneapolis  
McMillan, Arthur W., B.A. '14, Duluth  
Michael, Frank F., Jordan  
Miller, Arthur B., Heron Lake  
Moorhead, William C., Minneapolis  
O'Hearn, Thomas L., B.A. '16, Minneapolis  
Pegelow, Charles L., Two Harbors  
Peterson, Jay B., B.A. '15, Minneapolis  
Peterson, Oscar, B.A. '16, Granite Falls  
Pryor, Leland M., B.A. '16, Hinckley  
Robertson, Alfred J., B.A. '16, Carleton, St. Paul  
Shelly, Walter D., Minneapolis  
Stadsvold, Francis H., Fosston  
Sullivan, Joseph D., B.A. '14, Madison Lake  
Thomson, Metellus, Jr., Minneapolis  
Townley, John L., Jr., Fergus Falls  
Wilson, Leonard A., Lake Park  
Young, Donald A., Minneapolis  
Zumwinkle, Lyle E., Morton

#### SPECIAL—7

Booher, Leroy T., Jr., Armour, S. D.  
Burhans, Ira H., Minneapolis  
Davis, Harry W., Duluth  
Drake, Gustaf E., Minneapolis

Ottesen, Theodore H., Nevis  
Rankin, Robert L., Cambridge, Neb.  
Scott, Paul R., LL.B. '16 Washington and Lee, Alton, Ill.

### SECOND YEAR

#### REGULAR—52

Amundson, Bertram L., St. Peter  
Anderberg, K. R. Clarence, B.A. '16, Minneapolis  
Anderson, Wingate M., B.A. '16, Minneapolis  
Babcock, Dana B., Sisseton, S. D.  
Ballentine, James J., Minneapolis  
Bolsta, Charles H., Ortonville  
Brunsdale, K. Edward, Portland, N. D.  
Burns, Wendell T., B.A. '16, Duluth  
Colle, Alfred, Minneapolis  
Countryman, Marcellus L., Jr., B.A. '16, St. Paul  
Dalton, John E., B.A. '16, St. Paul  
Davis, Charles H., Minneapolis

Divet, Donovan R., Fargo, N. D.  
Doerr, Willard A., Two Harbors  
Dougherty, J. Emmett, Minneapolis  
Dykman, Howard, Spokane, Wash.  
Farley, John H., Minneapolis  
Frisch, Irving M., Minneapolis  
Fullerton, David H., Brainerd  
Greig, John E., Estherville, Ia.  
Grottum, Bjarne E., Windom  
Hale, Quincy H., B.A. '15, Spring Valley  
Harris, G. Erskine, St. Paul  
Head, Neil C., Minneapolis  
Hohman, Susan C., Ph.B. '99, Hamline, St. Paul

Hustad, Arthur R., B.A. '16, Benson  
 Johnston, Harold W., Nashwauk  
 Laferrriere, Francis X., Minneapolis  
 Lowe, Joseph D., River Falls, Wis.  
 Lundeen, David, Minneapolis  
 Mayer, Frank A. R., East Grand Forks  
 Morse, Leslie H., B.A. '13, Carleton,  
 Mankato  
 Nelson, Roy B., Goodhue  
 Olien, Charles N., Clarkfield  
 Quimby, Elbert W., B.A. '15 South  
 Dakota, Ashton, S. D.  
 Regan, John M., Minneapolis  
 Richter, Charles H., Foxhome  
 Riley, Kenneth V., B.A. '16, Minne-  
 apolis  
 Rosenquest, Russell C., St. Paul

Rustan, Martin B., B.A. '13 Fargo,  
 Underwood  
 Sachs, Louis, Minneapolis  
 Scriven, John L., Dixon, Ill.  
 Shepley, Lewis C., Farmington  
 Skanse, Peter E., Minneapolis  
 Stradtman, William, Glencoe  
 Thompson, Sivert W., B.A. '14, St.  
 Olaf, Devils Lake, N. D.  
 Thonn, Paul G., Moorhead  
 Thrush, Waldo B., Spencer, Ia.  
 Wanberg, Charles O., Galva, Ia.  
 Weikert, Claire I., St. Paul  
 Williams, Dwight, B.A. '16, Minneap-  
 olis  
 Williams, George E., Minneapolis

## SPECIAL—8

Holdhusen, Frank H., Minneapolis  
 Jennings, G. Elmer, Minneapolis  
 Lande, Clarence O., McGrath  
 Long, Michael A., Minneapolis

Lund, Eli R., Windom  
 Miller, Herbert J., Heron Lake  
 Shannon, Clarence A., Minneapolis  
 Winthrop, William L., Minneapolis

## FIRST YEAR

## REGULAR—68

Aichele, Emil L., St. Paul  
 Bain, James D., B.S. '16, Carleton,  
 Mankato  
 Bikson, Harry J., Hopkins  
 Bjorgo, Victor B., Red Wing  
 Boutelle, Frederick W., Minneapolis  
 Brandon, Martin O., Kensington  
 Butchart, Ellis J., Duluth  
 Carroll, Gerald T., Minneapolis  
 Cincera, Edward J., St. Paul  
 Covell, Karl H., Atwater  
 Dahle, Clarence A., B.A. '15, Wiscon-  
 sin, Minneapolis  
 DeMouilly, Leo, Lake Crystal  
 Dirksen, Everett M., Pekin, Ill.  
 Donley, Walter W., Jr., Minneapolis  
 Dow, Neal E., Worthington  
 Drews, Herbert H., Ashley, N. D.  
 Duffy, Ray V., Minneapolis  
 Eclov, Hjalmar, Minneapolis  
 Engan, Raymond C., Minneapolis  
 Evensen, Thorolf G., Great Falls, Mont.  
 Fallgatter, Russel S., Willmont  
 Ferch, Aaron J., Correll  
 Gillen, Charles W., Stillwater  
 Gloege, Arthur J., Bellingham  
 Goldberg, Louis W., Minneapolis  
 Graven, Henry N., Minneapolis  
 Grover, Stephen F., Jr., Grantsburg,  
 Wis.

Hall, Howard L., B.A. '15, M.A. '16,  
 Minneapolis  
 Hansen, Ivan O., B.A. '14, M.A. '15,  
 Minneapolis  
 Hjortholm, Herman C., Clermont, Ia.  
 Hoitomt, Adolf, Minneapolis  
 Hollenbeck, George M., B.A. '16, Car-  
 roll, Minneapolis  
 Hough, George P., Kerkhoven  
 Hougnon, Thomas J., Cambridge, Neb.  
 Huey, Harold G., Minneapolis  
 Huntting, Charles E., Jr., Minneapolis  
 Iverson, Clarence J., Aberdeen, S. D.  
 Kerfoot, Paul S., B.S. '16, Hamline,  
 St. Paul  
 Kleffman, Edgar W., Hibbing  
 Klossner, Winfred B. W., Winthrop  
 Larson, Earl E., Alexandria  
 Leonard, Burritt C., Minneapolis  
 Lindeman, Arthur H., North Redwood  
 Lokman, Lewis E., Pekin, Ill.  
 Maynard, John H., Wauabay, S. D.  
 Melin, Arthur H., Minneapolis  
 Mergens, Harold J., Weyburn, Sask.  
 Moore, Frank G., Pattonhill, Mont.  
 Neils, Theodore F., Sauk Rapids  
 Nolan, Joseph L., St. Paul  
 North, Earl J., Minneapolis  
 Orfield, Didrick J., B.A. '08, Minne-  
 apolis

Parker, Hugh G., Wadena  
 Perkins, Norval E., St. Paul  
 Petri, Franklin, Minneapolis  
 Reyerson, Paul, Dawson  
 Robb, John D., B.A. '15, Yafe, Min  
 neapolis  
 Rogstad, Einar A., Detroit  
 Sellars, G. Burrel, Minneapolis  
 Smith, Datyon, Monona, Ia.  
 Spriggs, Walter J., B.A. '16, St. Paul

Stillwell, Phillip J., Appleton  
 Taylor, Willard B., B.A. '16, Ohio  
 Wesleyan, Minneapolis  
 Thacker, Ralph W., B.A. '09, Olivet,  
 St. Paul  
 Torvestad, John N., B.S. '16, Hamline,  
 Fertile  
 Wescott, Frank S. U., Mappsburg, Va.  
 White, Kenneth S., River Falls, Wis.  
 Wiencke, Otto, Balaton

## SPECIAL—44

Allen, William W., Fairmont  
 Anderson, Godfrey W., Proctor  
 Bacon, Lucas M., St. Paul  
 Belstrom, Axel W., Minneapolis  
 Buckley, Edward T., Farmington  
 Bugher, Charles A., Ladysmith, Wis.  
 Carman, Donald, Detroit  
 Cox, Guy M., Walnut Hill, Ill.  
 Cullum, Richard A., Duluth  
 Dow, Lawrence H., Duluth  
 Eggert, Albert W., Minneapolis  
 Ekman, Carl E., Grand Rapids  
 Fagan, Edward J., Minneapolis  
 Flaten, Milo G., Minneapolis  
 Garrett, Albert W., Osseo  
 Graven, J. Howard, St. James  
 Halvorson, Stanford C., Minneapolis  
 Halverson, Walter S., Minneapolis  
 Kahner, Martin L., Minneapolis  
 Kempton, H. Seward, Duluth  
 Knoche, Enno A., St. Paul  
 Knott, Spencer H., Minneapolis

Kulberg, Samuel, Minneapolis  
 Lande, J. Herman, McGrath  
 Leisen, Raymond J., Minneapolis  
 Matson, Sidney S., Sherburn  
 Meyler, George A., Geneva, Ohio  
 Montgomery, Herbert L., Minneapolis  
 Oehler, Karl F., Devils Lake, N. D.  
 Pearlove, Edward J., Minneapolis  
 Pool, Harry R., Minneapolis  
 Robertson, Ellsworth G., Argyle  
 Scheid, Arthur F., Mankato  
 Schumacher, Clair F., St. Peter  
 Severson, Edwin S., St. Paul  
 Stadler, Roy E., Minneapolis  
 Steele, Julian H., St. Paul  
 Sullivan, Joseph E., Minneapolis  
 Swanson, Georg, Mankato  
 Timerman, Gates A., St. Paul  
 Towey, Robert E., Minneapolis  
 Weedell, H. Austin, Minneapolis  
 White, Valmah S., Minneapolis  
 Wolf, Earl D., Morristown

## UNCLASSED—3

Fulton, Thomas C.  
 Glick, George G., B.A. '14, Iowa

Matt, C. David, B.A. '09, Pennsylvania