The Bulletin *of the* University *of* Minnesota

General Information for the Year 1922-1923

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

The *Bulletin* comprises—

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

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

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

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

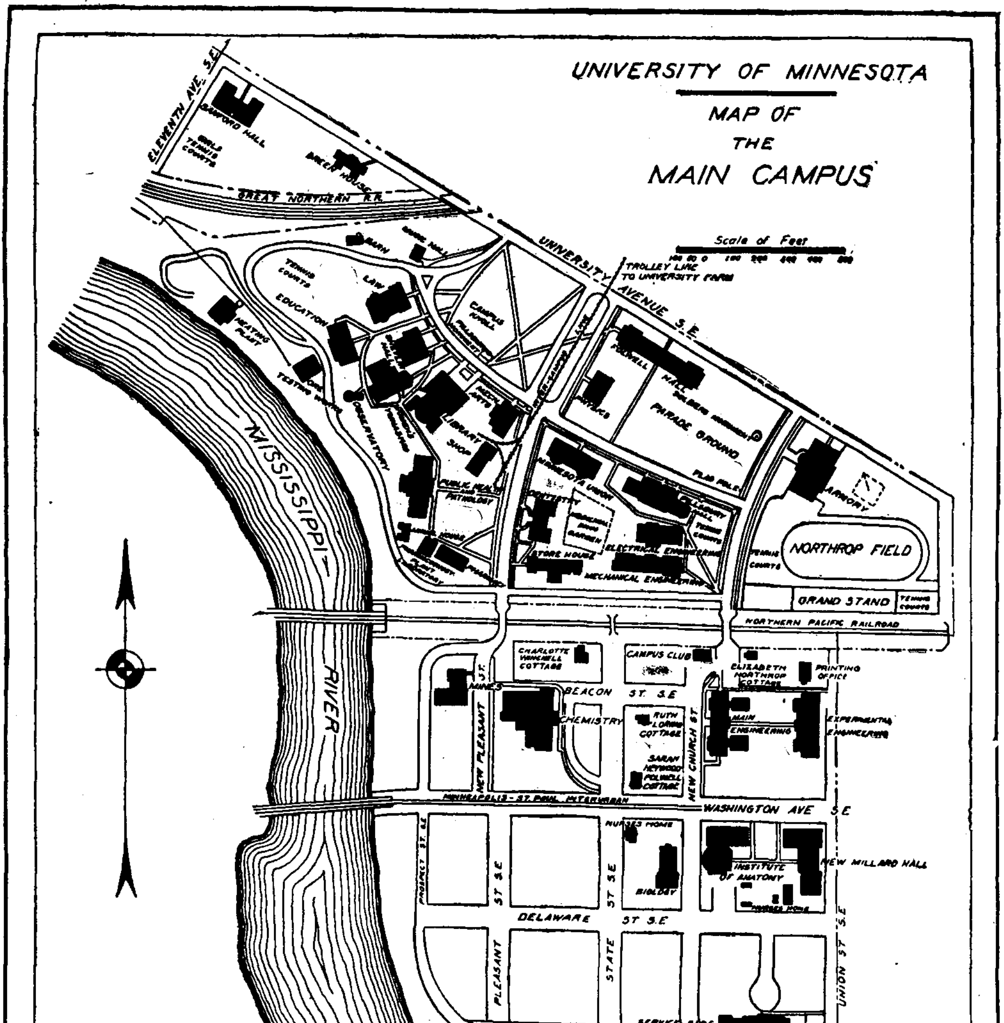
Current Problems Series. Containing papers of general interest in various lines of work.

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

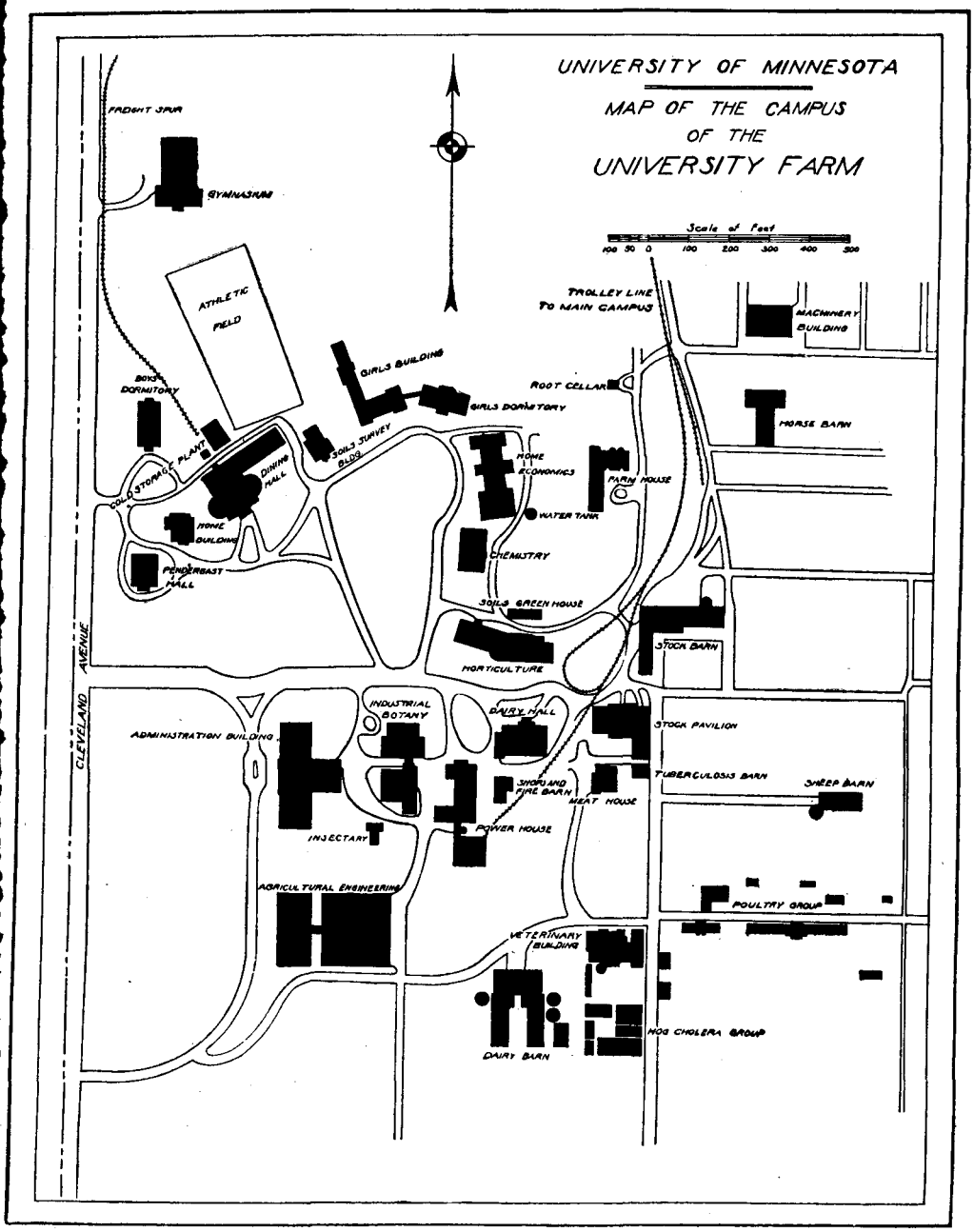
These publications are sent free to libraries and to other institutions publishing similar material. To individuals, a small charge is made. For lists and prices, address

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

CONTENTS



Area of Main Campus, 108.5 acres



Area of University Farm, 422.56 acres

1922

JULY

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1923

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AUGUST

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SEPTEMBER

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NOVEMBER

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DECEMBER

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UNIVERSITY CALENDAR

1922-23

1922			
September	16	Saturday	Payment of fees closes, except for new students
September	19-26		Examinations for removal of conditions and entrance examinations
			Physical examinations for all new students
September	19-23		Registration period, colleges of Science, Literature, and the Arts, and Agriculture, Forestry, and Home Economics
September	25	Monday	First semester evening extension classes begin
September	25-26		Registration days for all colleges not indicated above
September	26	Tuesday	Payment of fees for new students closes
September	27	Wednesday	Fall quarter begins, 8:30* a.m.
October	14	Saturday	Class Scrap Day; classes dismissed the third and fourth hours
October	26	Thursday	Senate meeting, 4:30 p.m.
November	4	Saturday	Home Coming Day; classes dismissed the third and fourth hours
November	7	Tuesday	General Election Day; a holiday
November	11	Saturday	Armistice Day; a holiday
November	30	Thursday	Thanksgiving Day; a holiday
December	14	Thursday	Senate meeting, 4:30 p.m.
December	20	Wednesday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
1923			
January	4	Thursday	Christmas vacation ends, winter quarter begins, 8:30* a.m.
January	19	Friday	First semester evening extension classes close
January	29	Monday	Second semester evening extension classes begin
February	12	Monday	Lincoln's Birthday; a holiday
February	15	Thursday	Senate meeting, 4:30 p.m.
February	22	Thursday	Washington's Birthday; a holiday
March	23	Friday	Winter quarter ends, spring vacation begins, 5:20 p.m.
April	4	Wednesday	Spring vacation ends, spring quarter begins, 8:30* a.m.
May	17	Thursday	Senate meeting, 4:30 p.m.

* First hour classes begin at 8:15 at University Farm.

May	18	Friday	Second semester evening extension classes close
May	30	Wednesday	Memorial Day; a holiday
June	17	Sunday	Baccalaureate service
June	20	Wednesday	Fifty-first annual commencement
June	20	Wednesday	Spring quarter closes, 5:20 p.m.
June	23-25		Registration days for Summer Session
June	26	Tuesday	Summer Session and summer quarter begin
July	4	Wednesday	Independence Day; a holiday
August	3	Friday	Summer Session closes
September	7	Friday	Summer quarter closes

Program of Entrance Examinations 1922-23

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.

Candidates wishing to take any of these examinations should notify the examiner in writing not later than September 1, December 1, or March 1.

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

Fall Quarter

Tuesday,	Sept. 19	9 a.m.	Business subjects, Elementary Algebra, Plane Geometry, Trigonometry
		2 p.m.	Manual subjects, Domestic Art and Science, Agriculture, Higher Algebra, Solid Geometry
Wednesday,	Sept. 20	9 a.m.	Astronomy, Botany, Geology, Chemistry, Physiography, Zoology, Physics, Physiology, General Science
		2 p.m.	American Government, History, Economics, Commercial Geography, History of Commerce, Economic History of England, Economic History of the United States, Sociology
Thursday,	Sept. 21	9 a.m.	English
		2 p.m.	German, Greek, French, Latin, Scandinavian, Spanish

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

Winter Quarter

Wednesday,	Dec. 27	9 a.m.	Business subjects, Elementary Algebra, Plane Geometry, Trigonometry,
		2 p.m.	Manual subjects, Domestic Art and Science, Agriculture, Higher Algebra, Solid Geometry
Thursday,	Dec. 28	9 a.m.	Astronomy, Botany, Geology, Chemistry, Physiography, Zoology, Physics, Physiology, General Science
		2 p.m.	American Government, History, Economics, Commercial Geography, History of Commerce, Economic History of England, Economic History of the United States, Sociology
Friday,	Dec. 29	9 a.m.	English
		2 p.m.	German, Greek, French, Latin, Scandinavian, Spanish

Spring Quarter

Monday,	Mar. 26	9 a.m.	Business subjects, Elementary Algebra, Plane Geometry, Trigonometry
		2 p.m.	Manual subjects, Domestic Art and Science, Agriculture, Higher Algebra, Solid Geometry
Tuesday,	Mar. 27	9 a.m.	Astronomy, Botany, Geology, Chemistry, Physiography, Zoology, Physics, Physiology, General Science
		2 p.m.	American Government, History, Economics, Commercial Geography, History of Commerce, Economic History of England, Economic History of the United States, Sociology
Wednesday,	Mar. 28	9 a.m.	English
		2 p.m.	German, Greek, French, Latin, Scandinavian, Spanish

SCHEDULE OF CONDITION EXAMINATIONS

Examination Week, September 22-26, 1922

Condition examinations will be offered according to the following schedule and will be open to students in all colleges who have conditions for which no previous opportunity for removal has been scheduled.

In case of any department not listed, inquiry should be made at the office of the dean of the appropriate college.

Friday,	Sept. 22	9 a.m.	Animal Biology, Botany, Physics, Agronomy and Farm Management, Animal Husbandry, Entomology and Economic Zoology, Anatomy
		2 p.m.	Astronomy, Chemistry, Agricultural Biochemistry, Bee Culture, Experimental Engineering, Physiology
Saturday,	Sept. 23	9 a.m.	Economics, Mathematics and Mechanics, History, Education, Agricultural Education, Dairy Husbandry, Farm Engineering, Drainage, Histology
		2 p.m.	French, Spanish, Italian, German, Greek, Latin, Scandinavian, Forestry, Home Economics, Drawing and Descriptive Geometry, Bacteriology
Monday,	Sept. 25	9 a.m.	Comparative Philology, Rhetoric, English, Horticulture, Plant Pathology, Poultry Husbandry, Rural and Agricultural Journalism, Metallurgical subjects, Embryology
		2 p.m.	Political Science, Music, Philosophy, Psychology, Sociology and Anthropology, Social and Civic Work, Soils, Veterinary Medicine, Civil, Electrical, Mechanical Engineering and Architectural subjects, Pathology
Tuesday,	Sept. 26	9 a.m.	Geology and Mineralogy, Pharmacology
		2 p.m.	Mining subjects

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

Similar examinations will also be given by certain of the colleges during the first thirty days of the winter and spring quarters. Announcement of these examinations will appear in the *Official Daily Bulletin.*

No student may take more than one examination to remove a condition.

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, comprising—
- THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS
- THE SCHOOLS OF AGRICULTURE, comprising—
  - THE CENTRAL SCHOOL, UNIVERSITY FARM
  - THE NORTHWEST SCHOOL, CROOKSTON
  - THE WEST CENTRAL SCHOOL, MORRIS
- THE AGRICULTURAL EXPERIMENT STATIONS, comprising—
  - THE STATE EXPERIMENT STATION, UNIVERSITY FARM
  - THE NORTHWEST EXPERIMENT STATION, CROOKSTON
  - THE NORTH CENTRAL EXPERIMENT STATION, GRAND RAPIDS
  - THE WEST CENTRAL EXPERIMENT STATION, MORRIS
  - THE NORTHEAST DEMONSTRATION FARM AND EXPERIMENT STATION, DULUTH
  - THE SOUTHEAST DEMONSTRATION FARM AND EXPERIMENT STATION, WASECA
  - THE FRUIT BREEDING FARM, ZUMBRA HEIGHTS
  - THE STATE TREE STATION, OWATONNA
  - THE FOREST EXPERIMENT STATIONS, ITASCA AND CLOQUET
- THE AGRICULTURAL EXTENSION DIVISION
- THE SHORT COURSES IN AGRICULTURE

THE LAW SCHOOL
THE MEDICAL SCHOOL, including—
- THE SCHOOL OF NURSING

THE COLLEGE OF DENTISTRY, including—
- THE SCHOOL FOR DENTAL HYGIENISTS

THE SCHOOL OF MINES, including—
- MINNESOTA SCHOOL OF MINES EXPERIMENT STATION

THE COLLEGE OF PHARMACY
THE SCHOOL OF CHEMISTRY
THE COLLEGE OF EDUCATION, including—
- THE UNIVERSITY HIGH SCHOOL

THE GRADUATE SCHOOL
THE SCHOOL OF BUSINESS
THE UNIVERSITY EXTENSION SERVICE, comprising—
- GENERAL EXTENSION DIVISION
- AGRICULTURAL EXTENSION DIVISION

THE BOARD OF REGENTS

The Hon. Fred B. Snyder, Minneapolis, President of the Board	1922
Lotus Delta Coffman, Minneapolis - - - - - - The President of the University	*Ex officio*
The Hon. J. A. O. Preus, St. Paul - - - - - - The Governor of the State	*Ex officio*
The Hon. J. M. McConnell, St. Paul - - - - - - Commissioner of Education	*Ex officio*
The Hon. John G. Williams, Duluth - - - - - - -	1921
The Hon. L. E. Potter, Springfield - - - - - - -	1921
The Hon. Charles L. Sommers, St. Paul - - - - - -	1921
The Hon. Pierce Butler, St. Paul - - - - - - -	1922
The Hon. C. W. Glotfelter, Waterville - - - - - - -	1922
The Hon. W. J. Mayo, Rochester - - - - - - - -	1925
The Hon. Milton M. Williams, Minneapolis - - - - -	1925
The Hon. George H. Partridge, Minneapolis - - - - - -	1926

EXECUTIVE OFFICERS

Lotus Delta Coffman, Ph.D., President
John J. Pettijohn, B.A., Assistant to the President
Rodney M. West, B.A., Registrar
Albert J. Lobb, Ph.B., LL.B., University Comptroller
Frank K. Walter, M.A., M.L.S., Librarian
Harold S. Diehl, M.A., M.D., Director of the University Health Service
John B. Johnston, Ph.D., Dean of the College of Science, Literature, and the Arts
Joseph M. Thomas, Ph.D., Assistant Dean of the Senior College, College of Science, Literature, and the Arts
William H. Bussey, Ph.D., Assistant Dean of the Junior College, College of Science, Literature, and the Arts.
Royal R. Shumway, B.A., Assistant Dean of Students' Work, College of Science, Literature, and the Arts
Ora M. Leland, B.S., C.E., Dean of the College of Engineering and Architecture
Walter C. Coffey, M.S., Dean and Director of the Department of Agriculture
Edward M. Freeman, Ph.D., Dean of the College of Agriculture, Forestry, and Home Economics
Everett Fraser, B.A., LL.B., Dean of the Law School
Elias Potter Lyon, Ph.D., M.D., Dean of the Medical School
Alfred Owre, B.A., M.D., C.M., D.M.D., Dean of the College of Dentistry
William R. Appleby, M.A., Dean of the School of Mines
Frederick J. Wulling, Phm.D., LL.M., Dean of the College of Pharmacy
Ora M. Leland, B.S., C.E., Dean of the School of Chemistry

MELVIN E. HAGGERTY, Ph.D., Dean of the College of Education
GUY STANTON FORD, Ph.D., Dean of the Graduate School
GEORGE W. DOWRIE, Ph.D., Dean of the School of Business
RICHARD R. PRICE, M.A., Director of University Extension
JESSIE S. LADD, Dean of Women
EDWARD E. NICHOLSON, M.A., Dean of Student Affairs
ERNEST B. PIERCE, B.A., Field Secretary of the University and Secretary of the General Alumni Association

THE UNIVERSITY OF MINNESOTA

COURSES AND DEGREES

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

Course in Training for State and Federal Administration.—A five-year course leading to the degree of bachelor of arts at the end of the first four years. Students whose programs satisfy the requirements of the Graduate School may receive the degree of master of arts at the end of the fifth year.

Course in Training for Municipal Administration and Engineering.—A five-year course leading to the degree of bachelor of science at the end of the first four years. Students whose programs satisfy the requirements of the Graduate School may receive the degree of master of arts at the end of the fifth year.

Course in Training for Diplomatic and Consular Service.—A five-year course leading to the degree of bachelor of science at the end of the first four years. At the end of the fifth year students whose programs satisfy the requirements of the Graduate School may receive the degree of master of arts.

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

Course in Military Science and Tactics.—The instruction offered in the Reserve Officers' Training Corps is open to students of this college.

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

Combined courses in Arts and Medicine.—A seven-year course leading to the degrees of bachelor of science and doctor of medicine, and an eight-year course leading to the degrees of bachelor of arts and doctor of medicine.

Combined course in Arts and Law.—A six-year course leading to the degrees of bachelor of arts and bachelor of laws.

Combined course in Arts and Dentistry.—A seven-year course leading to the degrees of bachelor of arts and doctor of dental surgery.

Combined course in Arts and Chemistry.—A five-year course leading to the degrees of bachelor of arts and bachelor of science in chemistry.

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

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

Combined courses in Arts and Architecture.—A four-year course in architecture and decoration leading to the degree of bachelor of science. A six-year course in arts and architecture leading to the degree of bachelor of science at the end of four years, bachelor of science in architecture at the end of the fifth year, and master of science in architecture at the end of six years.

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

THE COLLEGE OF ENGINEERING AND ARCHITECTURE offers four-year courses of study in Civil, Mechanical, and Electrical Engineering and Architecture. These courses lead to the degree of bachelor of science in civil, mechanical, or electrical engineering, or architecture.

This college also offers work in the Graduate School leading to the degree of master of science in the appropriate branch of engineering or in architecture.

The professional degree of civil, mechanical, or electrical engineer will be conferred upon those who have received the degree of bachelor of science in civil, mechanical, or electrical engineering, after four years of engineering experience in positions of responsibility, and who complete the equivalent of one additional year's college work in the Graduate School and present a satisfactory thesis. Graduates of the University of Minnesota will be permitted to do the year of graduate study in absentia under the direction of the faculty.

The candidate for the Engineer's degree who holds a Master's degree in engineering must have had four years of engineering experience in positions of responsibility and must also present a satisfactory thesis.

THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS offers four-year courses in Agriculture, Forestry, and Home Economics leading to the degree of bachelor of science. The course in Agriculture comprises general courses in agricultural education, agronomy, farm management,

dairy husbandry, animal husbandry, and horticulture, extension work and special courses in such agricultural sciences as agricultural biochemistry, agricultural economics, entomology, plant pathology, and soils.

The course in Forestry includes courses in technical forestry, commercial lumbering, and wood pulp and distillation products. In addition to the instructional work carried on at University Farm, a portion of the course is given at Itasca State Park, where a well-equipped demonstration forest is available as a laboratory.

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

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

The Schools of Agriculture offer three-year courses of study, giving special training in farm life and home economics, and adapted especially to the needs and opportunities of farm boys and girls. The Central School is located at the University Farm, St. Paul; the Northwest School, at Crookston; and the West Central School, at Morris.

The Dairy Short Courses.—These include a two-week course for experienced butter-makers, a three-week course for cheese-makers, and a one-week course for ice-cream makers during November and December; and during January and February a six-week elementary course in creamery work designed for those who have had but a limited practical experience. These courses offer to young men an opportunity to become more thoroly trained in the science and art of making the largest quantity of butter and cheese of the best possible grade, and teach the fundamentals of ice-cream making and milk plant management.

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

The Short Course for Traction Engineers and Threshermen will be given some time during the winter months. This course, which includes both lecture and laboratory work, deals especially with the care, operation, and adjustment of the separator, and is planned to meet the needs of both experienced threshermen and beginners. Some attention is also given to the operation of both steam and gas engines.

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

The Boys' and Girls' Week Short Course, held early in April, gives instruction in the care and management of farm animals, in the growing of field and garden crops, and in cooking, sewing, garment-making, and canning, with special reference to boys' and girls' club work.

The Experiment Station conducts investigations in the various lines of agriculture with a view to solving problems of interest and importance to the farmers of Minnesota. Secondarily, its work being closely correlated with that of the College of Agriculture, Forestry, and Home Economics, it offers educational and research advantages to undergraduate and graduate students of this college. The main station is located at the University Farm, St. Paul; there are substations at Crookston, Morris, and Grand Rapids; demonstration farms at Waseca and Duluth; and forest experiment stations at Cloquet and Itasca.

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

THE LAW SCHOOL offers a three-year course, leading to the degree of bachelor of laws. The so-called "case system" method of teaching law, approved by the leading law schools of the country, is employed. The school unites with the College of Science, Literature, and the Arts in offering a combined six-year course in Arts and Law, leading to the degrees of bachelor of arts and bachelor of laws, in which the first-year work in law is counted as the equivalent of a year's work toward the academic degree.

THE MEDICAL SCHOOL offers a five-year course, leading to the degree of doctor of medicine, comprising two years in the scientific departments of the school, two years in its practical or clinical departments, and one year in a hospital internship or in advanced laboratory study or research. All students are required to secure the degree of bachelor of science or of bachelor of arts at least four quarters before receiving the degree of doctor of medicine. To this end 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, consisting of (a) two years of work in the College of Science, Literature, and the Arts, including certain required subjects (see page 30), and (b) five years in the Medical School.

2. A combined course, leading to the degrees of bachelor of arts and doctor of medicine, consisting of (a) three years of properly selected work in the College of Science, Literature, and the Arts, including the required subjects noted, and (b) five years in the Medical School.

In both cases the bachelor of medicine degree is granted at the end of four years' acceptable work in the Medical School and before the one year of required internship.

The degree of bachelor of arts or bachelor of science from other recognized universities or colleges will be accepted toward the degree of doctor of medicine.

Graduate and research work is offered to qualified students. (See page 20.)

The School of Nursing is conducted in connection with the Medical School, the University Hospital service, and the Miller Hospital, St. Paul. It offers a three-year course, the first six months occupied in preliminary study, the remaining two and one-half years in hospital and out-patient training, leading to the degree of graduate in nursing. A combined five-year course in Arts and Nursing is offered by the College of Science, Literature, and the Arts and the School of Nursing, leading to the degrees of bachelor of science and graduate in nursing. The first two years and a summer quarter are spent in the Arts College; the third and fourth years in hospital work, and the fifth year in both hospital and class work.

A course in Public Health Nursing, covering two periods of four months each, which may be taken separately or in sequence is conducted by the School of Nursing with the assistance of the departments of Education and Psychology, and a number of social service organizations which, together with the Hennepin County Model Practice Field, provide ample opportunities for field work. A tuition fee of $25 is paid in each four-month period.

The Short Course in Embalming, offered by the General Extension Division with the coöperation of the Medical School, the School of Chemistry, and the State Board of Health, is a three-month course of study, given annually in the winter quarter. On the successful completion of the work a certificate is granted which is accepted by the State Board of Health in lieu of examination for an embalmer's license. A fee of $50 is required.

THE COLLEGE OF DENTISTRY offers a four-year course of study leading to the degree of doctor of dental surgery. This course requires as a prerequisite the completion of one full year of pre-dental work in the College of Science, Literature, and the Arts. It unites with the College of Science, Literature, and the Arts in offering a seven-year course consisting of three years in Arts and four years in Dentistry leading to the degrees of bachelor of arts and doctor of dental surgery, which are conferred at the close of the final year in the College of Dentistry. Professional work in the College of Dentistry is regarded as the counterpart of the major sequence which is required of those who complete the course for the bachelor of arts degree in the College of Science, Literature, and the Arts. The work of the third year is to be elected from courses offered in the Arts College subject to the approval of the dean of the College of Dentistry and the dean of the College of Science, Literature, and the Arts.

The School for Dental Hygienists.—This course consists of two years' work in the University Hospitals and the College of Dentistry, leading to the degree of graduate dental hygienist.

Graduate work is open in certain fields of dentistry to students having a baccalaureate or dental degree. (See page 20.)

Extension courses.—Courses in Prosthesis, Oral Surgery, Crown and Bridge Work, Porcelain Jacket Crowns, Orthodontia, and Dental Mechanics will be conducted by the General Extension Division, for the benefit of dental practitioners. A detailed description of these courses with the

dates of opening and closing may be obtained by addressing the General Extension Division.

THE SCHOOL OF MINES offers three regular four-year courses, namely, Mining Engineering, Mining Engineering (specializing in geology), and Metallurgy, leading to the degrees of engineer of mines, engineer of mines (in geology), and metallurgical engineer, respectively. They are designed to prepare 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 is a regular part of the curriculum and is required of all students who are candidates for degrees.

THE COLLEGE OF PHARMACY offers the following courses: A regular three-year course, leading to the degree of pharmaceutical chemist; a four-year course, leading to the degree of bachelor of science in pharmacy, which includes in addition to the regular three-year course the equivalent of one year in the College of Science, Literature, and the Arts; and two graduate courses, leading respectively to the degrees of master of science in pharmacy and doctor of science in pharmacy, which are open to those who have the degree of bachelor of science in pharmacy, and who have shown exceptional scholarship and ability.

THE SCHOOL OF CHEMISTRY offers three courses. Two of these, the four-year course in Chemistry, leading to the degree of bachelor of science in chemistry, and the five-year course in Arts and Chemistry, leading to the degree of bachelor of arts after four years and of bachelor of science in chemistry at the end of the fifth year, are designed for those who wish to become teachers of chemistry, to take positions as assistants in research, or to hold positions in chemical industries not requiring special engineering training.

The third course is in Chemical Engineering and leads to the degree of bachelor of science in chemical engineering at the end of four years and to the degree of master of science in chemical engineering at the end of the fifth year, which is taken in the Graduate School. It aims to give the student a broad foundation in chemistry, engineering, and allied sciences. The professional degree of chemical engineer will be conferred upon those who have received the degree of bachelor of science in chemical engineering, or its equivalent, when they have completed an additional year's work in the Graduate School, have had four years of practical experience in positions of responsibility in chemical engineering, and have presented a satisfactory thesis based upon their professional work. The Master's degree for work in chemical engineering will be accepted in lieu of the additional year of college work required for the professional degree.

THE COLLEGE OF EDUCATION offers a two-year course, beginning with the junior year, which furnishes 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. It also offers four-year courses in Art Education and Physical Education for Women, beginning with the freshman year. All

these courses lead to the degree of bachelor of science in education. A year of graduate work, at the option of the candidate, leads to the degree of master of arts.

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 insofar as they relate to advanced instruction offered for the second or higher degrees, namely, master of arts, master of science, electrical engineer, mechanical engineer, civil engineer, chemical engineer, and doctor of philosophy. The privileges of this school are in general open to all who have received Bachelor's degrees from reputable colleges and universities, based on courses substantially equivalent to those at this University.

Graduate work in medicine is maintained jointly by the Medical School and the Mayo Foundation for Medical Education and Research (see special bulletin). The degree of bachelor of science (or equivalent) and doctor of medicine and one year of intern service in an acceptable hospital are prerequisites for admission to the clinical departments. Properly qualified students may be admitted to the medical laboratory departments (Anatomy, Physiology, Bacteriology, and Pathology) without the medical degree and internship. A number of fellowships and scholarships are provided for selected students undertaking graduate courses in chosen specialties in medicine (see page 54). These courses cover a period of three years and lead to the degree of master of science or of doctor of philosophy in the various fields.

Graduate work in certain problems related to dentistry is offered to qualified students in the fundamental or laboratory departments mentioned above. Clinical material and opportunities to supplement this research are available from the Dental Clinic, the Medical Dispensary, and the University hospitals.

THE SCHOOL OF BUSINESS aims to give thoro and adequate training to prospective business executives, and to prepare students to analyze business data accurately and to make practical application of the principles involved. The school offers two full years of study, beginning with the junior year, leading to the degree of bachelor of science in business. The course is one of intensive study and specialization in particular branches of business, adapting the student's curriculum to his future plans. The fields include a general course in business, and courses in accounting, agricultural business, banking, merchandising, foreign trade, employment management, commercial organization, and secretarial work.

THE UNIVERSITY SUMMER SESSION is organized for two six-week terms from June to September 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 nine quarter credits in each term, except by special permission.

On the main campus, courses are offered in the colleges of Science, Literature, and the Arts, Education, Engineering and Architecture, and Dentistry, and in the Law, Business, Chemistry, and Graduate schools. The Medical School offers regular courses in the clinical branches.

On the University Farm campus, the College of Agriculture, Forestry, and Home Economics offers courses 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 Library Training School is held at the same time and place under the direction of the commissioner of education. For a special circular of summer work, inquire at the registrar's office.

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

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

The work of the Agricultural Extension Division is indicated on page 17. The General Extension Division conducts evening classes and correspondence courses; provides communities with faculty lectures and lyceum courses of popular lectures, concerts, and entertainments; maintains a municipal reference bureau and a bureau of visual instruction; holds annual short courses in merchandising, dentistry, embalming, banking, citizenship, and social service; offers guidance for the development of community organizations; and gives advice to schools and to other organizations on the selection and production of plays. Bulletins of evening classes and of correspondence and lecture courses may be had upon request. Address the General Extension Division.

THE UNIVERSITY LIBRARY

The University Library comprises all the collections of books belonging to the institution and contains about 370,000 volumes.

A large part of the library is housed in the Library Building on the main campus. Branch libraries are maintained in connection with each of the colleges. There are, in addition, small departmental collections attached to several departments.

A catalog of the entire collection is maintained in the General Library. There are, as well, special catalogs of the libraries of the colleges of Agriculture, Forestry, and Home Economics, Engineering, Law, Medicine, and Mines.

The purpose of the University Library is twofold: (1) to supply the books and references used in connection with the courses of instruction and for outside cultural reading; and (2) to help students to use them with a minimum of time and effort and a maximum of profit.

The *Library Handbook,* copies of which may be had gratis upon application at the library, contains information essential to the proper use of the library. It should be read carefully by every student.

Registration automatically entitles students to the privileges of the library.

The reference librarian and the assistants are at all times ready to aid students in familiarizing themselves with the library and in directing them in the use of the various catalogs and indexes.

THE STUDENT HEALTH SERVICE

A health fee of $2 per quarter is paid by each student of the University for the maintenance of the Students' Health Service. For this fee the student may receive physical examination and the professional services of the staff when needed.

The officers of the Health Service, and the Students' Hospital and Dispensary are located in Pillsbury Hall, first floor. The services of the hospital and dispensary are available at all hours of the day and night. Physicians of the Health Service are in attendance daily. The telephone call is University of Minnesota (Dinsmore 2760), Station 71.

The facilities of the dispensary are such that two hundred students a day can be given attention. The normal capacity of the hospital is twenty-five beds. In emergencies, the capacity can be increased. Ample provisions are made for the isolation of communicable diseases.

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

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

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

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

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

(c) Provision for the care and treatment of such cases of communicable diseases; isolation hospital.

(d) Treatment and professional care of all students who are ill or in need of medical advice or treatment. For extended care by the Health Service, it is necessary that the student enter the Students' Hospital. To this hospital any student may be admitted upon the recommendation of a staff physician. To all patients in the hospital the staff will furnish medical and nursing services.

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

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

3. Education.—Every student in the University is made familiar with the fundamentals of both personal and public hygiene. Through personal conferences on this subject, daily bulletins, exhibits, public lectures, etc., education in hygiene and right living is conducted.

MILITARY SCIENCE AND TACTICS

REQUIRED WORK

All physically fit male students are required to take instruction in military science for three hours each week during the first two undergraduate years of their course. Previous instruction in this subject at other institutions under an officer of the regular army detailed as professor of military science and tactics exempts the student from so much of this work as the length of his prior training justifies in each case. All students taking this course are given the instruction prescribed for the Basic Course, Senior Division, Reserve Officers' Training Corps. No credits are allowed for this work.

ELECTIVE WORK

Any student legally eligible for enrolment who has completed the Basic Course, Senior Division, R.O.T.C., or other military work announced as equivalent thereto, may register for and be enrolled in the Advanced Course, Senior Division, R.O.T.C., provided the professor of military science and tactics and the president of the University, respectively, recommend and approve such enrolment in each case.

Students enrolled in the Advanced Course receive from the government a fixed sum a day as commutation of rations while pursuing this course; they are required to sign an agreement to continue in the course during their time at the University (not to exceed two years), and to attend such summer training camps as are prescribed by the secretary of war, all expense incident to training camp attendance being borne by the government.

Students who pass successfully the Advanced Course are, upon the recommendation of the president of the University and the professor of

military science and tactics, eligible for appointment as reserve officers of the army in the lowest grade of the branch of the service of which they are members.

The Advanced Course embraces five departments: infantry, coast (heavy) artillery, signal corps, medical, and dental corps, in any one of which the student may be enrolled.

Three credits per quarter will be allowed for work in the advanced R.O.T.C. courses with a maximum of 18 quarter credits for the two-year course. The application of these credits toward any degree offered by the University is subject to determination by the college concerned.

DEGREES

The candidate for a degree must complete the requirements for graduation in his course. Any person may undergo, at a suitable time an examination in any subject, and if such person passes in all the studies and exercises of the course, he is entitled to an appropriate degree; provided, however, that at least one year's credit is earned at the University, before such degree is granted, and provided further that the examination, in every case, is held before a committee of the faculty appointed for that purpose. If the term of residence is only one year, that year must be the senior year; and in any case he must spend two quarters of the senior year in residence. This last requirement may be waived under such rules as may be established by each college for such exemption.

For detailed information concerning requirements, see pages 14 to 21; also the bulletin of the appropriate college or school.

THE UNIVERSITY STATE TEACHER'S CERTIFICATE

The University State Teacher's Certificate is granted to graduates of the College of Education. This certificate by state law authorizes students to teach in the public schools of Minnesota for two years from date of issue. After that time, upon satisfactory evidence of the student's successful teaching experience, the certificate may be made permanent by the endorsement of the commissioner of education and the president of the University.

ADMISSION

GENERAL REQUIREMENTS

Admission to the colleges or schools of the University which accept students directly from the high school is either by examination or certificate. The candidate who enters on the latter plan must present a certificate of graduation from an accredited high school or preparatory school and offer fifteen units of high school work so chosen as to include those subjects required by the college or school which he desires to enter. No candidate will be admitted with less than fifteen units. In case the candidate did not have an opportunity to take all the required subjects owing to the fact that they were not offered by the high school, the examiner may, however, authorize substitutions in the list of required subjects to the extent of one unit, unless otherwise stated in the requirements of the individual college or school.

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

All colleges will admit freshman students at the opening of the fall quarter. In addition, freshman students will be admitted at the opening of the winter and spring quarters in the colleges of Science, Literature, and the Arts; Agriculture, Forestry, and Home Economics; and Engineering and Architecture; in the School of Nursing they will be admitted at the opening of the spring quarter. All other students admitted at this time must present credentials of advanced standing from other colleges showing their qualification to continue the work of the winter or spring quarter.

Under List of Entrance Subjects (page 26) is shown the minimum and maximum number of units of any one subject that will be accepted by the various colleges of the University. For a statement of the specific units required in any subject or group, see Requirements of Individual Colleges, pages 27 to 35.

ADMISSION BY EXAMINATION

Entrance examinations are offered at the University during the week preceding the opening of classes in the fall, winter, and spring quarters. 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 the Individual Colleges, pages 27 to 35.) 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 examiner in writing not later than September 1, December 1, or March 1, respectively. See Schedule of Examinations, page 9.

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 below.)

1. Minnesota state high schools or other accredited schools in the state.
2. Schools in any other state accredited by the state university of that state.
3. Minnesota state teachers' colleges and normal schools or teachers' colleges 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 on page 25.

For a list of accredited schools in Minnesota, see pages 37-39.

REGISTRATION

The applicant for admission should request the principal or superintendent to forward to the examiner 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 examiner will notify the applicant with regard to his admission, and the registrar will send directions for registration.

LIST OF ENTRANCE SUBJECTS

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

GROUP A: ENGLISH

English, four units.

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

GROUP B: LANGUAGES

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

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

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—
- European, two units
- 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
Sociology, one-half unit

GROUP D: MATHEMATICS
- Elementary algebra, one unit
- Plane geometry, one unit
- Unified mathematics, two units
- 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
General Science, one unit

GROUP F: VOCATIONAL AND MISCELLANEOUS SUBJECTS

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

* All courses described on pages 14 and 15.

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

2. *Graduates of Minnesota State Teachers' Colleges*

Graduates of the Advanced Graduate Course of a Minnesota state teachers' college are admitted with advanced standing equivalent to one year's credit, and receive the degree of bachelor of arts upon completing in this college 135 credits provided they comply with the usual requirements for graduation. Such students will not be permitted to elect the following courses for credit: Education 1, or Psychology 1-2-3.

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

3. *Unclassed Students*

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

COLLEGE OF ENGINEERING AND ARCHITECTURE

Courses in Civil, Electrical, and Mechanical Engineering and Architecture

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

2. Mathematics, elementary algebra, one unit; plane geometry, one unit; higher algebra, one-half unit; solid geometry, one-half unit (see note).

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

NOTE.—Students desiring to enter this college who have not the specified credits in higher algebra and solid geometry, but who present the full fifteen acceptable units, will be admitted subject to their taking the necessary course or courses for the satisfaction of these requirements during their first quarter, without credit. They must expect, however, to attend the University Summer Session in the following summer in order to obtain the regular third quarter's work in mathematics, or mathematics and drawing. To avoid this irregularity in their courses, students are urged to obtain the required higher algebra and solid geometry in high school or the University Summer Session or Extension Division before entering this college.

For all students who intend to enter the College of Engineering and Architecture it is very desirable that physics as well as chemistry be in-

cluded in the high school course. Students entering the course in Architecture without chemistry must take this subject in the University.

No students will be admitted to this college at the beginning of the winter quarter unless they present the complete entrance requirements including higher algebra and solid geometry. They should attend Summer School the following summer to complete freshman mathematics and drawing.

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Students entering this college should submit their credentials to the enrolment 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.

Prospective students are urged to elect chemistry and physics as a part of their high school course.

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

Schools of Agriculture

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

LAW SCHOOL

Regular Students

Students desiring to enter the Law School must first complete two full years (not less than ninety quarter [sixty semester] credits) of collegiate work in science, literature, and the arts with an honor point for each credit at this or some other university or college of equal rank. In explanation of this requirement it may be noted that on the basis of A, B, C, and D as passing grades, A gives three honor points for each credit; B, two points; C, one point; and D, no point. It is impossible, therefore, for applicants with grades of only C and D to secure admission. (See admission to the College of Science, Literature, and the Arts, page 27.) Such candidates may be admitted upon presenting their credentials to the examiner.

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 faculty of the Law School recommends that prospective law students devote the major portion 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, at 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 seventy-five quarter (fifty semester) credits of academic work may become regular students by complying with the requirements for admission before the beginning of their senior year in the Law School. The additional credits necessary can not be secured while carrying the full course in law.

MEDICAL SCHOOL

On account of the limited capacity of the school, not more than eighty freshmen will be accepted. Applicants will be selected on the basis of scholarship, character, and general fitness. The entire eighty will be chosen early in July. All accepted applicants will receive a bill for a ten-dollar preliminary fee. This must be paid within ten days, in order to hold a place in the limited registration. The above fee will not be returnable should the student fail to enter. Other qualifications being equal, residents of Minnesota will be given preference when the selection of candidates is made.

Applicants for admission must present records covering two years of academic collegiate work, which are defined as including not less than ninety quarter (sixty semester) credits carrying at least an equal number of honor points. In explanation of this requirement it may be noted that on the basis of A, B, C, and D as passing grades, A gives three honor points for each credit; B, two points; C, one point; and D, no point. A student's grade must average C or higher. It is impossible, therefore, for applicants with grades of only C and D to secure admission. Those having a high ratio of honor points to total credits will be given preference.

The pre-medical academic credits must include the following:

1. Rhetoric, nine quarter (six semester) credits. At Minnesota this requirement is met by English 4-5-6.

2. Chemistry, eighteen quarter (twelve semester) credits, including general chemistry, qualitative analysis, and organic chemistry with laboratory work. At Minnesota, Chemistry 4-5 (or 1-2-3), 11, and 31-32 are necessary. Students are advised also to take chemistry in high school and quantitative chemistry in college.*

*Beginning with the fall of 1923-24 a total of 22 quarter (15 semester) credits will be required, including quantitative chemistry.

3. Physics, twelve quarter (eight semester) credits, including proper laboratory work. At Minnesota, Physics 1 and 2, and any two of the following combinations, Physics 21 and 22, 31 and 32, and 41 and 42 meet the requirements. Students are advised to complete them all.

4. Zoology, twelve quarter (eight semester) credits, including proper laboratory work. At Minnesota, Animal Biology 5-6-7 meets this requirement.

Beginning in 1923 an applicant must also average C or better, as determined by the honor point method, on his combined records in biology, chemistry, physics, and rhetoric.

5. Foreign language. Sufficient high school or college training to insure a reading knowledge of French or German medical literature. For French this requirement is fulfilled (a) by passing any two of Courses 8, 9, 10 (Scientific French) at Minnesota or by presenting acceptable credits covering similar work done elsewhere; (b) by passing an examination; the minimum preparation demanded for admission to this examination is fifteen credits of French. For German the language requirement is fulfilled (a) by passing Course 31-32 (Medical German) at Minnesota or by presenting acceptable credits covering similar work done elsewhere; (b) by passing an examination in Scientific German; the minimum preparation for admission to this examination is two years of German.

6. Pre-medical students are advised to secure preparation in some or all of the following subjects: Latin (high school or college), higher mathematics, psychology, sociology, drawing, and comparative anatomy.

Applicants whose pre-medical academic work has been taken elsewhere than at the University of Minnesota must present to the examiner certified credentials of both preparatory and college work, showing subjects, credits, and grades.

The degree of bachelor or doctor of medicine is conferred only upon those who have received the degree of bachelor of arts or bachelor of science from this or some other recognized university or college or who have done work equivalent to that required for such degree in this University. Combined courses offered by the College of Science, Literature, and the Arts and the Medical School lead to these degrees. (See page 17.)

Special Students

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

Unclassed Students

By unclassed students is meant (a) those undergraduate medical students who may be candidates for the bachelor of medicine or doctor of medicine degrees but who on account of deficiencies can not receive legal time credit for attendance, and (b) those undergraduates who are not candidates for a degree of bachelor of medicine or doctor of medicine but who are permitted to register for courses in the School of Medicine.

School of Nursing

Graduation from an approved high school or other preparatory school on the accredited list or equivalent education as determined by examination is a prerequisite for admission. Preference will be given to women of superior preliminary training. Applicants must be not 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 examiner'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.

Students in the School of Nursing receive board, room, and laundry for services rendered in connection with their training.

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

COLLEGE OF DENTISTRY

On account of the limited capacity of the college not more than ninety freshmen can be admitted. Application for admission should be in the examiner's office not later than July 15. Residents of Minnesota will be given prior consideration for vacancies existing at the date of their application. All applications must be accompanied by a ten-dollar preliminary fee, which will be credited toward the first quarter's tuition, or returned if the applicant is not accepted.

Applicants for admission must present one year of collegiate work in science, literature, and the arts, completed at this or some other recognized college or university. (See Admission to the College of Science, Literature, and the Arts, page 27.) High school physics or its equivalent must be completed by candidates before admission to the dental course proper.

The pre-dental academic work must include the following:

1. Rhetoric, fifteen quarter (ten semester) credits. At Minnesota this requirement is met by Rhetoric A-B-C.

2. Biology, twelve quarter (eight semester) credits. At Minnesota this requirement is met by Animal Biology 5-6-7.

3. Chemistry, twelve quarter (eight semester) credits, including general chemistry and qualitative analysis. This requirement is met at Minnesota by Chemistry 4-5 and 11.

4. Shop Practice or Technical Drawing, six quarter (four semester) credits. At Minnesota this requirement is met by Mechanical Engineering 11-12-13, or Drawing and Descriptive Geometry 41-42-43.

Students who can spend two years in the pre-dental work are advised to take the two-year pre-medical course.

Those whose pre-dental work has been taken elsewhere than at the University of Minnesota must present to the examiner certified credentials of both preparatory and college work, showing the subjects completed, credits, and grades.

School for Dental Hygienists

The requirement for admission to the School for Dental Hygienists is graduation from an accredited high school.

SCHOOL OF MINES

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

It is recommended that students who desire to enter this school take higher algebra and solid geometry in high school.

Freshmen will be divided into two classes, as follows:

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

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

COLLEGE OF PHARMACY

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

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

Owing to the limited capacity of this college not more than sixty freshmen can be admitted. Applications for admission should be in the examiner's office not later than August 1, by June 1 if possible.

SCHOOL OF CHEMISTRY

Arts and Chemistry Course (five years)

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

Courses in Chemistry and Chemical Engineering

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

2. Mathematics, elementary algebra, one unit; plane geometry, one unit; higher algebra, one-half unit; solid geometry, one-half unit (see note).

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

NOTE.—Students desiring to enter the School of Chemistry who have not the specified credits in higher algebra and solid geometry, but who present the full fifteen acceptable units, will be admitted subject to their taking the necessary course or courses for the satisfaction of these requirements during the first quarter, and without credit. They must expect, however, to attend the University Summer Session in the following summer in order to obtain the regular third quarter's work in mathematics, or mathematics and drawing. To avoid this irregularity in their courses, students are urged to obtain the required higher algebra and solid geometry in high school or the University Summer Session or Extension Division before entering this school. It is also very desirable that physics and chemistry be included in the high school course; in fact, if chemistry is presented for entrance, the student's work in the first two years will be greatly simplified.

COLLEGE OF EDUCATION

Applicants for admission to this college must present credentials showing the completion of a regular four-year high school course. For all work excepting the courses in Art Education and Physical Education the completion of two full years of college work (not less than ninety quarter credits carrying not less than ninety quarter honor points) in science, literature, and the arts at this or some other college or university of equal rank is required. In explanation of this requirement it may be noted that on the basis of A, B, C, and D as passing grades, A gives three honor points for each credit; B, two points; C, one point; and D, no point. It is impossible, therefore, for applicants with grades of only C and D to secure admission.

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 sixty-three quarter credits and are admitted as unclassed students pending the completion of twenty-seven additional credits.

Graduates of the three-year course in the state teachers' colleges of Minnesota may receive not more than one hundred thirteen quarter credits; credits earned in such three-year normal course shall be applied, in case they are deemed of equivalent merit, in the College of Education, to courses leading to certificates for supervisors in elementary grades, as principals in state graded schools, as teachers in junior high schools, or in normal school departments in high schools; students coming from such

three-year course shall not receive certificates in high school subjects from the University without completing the prescribed courses of the University for such certificates.

SCHOOL OF BUSINESS

Candidates for admission to the degree courses offered by this school must have completed the two-year pre-business course given in the College of Science, Literature, and the Arts, or the College of Agriculture of this University, or its equivalent in some other recognized college or university. (See Admission to the College of Science, Literature, and the Arts, page 27 and the College of Agriculture, page 29.)

Regularly enrolled students in other schools or colleges of the University may be admitted only to those courses in the School of Business which are announced in their respective bulletins.

Permission to enter as special students may be obtained from the dean in case of mature business men and women, provided they are graduates of accredited high schools, with tested executive experience. If later, they decide to become candidates for a degree, such students must satisfy all the requirements for admission to the degree course.

ADMISSION AS UNCLASSED STUDENTS

Only by permission of the faculty of the school or college which he desires to enter, may an applicant be admitted as an unclassed student. A new application must be made each quarter to the committee in charge. No unclassed 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 those offered in this institution. The certified record of courses taken in other institutions must be upon the official blank of the institution granting the certificate and should show:

(a) The subject studied, the catalog course number, and the descriptive title.

(b) The number of weeks and hours a week spent upon each subject.

(c) The value of the course expressed in credits.

(d) The result. The exact grades should be stated, accompanied by an explanation of the marking system employed.

(e) A letter or statement of honorable dismissal.

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

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

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

2. *From Minnesota teachers' colleges*

Graduates of the Advanced Graduate Course of a Minnesota state teachers' college are admitted to the College of Science, Literature, and the Arts with one year (forty-five quarter credits) of advanced standing. Graduates of such advanced courses are admitted to the College of Education with an allowance of ninety quarter credits towards graduation.

Individual graduates of the Advanced Latin Course (five-year) or of the Advanced English Course (five-year) of a Minnesota state teachers' college who, on the basis of maturity and ability, present certificates of special fitness from the president of such college, will be admitted to the College of Science, Literature, and the Arts with forty-five quarter credits of advanced standing. Graduates of such courses are admitted to the College of Education with an allowance of sixty-three quarter credits towards graduation.

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

State teachers' colleges at the following places are recognized: Bemidji, Duluth, Mankato, Moorhead, St. Cloud, Winona.

3. *Junior colleges*

In accordance with the policy of the University to encourage able schools to give one or two years of college work, the University Senate has prescribed conditions under which such work may be recognized for advanced standing. Copies of the standards may be had upon inquiry at the registrar's office. The following schools in Minnesota have complied with the requirements: Concordia College, St. Paul; Hibbing Junior College; Rochester Junior College; St. John's College, Collegeville; Stanley College, Minneapolis; Villa Sancta Scholastica, Duluth; Augsburg Seminary, Minneapolis; St. Benedict's College, St. Joseph; St. Mary's Hall, Faribault; Eveleth Junior College; Winona State Teachers College; Pipestone Junior College; Duluth State Teachers College.

4. *Miscellaneous*

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

LIST OF ACCREDITED PREPARATORY SCHOOLS

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

Ada
Adams
Adrian
Aitkin
Akeley
Albert Lea
Alden
Alexandria
Amboy
Annandale
Anoka
Appleton
Argyle
Arlington
Atwater
Aurora
Austin
Bagley
Barnesville
Belle Plaine
Bemidji
Benson
Bird Island
Biwabik
Blackduck
Blooming Prairie
Blue Earth
Brainerd
Breckenridge
Browns Valley
Buffalo
Buhl
Caledonia
Cambridge
Canby
Cannon Falls
Carlton
Cass Lake
Chaska
Chatfield
Chisholm
Clarkfield
Cleveland
Cloquet
Cokato
Coleraine
  Greenway
  Olcott
Cottonwood
Crookston
Crosby-Ironton
Dassel
Dawson
Deer River
Delano
Delavan
Detroit
Dodge Center
Duluth
  Central
  Denfeld
Eagle Bend
East Grand Forks
Elbow Lake
Elk River
Elmore
Ely
Eveleth
Excelsior
Fairfax
Fairmont
Faribault
Farmington
Fergus Falls
Fertile
Forest Lake
Fosston
Frazee
Fulda
Gaylord
Gilbert
Glencoe
Glenwood
Glyndon
Graceville
Grand Meadow
Grand Rapids
Granite Falls
Hallock
Halstad
Hancock
Harmony
Hastings
Hawley
Hayfield
Hector
Henderson
Herman
Heron Lake
Hibbing
Hinckley
Hopkins

Houston
Howard Lake
Hutchinson
International Falls
Ivanhoe
Jackson
Janesville
Jordan
Kasota
Kasson
Kenyon
Kerkhoven
Lake Benton
Lake City
Lake Crystal
Lake Park
Lakefield
Lamberton
Lanesboro
Le Roy
Le Sueur
Le Sueur Center
Lindstrom-Center City
Litchfield
Little Falls
Long Prairie
Luverne
Lyle
McIntosh
Mabel
Madelia
Madison
Mahnomen
Mankato
Mantorville
Maple Lake
Mapleton
Marshall
Melrose
Milaca
Minneapolis
  Central
  East
  North
  South
  West
Minneota
Montevideo
Montgomery
Monticello
Moorhead
Mora
Morris
Morristown
Morton
Mound
Mountain Iron
Mountain Lake
Nashwauk-Keewatin
New Prague
New Richland
New Ulm
North St. Paul
Northfield
Norwood-Young
  America
Olivia
Ortonville
Osakis
Owatonna
Park Rapids
Paynesville
Pelican Rapids
Perham
Pine City
Pine Island
Pine River
Pipestone
Plainview
Preston
Princeton
Proctor
Red Lake Falls
Red Wing
Redwood Falls
Renville
Rochester
Roseau
Royalton
Rush City
Rushford
St. Charles
St. Cloud
St. Francis
St. James
St. Louis Park
St. Paul
  Central
  Humboldt
  John A. Johnson
  Mechanic Arts
St. Peter
Sandstone
Sauk Centre
Sauk Rapids
Shakopee
Sherburn
Slayton
Sleepy Eye
South St. Paul
Spring Grove
Spring Valley
Springfield
Staples
Stephen
Stewartville
Stillwater
Thief River Falls
Tower
Tracy
Two Harbors
Tyler
Villard
Virginia
Wabasha
Wadena
Walker
Warren
Warroad
Waseca
Waterville
Wayzata
Welcome
Wells
West Concord
Wheaton
White Bear
Willmar
Windom
Winnebago
Winona
Winthrop
Worthington
Zumbrota

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

Collegeville
- St. John's College

Duluth
- Cathedral High School for Boys
- Cathedral High School for Girls
- Villa Sancta Scholastica

Faribault
- Bethlehem Academy
- St. Mary's Hall
- Shattuck Military Academy

Fergus Falls
- Park Region Luther College

Graceville
- St. Mary's Academy

Hutchinson
- Hutchinson Theological Seminary

Minneapolis
- Blake School for Boys
- Northrop Collegiate Institute
- Minnehaha Academy
- Minnesota College
- St. Margaret's Academy
- Stanley Hall

Montevideo
- Windom Institute

Moorhead
- Concordia College

Owatonna
- Pillsbury Academy

Red Wing
- Academy of the Red Wing Seminary

Rochester
- St. John's High School for Girls

St. Joseph
- Convent of St. Benedict

St. Paul
- Bethel Academy
- College of St. Catherine
- Oak Hall (Backus School for Girls)
- St. Joseph Academy
- St. Paul Academy
- St. Thomas College
- Summit School
- Visitation Convent

St. Peter
- Academy, Gustavus Adolphus College

Winnebago
- Parker College

Winona
- Cathedral High School
- Cotter High School
- St. Claire Seminary
- St. Mary's College

DESCRIPTION OF SUBJECTS ACCEPTED FOR ADMISSION

The following statements indicate in a general way the preparation which the University expects in the various subjects accepted for admission. The number of units in parentheses following each subject indicates the maximum credit accepted by any one college of the University and does not mean that all colleges will accept the maximum stated. See pages 27 to 35 for statements of the requirements of the individual colleges.

GROUP A. ENGLISH

(Three or four units)

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

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

I

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

II

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

III

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

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

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

Group 1. The *Old Testament*, comprising at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings, and Daniel, together with the books of Ruth and Esther; the *Odyssey*, with the omission, if desired, of Books I, II, III, IV, V, XV, XVI, XVII; the *Iliad*, with the omission, if desired, of Books XI, XIII, XIV, XV, XVII, XXI; Virgil's *Aeneid*. The *Odyssey*, *Iliad*, and *Aeneid* should be read in English translations of recognized literary excellence.

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

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

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*If not chosen for study under (B).

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 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's *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 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 *Tattler* and the *Spectator* (about 200 pages); Boswell's selection from the *Life of Johnson* (about 200 pages); Franklin's *Autobiography;* Irving's *Sketch Book* (about 200 pages), or *Life of Goldsmith;* Southey's *Life of Nelson;* Lamb's *Essays of Elia* (about 100 pages); Lockhart's *Life of Scott* (about 200 pages); Thackeray's lectures on Swift, Addison, and Steele in the *English Humorists;* Macaulay's *Lord Clive, Warren Hastings, Milton, Addison, Goldsmith, Frederick the Great, Madame d'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 Traveler* and *The Deserted Village;* Pope's *The Rape of the Lock;* a collection of English and Scotch *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, Herve 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.

(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

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

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

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

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

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

Greek

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

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

German (four units)

In the first year the student should acquire:

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

2. A reading vocabulary of a thousand words; facility in expressing his thoughts in simple sentences. As a means to this, from 75 to 100 pages of narrative prose, and some poetry, should be read. Using the subject-matter of the daily reading lesson as a basis, the teacher should, through rapid question and answer, develop the student's power of self-expression in the foreign idiom.

3. The essentials of German grammar, to be taught inductively in conjunction with the oral development of the reading lesson indicated in (2). Toward the last of the year the essentials should be reviewed with accuracy and in detail, with the help

of sentences and free composition. Some free composition, or written answers to questions, should be required frequently after the first weeks.

In the second year the student should:

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

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

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

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

French (four units)

Work of the first year should comprise:

1. Careful drill in pronunciation.
2. Rudiments of grammar, including inflection of the more common irregular verbs.
3. Abundant practice in turning simple English into French.
4. Reading of 100 to 175 pages of simple French, including ample practice in sight translation.
5. Writing of French from dictation.
6. Practice in spoken French. A large part of the instruction should be given in French.

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.
6. Drill in spoken French, in the form of questions and answers and summaries in French material read.

Work of the third and fourth years: If a third and fourth year are offered, they should consist of (1) continued study of grammar, (2) advanced connected prose composition, (3) reading of more difficult French with emphasis on the literary side, and (4) 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 as well as 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

European History (two units).—(a) Ancient and medieval to 1648 A.D. and modern 1648 A.D. to the present.

or

(b) Ancient up to 800 A.D. and medieval and modern 800 A.D. to the present.

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

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

Social Sciences

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

Elementary Economics (one-half unit).—Insofar as is consistent with the lack of maturity of high school students, they should master the principles which underlie the economic system. Such historical and descriptive matter should be employed as will enable the student to apply his principles to actual business situations.

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

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

Sociology (one-half unit).—This course should consist largely of a study of community social problems, but should not neglect the larger and more general social problems of the state and nation, such as immigration, poverty and crime and their treatment, defective classes, family adjustment, conservation, and social measures for health protection. Social theory should be studied in this course insofar as it assists in an understanding of the social problems, but not as an end in itself. Good results should be obtainable by a well-trained teacher from using the community in which the school is located as laboratory material for study, if such work is planned with tact. A good elementary text and supplementary readings are essential.

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 manipulations 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.

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.

Unified Mathematics, First Year (one unit).—A general course in mathematics consisting of the fundamental elements of elementary algebra, informal, experimental, and constructive work in geometry, numerical trigonometry, and a simple introduction to demonstrative geometry. The course should emphasize especially the notion of the dependence of one quantity upon another (the function idea), the formula, the equation, and the graph. Understanding of the laws of the fundamental operations as applied in the solution of simple equations in one and two unknowns; fractions; positive and negative numbers; three simplest cases of factoring; simple work in statistics; graphs; solution of quadratic equations by graph and by factoring, at least; simple work on roots and powers; logarithms and the slide rule, optional. Simple geometric constructions; theorems proved informally to introduce the notion of similar triangles; numerical trigonometry, simple applications using the sine, cosine, and tangent notions. Enough work on simple demonstrative geometry to give an idea of a logical proof.

Unified Mathematics, Second Year (one unit).—This course is intended to follow the one above. It is built up around the fundamental parts of a modern progressive demonstrative geometry course. In this course the student should learn the various methods of formal proof and how to apply them to the most fundamental propositions of plane geometry. Some work on the fundamental ideas of lines and planes in space (solid geometry) should also be given. A study of the fundamental theorems on congruence of triangles and their application; parallelograms; polygons; loci; inequalities; proportional line-segments; circles; areas; similar triangles; trigonometry; ratio and proportion; inscribed and circumscribed polygons; area of a circle. The algebra of this course consists of a continuation of the algebra of the first course. Solution of quadratic equations by completing the square and by formula; graphs of the parabola, circle, ellipse, and hyperbola; solution of simple simultaneous quadratic equations; formal treatment of fractions and formulas; radicals and radical equations of a simple type; factoring and proving trigonometric identities.

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.

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.

Trigonometry (one-half unit).—Definitions and relations of the six trigonometric functions as ratios; circular measurement of angles.

The principal formulas, in particular for the sine, cosine, and tangent of the sum and the difference of two angles, of the double angle and the half angle, the product expressions for the sum or the difference of two sines or of two cosines, etc.; the transformation of trigonometric expressions by means of these formulas.

Solution of trigonometric equations of a simple character.

Theory and use of logarithms (without the introduction of work involving infinite series).

The solution of right and oblique triangles and practical applications.

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 reactions.

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

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

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

Physiology (one-half unit).—A good recent text should be used. Illustrative material, such as skeleton, manikin, and charts, should be available. Single experiments should be carried out, particularly on the students themselves. Practical application and hygiene should be emphasized.

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

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

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

General Science (one unit).—The course should consist of an elementary study of the applications of science to the affairs of the everyday life. Such topics as atmosphere and the weather, house-heating and ventilation, foods, water supply, hygiene, and disease preventions are types of the topics which should make up the course. It is not intended that the course should be organized like the special science and it should not be organized with the idea of preparing students for work in the special sciences. The justification of the course must be in terms of its own intrinsic value as a training for life. This point of view is expressed in most of the late textbooks on general science.

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.

EXPENSES

FEES

The University year, extending from October to June, is divided into three terms called quarters. On the specified dates (see Calendar p. 7) prior to the opening of each quarter, the following fees are due from each student: (a) tuition, (b) incidental, and (c) such special fees and deposits as may be required.

Payment of fees can not be deferred. Special attention is called to the paragraph on Penalty Fees (page 49) for further information on late registration and late payment of fees.

TUITION FEE

School or College	Quarter Fee		Credit Hour Fee*	
	Resident	Non-resident	Resi-dent	Non-resident
College of Science, Literature, and the Arts.	$20.00	$30.00	$1.75	$2.50
College of Engineering and Architecture.....	30.00	40.00	2.50	3.25
College of Agriculture, Forestry, and Home Economics	20.00	30.00	1.50	2.25
Law School	30.00	40.00	2.75	3.75
Medical School	60.00	70.00	†2.50	†3.00
School of Nursing (preliminary course)	25.00	25.00		
Public Health Nursing (four-month period)	25.00	25.00		
College of Dentistry.....	60.00	70.00	†2.50	†3.00
Dental Hygienists	35.00	35.00		
School of Mines.....	30.00	40.00	2.50	3.25
College of Pharmacy.....	30.00	40.00	†1.25	†1.75
School of Chemistry.....	30.00	40.00	2.50	3.25
College of Education.....	20.00	30.00	1.75	2.50
Graduate School	‡10.00	‡10.00	‡1.00	‡1.00
School of Business.....	30.00	40.00	2.75	3.75

* Students carrying less than the complete schedule of work may pay fees on a credit hour basis.

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

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

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.§

§ 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 th second.

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.

This is not to be interpreted as applying to students in such combination courses as Arts and Medicine, Arts and Dentistry, Arts and Business, etc., provided such students pay regular quarter fees for the full period of residence in the higher fee college.

INCIDENTAL FEES

Minnesota Union membership (required of men).....$1.00 a quarter
Shevlin Hall fee (required of women)..... 1.00 a quarter
Health fee (required of everyone)..... 2.00 a quarter..

DEPOSIT FEES

General deposit.—At the student's first registration each year a deposit fee of five dollars ($5) (Medicine, Dentistry, and Pharmacy, ten dollars) is required of every student to cover the following charges:

Rental of post-office box, University post-office (required of all).....$0.20 a quarter
Locker rental.....$0.75 to 1.50 a year
Locker key deposit.....$0.25

Case book deposit (Law School), laboratory breakages, library fines, or damage to University property.

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, an additional fee of five dollars ($5) will be required.

Military deposit.—Military deposit (required of all students taking military drill).....$10.00

Laboratory deposit.—A laboratory deposit of five dollars ($5) is also required of students registered for courses in chemistry to cover the cost of materials. The unused balance will be returned at the end of the course.

SPECIAL FEES

Music fee (in addition to tuition for those electing music)
Instrumental and vocal (one lesson a week).....$25.00
Instrumental and vocal (two lessons a week).....$45.00
Gymnasium fee (required of women taking three-hour gymnasium courses).....$2.50 a quarter
Gymnasium fee (required of women taking two-hour gymnasium courses).....$2.00 a quarter
(Maximum charge for one quarter is $3.50)

The following special items may be included:

Condition examination.....$1.00

Special examination for removal of condition, at other than the set time* $5.00

Examination on subjects taken out of class*.....$5.00
(No fee for such examination on first entering the University, if taken within the first six weeks.)

Large diploma fee: any graduate may receive the large diploma on surrender of the standard diploma and payment of the special fee of $5.00

Duplicate transcript of record: one official transcript of record will be issued to each student free of charge. Each additional transcript will be issued only on payment of.....$1.00

PENALTY FEES

Registration penalties.—A penalty fee for late registration, late change of registration, or late payment of fees shall be two dollars ($2) and one dollar ($1) additional for each day of delay after classes begin, provided that no student shall pay more than twelve dollars ($12) of penalty in any given quarter.

Library fines.—All overnight books taken from the "Reserves" must be returned at 8:30 the following morning. If not returned at that hour a fine of twenty-five cents will be imposed, and an additional ten cents will be charged for every hour or fraction of an hour thereafter that the book is retained.

Books issued during the day for reading-room use must be returned within two hours. If not returned promptly a fine of twenty-five cents for the first hour and ten cents additional for every hour or fraction of an hour thereafter that the book is overdue, will be charged. The two-hour limit will not be enforced between 6 p.m. and 10 p.m.

REFUNDS

Tuition.—Students who cancel their registration before the close of any quarter are entitled to refunds of the tuition fee on the following basis:

Period of Attendance	Percentage of Refund
None	100
Two days to one week	90
One week to two weeks	80
Two weeks to three weeks	70
Three weeks to four weeks	60
Four weeks to five weeks	50
Five weeks to six weeks	40

No student who has been in attendance more than one half of the quarter shall receive any refund of tuition.

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

Locker rental.—Full rental fee for lockers may be refunded during the first two weeks of a quarter. After that time no deduction is made.

Health fee.—A new student withdrawing from the University within a period of ten days after enrolment shall receive a refund of $1 of the health fee. No health fee refundment for any student will be made after a period of ten days from date of registration.

LIVING EXPENSES

BOARD AND ROOM

Women

Sanford Hall.—Sanford Hall, the one dormitory for women, accommodates two hundred fourteen students, about one third of whom may be freshmen. There are chaperons and a house nurse to look after the welfare, comfort, and health of the students who live at the hall. The charge for room and board is three hundred thirty dollars ($330) for the University year. Many more students apply for admittance into Sanford than can be accommodated and there is always a large waiting list. Usually, all the rooms are taken by June 1 of each year.

Communications requesting further information and applications for admittance should be addressed to Mrs. Ora C. Gayle, house director, Sanford Hall.

Coöperative cottages.—Three coöperative cottages, each in charge of a chaperon, offer comfortable homes for about forty-two women. One cottage, the Elizabeth Northrop, is for the exclusive use of women medical students. By assisting with the work of the houses, the students are able to keep expenses under thirty dollars per month. In assigning students to these cottages, preference is given to women earning a part of their expenses. These rooms are all engaged at the present time. Occasionally a vacancy occurs. Application may be made to the dean of women.

Home management houses.—Two residences for women, located near the Agricultural College campus, are maintained by the Division of Home Economics, furnishing accommodations for a small number of students. The charge is ninety dollars ($90) for each quarter, payable in advance. This sum covers the cost of living in the houses with the exception of luncheons for the first five days of the week. Applications should be sent to the chief of the Division of Home Economics, University Farm, St. Paul. A deposit fee of ten dollars ($10) is required when a room is reserved.

Rooming houses.—About one hundred seventy-five houses are approved by the University as residences for women. Attention is called to the ruling of the Board of Regents that women students are not allowed to reside in any house which is not on the approved list except by special arrangement with the dean of women. Women students do not reside in any house where men are taken as roomers. All women students should bring at least three sheets, two pillow cases, and towels, all to be marked with the full name of owner. No electric light stronger than forty watt is to be allowed in a

student's room. No electric appliances are to be used except by permission of the householder. Room rent varies from eight ($8) to fifteen dollars ($15) a month for each student; board at the present time is from five ($5) to eight dollars ($8) a week.

Two meals on the cafeteria plan are served at Shevlin Hall daily, with the exception of Sunday.

For further information and lists of addresses, application may be made to Mrs. M. E. Staples, head of Housing Bureau, Shevlin Hall.

Men

A list of approved boarding and rooming houses may be had upon request at the manager's office of the Minnesota Union. Good double rooms for two men can be obtained within easy walking distance of the campus for from eighteen ($18) to thirty dollars ($30) per month. Good single rooms rent for from twelve ($12) to eighteen dollars ($18) per month. Board at the present time varies from five ($5) to eight dollars ($8) per week.

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 (1921-22) the average price paid for breakfast was sixteen cents ($.16); for luncheon and dinner, twenty-eight cents ($.28) each.

SELF-SUPPORT

The Employment Bureau is maintained for the purpose of assisting both men and women 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 many students, with the aid of the money saved during the summer, are making all of their college expenses. Some are able to make their expenses during the college year, but this can be done only by students of unusual force and adaptability, or with exceptional opportunities. The majority of students must meet stern competition; must live economically; must guard their 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. Prospective students should have at least $150 or the equivalent in addition to tuition fees; and then it will be necessary for them to live very economically. Before they can place themselves in a self-supporting position they may have to try again and again, and meanwhile their 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, stenographers, bookkeepers, cashiers, salesmen, solicitors, telegraph and telephone operators, teachers, tutors,

mechanics, musicians, waitresses and waiters, domestic workers, laborers, janitors, and in many other capacities. Considerable work can be secured within walking distance of the campus.

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

Applicants should also bear in mind that during the opening week of school there are several hundred students who apply at the Employment Bureau for work. It is manifestly impossible to place all of these students as soon as they apply and many students have to wait for a few days or even weeks before they can secure work. Those students who are not fortunate enough to be placed at once should not be discouraged but should keep in touch with the bureau so that they will be available when there is work.

It usually is not advisable for a student to make a sacrifice to come to the city before the opening of the school year in hopes that he can get a position before the other students arrive because as a rule most of the work for self-supporting students is created by the presence of the other students on the campus. Therefore, until the other students are here there are very few part-time jobs available.

Those who find themselves without funds at the beginning of the college year could 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 could 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.

GENERAL EXPENSES—ESTIMATED

The following table gives an estimate of the expenses of the average student during his first year in college. The different columns give estimates for the different colleges. This estimate does not include expenses for clothing, railroad fare, and vacations.

ESTIMATED EXPENSES OF THE ORDINARY STUDENT DURING HIS FIRST YEAR IN COLLEGE

	Academic Agriculture, Forestry, Home Econ., Education	Mines Business Chemistry Pharmacy	Law	Eng. and Arch.	Dentistry	Medicine
Health fee	$ 6.00	$ 6.00	$ 6.00	$ 6.00	$ 6.00	$ 6.00
Minn. Union or Shevlin Hall fee	3.00	3.00	3.00	3.00	3.00	3.00
*Deposit fee	5.00	5.00	5.00	5.00	10.00	10.00
Gym. suit (approx.)	8.00	8.00	8.00	8.00	8.00	8.00
Laundry	36.00	36.00	36.00	36.00	36.00	36.00
Room rent	85.00	85.00	85.00	85.00	85.00	85.00
Board	225.00	225.00	225.00	225.00	225.00	225.00
Tuition	60.00	90.00	90.00	90.00	180.00	180.00
†Incidentals	200.00	200.00	200.00	200.00	200.00	200.00
Books and Instrum'ts	25.00	25.00	35.00	60.00	160.00	35.00
Total	$653.00	$683.00	$693.00	$718.00	$913.00	$788.00

* For students taking military drill, an additional deposit fee of ten dollars is required.

†An additional tuition fee of ten dollars per quarter is charged all students who are not residents of the state of Minnesota.

By reducing the amount spent for incidentals and by obtaining cheaper board and room many students will be able to live for less than the amount estimated in the above table. Likewise, other students will pay more for board, room, and incidentals, and will not be able to live for the amounts estimated in the above table. Below we give an estimate of the minimum, average, and liberal expenses of the freshman student during the college year. To live within the minimum amount a student must forego all luxuries and economize in every way possible. This estimate does not include expenses for clothing, railroad fare, and vacations.

	Minimum	Average	Liberal
Academic, Agriculture, Forestry, and Home Economics, and Education	$446.00	$653.00	$ 917.00
Mines, Business, Chemistry, and Pharmacy	476.00	683.00	947.00
Law	486.00	693.00	962.00
Engineering and Architecture	506.00	718.00	992.00
Dentistry	701.00	913.00	1,187.00
Medicine	581.00	788.00	1,062.00

SCHOLARSHIPS, LOANS, AND PRIZES

GRADUATE FELLOWSHIPS AND SCHOLARSHIPS

The Shevlin Fellowships

Four annual Shevlin fellowships of $500 each are open to graduates of any acceptable college or university, one each in the colleges of Agriculture, Chemistry, Medicine, and Science, Literature, and the Arts respectively. Applications for these fellowships must be made on or before March 1. Blank applications can be obtained from the dean of the Graduate School.

The Class of 1890 Fellowship

As a gift of the class of 1890 the annual income from the sum of $2,500 is open to a graduate of the College of Science, Literature, and the Arts or the College of Engineering and Architecture of the University of Minnesota who has shown distinguished ability and initiative as a student and who desires to make further preparation for public service.

The Albert Howard Scholarship

This scholarship of $120 a year is awarded to graduates of the College of Science, Literature, and the Arts of the University of Minnesota.

United States Radiator Corporation Scholarship

A scholarship of $500 is given by the United States Radiator Corporation for special research work in heating. It is available to graduate students in engineering who have taken work in heating and ventilating, and is given for research work in these lines. The holder of this scholarship submits a thesis, and the approval of his work comes under the College of Engineering and Architecture.

The DuPont Fellowship in Chemistry

This fellowship, established by E. I. DuPont de Nemours and Company, yields $750 annually. The holder devotes his entire time to graduate study and is not required to render any service to the University.

The Northern Fire Apparatus Company Fellowship

The Northern Fire Apparatus Company of Minneapolis has provided this fellowship in the College of Engineering and Architecture. It amounts to $750 and is devoted to research relating to pumping machinery.

Teaching Fellowships, Assistantships, and Scholarships

The following fellowships, assistantships, and scholarships, are open to graduates of any acceptable college or university. They carry stipends ranging from $225 to $1,200 with remission of tuition in the Graduate School. Applications may be made through the dean of the Graduate School on or before March 15.

Agriculture	16 assistants
Animal Biology	2 teaching fellows 8 assistants 2 scholars
Anthropology	1 assistant 1 scholar
Astronomy	1 scholar
Botany	6 teaching fellows
Chemistry	22 assistants
Comparative Philology	1 scholar
Economics	2 teaching fellows 2 scholars
Education	4 assistants 1 scholar
Engineering, Electrical	2 teaching fellows 1 assistant
English	1 assistant 21 scholars
Geology and Mineralogy	2 scholars
German	3 teaching fellows 2 scholars
History	5 teaching fellows 2 assistants 2 scholars
Mathematics	1 teaching fellow 2 assistants 1 scholar
*Medicine and Surgery:	
(1) Medical School	16 fellows 12 assistants 5 scholars
(2) Mayo Foundation	107 fellows
Philosophy	1 scholar
Physics	4 teaching fellows 10 assistants
Political Science	3 scholars
Psychology	6 teaching fellows 1 scholar
Romance Languages	4 teaching fellows 1 scholar
Scandinavian	1 scholar
Sociology and Anthropology	1 assistant 2 scholars*

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

UNDERGRADUATE SCHOLARSHIPS

The Moses Marston Scholarship in English

This scholarship, the annual income from a fund of $1,000, is to be used to further English study, and 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. Further information may be had from the office of the School of Business. Applications must be in the hands of the dean of this school by March 1.

Minnesota State Pharmaceutical Association Scholarship

A scholarship amounting to $90 is awarded annually by the Minnesota State Pharmaceutical Association to the student, a citizen of the United States and a resident of Minnesota for at least five years, who has earned the highest general rating in the work of the second year of the regular course in the College of Pharmacy. If such student should discontinue attendance at the college, the said sum is to be awarded to the student next highest in standing who meets the other requirements.

The Fairchild Scholarship

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

The Lions Club Scholarship

The Lions Club offers an annual scholarship amounting to $100 which is available for a student in the course in Americanization Training.

The St. Paul College Club Scholarships

The St. Paul College Club offers annually six scholarships of $150 each to women students. Applications may be made to the dean of women before May 1.

The Minneapolis College Women's Club Scholarship

The Minneapolis College Women's Club offers annually four scholarships of $150 each, to be awarded to women in the junior or senior class. Applications may be made to the dean of women before May 1.

The W. S. G. A. Scholarship

The Women's Self-Government Association of the University offers annually four scholarships of $100 each, to be awarded to women of the junior or senior class. Applications may be made to the dean of women before May 1.

The Faculty Women's Club Scholarship

The Student Section of the Faculty Women's Club offers annually a scholarship of $150, to be awarded to some woman student. Applications may be made to the dean of women before May 1.

The Woman's Club Scholarship

The Arts and Letters Section of the Woman's Club of Minneapolis offers annually a scholarship of $100, to be awarded to a woman student, preferably in the College of Science, Literature, and the Arts. Applications may be made to the dean of women before May 1.

The Nina Morais Cohen Scholarship

The Nina Morais Cohen Scholarship of $100 is awarded annually to a woman student of Jewish descent. Applications may be made to the dean of women before May 1.

The George H. Partridge Scholarships

Through the generosity of Mr. George H. Partridge five scholarships of $100 each are available annually for young women of high scholarship and fine character. These scholarships are awarded by selection without special application. Fuller particulars may be had from the dean of women.

The Mrs. Elbert L. Carpenter Scholarship

Through the generosity of Mrs. Elbert L. Carpenter, a scholarship of $100 annually, is available for a young woman of high scholarship and fine character. This scholarship is awarded by selection without special application. Fuller particulars may be had from the dean of women.

The Mrs. G. C. Christian Scholarship

Through the generosity of Mrs. G. C. Christian a scholarship, amounting to $100 annually, is available for young women of high scholarship and fine character. This scholarship is awarded by selection without special application. Fuller particulars may be had from the dean of women.

The Mrs. George P. Douglas Scholarship

Through the generosity of Mrs. George P. Douglas, a scholarship amounting to $100 annually is available for young women of high scholarship and fine character. This scholarship is awarded by selection without special application. Fuller particulars may be had from the dean of women.

The Argosy Club Scholarship

The Argosy Club offers annually a scholarship of $100 which is awarded to a woman student in the course in Americanization Training.

The Pathfinder Club Scholarship

The Pathfinder Club offers annually a scholarship of $50 which is awarded to a woman student in the course in Americanization Training.

The Get Together Club Scholarship

The Get Together Club offers two scholarships of $100 each, which are available to students of the Division of Home Economics. In awarding them, the character, the scholarship, and the need of the applicant will be considered. Preference will be given to students in the junior and senior classes. Applications for these scholarships may be made to the chief of the Division of Home Economics.

The Phi Upsilon Omicron Scholarship in Home Economics

The Twin City chapter of Phi Upsilon Omicron offers a scholarship of $50, which is available to students of the Division of Home Economics. Any student in the division will be eligible but preference will be given to freshmen and sophomores. The award will be in the hands of a faculty committee; applications should be made to the chief of the Division of Home Economics.

Sharples Prize Scholarship

A senior scholarship for women in the College of Agriculture, Forestry, and Home Economics (both graduate and undergraduate) who have completed eight quarters, or five semesters, work toward graduation. The amount of the scholarship is $500 contributed by the Sharples Separator Company of West Chester, Pennsylvania. Selection is made on character, scholarship, and special training.

Caleb Dorr College Scholarships

Contributed by the late Caleb Dorr, of Minneapolis. A number of scholarships of approximately $150 each, are given as "rewards of industry and attainment" to students in the College of Agriculture, Forestry, and Home Economics. Nine scholarships were granted in 1921-22. Character, scholarship, and public service are bases for awards. The faculty committee may prescribe additional bases when these seem desirable.

Caleb Dorr Research Fellowships

The late Caleb Dorr, of Minneapolis, has caused to be set aside $20,000, the income of which is to be devoted toward "establishing and maintaining research fellowships in the Department of Agriculture." No definite allotment has yet been made, but the fellowships will probably be approximately $500 each. Four awards, of $500 each, were made in the year 1921-22. For the basis of selection and for the number of fellowships available in 1922-23, consult the dean of the College of Agriculture, Forestry, and Home Economics.

School of Music Scholarship

The School of Music offers for the year 1922-23 a number of scholarships. In awarding these, the character, scholarship, and the needs of the applicants will be considered. Application may be made to Mr. Carlyle Scott.

LOAN FUNDS

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

The Faculty Women's Club Emergency Fund

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

The Gilfillan Trust Fund

The annual income from this fund of $50,000, established by Judge John B. Gilfillan of Minneapolis, is available as a loan to worthy students of the University who are residents of Minnesota.

The Elliot Trust Fund

The annual income from this fund of $5,000, established by the will of the late Mrs. Mary H. Elliot, is loaned without interest to 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 the profession will be taken into consideration.

The Ludden Estate Loan Fund

The annual income from this fund of approximately $10,000, established by the will of the late John D. Ludden, of St. Paul, is available for loans to any student of the University of Minnesota.

The Ludden Real Estate Loan Fund

An annual income of $3,000, derived from real estate willed to the University by the late John D. Ludden, of St. Paul, is available for loans to any student of the University of Minnesota.

The Loan Fund for Women Students of the University

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

The Minneapolis Colony of New England Women Loan Scholarship

A loan scholarship of $100 is available annually for a woman student of New England birth or ancestry who is a member of the junior or senior class. Applications, accompanied by testimonials, may be made to the dean of women before May 1.

The Howard W. Baker Fund

By the will of Mr. Howard W. Baker, who died December 30, 1919, the University has received securities valued at approximately $40,000, the income of which is to be used for the Department of Surgery.

The Alumnae Club Loan Fund

The Alumnae Club has established a small loan fund to be used for assisting women students. Applications may be made to the dean of women at any time.

The Minneapolis College Women's Club Loan Fund

The College Women's Club of Minneapolis has established a small loan fund to be used for assisting women students. Applications may be made to the dean of women at any time.

St. Paul Alumnae Loan Fund

The Alumnae of St. Paul have established a small loan fund to be used for assisting women students. Applications may be made to the dean of women at any time.

The P. E. O. Loan Fund

The P. E. O. organization has a loan fund available for the use of women students. Applications may be made to the dean of women at any time.

The Minnesota Federation of Women's Clubs Loan Scholarships

The Minnesota Federation of Women's clubs has charge of three loan scholarships which provide money to be loaned to young women who are residents of Minnesota, the sum borrowed not to exceed $250. These loan scholarships are as follows:

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

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

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

Before making a request for these loans applicants should obtain consent of parents or guardians. Applications, accompanied by testimonials, may be made to the dean of women before May 1.

The Duluth Branch of the Association of Collegiate Alumnae Loan Scholarship

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

The Ludden Trust Fund

The income from $10,000, a gift of the late John D. Ludden, of St. Paul, is available for loans to students in the Department of Agriculture. Application blanks may be obtained from the dean of the Department of Agriculture.

Caleb Dorr Loan Fund

A loan fund open to students in the College of Agriculture, Forestry, and Home Economics, contributed by the late Caleb Dorr, of Minneapolis. The amount is variable and the conditions of the loan are similar to other loan funds.

Students' Trust Funds

The class of 1902 and the class of 1916 each has established a fund of $100 which is available for temporary loans to deserving students who are not below the junior class in the School of Agriculture. Applications may be made to the principal of the school.

The Home Economics Self-Government Association Loan Fund

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

PRIZES

The John S. Pillsbury Prize

Three prizes of $100, $50, and $25 respectively, are awarded annually to the winners of the first three places in the Pillsbury Oratorical Contest. The winner of the first prize becomes the representative of the University in the annual contest of the Northern Oratorical League.

The Frank H. Peavey Prize

This prize of $100 is divided equally among the members of the team winning the annual freshman-sophomore debate.

The Freshman-Sophomore Oratorical Contest

Three prizes of $50, $30, and $20 are awarded annually to the winners of the three first places in the freshman-sophomore oratorical contest.

The Frank O. Lowden Prize

The annual income from $3,000 is given as two prizes of $100 and $50 to the winners of first and second places in the contest of the Northern Oratorical League. The members of this league are the University of Michigan, Northwestern University, the University of Wisconsin, the University of Iowa, the University of Illinois, and the University of Minnesota.

The Alumni Weekly Gold Medal

This medal is awarded annually on the recommendation of the faculty members of the Senate Committee on Debate and Oratory to that member of the graduating class who has made the best record in public speaking during his college course. In the absence of a suitable candidate, the committee may withhold the award.

The '89 Memorial Prize in History

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

The Journal Prizes in History

Mr. H. V. Jones, of the *Minneapolis Journal,* offers each year a first prize of $50 and a second prize of $25 for the two best papers in history written by undergraduates. Literary form will be taken into prominent consideration. Papers must be submitted before May 17.

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 1926.

Harris Political Science Prizes

Two prizes of $150 and $100 are given annually by Professor N. D. Harris, of Evanston, Illinois, to the writers of the two best essays upon certain specified subjects in the fields of state and local government, foreign politics, or foreign relations. The contest is open to undergraduate men in Indiana, Illinois, Minnesota, Iowa, Michigan, and Wisconsin.

The Menorah Prize

The Intercollegiate Menorah Association, through the generosity of Mr. Arthur M. Harris, of Minneapolis, offers an annual prize of $100 for the best paper written on any subject in history, literature, religion, philosophy, or sociology relating to Jews or Judaism, to be approved by a faculty committee. The prize is open to any student 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 degree of bachelor of laws.

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 and Architecture 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.

The American Institute of Architects' Medal

This medal is awarded annually by the American Institute of Architects to the senior in each of the leading architectural colleges of the United States who has the highest scholastic standing throughout his course.

The Conference Medal

The Conference Medal is awarded each year by the Intercollegiate Conference Athletic Association to the man, graduating in the senior class of each conference university, who, through a course of four scholastic years' residence in the same university, has the highest degree of achievement in his athletic, as well as in his scholastic, work.

The Emil Geist Prize in Surgery

Dr. Emil Geist, associate professor of orthopedic surgery, contributes $220 annually as a prize for original work in anatomy.

ORGANIZATIONS AND PUBLICATIONS

SELF-GOVERNMENT ORGANIZATIONS

The Minnesota Union was organized in the spring of 1908 "to promote the best interest 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 quarter, payable at the time of registration. The legislature gave the Chemistry Building for the use of the Union and appropriated $17,500 for remodeling.

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

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

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

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

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

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

MISCELLANEOUS ORGANIZATIONS

There are at the University more than two hundred student organizations representing religious, ethical, literary, scientific, dramatic, athletic, social, and other activities.

PUBLICATIONS

The Bulletin of the University of Minnesota includes the reports of the president and of the Board of Regents, the annual register, the bulletin of general information, the annual announcements of the individual colleges of the University, announcements of special courses of instruction, reports of University officers, etc.

Research Publications of the University of Minnesota contain reports of original investigations made by members of the University. The several series offer the opportunity for the publication of comprehensive monographs and of papers of special importance to the people of the state. The following series are issued: Bibliographical Series, Studies in the Social Sciences, Studies in Engineering, Studies in the Biological Sciences, Studies in Language and Literature, Current Problems.

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

Minnesota Law Review.—A legal magazine published monthly, December to June inclusive, by the faculty and students of the Law School.

School of Mines Experiment Station Bulletins contain reports of results of investigations conducted by the State Mines 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, of Northeastern, and of Southern Minnesota; Preliminary Report on the Clays and Shales of Minnesota, Geology and Ore Deposits of the Cuyuna Iron Range, and Peat Deposits in Minnesota; Report on the Magnetite Deposits of the Eastern Mesabi Range.*

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

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

Lists with prices of preceding publications will be furnished by the University 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 semimonthly clip-sheet containing brief instructive articles, designed for reprinting by the newspapers of the state.

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

The Daily Bulletin is the official organ of the administration. It contains announcements of meetings of regents, of faculties, of committees, and notices of importance to every department of the University.

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 Minnesota Farm Review is a weekly operated under the direction of a committee representing the faculty, the alumni, and the students of the Department of Agriculture, and edited by the Division of Publications and Journalism, as a laboratory for students in journalism.

The Gopher, the junior annual, is a book published annually by the junior class of the University.

The School of Forestry Annual is a book published annually by the students of the Forestry Division.

The Technolog is issued once a month by the Association of Engineering Students. It is devoted to the publication of articles upon engineering subjects.

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

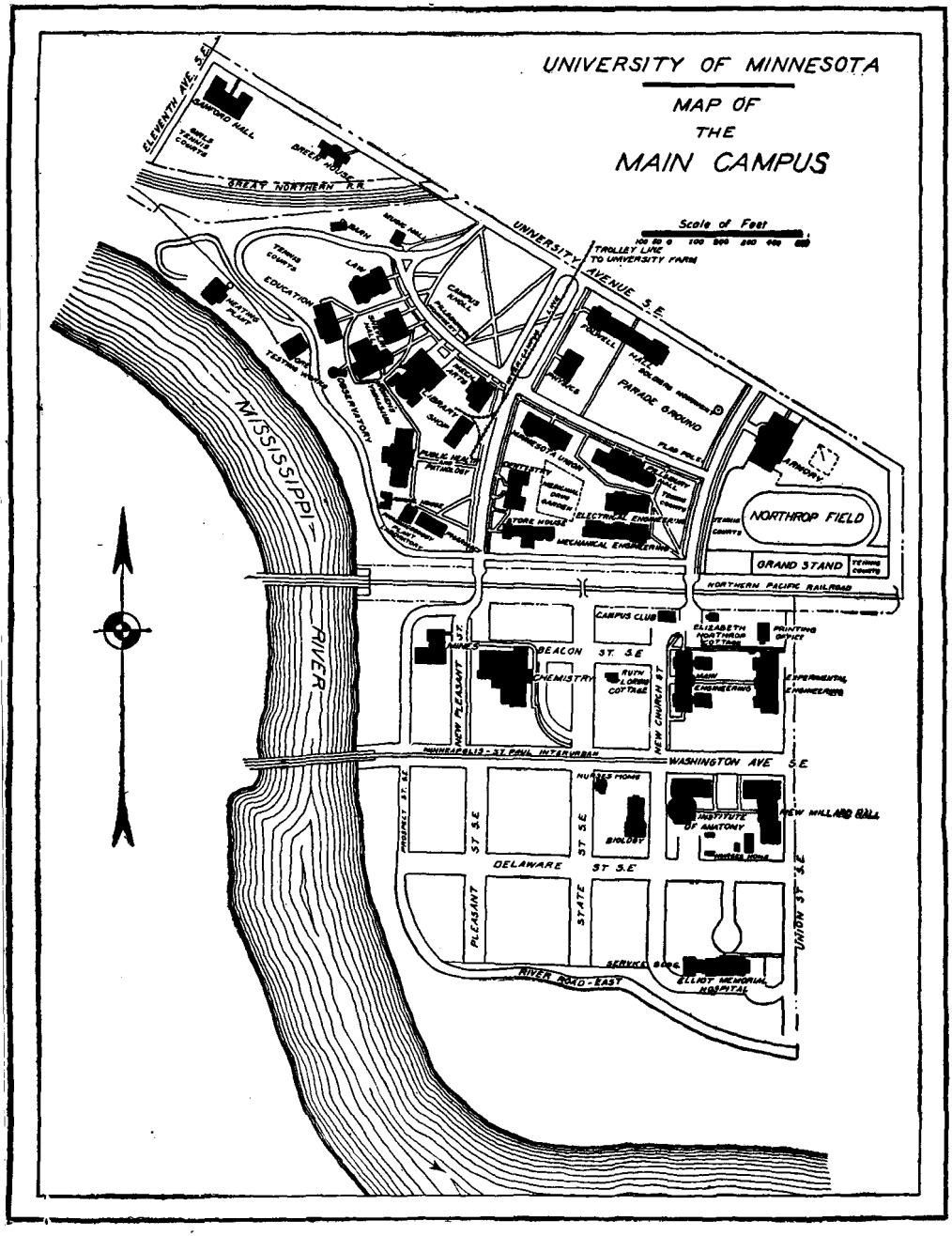
The Minnesota Alumni Weekly is issued each Monday during the University year. It is published in the interests of the alumni and the University.

INDEX

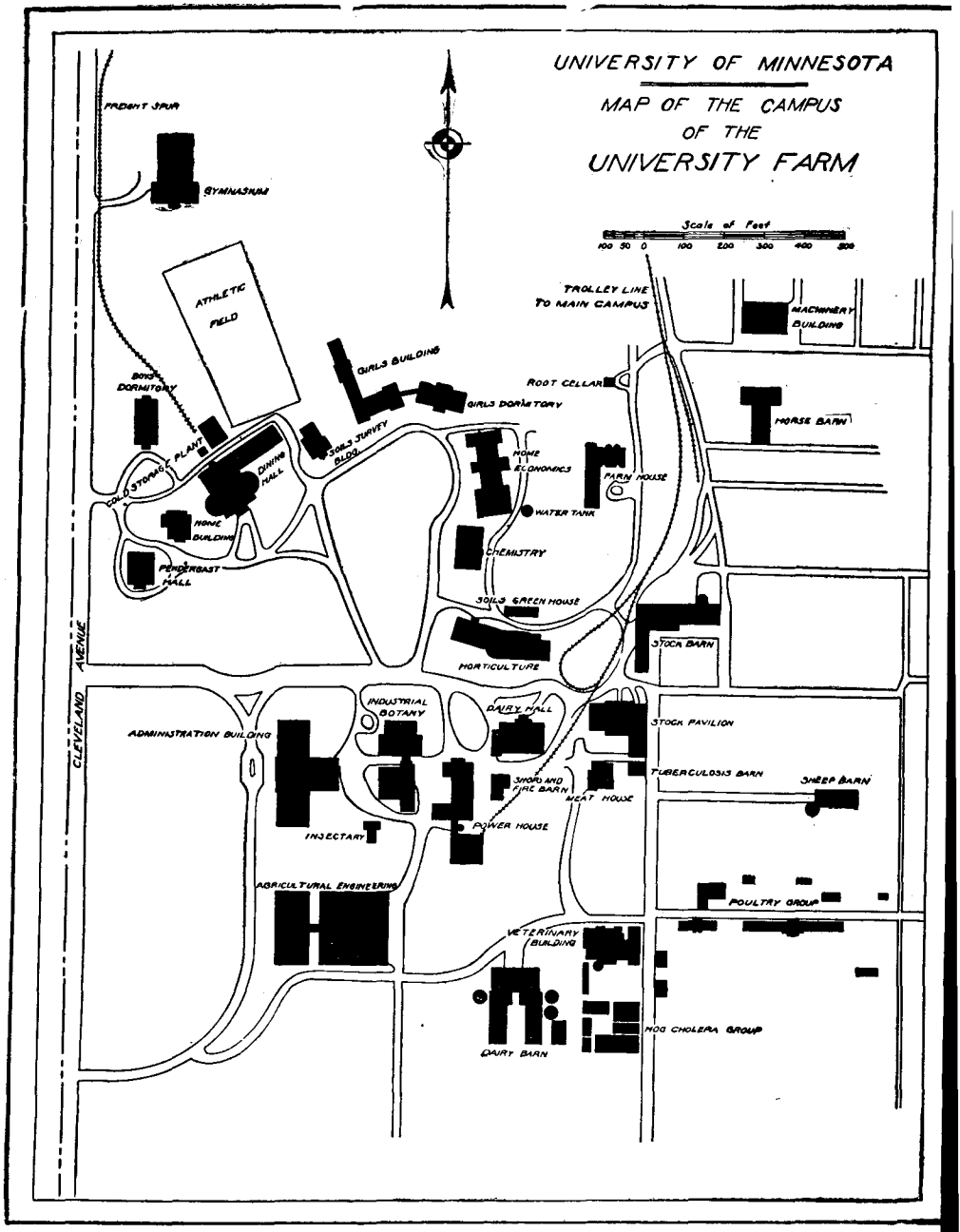
THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

ANNOUNCEMENT OF COURSES
FOR THE YEAR

1922-1923



Area of Main Campus, 108.5 acres



Area of University Farm, 422.56 acres

1922

JULY

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1923

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UNIVERSITY CALENDAR

1922-23

1922			
September	16	Saturday	Payment of fees closes, except for new students
September	19-26		Examinations for removal of conditions and entrance examinations
			Physical examinations for all new students
September	19-23		Registration for new students
September	25-26		Changes in registration
September	25	Monday	Optional examination in English
September	26	Tuesday	Required examination in English
September	26	Tuesday	Payment of fees for new students closes
September	27	Wednesday	Fall quarter begins, 8:30* a.m.
October	14	Saturday	Class Scrap Day; classes dismissed the third and fourth hours
October	26	Thursday	Senate meeting, 4:30 p.m.
November	4	Saturday	Home Coming Day; classes dismissed the third and fourth hours
November	7	Tuesday	General Election Day; a holiday
November	11	Saturday	Armistice Day; a holiday
November	30	Thursday	Thanksgiving Day; a holiday
December	14	Thursday	Senate meeting, 4:30 p.m.
December	20	Wednesday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
1923			
January	2	Tuesday	Registration for new students
January	4	Thursday	Christmas vacation ends, winter quarter begins, 8:30* a.m.
February	12	Monday	Lincoln's Birthday; a holiday
February	15	Thursday	Senate meeting, 4:30 p.m.
February	22	Thursday	Washington's Birthday; a holiday
March	23	Friday	Winter quarter ends, spring vacation begins, 5:20 p.m.
April	2	Monday	Registration for new students
April	4	Wednesday	Spring vacation ends, spring quarter begins, 8:30* a.m.
May	17	Thursday	Senate meeting, 4:30 p.m.
May	30	Wednesday	Memorial Day; a holiday
June	17	Sunday	Baccalaureate service
June	20	Wednesday	Fifty-first annual commencement
June	20	Wednesday	Spring quarter closes, 5:20 p.m.
June	23, 25		Registration days for Summer Session
June	26	Tuesday	Summer Session and summer quarter begin
July	4	Wednesday	Independence Day; a holiday
August	3	Friday	Summer Session closes
September	7	Friday	Summer quarter closes

* First hour classes begin at 8:15 at University Farm.

THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

FACULTY

LOTUS DELTA COFFMAN, Ph.D., President
WILLIAM WATTS FOLWELL, LL.B., President Emeritus
[1]CYRUS NORTHROP, LL.D., President Emeritus
JOHN B. JOHNSTON, Ph.D., Dean, Professor of Neurology
JOHN F. DOWNEY, M.A., C.E., LL.D., Dean Emeritus
EDWARD E. NICHOLSON, M.A., Dean of Student Affairs, Assistant Professor of Chemistry
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W. H. Brown, B.A., Scholar
Earl R. Carlson, B.A., Scholar

GERMAN

Esther Hendrikson, M.A., Teaching Fellow
Anna Heilmaier, B.A., Scholar
Edgar Hemminghaus, B.A., Scholar

GREEK

Dorothy B. Strong, B.A., Assistant

HISTORY

Livia Appel, B.A., Teaching Fellow
Gladys Blakey, M.A., Assistant
Georgina Droitcour, M.A., Assistant
George Hendricks, B.A., Scholar
Frances Irwin, B.A., Teaching Fellow
Lou Ella Miles, B.A., Teaching Fellow
Leah Morehouse, B.A., Teaching Fellow
Faith Thompson, M.A., Assistant

HUMAN PHYSIOLOGY

Charles C. Shepard, Teaching Fellow

MATHEMATICS

Elizabeth Carlson, M.A., Assistant
James M. Earl, B.A., Scholar
Carey M. Jensen, M.A., Teaching Fellow
W. A. Ziegler, B.A., Assistant

MUSIC

Helen Schmidt, B.A., Assistant

PHYSICS

S. E. Borgeson, Assistant
James W. Broxon, M.A., Teaching Fellow
J. W. Buchta, B.A., Teaching Fellow
Cha Chien, B.A., Teaching Fellow
H. F. Fruth, M.A., Teaching Fellow
Iwao Fukushima, B.A., Teaching Fellow
Israel Maizlish, B.A., Teaching Fellow
Leila Munson, B.A., Assistant
Merle Tuve, Assistant
Charlotte Zimmerscheid, B.A., Teaching Fellow

POLITICAL SCIENCE

Oliver P. Field, B.A., Assistant
Fred J. Geyerman, Scholar
Darrell F. Johnson, B.A., Scholar

PSYCHOLOGY

Lewis O. Anderson, M.A., Teaching Fellow
Josephine C. Foster, Ph.D., Assistant
Ignatius Hamel, Ph.D., Assistant
Margaret Kincaid, M.A., Teaching Fellow

Dorothea McLaurin, B.A., Teaching Fellow
Calvin P. Stone, B.A., Teaching Fellow
Mary L. Sturman, B.A., Teaching Fellow

PUBLIC SPEAKING

Bryan A. Gilkinson, B.A., Assistant
Leone B. Nunan, Assistant
Wendell Rogers, B.A., Assistant
Alfred Schweppe, M.A., Assistant

ROMANCE LANGUAGES

Bessie A. Grimm, B.A., Teaching Fellow
Prudence Merriman, B.A., Teaching Fellow
Walter E. Todd, B.A., Assistant
Isabel Wheeler, B.S., Teaching Fellow
Miles Willsey, B.A., Teaching Fellow

SCANDINAVIAN

Azelia Seelin, Scholar

SOCIOLOGY

Marion Bjorhus, Scholar
Lorna B. Chambers, B.A., Teaching Fellow
W. H. Gaumnitz, B.S., Scholar
Ernest J. Meill, M.A., Scholar

GENERAL INFORMATION

ADMISSION

To the freshman year.—Admission is either by certificate (for graduates of accredited secondary schools) 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 of 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 (vocational and miscellaneous subjects).

A detailed statement of admission requirements may be found in the bulletin of general information.

Examination in English.—All entering freshmen are required to take an examination in English. Any student who fails to pass this examination will be required to register with the Extension Division for subfreshman rhetoric for as many quarters as may be necessary. During this time he can be registered in this college for not more than fourteen credits.

For students who wish to be excused from freshman English there are optional examinations in literature and in composition. A student who passes both these examinations will be excused from freshman English and may take any courses in English, Rhetoric, and Public Speaking for which English A-B-C is the only prerequisite. A student who passes only the test in literature is excused from the work in literature. He must complete his Junior College requirement in English by taking Rhetoric 4-5-6, and may register for any courses in English for which English A-B-C is the only prerequisite. A student who passes only the test in composition is excused from the work in composition. He must complete his Junior College requirement in English by taking English 1-2-3, and may register for Rhetoric 11-12-13 or Public Speaking 41-42-43 or 45-46.

To advanced standing.—Attention is called to the following rules governing students entering with advanced standing.

Credits of advanced standing are provisional and are finally adjusted upon the following basis: Any student who, after one year's residence, has failures in nine credits or more 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 recovered only by special examination.

A student entering with advanced standing must earn an average of one honor point per credit for all work in this college counted for graduation or for admission to the Senior College.

A student admitted to the Senior College and failing to meet this requirement may be excluded from the Senior College at any time after the first quarter.

Examinations for advanced standing.—Any student upon first registration at the University may, with the approval of the Students' Work Committee, be allowed without charge to take examinations for advanced standing in subjects in which the student declares himself to be prepared. Such examinations must be taken within the first six weeks of residence.

REGISTRATION

Students are required to register on the days announced in the University calendar. Only in very exceptional circumstances will a student be allowed to register thereafter.

FEES

Tuition fee (per quarter)	
Residents of Minnesota	$20.00
Non-residents	30.00
Deposit (first quarter only)	5.00
Military deposit (required of all students taking military drill)	10.00
Health fee (per quarter)	2.00
Minnesota Union or Shevlin Hall (per quarter)	1.00
Special fees	
Examination for removal of conditions	1.00
Examinations for credit (after the first quarter in residence)	5.00
Special examinations	5.00
Laboratory deposit (required of students registered for courses in chemistry)	5.00

Penalty fees

Registration penalties.—The penalty fee for late registration, late change of registration, or late payment of fees is two dollars ($2), with one dollar ($1) additional for each day of delay after classes begin, provided that no student shall pay more than twelve dollars ($12) of penalty in any given quarter.

CLASS ROUTINE AND SCHOLASTIC REQUIREMENTS

Schedule.—Classes are held every week day, ending for the week at 1:20 p.m., on Saturday. Class periods begin at 8:30, 9:30, 10:30, 11:30 a.m., 12:30, 1:30, 2:30, 3:30, and 4:30 p.m., and continue fifty minutes. A convocation of faculty and students is held at 11:30 on certain Thursdays.

In the Junior College, courses are normally five-credit courses; in the Senior College, three-credit courses. There are also three-credit courses in the Junior College and one, two, four, and five-credit courses in the Senior College.

Examinations and grades.—Examinations are held at the end of each quarter. A student's grade is based on class work and examinations. Four grades, A, B, C, and D, are given for work of varying degrees of merit. Work of lower grade is marked E (condition) or F (failure). Work which is of at least D grade but not complete may, if the student presents a

satisfactory excuse, be marked I (incomplete). For rules governing the removal of incompletes and conditions, see the pamphlet of faculty regulations.

Credits and honor points.—Requirements for graduation are expressed in credits, indicating amount of work, and in honor points, indicating grade of work. Each credit demands on the average three hours a week of the student's time; that is, one recitation with two hours of preparation, or three hours of laboratory work. Honor points are computed as follows: each credit with the grade of A carries three honor points; each credit with the grade of B, two honor points; each credit with the grade of C, one honor point. The grade of D carries no honor points. The grade F carries minus one honor point per credit, the penalty being removed if the course is repeated with a passing grade.

Reasonable advance toward graduation.—Continued residence in the college is conditioned upon reasonable advance toward graduation. The Students' Work Committee may at any time drop from the rolls of the college any student who does not make such reasonable advance.

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

Habitual bad English.—Any student who, either in speaking or in writing, habitually uses bad English shall be reported by his instructor to the dean with all available evidence. If the dean considers this evidence sufficient, he will require the student to take without credit such further work in rhetoric as the chairman of the Department of English may specify.

THE JUNIOR AND SENIOR COLLEGES

1. The college distinguishes between the Junior College, consisting of the first two years, and the Senior College, consisting of the third and fourth years. Each college is under the general direction of an assistant dean. See Directory of Administrative and Departmental Offices.

2. The college distinguishes also between Junior College courses, intended primarily for freshmen and sophomores, and Senior College courses, intended primarily for juniors and seniors.

3. Senior College courses appear in the announcement as open to "juniors and seniors" or to "juniors, seniors, and graduates." The prerequisites for these courses are governed by the following rule: If the prerequisite courses are open to freshmen in their first and second quarters, they must amount to at least fifteen credits; if not, they must amount to at least ten credits. (Certain courses restricted to juniors and seniors are not Senior College courses in this sense.)

Senior College courses may be taken by sophomores who have had one honor point per credit in their previous work, and have completed with a grade of C the prerequisites for the courses desired; but courses which carry graduate credit may not be taken earlier than the third quarter of the student's sophomore year.

4. Students registered in combined arts and professional courses shall secure forty-five credits and forty-five honor points per year (three quarters) of work required in this college before being recommended for entrance to the work of the professional school. In order that such students may receive the Bachelor's degree after completion of the required professional work, the faculty of the professional school shall certify that they have maintained an equivalent standing in the work of the professional school which is counted toward the degree given by this college.

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

FACULTY ADVISERS FOR STUDENTS

In the Junior College.—Every freshman is assigned by the assistant dean for the Junior College to a class officer whose general purpose is to help the student to get the best out of his college course, to develop his responsibility for planning his work, and to encourage him to make the most of his own powers. The student should go to his class officer for information and help in all matters pertaining to his college work. The Junior College office (106 Folwell Hall) is open daily to students who want information or advice.

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

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

In the sophomore year the class officer gives especial attention to the completion of the requirements of the Junior College and the preparation for the major study in the Senior College. Whenever a student has decided what his major subject is to be, he should at once report to the assistant dean for the Senior College.

In the Senior College.—When the student has chosen his major subject, he is assigned by the department in charge of that subject to a major adviser who has oversight of all his scholastic work in the Senior College.

Students' Work Committee.—All matters of curriculum irregularities and scholastic delinquencies are controlled by the Students' Work Committee, consisting of the assistant dean for students' work, chairman; and the assistant deans for the Junior and Senior colleges.

AUDITORS

No regularly enrolled student may be admitted to classes as an auditor until his senior year. Any senior whose high scholastic standing enables him to carry a small program may register as an auditor. Persons not enrolled as students may hear lectures and class discussions regularly by registering as auditors and paying a prescribed fee. They must first secure the permission of the instructor in charge of the course and of the dean. Admission of auditors may be denied in case of classes which are crowded or in which the work is of such a nature that the presence of visitors would be a detriment.

COURSES OF STUDY

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

Courses given within this college:

1. A general course leading to the degree of bachelor of arts.

2. A four-year course with a major in music, leading to the degree of bachelor of arts.

3. A four-year course in Training for Diplomatic and Consular Service leading to the degree of bachelor of arts.

4. A four-year course in Training for State and Federal Administration leading to the degree of bachelor of arts.

5. A four-year course leading to the degree of bachelor of arts with special training in military science and tactics.

6. A four-year course in Americanization Training Work leading to the degree of bachelor of science.

7. A four-year course for medical technicians leading to the degree of bachelor of science.

8. A four-year course in Training for Municipal Administration and Engineering leading to the degree of bachelor of science.

9. A four-year course in Training for Social and Civic Work leading to the degree of bachelor of science.

10. A two-year course prescribed for admission to the School of Business.

11. A one-year course prescribed as the minimum requirement for admission to the College of Dentistry and a two-year course recommended as an alternative for pre-dental students.

12. A two-year course prescribed for admission to the College of Education.

13. A two-year course preliminary to training in Interior Decoration in the College of Engineering.

14. A two-year course recommended for students intending to enter the Law School.

15. A five-year course leading to the degrees of bachelor of arts and bachelor of science in chemistry.

16. A seven-year course leading to the degree of bachelor of arts and doctor of dental surgery.

17. A six-year course leading to the degrees of bachelor of arts and bachelor of laws.

18. An eight-year course leading to the degrees of bachelor of arts, bachelor of medicine, and doctor of medicine.

19. A seven-year course leading to the degrees of bachelor of science, bachelor of medicine, and doctor of medicine.

20. A six-year course leading to the degree of bachelor of science and master of science in architecture.

21. A five-year course leading to the degrees of bachelor of science and graduate in nursing.

REGULATIONS APPLYING TO ALL COURSES

Military drill is required of all freshman and sophomore men and physical education of all freshman men and all freshman and sophomore women.

English-Rhetoric A-B-C (or in some courses Rhetoric 4-5-6) is required of all students in their freshman or sophomore year.

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

Students must elect at least 13 credits of work a week. To take less than that number, a student must secure permission from the Students' Work Committee.

Students ordinarily may not elect more than 17 credits. After two quarters of residence a student may register for 18 credits provided he has an average of 1½ honor points per credit for the two quarters *previous to the time of registration* and no condition or failure for the quarter immediately preceding registration. A student carrying 18 credits may be required to revise his program if his work shows a serious decline.

All freshmen and sophomores are required to elect one third of their credit hours in the afternoon.

To secure a degree from this college a student must earn at least 45 credits in residence at this college. If the term of residence is only one year the year must be the senior year; and in any case, he must spend two "quarters" of the senior year in residence.

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

GENERAL REQUIREMENTS

1. The student must earn 180 credits and 180 honor points, or a smaller number of credits determined as follows: for every five honor points in excess of one honor point per credit, the number 180 is diminished by one.

2. The student may not receive credit for beginning courses (two quarters, 10 credits) in more than one of the foreign languages, exclusive of Greek and Italian, unless his major adviser approves such courses as necessary for the proper development of the student's major work.

3. Not later than the end of his sophomore year, each student must elect the department in which he intends to do his major work. He will then be assigned to a major adviser by that department.

Junior College

Departments offering Junior College courses are grouped as follows:

Group A English.

Group B Foreign languages: German, Greek, Latin, Romance Languages, Scandinavian.

Group C Social sciences: Anthropology, Economics, History, Political Science, Sociology.

Group D Natural sciences: Animal Biology, Astronomy, Bacteriology and Immunology, Botany, Chemistry, Geology and Mineralogy, Human Physiology, Physics, Psychology.

Group E Architecture, Mathematics, Music, Philosophy.

REQUIREMENTS FOR THE JUNIOR COLLEGE

1. Group A 15 credits in English-Rhetoric.

Group B The student must present for entrance four years of one foreign language, or he must complete 20 credits in one language in college, or he must continue a language, which he presented for entrance, according to the following schedule:

Amount Presented for Entrance	*Amount Required in Junior College*
Four years of one language	None
Three years of one language	5 credits in same language
Two years of one language	10 credits in same language
Less than two years of one language	20 credits in one language

Group C 10 credits in one subject

Group D 10 credits in one subject (courses in physiography and geography do not meet this requirement)

Group E No requirement

2. Two of these required subjects must be begun the first quarter and the others not later than the fourth quarter of a student's course. A subject taken to meet one of these requirements must be continued for at least two quarters.

3. The student must earn 15 additional credits in each of two of the five groups, A, B, C, D, E.

4. The requirements in physical education and drill stated above must be met during the Junior College years.

5. The student must earn a total of 90 credits and 90 honor points, or a smaller number of credits determined as follows: For every five honor points in excess of one honor point per credit, the number 90 is diminished by one.

Senior College

Admission.—For admission to the Senior College a student must have satisfied the requirements of the Junior College.

Requirements.—1. A major sequence, 27 to 36 credits. Each student must complete a coherent and progressive sequence of courses, known as a major sequence, which shall include, as specified by the department which offers it, from 27 to 36 credits in Senior College courses. Such major sequences are offered by the following departments: Animal Biology, Anthropology, Architecture, Astronomy, Bacteriology, Botany, Chemistry, Economics, English, Geology and Mineralogy, German, Greek, History,

Human Anatomy, Human Physiology, Latin, Mathematics, Music, Philosophy, Physics, Political Science, Psychology, Romance Languages, Sociology. The courses constituting a major sequence in any department are announced in the departmental statement.

A student must maintain an average of one honor point per credit hour in the work of the major sequence.

2. A minor sequence, 9 credits. A student must secure in some department other than his major department and in addition to his major sequence, 9 credits in Senior College courses.

OLD CURRICULUM

Students who intend to satisfy the requirements for graduation or for admission to the Senior College under the old curriculum, are referred to page 23 of the 1920-21 bulletin.

SPECIAL REGULATIONS

Election of subjects in other colleges or schools.—In the senior year, any student registered in the College of Science, Literature, and the Arts may elect not to exceed 6 credits per quarter in any other college or school of this University, provided that (1) the courses are indicated by the dean of the college or school in question and approved by the Advisory Committee of this college as suitable for such election; and (2) no duplication of subject occurs. Courses so taken are counted toward the bachelor of arts degree on the same terms as those taken in the College of Science, Literature, and the Arts. A list of such courses will be found at the end of the program.

By resolution of the Board of Regents students in any college electing work in any other college must complete the work so elected before they are allowed to come up for the degree for which they are candidates.

Seniors desiring further information regarding courses open should consult the assistant dean for the Senior College.

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

No student registered in the College of Science, Literature, and the Arts may enroll for an extension course without permission of the Students' Work Committee.

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

Students registered in this college must obtain the permission of the Students' Work Committee to register for correspondence courses.

II. FOUR-YEAR COURSE LEADING TO THE DEGREE OF BACHELOR OF ARTS WITH A MAJOR IN MUSIC

To secure the degree of bachelor of arts with a major in music, a student must fulfill the requirements of both the Junior and Senior colleges as stated on pages 25 to 27, securing 144 credits in courses other than practical music (piano, voice, etc.). The following program satisfies the requirement for a student who has had three years of a single language in high school. Other students will require more than four years to complete the course.

In order to register for courses in music during his freshman and sophomore years, a student must signify his intention of working for a major in music. A student transferring to another major would lose credit for courses in practical music taken during the freshman and sophomore years.

Students completing the course as announced in 1920-21, will receive the degree of bachelor of music. However, students now pursuing that course may secure the bachelor of arts degree by fulfilling the new requirements.

Entrance requirements, according to instrument selected, are:

Piano: Czerny's *School of Velocity* and the easier Haydn and Mozart sonatas (or equivalent).

Voice: Good natural equipment and 2 years of piano.

Violin: First ten studies from Kayser *Etudes* (or equivalent).

A student wishing to register in the music course must first pass an examination in practical music before a committee of the faculty of the Music Department. This applies also to academic juniors and seniors who wish to elect courses in practical music.

Students who do not pass the above examination and who still wish to take music may, with the consent of the head of the department, register for the freshman theoretical subjects and a subfreshman course in practical music.

FRESHMAN YEAR

	Credits
Piano, etc.	9
Harmony	9
Ear-Training	3
History 11-12-13	10
English A-B-C	15

SOPHOMORE YEAR

	Credits
Piano, etc.	9
Counterpoint	6
Ear-Training	0
Psychology 1-2, 4-5	10
Elective in one group other than E (see p. 26)	15
Language (see p. 26)	5

JUNIOR YEAR

	Group I	Group II	Group III
Advanced Harmony	..	6	..
Ensemble	6	6	9
History of Music	9	9	9
Normal Piano	..	..	6
Piano	12	12	12
Elective	12 to 24	6 to 18	3 to 15

SENIOR YEAR

	Group I	Group II	Group III
Advanced Counterpoint	..	6	..
Advanced Normal Piano	..	..	6
Analysis	3	..	..
Bach-Beethoven	9	9	9
Composition Orchestration	..	9	..
Ensemble	6	6	6
Piano	12	12	12
Romantic Movement	6	..	6
Elective	3 to 15	3 to 15	3 to 15

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

The degree of bachelor of arts is conferred at the end of four years. Students whose programs satisfy the requirements of the Graduate School may receive the degree of master of arts at the end of the fifth year.

JUNIOR COLLEGE

Students in this course must satisfy the Junior College requirements. In addition, certain prescribed courses in history, economics, and political science should be taken under the direction of the student's major adviser.

SENIOR COLLEGE

In the Senior College the student will take the following work:

Major sequence E in political science and such additional work in economics, history, and law, not exceeding 30 credits, as may be prescribed by the major adviser and the committee in charge of the course.

In foreign languages, 15 credits, or at least a minor sequence. A speaking knowledge of one language is required and a thoro reading knowledge of a second.

Electives to make up a total of not less than 90 credits in this college.

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

GRADUATE SCHOOL

In the fifth year the student will take the following work:

Research in economics or political science for the consular service.

Research in history or political science for the diplomatic service.

Additional Senior College courses in history, economics, law, or political science, to be selected by the student under the direction of the Graduate School and the committee in charge of the course.

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

The degree of bachelor of arts is conferred at the end of four years. Students whose programs satisfy the requirements of the Graduate School may receive the degree of master of arts at the end of the fifth year.

JUNIOR COLLEGE

Students in this course must satisfy the Junior College requirements. Certain specified courses in history, economics, and political science must be taken under the direction of Mr. J. S. Young, of the Department of Political Science.

SENIOR COLLEGE

In the Senior College the student will take the following work:

Major sequence A or F in political science. In economics 18 credits selected from the following courses: 191f-192w, Public Finance; 193s, State and Local Taxation; 161f, Labor Problem; 72f, Economics of Transportation; 14s, Statistics; 158s, Government and Business; 154s, Public Utilities; 41s, Financial History of the United States.

In history 9 credits selected from 113-114-115, Economic History of the United States; 40s, Recent American History; 153s, West in American Politics since 1865; and 146w-147s, Constitutional History of the United States.

Electives to make up a total of not less than 90 credits in this college. The selection of these courses will be made under the direction of the major adviser and the committee in charge of the course.

GRADUATE SCHOOL

In the fifth year the student will take the following work:

Research in the field of American government or administration.

Additional Senior College courses in history, economics, law, or political science, to be selected by the student under the direction of the Graduate School and the committee in charge of the course.

V. 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.

All students, of any class, registered for military training, are members of the Reserve Officers' Training Corps, and as such are issued all necessary uniform clothing and equipment by the government free of charge.

After completing the two years required, students may discontinue military work if they wish.

ELECTIVE WORK

Students who have completed the Basic Course, R.O.T.C., and are selected for advanced work by the professor of military science and tactics, and who sign an agreement with the government to continue this work for the remainder of their college course (not to exceed two years) and to attend one summer training camp, are eligible for the Advanced Course, R.O.T.C., prescribed in Special Regulations No. 44, War Department, 1919.

The faculty will recommend for graduation any student who has satisfactorily completed the work of the Advanced Course, R.O.T.C., and has completed 174 college credits, with 174 honor points, including all other specific requirements for graduation.

Students enrolled in the Advanced Course, R.O.T.C., are furnished with the necessary uniforms and equipment, and receive from the government a fixed allowance per day while enrolled in this course, except during the period in which they are actually at a training camp, when they are paid at the rate prescribed for privates in the army.

All students who complete the Advanced Course, R.O.T.C., and who graduate from the University will, if recommended by the professor of military science and tactics and the president of the University, be commissioned in the Officers' Reserve Corps of the United States Army.

VI. FOUR-YEAR COURSE IN AMERICANIZATION TRAINING WORK LEADING TO THE DEGREE OF BACHELOR OF SCIENCE

This course is developed to equip its students with the anthropological, professional, technical, and practical field knowledge of the various phases of Americanization leadership. Its graduate courses lead to higher degrees in anthropology.

The following program presents the required courses to be taken during the freshman and sophomore years by all students who are registered in the four-year course. The courses for the junior and senior years are merely suggested. All registrants will find a conference with the department the best way to answer questions about registration.

1. Animal Biology 1-2
2. Anthropology 1, 4, 5, 12
3. Economics 3-4, Principles of Economics
4. English A-B-C
5. History 1-2, Modern World, 5-6, American History
6. Modern language, 10 credits
7. Political Science 1
8. Psychology 1-2

FRESHMAN YEAR

Fall	Credits	Winter	Credits	Spring	Credits
English A	5	English B	5	English C	5
History 1	5	History 2	5	History 5	5
Animal Biology 1	5	Animal Biology 2	5	Anthropology 1	5

SOPHOMORE YEAR

Fall	Credits	Winter	Credits	Spring	Credits
Modern language	5	Modern language	5	Political Science 1	5
Anthropology 5	3	Anthropology 4	3	Anthropology 12	3
History 6	5	Economics 3	5	Economics 4	5
Psychology 1	3	Psychology 2	3	Electives	0-4

JUNIOR AND SENIOR YEARS

	Credits
Credits in Department of Anthropology and Americanization Training	60
Electives	30
(Consult director concerning electives)	

For the requirements for teacher's certificate in Americanization Training, see bulletin of College of Education.

For courses in home economics open to students in Americanization Training, see statement of Department of Home Economics.

VII. FOUR-YEAR COURSE FOR MEDICAL TECHNICIANS LEADING TO THE DEGREE OF BACHELOR OF SCIENCE

During the first two years the student will be registered in this college. He must satisfy one of the following sets of requirements, and must earn 90 credits and 90 honor points.

1. The pre-medical requirements. (See the seven-year course in Science and Medicine, p. 41.)
2. The pre-medical requirements, with the substitution of the Junior College foreign language requirement (0 to 20 credits; see p. 26.) in French or German.
3. The Junior College specific group requirements (see p. 26), satisfied as follows:

		Credits
Group A.	English A-B-C	15
Group B.	French or German	0 to 20
Group C.	Social Science	10
Group D.	Animal Biology	10 or 12
	Chemistry (General Inorganic, Qualitative Analysis, Elementary Organic)	20+
	Electives to make a total of	90

During the third and fourth years the student will be registered in the Medical School and elect work in medical science, subject to the approval of the assistant dean for the Senior College and one of a group of advisers named by the dean of the Medical School. The courses recommended will form a sequence which will fit the student for specialized work as laboratory or clinical technician. During the four years the student must earn 180 credits and 180 honor points.

A special bulletin of the Medical Technician course will be sent by the registrar on application.

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

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

FIRST YEAR

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

SECOND YEAR

	Credits
Municipal Government	5
Principles of Economics	10
History	10
Physics	12
Engineering drawing	6
Electives	3 or 5
	46 or 48

THIRD AND FOURTH YEARS

(Courses in italics are required; others are elective)

POLITICAL SCIENCE: 171, *Municipal Corporations;* 115, *Municipal Problems;* 131-132, *Public Administration;* 133, *Problems in Administration;* 221-222-223, Seminar in Local Government and Administration; 51-52-53, Business Law; 157, Police Power; 141, Problems in State Government.

ECONOMICS: 25-26, *Principles of Accounting;* 191-192, *Public Finance;* 193, *State and Local Taxation;* 154, *Public Utilities;* 161, Labor Problems and Trade Unionism; 91, Principles of Organization and Management; 158, Government and Business; 72, Economics of Transportation; 14, Elements of Statistics.

ENGINEERING: 11-12-13, *Surveying;* 51-52, *Highways and Pavements;* 162, *Water Supply;* 163, *Sanitary Engineering;* 272, City-Planning.

OTHER COURSES: Bacteriology 1, *General Bacteriology;* Sociology 1, Introduction to Sociology; Sociology 55, Housing Problems; Sociology 123, Social Statistics.

FIFTH YEAR

In this year the student will carry such courses as have not been completed in the preceding years and which seem in the opinion of his adviser to be necessary for the completion of his training. In addition to this he will conduct in the Twin Cities or vicinity a practical research in municipal government and administration, supplemented by work in the library and in the research bureau. The year will thus consist of about equal proportions of class work and research and reference bureau work. If desirable, the student will be allowed to take courses not mentioned above.

IX. FOUR-YEAR COURSE IN SOCIAL AND CIVIC WORK LEADING TO THE DEGREE OF BACHELOR OF SCIENCE

This course is organized in response to a demand for distinctive technical training for professional service. Satisfactory completion of the four-year course leads to the degree of bachelor of science. The fifth year's work leads 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 degree of master of arts 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. With 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 AND SECOND YEARS

REQUIRED
English A-B-C
Sociology 1, 6
Economics 3-4
Political Science 1
Psychology 1-2; 7 or 4-5
Animal Biology 1-2

ELECTIVE
Sociology 14
Anthropology 1
Philosophy 2, 3

THIRD YEAR

Sociology 51, 52, 53, 55, 90-91-92, 60
Economics 62, 161
Political Science 11

Sociology 100, 101, 102, [104][1], 114
Anthropology [110][1], 112
Bacteriology 1
Economics [118-119-120][1], 14
Education 1, 3
Preventive Medicine and Public Health (Medical School) 103
Political Science 7, 157

FOURTH YEAR AND GRADUATE WORK

Sociology 100, (if not already elected), 110, 119, 120, 122, 123, 134, 135
Political Science 157, (if not already elected)

Sociology 128, 130, [132][1], 133, 138-139, 140, 141
Animal Biology 183
Anthropology 113, 114
Economics 162, 167-168, 169
Home Economics 70, 71, 72
Philosophy 124
Physical Education for Women 43-44-45, 33
Political Science 145, 151, 152, 157
Psychology 144-145
Educational Psychology 134-135-136, 149-150-151

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

X. PRE-BUSINESS COURSE

The pre-business course in the College of Science, Literature, and the Arts, required for admission to the School of Business, is made up as follows:

1. 10 credits in Economic History (Economics 1-2)
2. 15 credits in English-Rhetoric (Rhetoric A-B-C)
3. 10 credits in *one* of the following social sciences: anthropology, history, political science, sociology
4. 10 credits in mathematics or in *one* of the laboratory sciences: animal biology, botany, chemistry, physics. (Mathematics 8 and 20 are required of students who intend to specialize in accounting or banking.)

[1] Courses enclosed in brackets are not offered in 1922-23.

5. Four years of one language in preparatory school or 20 credits in one language in college, or the continuance of a language begun in preparatory school according to the following schedule:

Amount Presented for Entranc	*Amount Required in the Pre-Business Course*
4 years in one language	None
3 years of one language	5 credits in same language
2 years of one language	10 credits in same language
Less than 2 years of one language	20 credits in one language

6. 6 credits in psychology (Psychology 1-6)
7. 10 credits in the Principles of Economics (Economics 3-4)
8. 8 credits in the Principles of Accounting (Economics 25-26). Three additional credits (Economics 27) are required of students who expect to specialize in accounting
9. 5 credits in Statistics (Economics 14)
10. A total of at least 90 credits and an average of one honor point per credit, or a smaller number of credits to be determined as follows: For every five honor points in excess of one honor point per credit, the number 90 is diminished by one.

NOTE: Students preparing to follow lines of business relating to agriculture may substitute for items 1, 7, and 9 Courses 20-21, 5-6 and 13 in the Department of Agricultural Economics. (See bulletin of the College of Agriculture.) In lieu of items 3 and 4, they are expected to take 5 credits in American Government, 20 credits in chemistry and animal biology or botany, and a minimum of 5 credits in technical agricultural courses.

XI. PRE-DENTAL COURSES

1. The one-year course consists of a year of prescribed work during which the students are registered in this college and are subject to its regulations. The required courses are as follows:

1. Animal Biology 5-6-7 (12 cr.)
2. Chemistry 4-5, General Chemistry, two quarters (8 cr.)
3. Chemistry 11, Qualitative Chemistry, one quarter (4 cr.)
4. English A-B-C (15 cr.)
5. Shop practice in the engineering shops, three quarters (6 cr.) or Drawing 41-42-43, Technical Drawing (6 cr.)

2. The two-year course recommended for pre-dental students is identical with the first two years of the seven-year course in Science and Medicine on page 41.

XII. GENERAL COURSE PRELIMINARY TO THE COLLEGE OF EDUCATION

The requirements for admission to the College of Education are identical with those for admission to the Senior College, with the addition that students must have completed six credits in General Psychology. All students who expect to receive the teacher's certificate from the University of Minnesota at the end of a four-year college course must register in the College of Education beginning with their junior year.

The College of Education has arranged for a number of specialized curricula leading to the teacher's certificate in a special subject or group of subjects. In the cases of some specialized curricula the regular requirements

of the Junior College are waived or readjusted. In order properly to complete certain of these curricula, it is necessary for a student to begin a proper arrangement of his program during the freshman or sophomore year. Students planning to teach should consult the statement of requirements in the College of Education bulletin.

XIII. FOUR-YEAR COURSE IN INTERIOR DECORATION LEADING TO THE DEGREE OF BACHELOR OF SCIENCE

This course offers to students of the College of Science, Literature, and the Arts the opportunity to prepare themselves for certain lines of work such as domestic architecture and interior decoration without taking the full technical course in Architecture.

Students registering in this course should secure the approval of the staff in Architecture, and the advice of the staff should be sought with regard to the choice of electives and of special courses in architecture.

The work of the junior and senior years consists largely of professional courses in the Department of Architecture.

Required	Credits
English A-B-C	15
Mathematics 6 (with prerequisites)	5 or 10
French (see Junior College requirements, page 26)	0 to 20
History 11-12-13	10
Physics 1 and 2 and any one of the continuations, 21, 31, 41, with laboratory	8 to 12
or	
Chemistry 1-2-3 or 4-5	8 to 12
Architecture 21-22-23	6
Architecture 31-32-33	12
Drawing 30	3

FOR THOSE WHO ENTER WITH HIGHER ALGEBRA AND TWO YEARS OF FRENCH

Fall	Credits	Winter	Credits	Spring	Credits
English A	5	English B	5	English C	5
Mathematics	5	French	5	French	5
Elective	5	Elective or physics	5	Elective or physics	5

Sophomore Year

Architecture 21-22-23	6
Architecture 31-32-33	12
History 11-12-13	10
Chemistry or physics	8 to 12
Drawing 30	3
Electives	2 to 10 (to complete a total of 90 for the two years)

NOTE: Students who intend to take physics should elect Physics 1 and 2 during the freshman year.

XIV. GENERAL COURSE PRELIMINARY TO THE LAW SCHOOL

This course is designed to satisfy the requirements for admission to the Law School, which are ninety academic credits and ninety honor points.[1]

Pre-legal students in the Junior College are required to comply with the rules of the General Course on pages 25 and 26. The following course is recommended by the faculty of the Law School as the best available under these rules:

1. Latin, 0 to 20 credits
2. English A-B-C
3. Natural Science, 10 credits
4. Political Science 1
5. Philosophy 2 and 50-51
6. History 3-4 and 33-34
7. Economics 3-4

Other subjects recommended for pre-legal students are Psychology 1-2; Public Speaking 45-46; Rhetoric 15-16-17; Economics 1-2, 143-144, 155; and 167-168; History 146-147, and 116-117-118; Philosophy 1, 3, 124, and 129; Political Science 7, 11, 15, 65, 121-122, 123, and 161.

The faculty of the Law School strongly advises students to complete the whole or at least three years of the Arts course before entering upon the study of law. Attention is called to the combined six-year course in Arts and Law, on page 40.

OTHER VOCATIONAL COURSES

For information and advice regarding the selection of studies in preparation for various vocations, the student should consult the heads of the departments concerned. 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. It is important in preparation for a vocation, not only to secure training in the major subjects, but also in the related subjects.

A considerable collection of literature and other information bearing upon the choice of a vocation and especially upon occupations open to women is available for the use of class officers and students.

COMBINED ARTS AND PROFESSIONAL COURSES

For the benefit of those who wish to begin a professional course before completing the four-year course in Science, Literature, and the Arts, the following combination courses and short courses are offered.

[1] As students are admitted to the Law School only at the beginning of the academic year, those who have at that time 75 credits with 75 honor points may, with the consent of the faculty of the Law School, be admitted as special students with the right to become regular by securing the additional credits and honor points before the beginning of the third year in the Law School. But these additional credits can not be secured while carrying the full course in Law.

REGULATIONS GOVERNING COMBINED COURSES LEADING TO THE BACHELOR OF ARTS DEGREE

1. The degree of bachelor of arts shall be voted by the faculty of the College of Science, Literature, and the Arts.

2. For the first three years of his course the student shall be registered in the College of Science, Literature, and the Arts and be subject to the regulations of that college.

3. During his first two years he must satisfy the requirements of the Junior College (pp. 25, 26).

4. During his junior year he may elect work subject to the approval of the dean of the professional school or college and the assistant dean for the Senior College.

5. One full year of professional work may be offered as the equivalent of the senior year (forty-five credits) of the College of Science, Literature, and the Arts, provided:

(a) That the professional courses taken have as a prerequisite at least two years of collegiate work.

(b) That there is no duplication of courses already taken in the College of Science, Literature, and the Arts.

(c) That no substitution of professional courses for courses in the College of Science, Literature, and the Arts has been permitted.

(Note: It will be the policy of the College of Science, Literature, and the Arts to introduce into its curriculum those courses in other colleges or schools which in the judgment of the faculty may properly be credited toward the bachelor of arts degree.)

6. The student shall be required to secure at least one hundred eighty credits and one hundred eighty honor points.

XV. THE FIVE-YEAR COURSE IN ARTS AND CHEMISTRY

The degree of bachelor of arts is given at the end of the fourth year and the degree of bachelor of science in chemistry at the end of the fifth year.

FRESHMAN, SOPHOMORE, AND JUNIOR YEARS

During the first three years of the course the student is registered in the College of Science, Literature, and the Arts and is subject to its rules. He must complete the requirements of the Junior College and 45 credits in the Senior College, approved by the dean of the School of Chemistry and the assistant dean for the Senior College, and must secure 135 honor points. This work must include the following subjects:

1. Chemistry 6-7-8 or 9-10
2. Chemistry 12-13, Qualitative Analysis
3. Chemistry 20-21, Quantitative Analysis
4. German 28-29, Advanced Chemical German, and prerequisites
5. Mathematics 6, 7, 30, 50, 51, 52
6. Physics 1, 2, 21, 22, 41, 42
7. Drawing 41-42-43, Technical Drawing

The program for students entering with chemistry, higher algebra, and two years of German is given below. Programs for students entering without these requirements are in the offices of the assistant dean for the Junior College and of the dean of the School of Chemistry.

SENIOR YEAR

During his fourth year the student must complete the work required in the junior year of the four-year course in Chemistry of the School of Chemistry and must maintain a standing equivalent to that required by this college for graduation.

The degree of bachelor of arts is voted by the College of Science, Literature, and the Arts at the end of the fourth year, and the student must present a total of not less than 180 credits and 180 honor points, including the required work mentioned above.

POST-SENIOR YEAR

The fifth year is the same as the fourth year of the four-year course in Chemistry, and upon its completion the student will be entitled to the degree of bachelor of science in chemistry.

SUGGESTED PROGRAM

For students entering with chemistry, higher algebra, and two years of German.

Freshman Year

Fall	Credits	Winter	Credits	Spring	Credits
English-Rhetoric A	5	English-Rhetoric B	5	English-Rhetoric C	5
Chemistry 9	5	Chemistry 10	5	Chemistry 12	5
Mathematics 6	5	Mathematics 7	5	Mathematics 30	5

Sophomore Year

Fall	Credits	Winter	Credits	Spring	Credits
German 27	3	German 28	3	German 29	3
Mathematics 50	5	Mathematics 51	5	Mathematics 52	5
Chemistry 13	5	Chemistry 20	5	Chemistry 21	5
Drawing 41	2	Drawing 42	2	Drawing 43	2

Junior Year

Fall	Credits	Winter	Credits	Spring	Credits
Chemistry 35	5	Chemistry 36	5	Chemistry 37	5
Physics 1, 2	4	Physics 21, 22	4	Physics 41, 42	4
Social Science	5	Social Science	5	Electives	5-8
Electives	3	Electives	3		

XVI. SEVEN-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 students of the college and must secure 135 credits. In his third year the student elects work in this college subject to the approval of the dean of the College of Dentistry and of the assistant dean for the Senior College. The final year of the course in the College of Dentistry counts as the equivalent of the fourth year (45 credits) of the Arts course. During this year the student must maintain a standing equivalent to that required by this college for graduation.

XVII. 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 135 credits. During his third year the student will elect work in this college subject to the approval of the dean of the Law School and the assistant dean for the Senior College. The first year of the course in the Law School counts as the equivalent of the fourth year (45 credits) of the Arts course. During this year the student must maintain a standing equivalent to that required by this college for graduation.

XVIII. EIGHT-YEAR COURSE IN ARTS AND MEDICINE, LEADING TO THE DEGREES OF BACHELOR OF ARTS, BACHELOR OF MEDICINE, 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 students of the college, and must secure 135 credits and an average of one honor point per credit. During his third year, the student elects work in this college subject to the approval of the director of the professional course and the assistant dean for the Senior College. The first year of the course in the Medical School counts as the equivalent of the fourth year (45 credits) of the Arts course. During this year, the student must maintain a standing equivalent to that required by this college for graduation. During the four years the student must earn 180 honor points.

FRESHMAN AND SOPHOMORE YEARS

The following subjects must be included:

- English-Rhetoric, 15 credits
- Zoology, 12 credits
- Qualitative Analysis, Quantitative Analysis*, and Organic Chemistry, with the elementary courses prerequisite to them.
- French or German sufficient to secure a reading knowledge
- Three quarters of work in physics (including laboratory) with prerequisite work in mathematics

The following subjects are recommended as electives: advanced animal biology and chemistry, freehand drawing, Latin, higher mathematics, a fourth quarter of physics, psychology, and sociology.

JUNIOR YEAR

The student elects work in this college subject to the approval of the director of the professional work and the assistant dean for the Senior College.

* Quantitative Analysis required for admission to the Medical School in 1923 and thereafter.

SENIOR YEAR

This year is taken in the Medical School, and is counted toward the degree of bachelor of arts.

XIX. SEVEN-YEAR COURSE IN SCIENCE AND MEDICINE, LEADING TO THE DEGREES OF BACHELOR OF SCIENCE, BACHELOR OF MEDICINE, 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 90 credits and an average of one honor point per credit hour, and must complete the subjects prescribed above for eight-year course in Arts and Medicine, substituting 9 credits in rhetoric for 15 credits in English-Rhetoric.

Three quarters of physics are required; a fourth is strongly advised.

Students who enter with higher algebra elect trigonometry the first quarter.

Students who enter without chemistry are advised to take Qualitative Analysis during the summer following the freshman year.

Students must select such language work as will give them a reading knowledge of medical French or medical German before entering the Medical School. They may meet this requirement by passing two quarters' work in scientific French (French 8-9-10), or medical German (German 31-32), or by taking a special examination after completing 15 credits of French or two college years of German. This examination is conducted by the department concerned.

Electives during the summer quarter and in the second year may be taken from any courses open to sophomore students in the College of Science, Literature, and the Arts.

A student applying for admission to the Medical School must have satisfied all requirements before July 1.

A. FOR THOSE WHO ENTER WITH TWO YEARS OF EITHER FRENCH OR GERMAN

First Year

Fall	Credits	Winter	Credits	Spring	Credits
Chemistry	4	Chemistry	4	Chemistry	4
French	5	French	3	French	3
or		or		or	
German	4	German	3	German	3
Algebra or		Trigonometry	5	Physics	4
Trigonometry	5	or		Zoology	4
Zoology	4	Physics	4		
		Zoology	4		

Second Year

Fall	Credits	Winter	Credits	Spring	Credits
Chemistry	4	Chemistry	4	Chemistry	4
Rhetoric	3	Rhetoric	3	Rhetoric	3
Physics	4	Physics	4	Elective	5
Elective	4-6	or		Elective	4
		Elective	5		
		Elective	4-5		

B. FOR THOSE WHO ENTER WITHOUT LANGUAGE AND WITHOUT HIGHER ALGEBRA

First Year

Fall	Credits	Winter	Credits	Spring	Credits
Chemistry	4	Chemistry	4	Chemistry	4
French	5	French	5	French	5
or		or		or	
German	5	German	5	German	5
Algebra	5	Trigonometry	5	Physics	4
Zoology	4	Zoology	4	Zoology	4

Summer Quarter

	Credits
Physics	4
Electives	0-5

Second Year

Fall	Credits	Winter	Credits	Spring	Credits
Chemistry	4	Chemistry	4	Chemistry	4
German	5	French	3	French	3
or		or		or	
Electives	2-6	German	3	German	3
Physics	4	Physics	4	Electives	3-7
Rhetoric	3	or		Rhetoric	3
		Electives	0-3		
		Rhetoric	3		

JUNIOR AND SENIOR YEARS

The work during these two years is taken in the Medical School, and is credited toward the degree of bachelor of science. To secure this degree the student must have 180 credits and 180 honor points, and have completed the first two years of the Medical course.

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 Students' Work Committee 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.

XX. SIX-YEAR COURSE IN ARTS AND ARCHITECTURE

This course is designed to combine with the full technical course in Architecture the broad cultural training recognized as most desirable in preparation for the practice of this profession. The course will lead to the degrees of bachelor of science at the end of four years, and master of science in architecture at the end of six years.

Students wishing to elect this course should consult the Department of Architecture. For the first two years the requirements do not differ materially from those laid down in the course preliminary to training in Interior Decoration, page 36 of this bulletin.

XXI. FIVE-YEAR COURSE IN ARTS AND NURSING LEADING TO THE DEGREES OF BACHELOR OF SCIENCE AND GRADUATE IN NURSING

During the first two years of three quarters each in this course the student is registered in the College of Science, Literature, and the Arts. This period is followed by ten quarters during which the student is registered in the University School of Nursing. The last two quarters of the fifth year is devoted to elective work in the University, in preparation either for teaching and supervision in schools of nursing or for public health nursing.

The student is required to earn one hundred thirty-five credits and one hundred thirty-five honor points in courses which regularly carry credit in the College of Science, Literature, and the Arts. The satisfactory completion of the required professional work is accepted as the equivalent of the senior year in this college.

FRESHMAN YEAR

	Credits
English-Rhetoric, A-B-C	15
Foreign language (elec.)	15
Chemistry 6-7-8	15
	45

SOPHOMORE YEAR

Fall	Credits	Winter	Credits	Spring	Credits
Psychology 1	3	Psychology 2	3	Psychology 3	3
History 1	5	History 2	5	Human Physiology 4	5
General Bacteriology 1	5	Economics 3	5	Economics 4	5
Rhetoric 11	3	Rhetoric 12	3	Human Anatomy 2	3
	16		16		16

At the opening of the third year the student registers in the preliminary course of the School of Nursing but carries the following program of courses approved in both college and school.

THIRD YEAR—FALL QUARTER

	Credits
Elem. Pharmacology 1	3
Bacteriology 101	4
Home Economics 21	5
Sociology 1	5
	17

THIRD YEAR—WINTER QUARTER

The theoretical and practical work of this quarter includes lettering, history and ethics of nursing, hospital economics, personal hygiene, nursing practice, and dietetics; with general work in the wards for a portion of each day under supervision.

THIRD AND FOURTH YEARS

In the succeeding spring and summer quarters of this year and in the four quarters of the fourth year the student is assigned to graded services and to lecture and recitation courses in the associated hospitals.

FIFTH YEAR

During the final year the first two quarters are devoted to advanced nursing in hospital and dispensary service. The last two quarters are taken in class work in a course which the student elects either in public health nursing or in nursing education. Schedules of these courses will be found in the bulletin of the School of Nursing and the bulletin of Public Health Nursing. Either election must include courses carrying twenty-five credits in the College of Science, Literature, and the Arts, and must be approved by the assistant dean for the Senior College.

DEPARTMENTAL STATEMENTS

EXPLANATIONS

A *dagger* (†) indicates that all quarters of the course must be completed before credit is received for any quarter.

Course numbers.—Junior College courses (primarily for freshmen and sophomores) are numbered from 1 to 49. Senior College courses are numbered as follows: courses primarily for juniors and seniors, from 50 to 99; for juniors, seniors, and graduates, from 100 to 199; for graduates only, from 200 up. This system is not uniformly followed by departments in other colleges than Science, Literature, and the Arts.

ANIMAL BIOLOGY

Professors HENRY F. NACHTRIEB, Head; HAL DOWNEY, (Histology), JOHN B. JOHNSTON, WILLIAM A. RILEY, THOMAS S. ROBERTS, CHARLES P. SIGERFOOS; Associate Professor ELMER J. LUND; Assistant Professors ROYAL CHAPMAN, DWIGHT E. MINNICH, OSCAR W. OESTLUND; Instructors JOHN A. CEDERSTROM, MARSHALL HERTIG, ADOLPH RINGOEN; Assistants OSCAR B. BERGMAN, GEORGE H. CHILDS, CLYDE H. FREDRICKSON, LOUIS A. FRIED, EDWIN J. KEPLER, GORDON C. MACRAE, LEWIS E. NELSON, EMILY H. PAYNE, HUBERT L. PERSON, EMMETT ROWLES.

NOTE: Credit is given for acceptable work done at any approved seaside laboratory.

INTRODUCTORY COURSES

1-2†. GENERAL ZOOLOGY. Structure, physiology, embryology, classification, and evolution of animals. Textbook, lectures, laboratory and quizzes. MR. SIGERFOOS, MR. MINNICH, MR. RINGOEN.

5-6-7†. GENERAL ZOOLOGY. Same as 1-2, for pre-medical and pre-dental students. MR. SIGERFOOS, MR. RINGOEN.

14-15-16†. GENERAL ZOOLOGY. Same as 1-2, for Agriculture, Forestry, and Home Economics. MR. SIGERFOOS, MR. RILEY.

44. ANIMAL PARASITES AND PARASITISM. Structure and life history of representative parasites. Methods of control and prevention will be emphasized. Lectures and laboratory. MR. RILEY.

45. RELATIONS OF INSECTS TO DISEASE. Life history, habits, and methods of control of homonoxious species. MR. RILEY.

48. GENERAL ECOLOGY. Considers the relationships of animals to the inorganic and organic factors of the environment. Lectures, assigned reading, laboratory, and field work. MR. CHAPMAN.

INTERMEDIATE AND ADVANCED COURSES

9-10†. HISTOLOGY. Comparative study of the microscopic structure of animal tissues and the organs of mammals. Textbook, lectures, and laboratory. It is advisable to complete the year with Course 11. MR. DOWNEY

11. CYTOLOGY AND TECHNIQUE. The animal cell and elements of microscopical technique. Lectures and laboratory. MR. NACHTRIEB.

17. GENERAL PHYSIOLOGY. Physical and chemical properties of living protoplasm and cells. Rôle of diffusion, osmotic pressure, ions, and colloids in cell physiology. Permeability. Lectures, laboratory, assigned reading. MR. LUND.

18. GENERAL PHYSIOLOGY. Comparative physiology of respiration, nutrition, and growth. The nature of the production of movement, heat, light, and electricity of organisms. Lectures, laboratory, assigned reading. MR. LUND.

19. PRINCIPLES OF ANIMAL BEHAVIOR. Comparative physiology of the nervous system and sense organs of lower organisms. Lectures, laboratory, assigned reading. MR. LUND.

37-38-39†. GENERAL ENTOMOLOGY. Elements of entomology leading up to discussion of the principles of taxonomy and their application to the classification of insects. MR. OESTLUND.

46-47†. ORNITHOLOGY. Lectures, laboratory and field work. Field glasses and handbook required. Class limited to ten. MR. ROBERTS.

75. NATURE STUDY. Especially for the fitting of teachers for the secondary schools. MR. SIGERFOOS.

107. PROTOZOOLOGY. Lectures, references, and laboratory work on the structure and life histories of Protozoa. MR. SIGERFOOS.

109-110-111. GENERAL PHYSIOLOGY. A thoro survey of fundamental physiological processes in organisms. Based on Bayliss's *Principles of General Physiology*. Laboratory, lectures, and reading. MR. LUND.

117-118-119.† ECOLOGY OF INSECTS. Lectures, assigned reading, laboratory and field work. MR. CHAPMAN.

124. ADVANCED ECOLOGY. Similar to Course 117-118-119 with special field work. MR. CHAPMAN.

125-126-127†. ADVANCED ENTOMOLOGY. Morphology and classification of insects, and lectures on the history of entomology. MR. OESTLUND.

130. BIOLOGY AND TAXONOMY OF THE APHIDIDAE. MR. OESTLUND.

139-140†. HISTOLOGY AND DEVELOPMENT OF INSECTS. Lectures, and laboratory work. MR. RILEY.

144-145-146. ANIMAL PARASITES AND PARASITISM. The second quarter of the course is devoted primarily to the relation of insects to diseases of man and animals. MR. RILEY.

149-150-151†. BLOOD OF VERTEBRATES. A comparative study of the blood and blood-forming organs of vertebrates. A portion of the time to be devoted to research. MR. DOWNEY.

154-155†. HEMATOLOGY. Lectures and laboratory work on the blood and blood-forming organs of man and mammals. MR. DOWNEY.

181-182†. EMBRYOLOGY. A comparative study of the development of Chordata. Reconstruction methods. Textbook, lectures, laboratory. MR. NACHTRIEB.

183. GENETICS AND EUGENICS. Facts and theories of heredity and application to man. Textbook, lectures, and demonstrations. MR. NACHTRIEB.

197-198-199. PROBLEMS. Advanced work in some special line. MR. NACHTRIEB, MR. DOWNEY, MR. JOHNSTON, MR. RILEY, MR. SIGERFOOS, MR. LUND, MR. CHAPMAN, MR. OESTLUND, MR. MINNICH.

GRADUATE COURSES. SEE THE BULLETIN OF THE GRADUATE SCHOOL

201-204. RESEARCH IN ENTOMOLOGY.

213-216. RESEARCH IN BIOLOGICAL OXIDATIONS.

217-218-219. RESEARCH IN THE PHYSIOLOGY OF THE LOWER ORGANISMS WITH SPECIAL REFERENCE TO THE PROTOZOA.

225-228. RESEARCH ON THE GROSS AND MICROSCOPIC ANATOMY OF THE GANOIDS.

229-232. RESEARCH IN ANIMAL HISTOLOGY.

233-236. RESEARCH IN VERTEBRATE CONNECTIVE TISSUE WITH SPECIAL REFERENCE TO THE CELLULAR ELEMENTS.

237-240. RESEARCH IN VERTEBRATE HEMATOLOGY.

245-248. COMPARATIVE NEUROLOGY.

249-252. RESEARCH IN NEUROLOGY.

253-256. DYNAMICS OF PROTOPLASM AND CELLS.

257-260. SENSORY PHYSIOLOGY OF INVERTEBRATES.

205-208, 209-212, 261-264, 265-268. See Entomology and Economic Zoology, page 48.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Professors WILLIAM A. RILEY, Chief; ARTHUR G. RUGGLES, FREDERIC L. WASHBURN; Assistant Professors ROYAL N. CHAPMAN, HARRY H. KNIGHT, OSCAR W. OESTLUND; Instructor SAMUEL A. GRAHAM, MARSHALL HERTIG.

COURSES

The courses in this department are closely correlated with those of the Department of Animal Biology. Courses 37-38-39, 44, 45, 117-118-119, 125-126-127, 130, 139-140, 144-145-146 are offered under these numbers in both departments. In addition the following courses in entomology and economic zoology are available:

3. ECONOMIC ENTOMOLOGY. Characteristics and habits of insect pests and beneficial insects and methods of control. MR. RUGGLES.

4. ECONOMIC VERTEBRATE ZOOLOGY. Relation of birds and wild animals to agriculture. Lectures, laboratory, and field work. MR. WASHBURN.

8. FUR-BEARING ANIMALS. Varieties and habits of fur-bearing animals. Special reference to their adaptability to domestication and commercial fur-farming. MR. WASHBURN.

12. FOREST ZOOLOGY. Forest animals. Relation of birds and of various four-footed animals to forest protection. MR. WASHBURN.

150. INSECTICIDES AND THEIR ACTION. A study of the chemical composition, and physical properties, and the physiological action of standard, of little-known, and of new insecticides.

197. INTRODUCTION TO RESEARCH. Preparation for investigational work in lines of entomology, parasitology, or economic zoology. Advanced laboratory, field, and library work; training in the preparation of bibliographies and manuscripts; special problems. Summer work should be planned when possible. MR. RILEY, parasitology, insect morphology; MR. RUGGLES, general economic entomology; MR. WASHBURN, economic vertebrate zoology; MR. CHAPMAN, insect ecology; MR. OESTLUND, MR. KNIGHT, systematic entomology.

GRADUATE COURSES. SEE THE BULLETIN OF THE GRADUATE SCHOOL

201-204. RESEARCH IN ENTOMOLOGY. MR. RILEY, MR. CHAPMAN, MR. KNIGHT, MR. OESTLUND.

205-208. RESEARCH IN ECONOMIC ENTOMOLOGY. MR. RUGGLES.

209-212. RESEARCH IN ECONOMIC VERTEBRATE ZOOLOGY. MR. WASHBURN.

261-264. RESEARCH IN PARASITOLOGY AND MEDICAL ENTOMOLOGY. MR. RILEY.

265-268. RESEARCH IN INSECTICIDES.

213-216, 217-218-219, 225-228, 229-232, 233-236, 237-240, 245-248, 249-252, 253-256, 257-260. See Animal Biology, page 47.

ANTHROPOLOGY AND AMERICANIZATION TRAINING

Professor ALBERT ERNEST JENKS, Chairman; Instructors RUTH M. LINDQUIST (Home Economics), GLADYS SPEAKER.

COURSES

1. INTRODUCTION TO ANTHROPOLOGY. Origin and development of mankind and the races; racial distribution, and immigration; the bearing of anthropology on present day thought and problems. MR. JENKS.

4. CULTURAL ANTHROPOLOGY. Origin and early development of the most important activities and institutions which had their beginning among primitive man. MR. JENKS.

5. GENERAL IMMIGRATION. Recent world migrations. Causes and effects of immigration to the United States; problems of immigrant legislation, control, and distribution.

12. ETHNOLOGY. The different so-called races of men; their historical classifications; determinants of ethnic types; important ethnic problems. MISS SPEAKER.

57-58-59. RACE LEADERS AND PROGRAMS. Studies of racial or national leaders in Europe. Preparation of programs, in English, from racial data as means of contact for mutual understanding between Americans and various racial groups in America. MISS SPEAKER.

70. FOOD PREPARATION IN RELATION TO SOCIAL WORK. A study of the principles underlying cookery with special emphasis on the preparation of foods to be used in homes with limited incomes. MISS LINDQUIST.

71. ELEMENTARY DIETETICS FOR THE SOCIAL WORKER. Involves principles underlying adequate feeding. Food habits of different economic and racial groups forming the basis for actual planning and preparation of meals.

72. HOME MANAGEMENT PROBLEMS. Involves the making of sound budgets. Studies are based upon racial groups and the size of the family, together with the income. MISS LINDQUIST.

80. THE AMERICAN INDIAN. Origin and migrations of the Indian. Basic material for study of origin and spread of indigenous cultures.

108. PHILIPPINE PEOPLES. 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. MR. JENKS.

110. PHYSICAL ANTHROPOLOGY AND AMALGAMATION. Theory of evolution as applied to natural and cultural man. Eugenics in theory, law, and practice. Studies in amalgamation of peoples. (Not offered in 1922-23.) MR. JENKS.

112. THE AMERICAN NEGRO. MR. JENKS.

113. THE OLDER IMMIGRANTS. Characteristics, contributions, and distribution of the older immigrant peoples in America; their modification and importance to us. MR. JENKS.

114. THE NEWER IMMIGRANTS. Characteristics, contributions, and distribution of the newer immigrant peoples in America; their modification and importance to us. MR. JENKS.

115. AMERICANISMS AND ASSIMILATION. Essential and unique historical Americanisms, and their value and virility for the future in America. Conditions and facts of assimilation. MR. JENKS.

117. THE IMMIGRANT WOMAN. The peculiar problems of the woman immigrant in personal service, in industrial groups, in the home, and out of regular employment. MISS SPEAKER.

118. GOVERNMENT AND THE IMMIGRANT. Legal and administrative aspects of Americanization. Laws affecting immigration, citizenship, and naturalization; administration of these laws through governmental agencies; political experiences of the foreign-born.

120. METHODS OF AMERICANIZATION. Practical methods of Americanization in use in the United States, together with facts and conditions of their success and failure. MR. JENKS.

123-124. PROBLEMS IN ANTHROPOLOGY. An advanced course of method and independent research. MR. JENKS.

128. TECHNIQUE OF TEACHING ADULTS. Technique of teaching adults—the foreign-speaking, the illiterate, the fatigued—in keeping with the dignity of mature years, and the mental processes of mature minds of foreigners.

130. ORGANIZATION AND ADMINISTRATION OF AMERICANIZATION WORK. Existing organization and administration—federal, state, municipal, neighborhood, industrial, church, racial, family, etc. Methods of organizing groups, and of interorganic coöperation. MR. JENKS, MISS SPEAKER.

131-132-133. SUPERVISED AMERICANIZATION WORK. Practical field work among foreign peoples in our vicinity. MISS SPEAKER.

136. AMERICANIZATION DIRECTORSHIP. (Not offered in 1922-23.) MR. JENKS.

141. PRINCIPLES OF ADULT ELEMENTARY EDUCATION. Language study as a tool in assimilation of peoples; ethnic peculiarities of language habit; racial bases for development of subject-matter; problems of adult language-habit substitution; voluntary versus compulsory nationalization of language.

142. THE ADULT ELEMENTARY LEARNING PROCESS. Physiology of vocal sound production; psychology of sound and symbol interpretation; phonics and phonetics and their relation to reading, spelling, writing, and intelligible speech.

143. THE ADULT ELEMENTARY TEACHING PROCESS. Survey of current methods of instruction; courses of study, textbooks, leaflets, vocabulary studies; beginning, intermediate, and advanced instruction in the English language; teaching materials and devices.

150-151-152. FIELD PROBLEMS IN AMERICANIZATION. An advanced course of method and independent research.

204. SEMINAR IN ANTHROPOLOGY. Consult Graduate School bulletin. MR. JENKS.

ARCHITECTURE

COLLEGE OF ENGINEERING AND ARCHITECTURE

Professors FREDERICK M. MANN, Head; LEON ARNAL; Associate Professor JAMES H. FORSYTHE; Assistant Professors SAMUEL C. BURTON, ROY C. JONES, ROBERT T. JONES; Special Lecturers PAUL C. GAUGER, ARTHUR R. NICHOLS; Instructors RALPH HAMMETT, CARL E. JOHNSON.

JUNIOR COLLEGE COURSES

14-15-16. ARCHITECTURAL HISTORY (Ancient and Renaissance). MR. FORSYTHE.

17-18-19. ARCHITECTURAL HISTORY (Medieval and Modern). MR. MANN.

21-22†-23. FREEHAND DRAWING. Freehand perspective and drawing with charcoal, pencil, and color from architectural ornament and details of the figure. MR. JOHNSON.

31-32†-33. ELEMENTS OF ARCHITECTURE. Beginning study for students in the course in Architecture and Decoration. MR. FORSYTHE, MR. HAMMETT.

34-35-36. ARCHITECTURAL DESIGN. Original problems dealing in general with elements of elevation and their composition into simple architectural units. Sketch problems dealing with elementary plan compositions. Individual criticism and library research. MR. R. C. JONES.

SENIOR COLLEGE COURSES

51-52-53. ELEMENTS OF CONSTRUCTION. Details of building construction, particularly as related to domestic architecture and to interior finish. For students in the course in Architecture and Decoration. MR. R. T. JONES.

81. COLOR AND DESIGN. Elements of design and the use of color. An elementary course intended for students in dramatics preliminary to the study of stage setting. MR. BURTON.

161. HISTORY OF SCULPTURE AND PAINTING. Historical study of ancient, Renaissance, and modern sculpture, and of the Renaissance and modern schools of painting. MR. BURTON.

181-182. DECORATION AND ALLIED ARTS. History of interior decoration and furniture. Use of color in interior decoration. MR. MANN.

ASTRONOMY

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

COURSES

4-5.[1] INTRODUCTION TO ASTRONOMY. Lectures and recitations on the elements of astronomy. Illustrated by lantern slides, simple apparatus, equipment at observatory, diagrams, and telescopic observations. Questions, exercises, problems, and naked-eye observations are assigned. MR. BEAL.

7. NAVIGATION. A study of the principles of piloting, dead reckoning, nautical astronomy, etc. This course prepares men for positions as ensigns and as officers in the merchant marine. MR. LEAVENWORTH.

11.[2] DESCRIPTIVE ASTRONOMY. Lectures and recitations on the general principles and fundamental facts of astronomy. Illustrated by lantern slides, simple problems, naked-eye and telescopic observations. MR. LEAVENWORTH, MR. BEAL.

25.[2] STELLAR ASTRONOMY. Review of present state of knowledge concerning the stars, and nebulae. Theories of stellar evolution. MR. LEAVENWORTH, MR. BEAL.

51-52-53. GENERAL ASTRONOMY. A thoro study of the general principles of astronomy, illustrated by lantern slides, simple problems, and telescopic observations. MR. LEAVENWORTH.

62. ELEMENTS OF PRACTICAL ASTRONOMY. Theory and use of astronomical instruments in determining time, latitude, longitude, azimuth, and positions of heavenly bodies. MR. LEAVENWORTH.

[1] This course satisfies the Junior College requirement for science.
[2] This course does not satisfy the Junior College requirement for science.

101-102-103. 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. MR. LEAVENWORTH.

111-112-113. CELESTIAL MECHANICS. Analytical study of the motion of two bodies. General view of the theory of perturbations. MR. BEAL.

140. METHOD OF LEAST SQUARES. The combination and adjustment of observations and the discussion of their precision as applied especially to engineering, physics, astronomy, and psychology. MR. LEAVENWORTH.

BACTERIOLOGY AND IMMUNOLOGY

MEDICAL SCHOOL

Professor WINFORD P. LARSON, Chief; Associate Professor ARTHUR T. HENRICI; Instructors ANNE BENTON, BERYL S. GREEN, ROBERT G. GREEN, DAVID O. SPRIESTERSBACH.

For full description of courses see bulletin of the Medical School.

1. GENERAL BACTERIOLOGY. Lecture course and laboratory work covering general work in bacteriology. DR. LARSON, DR. HENRICI, MR. GREEN, MR. SPRIESTERSBACH.

101. SPECIAL BACTERIOLOGY FOR MEDICAL STUDENTS. The study of disease-producing micro-organisms. DR. LARSON, MR. GREEN.

103. SPECIAL BACTERIOLOGY FOR STUDENTS OF AGRICULTURE. Soil and dairy bacteriology. Bacteria causing diseases of domestic animals. DR. HENRICI, MR. SPRIESTERSBACH.

105. HOUSEHOLD BACTERIOLOGY. MISS BENTON.

114. THE HIGHER BACTERIA. DR. HENRICI.

116. IMMUNITY. Wasserman test. Vaccines. Anaphylaxis. DR. LARSON.

117. PATHOGENIC PROTOZOA. DR. LARSON.

118. MORPHOLOGY AND TAXONOMY OF BACTERIA. DR. HENRICI.

119. BACTERIOLOGICAL CHEMISTRY. MR. GREEN, MR. SPRIESTERSBACH.

120. ADVANCED BACTERIOLOGY. DR. LARSON, DR. HENRICI, MR. GREEN, MR. SPRIESTERSBACH.

BOTANY

Professors C. OTTO ROSENDAHL, Chairman; ELIAS J. DURAND, LEE I. KNIGHT, JOSEPHINE E. TILDEN; Associate Professors FREDERIC K. BUTTERS, RODNEY B. HARVEY; Assistant Professors WILLIAM S. COOPER, EDWARD W. D. HOLWAY, NED L. HUFF; Instructors CHARLES L. FARABAUGH, ARTHUR M. JOHNSON; Assistants RAYMOND LANDON, ETHEL MYGRANT, EDNA L. SONTAG.

COURSES

1-2. General Botany. Mr. Durand, Mr. Butters, Mr. Huff, Mr. Johnson, and assistants.

7. Taxonomy of Flowering Plants. A general study of the classification and relationships of flowering plants. Mr. Rosendahl, Mr. Johnson.

12. General Morphology of Algae. Miss Tilden.

13. General Morphology of Fungi. Mr. Johnson.

21. Elementary Ecology. An introductory course in the study of plants in relation to their environment. Mr. Cooper.

22. Elementary Plant Physiology. An introductory course giving a general survey of plant functions. Mr. Knight, Mr. Harvey, Mr. Farabaugh.

48. Plant Industry. Lecture demonstration course on relation of plants to modern important industries and conservation policies. Especially for students in arts and the professions. Given with the coöperation of special lecturers from the departments of the plant science group. Mr. Rosendahl, Mr. Freeman, and special lecturers.

51. Histological Methods. Training in the technique of preparing plant material for microscopic study. Mr. Rosendahl.

62. General Morphology of Bryophytes and Pteridophytes. Structure, evolution, and classification of liverworts, mosses, and ferns. Mr. Huff.

63. General Morphology of Gymnosperms and Angiosperms. Structure, evolution, and classification of seed plants. Mr. Butters.

107. Morphology and Taxonomy of Bryophytes. Structure and classification of liverworts and mosses. Mr. Durand.

108. Morphology and Taxonomy of Pteridophytes. An intensive study of lycopods, ferns, and their allies; their structure, history, and classification. (Not offered in 1922-23.) Mr. Butters.

110. Morphology and Taxonomy of Gymnosperms. An intensive study of cycads, conifers, and their allies; their structure, history, and classification. Mr. Butters.

113-114-115. Advanced Taxonomy. Special attention is given to the taxonomy of difficult natural groups of angiosperms, involving systematic principles and practice, rules of nomenclature, and systems of classification. Mr. Rosendahl.

118. Cytology. A study of the origin, development, structure, and functions of the plant cell and its various constituents. Mr. Rosendahl.

123-124-125-126. MORPHOLOGY AND TAXONOMY OF THE ALGAE. Myxophyceae, Chlorophyceae, Phaeophyceae, Rhodophyceae. Advanced studies in selected groups. Any of the above courses may be taken separately. MISS TILDEN.

127. ANATOMY OF VASCULAR PLANTS. A study of the microscopic structure of vascular plants with particular attention to the development and evolution of the vascular system in the root, stem, and leaf. MR. BUTTERS.

131. FIELD ECOLOGY. A survey of the local plant communities and successions followed by a written report, and by a study of the general principles of plant association and succession. MR. COOPER.

132. ECOLOGICAL ANATOMY. The individual plant and its parts as related to environment; special plant forms and structures, their causes and significance. MR. COOPER.

133. FOREST GEOGRAPHY OF NORTH AMERICA. Preliminary discussion of the principles of plant distribution followed by a detailed study of the forest regions of North America. MR. COOPER.

141. PHYSICAL PHASES OF PLANT PHYSIOLOGY. The intake and translocation of materials, and the energy relations of the plant. MR. KNIGHT, MR. HARVEY.

142. PLANT METABOLISM. The synthesis of plant food, its transformation and utilization by the plant. MR. KNIGHT, MR. HARVEY.

143. PLANT METABOLISM AND GROWTH. A continuation of Course 142, dealing with respiration, growth, and movement. MR. HARVEY, MR. KNIGHT.

144. PLANT MICROCHEMISTRY. A study of the localization of materials of physiological importance in the plant and their relation to physiological processes. MR. HARVEY.

PLANT PATHOLOGY AND BOTANY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Professors EDWARD M. FREEMAN, Chief; ELVIN C. STAKMAN; Instructors HENRY D. BARKER, LOUISE DOSDALL, ALVIN H. LARSON, JULIAN G. LEACH, JAMES L. SEAL.

GENERAL STATEMENT

For specialization in this department, see special requirements in Course of Study.

INTRODUCTORY COURSES

1. PLANT PATHOLOGY. Elementary study of plant diseases due to fungi, bacteria, and slime molds; life histories and preventive methods. Lectures, laboratory, and reference. Not open to those who have completed 10. MR. STAKMAN, MR. LEACH, MR. SEAL.

7-8. WEEDS AND GRASSES. Agricultural and applied botanical study of weeds and grasses with special reference to agricultural importance. MR. LARSON.

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. MR. LARSON.

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 1. Offered in alternate years. MR. STAKMAN, MR. LEACH, MR. SEAL.

12. SEED PROBLEMS. Special seed problems are assigned. Advanced work in seed-testing methods. MR. LARSON.

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 6. MR. BARKER.

ADVANCED COURSES

105-106-107. MYCOLOGY. A general study of the morphology, taxonomy, and biology of fungi. Lectures, laboratory, greenhouse, and field work. MR. FREEMAN, MR. STAKMAN, MISS DOSDALL.

108. METHODS. Plant pathological methods including mycological and bacteriological technique. Laboratory, lecture, and greenhouse work. Special problems. MR. STAKMAN, MR. LEACH.

110. PRINCIPLES OF PATHOLOGY. Comparative biology of plant pathogens; pathological plant anatomy; parasitism, biologic specialization, resistance, and immunity. Will be given in close coöperaton with Division of Agricultural Biochemistry and divisions offering work in plant-breeding. MR. STAKMAN, MR. BARKER.

111. DISEASES OF FIELD CROPS. Detailed study of diseases of cereal and forage crops, including symptomology, etiology, and practical methods of control. Laboratory, lecture, and field work. MR. STAKMAN, MR. BARKER.

CHEMISTRY

SCHOOL OF CHEMISTRY

Professors PAUL H. M.-P. BRINTON, WILLIAM H. HUNTER, CHARLES F. SIDENER; Associate Professors EVERHART P. HARDING, Frank H. MACDOUGALL, M. CANNON SNEED; Assistant Professors LILLIAN COHEN, ISAAC W. GEIGER, LAWRENCE M. HENDERSON, LLOYD H. REYERSON, LEE I. SMITH; Instructors CARL FOSSE, WALTER M. LAUER, LANDON A. SARVER.

COURSES

DIVISION OF GENERAL INORGANIC CHEMISTRY

1-2†-3. GENERAL INORGANIC CHEMISTRY. (Pre-med., pre-dent.) Study of the general laws of chemistry and of the non-metals and their compounds. 2. Continuation of Course 1. 3. Study of the metals and their compounds. Continuation of Course 2.

4-5†. GENERAL INORGANIC CHEMISTRY. (Pre-med., pre-dent.). Study of general laws of chemistry and of non-metals and their compounds. More intensive than Course 1 and 2. 5. Study of metals and their compounds. Continuation of Course 4. MR. HENDERSON.

6-7†-8. GENERAL INORGANIC CHEMISTRY. Includes study of general laws of chemistry and non-metals, metals and their compounds. 7. Continuation of Course 6. 8. Metals and their compounds. MISS COHEN.

9-10†. GENERAL INORGANIC CHEMISTRY. General laws of chemistry; non-metals and their compounds. More intensive than Courses 6 and 7. 10. Metals and their compounds. MR. SNEED.

11. QUALITATIVE CHEMICAL ANALYSIS. (Pre-med., pre-dent.) Laboratory work in systematic qualitative analysis with lectures on solution, ionization, and chemical and physical equilibrium, oxidation and reduction, etc. MISS COHEN, MR. HENDERSON.

12-13†. QUALITATIVE CHEMICAL ANALYSIS. Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, etc. MR. SNEED, MR. FOSSE.

101. HISTORY OF CHEMISTRY. The historical development of the theories of chemistry from the period of the ancients to the present time is covered by this course, particular emphasis being given to modern theories and laws. MISS COHEN.

102. ADVANCED QUALITATIVE ANALYSIS. This course includes an analysis of minerals, alloys, paints, and the methods of detecting some of the rarer elements. MR. SNEED.

103-104-105. ADVANCED INORGANIC CHEMISTRY. A discussion of valence, the periodic system, and the chemistry of certain elements and compounds such as cobalt, silver, mercury, tungsten, and their derivatives. MR. SNEED.

DIVISION OF ANALYTICAL CHEMISTRY

20-21. QUANTITATIVE ANALYSIS. Introductory courses covering the general principles and methods of quantitative analysis. Typical problems are assigned and attention given to proper laboratory practice. Course 20, Gravimetric Analysis; Course 21, Volumetric Analysis. Senior College course. MR. GEIGER, MR. SARVER, MR. SIDENER.

27. QUANTITATIVE ANALYSIS. (Pre-med.) An introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems are assigned and attention given to proper laboratory practice. Senior College course. MR. BRINTON, MR. GEIGER, MR. SARVER, MR. SIDENER.

123. ADVANCED ANALYTICAL CHEMISTRY. Analytical methods for the determination of the common constituents of iron ore, iron, and steel are discussed and compared, with emphasis upon the general principles involved. Typical problems are assigned for laboratory practice. MR. SIDENER, MR. GEIGER, MR. SARVER.

124. ADVANCED ANALYTICAL CHEMISTRY. A survey of the methods of analytical chemistry applied to the analysis of minerals and ores. Typical procedures for laboratory practice serve as a basis for discussion of more general methods. MR. BRINTON, MR. SIDENER, MR. GEIGER, MR. SARVER.

125. ADVANCED ANALYTICAL CHEMISTRY. Selection may be made to meet the particular needs of the student from the following: silicate analysis, non-ferrous alloy analysis, water analysis, problems in electro-analysis, etc. MR. SIDENER, MR. SARVER.

127-128-129. CHEMISTRY OF THE RARE ELEMENTS. Chemical relations and general reactions of those rarer elements not considered in more general courses. Analyses of commercially important ores and compounds of these elements are made. MR. BRINTON.

DIVISION OF ORGANIC CHEMISTRY

31-32†. ELEMENTARY ORGANIC CHEMISTRY. (Pre-med.) A discussion of the important classes of organic compounds, both aliphatic and aromatic. The laboratory work includes the preparation of typical substances. Senior College course. MR. SMITH.

35-36†-37. ORGANIC CHEMISTRY. An introduction to the chemistry of carbon compounds. The laboratory work will include the preparation of characteristic substances. Senior College course. MR. HUNTER.

131. ORGANIC ANALYSIS. Practice in the identification of organic compounds, and the modern methods of quantitative organic analysis. MR. LAUER.

133. REAGENTS IN ORGANIC CHEMISTRY. A discussion of typical reagents used in organic reactions: their limits of applicability, methods of use, and types of substances with which they react. May be accompanied by appropriate laboratory work in Chemistry 138. MR. SMITH.

134. THE TERPENES. A discussion of the chemistry of the terpenes, including the bicyclic compounds and their important substitution products. Two credits. May be accompanied by appropriate laboratory work in Chemistry 138. MR. FRANKFORTER.

138. ADVANCED ORGANIC CHEMISTRY LABORATORY WORK. Difficult preparations and problems. It is intended primarily to supplement the student's knowledge of the methods of organic chemistry. Students may also register for this course who desire appropriate laboratory work for other advanced courses.

139. ADVANCED ORGANIC CHEMISTRY LABORATORY WORK. Selected laboratory problems of an advanced nature, including some original work. An introduction to research work. These advanced laboratory courses may be taken under any member of the Division of Organic Chemistry.

DIVISION OF PHYSICAL CHEMISTRY

140-141†-142. PHYSICAL CHEMISTRY. A general survey of the subject. Three lectures and one recitation. Laboratory work three or six hours per week. MR. MACDOUGALL.

143-144-145. THERMODYNAMICS AND CHEMISTRY. A detailed study of the principles of thermodynamics and their application to physical and chemical phenomena. (Not offered in 1922-23.) MR. MACDOUGALL.

146-147-148. KINETIC THEORY AND ATOMISTICS. Kinetic theory of gases and liquids, crystal structure, structure of atom, quantum theory. MR. MACDOUGALL.

149. PRINCIPLES OF COLLOIDAL CHEMISTRY. MR. REYERSON.

150. APPLICATION OF COLLOIDAL CHEMISTRY. (Not offered in 1922-23.) MR. REYERSON.

151. RADIOCHEMISTRY. The occurrence, methods of isolation, and physical chemical properties of the radioactive substances, together with a brief consideration of the chemical, geological, and biological bearing of the subject. MR. HENDERSON.

152. LABORATORY COURSE IN RADIOCHEMISTRY. To accompany or follow Course 151. MR. HENDERSON.

153-154-155. ADVANCED PHYSICAL CHEMISTRY LABORATORY. To accompany or follow any of the advanced courses in physical chemistry. MR. MACDOUGALL.

156. APPLICATIONS OF PHYSICAL CHEMISTRY TO ORGANIC CHEMISTRY. Illustrations of the use of physicochemical methods in organic research. MR. HENDERSON.

DIVISION OF TECHNOLOGICAL CHEMISTRY

161-162-163. FOOD ANALYSIS. A course including the chemical analysis of the various food materials and food products and the detection of food adulterants. MR. HARDING.

AGRICULTURAL BIOCHEMISTRY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Professors ROSS A. GORTNER, CLYDE H. BAILEY; Associate Professor LEROY S. PALMER; Assistant Professors CORNELIA KENNEDY, CLARENCE A. MORROW, JOHN J. WILLAMAN; Instructors ARTHUR K. ANDERSON, PAUL F. SHARP.

INTRODUCTORY COURSES

3. TYPES OF CARBON COMPOUNDS. An elementary study of the different groups of carbon compounds, with special reference to their relationships and their occurrence in biological materials. MR. ANDERSON.

7-8. GENERAL AGRICULTURAL BIOCHEMISTRY. A lecture and laboratory course involving a qualitative and quantitative study of the types of organic and inorganic compounds found in plants and animals and of the chemical changes involved in metabolism, growth, and maintenance. MR. ANDERSON.

15. PRINCIPLES OF ANIMAL NUTRITION. The chemical and physiological principles underlying digestion, metabolism, utilization of feeds, maintenance, growth, fattening, milk production, vitamine hypothesis, and deficiency diseases. MR. PALMER.

ADVANCED COURSES

101-102. AGRICULTURAL QUANTITATIVE ANALYSIS. The estimation of inorganic and organic constituents of biological products, the proximate analysis of foods and feeding stuffs, the use of the polariscope, immersion refractometer, colorimeter and nephelometer, viscosimeter, and other special apparatus. MR. MORROW.

103. DAIRY CHEMISTRY. Lectures and laboratory work on the physical, colloidal, and chemical properties of milk and dairy products, the chemistry of the various constituents of milk, and of the processes involved in the manufacture of dairy products. MR. PALMER.

106. CHEMICAL TECHNOLOGY OF AGRICULTURAL 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. MR. BAILEY.

108. CHEMISTRY OF WHEAT AND WHEAT PRODUCTS. A lecture course on the chemical technology of the production and milling of wheat and the conversion of its products into human food. MR. BAILEY.

110. FLOUR LABORATORY METHODS. A laboratory course in methods of analysis of wheat and its products; milling tests of wheat, baking, and special tests of flour. Designed to train students for research and control work in the cereal industry. MR. BAILEY.

111-112. PHYTOCHEMISTRY. Advanced course dealing with the colloidal state, and the chemistry of proteins, carbohydrates, glucosides, tannins, fats, plant acids, enzymes, and pigments and their physicochemical relations to the vital processes involved in growth and nutrition. MR. MORROW.

113-114. BIOCHEMICAL LABORATORY METHODS. A laboratory course paralleling the lectures in 111. MR. MORROW, MR. SHARP.

116. ADVANCED ANIMAL NUTRITION. Lectures and assigned readings on recent developments in animal nutrition, covering the field of proteins, mineral metabolism, vitamines, and the relation of nutrition to disease. MR. PALMER, MISS KENNEDY.

117. LABORATORY PROBLEMS IN ANIMAL NUTRITION. A laboratory course on methods used in nutrition studies. (Because of limited laboratory facilities, students planning to register for this course should obtain permission from the instructors before registration.) MR. PALMER, MISS KENNEDY.

118. LABORATORY PROBLEMS IN BIOCHEMISTRY. Special laboratory work in the preparation and isolation of pure compounds which occur in living cells, the study of biochemical reactions, and special methods of identification or determination of biochemical products. MR. GORTNER, MR. BAILEY, MR. PALMER, MR. MORROW, MR. WILLAMAN.

COMPARATIVE LITERATURE

Professor OSCAR W. FIRKINS.

COURSES

101-102-103†. DRAMA. An outline of the history of drama, including the drama of to-day. Lectures and readings. MR. FIRKINS.

105-106-107†. PRINCIPLES OF CRITICISM. Lectures and readings. MR. FIRKINS.

110. THE INTERNATIONAL ROMANTIC MOVEMENT IN EUROPE (1775-1825). MR. FIRKINS.

203. THE ARTHURIAN LEGEND. Consult Graduate School bulletin. MR. FIRKINS.

206. FRENCH AND ENGLISH LITERARY CRITICISM: from the sixteenth century to the present time. Consult Graduate School bulletin. MR. FIRKINS.

COMPARATIVE PHILOLOGY

Professor FREDERICK KLAEBER, Head; Assistant Professor SAMUEL KROESCH (German).

COURSES

101-102†. GENERAL INTRODUCTION TO THE SCIENCE OF LANGUAGE. Prerequisites, one of the following groups: (1) five years foreign language, four may be in high school and one in college; (2) two years foreign language in college; (3) four credits Old English. MR. KLAEBER.

103. UNIVERSAL LANGUAGE. Comparison of important languages grammatically and lexically. Movement for creation of an international language. Consideration of Volapük, Esperanto, Ido, etc. MR. KLAEBER.

105. THE LIFE OF WORDS. Etymology and semasiology. Growth of vocabulary; change of words in form and meaning. MR. KLAEBER.

108. COMPARATIVE PHONETICS. A study of speech sounds and the nature of their production with special reference to English, French, and German. Open to students of the modern languages. Identical with German 108. MR. KROESCH.

109-110-111†. HISTORY OF THE GERMAN LANGUAGE. Lectures, discussions, assigned readings. This course is identical with German 109-110-111. (Not given in 1922-23.) MR. KLAEBER.

141-142-143†. HISTORICAL GRAMMAR OF THE ENGLISH LANGUAGE. I. Sounds and spelling. II. Accidence and syntax. (Not given in 1922-23.)

203-204. GOTHIC. Consult Graduate School bulletin.

209-210. OLD HIGH GERMAN. Consult Graduate School bulletin.

DRAWING AND DESCRIPTIVE GEOMETRY

Professor WILLIAM H. KIRCHNER, Head; Instructors JOHN O. CEDERBERG, ROBERT F. SCHUCK.

COURSES

30. PROJECTION AND SHADOWS. Methods of representation, arrangement of views, sections, surfaces, tangencies, and penetrations; and architectural

shades and shadows. (Required of sophomore students taking the course in Interior Decoration.) MR. KIRCHNER.

41-42-43. TECHNICAL DRAWING. (a) A general course in the theory and practice of drawing. Sketching, lettering, tracing, conventions, renderings, and mechanical drawing. (b) Modification of the above course of particular interest to dental and medical students. MR. CEDERBERG, MR. SCHUCK.

44. LETTERING. A course in plain, single-stroke lettering. MR. KIRCHNER and assistants.

45. ALPHABETS. Construction and analysis of various types of letters. Demonstrations and exercises. MR. KIRCHNER, MR. SCHUCK.

47-48-49. DRAWING, ENGRAVING, AND DECORATION. A study of the graphic arts and processes with special emphasis on their application to the art of printing. MR. KIRCHNER.

ECONOMICS

SCHOOL OF BUSINESS

Professors GEORGE W. DOWRIE, Head; JOHN D. BLACK, ROY G. BLAKEY, FREDERICK B. GARVER, NORMAN S. B. GRAS, JEREMIAH S. YOUNG (Political Science); Associate Professors ALVIN H. HANSEN, WILLIAM L. HART (Mathematics), BRUCE D. MUDGETT; Assistant Professors Z. CLARK DICKINSON, ERNEST A. HEILMAN, HOWARD S. NOBLE, H. BRUCE PRICE, JOHN J. REIGHARD, J. WARREN STEHMAN, HOLBROOK WORKING; Professorial Lecturer J. FRANKLIN EBERSOLE; Instructors JOSEPH E. CUMMINGS, RALPH H. FARMER, RICHARD A. GRAVES, ARTHUR B. GUNNARSON, MILDRED L. HARTSOUGH, CHARLES B. KUHLMANN, OTTO F. KUHLMANN, WILLIAM H. MCCORD, WALTER R. MYERS, MILTON N. NELSON, HARRY J. OSTLUND, FRED B. RINGHAM, LAWRENCE SMITH, W. BAYARD TAYLOR, VIRGIL R. WERTZ, NINA L. YOUNGS.

COURSES

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

3-4†. PRINCIPLES OF ECONOMICS. MR. HANSEN and others.

14. ELEMENTS OF STATISTICS. MR. MUDGETT and others.

25-26†-27. PRINCIPLES OF ACCOUNTING. MR. HEILMAN and others.

51-52-53†. BUSINESS LAW. (See Political Science 51-52-53.)

62. SOCIAL INSURANCE. Risks of death, accident, ill-health, invalidity, unemployment, superannuation. Detailed study of workmen's compensation in the United States; and consideration of progress in the United States and foreign countries of protection against other socially important hazards. MR. MUDGETT.

65. COLONIZATION. (See Political Science 65.)

72. ECONOMICS OF TRANSPORTATION. MR. CUMMINGS.

74. TRANSPORTATION PROBLEMS. An intensive study of certain important problems such as valuation, public ownership, operation, and regulation. MR. CUMMINGS.

85. PRINCIPLES OF MARKETING. A general course dealing with the mechanism and operation of markets: classification, organization, market agencies as factors in production. The price-making process: control of supply, assumption of risk, incidence of marketing costs. Wastes of competition. MR. NELSON.

90. ECONOMICS OF CONSUMPTION. (See College of Agriculture bulletin.)

103-104†. VALUE AND DISTRIBUTION. MR. GARVER, MR. WORKING.

105. HISTORY OF ECONOMIC IDEAS. MR. GARVER.

106. LAND ECONOMICS. A study of several problems arising out of the land basis of civilization, such as property in land, land utilization, land classification, land settlement, status of the agricultural classes, farm labor, farm ownership and tenancy. MR. BLACK.

107. LAND TENURE. (See College of Agriculture bulletin.)

108. MARKETING OF FARM PRODUCTS. MR. PRICE.

113. THEORY OF STATISTICS. The calculation and use of various constants of importance in the analysis of statistical data; averages, measures of dispersion and of correlation, partial correlation; and the theory of errors. MR. MUDGETT.

118-119-120†. ECONOMIC HISTORY OF EUROPE AND THE UNITED STATES, 1750 TO THE PRESENT. (See History 113-114-115.)

121-122-123†. ECONOMIC HISTORY OF EUROPE, 1300-1750. (See History 116-117-118.) (Not offered in 1922-23.)

143-144†. THE FINANCIAL SYSTEM. MR. DOWRIE and others.

149. BUSINESS CYCLES. MR. EBERSOLE.

153. THE TRUST PROBLEM. MR. NELSON.

154. PUBLIC UTILITIES. Economic and legal bases of classification. Relative advantages of public ownership and regulation. Central and municipal regulation compared. The basis of rates; relative rates; rates and service. Summary of the theories of valuation. MR. REIGHARD.

155. CORPORATION FINANCE. MR. STEHMAN.

157. POLICE POWER. (See Political Science 157.)

158. GOVERNMENT AND BUSINESS. (See Political Science 158.)

160. ECONOMIC MOTIVES. Psychological approach to certain problems of economic theory. MR. DICKINSON.

161. LABOR PROBLEMS AND TRADE UNIONISM. MR. HANSEN.

162. THE LABOR MOVEMENT IN AMERICA AND ENGLAND. MR. HANSEN.

167. INDUSTRIAL RELATIONS. MR. DICKINSON.

168. PERSONNEL MANAGEMENT. MR. DICKINSON.

169. THE LABOR AND SOCIALIST MOVEMENT IN EUROPE. MR. HANSEN.

176. COMMERCIAL POLICIES. Theory of international commerce; free trade, reciprocity, protection, subsidies, preferential treatment, the open door, international finance, commercial treaties, foreign politics, and other governmental and organized efforts to affect trade. American problems emphasized. MR. BLAKEY.

191-192†. PUBLIC FINANCE. MR. BLAKEY.

193. STATE AND LOCAL TAXATION. MR. BLAKEY.

EDUCATIONAL ADMINISTRATION

COLLEGE OF EDUCATION

Professors MERVIN G. NEALE, Chairman; LEONARD V. KOOS, FLETCHER H. SWIFT; Special Lecturer SAMUEL R. POWERS.

COURSES

119. THE ELEMENTARY SCHOOL CURRICULUM. Principles underlying the organization of subject-matter for courses in the elementary school, including a critical examination of curricula, syllabi, and school tests in the light of their function in teaching and administration of the curriculum.

124. EDUCATIONAL ADMINISTRATION. The present status and tendencies in the organization and administration of state and city school systems. Interpretations. MR. NEALE.

125-126. CITY SCHOOL ADMINISTRATION. For superintendents and principals. Detailed study of the principles and practices of city school administration. MR. NEALE.

164. PROBLEMS OF HIGH SCHOOL ADMINISTRATION. A study of elimination from school, secondary vocational education, the marking system, classification of students, high school library, social organization and extracurricular activities, community relationships, teaching schedule, buildings, costs. MR. KOOS.

167-168. JUNIOR HIGH SCHOOL. A study of the special purposes of this institution and the appropriate reorganizations to achieve them; the history of the movement. MR. KOOS.

174. PUBLIC SCHOOL FINANCE. A critical study of problems of Federal and state aid to public schools: sources, methods, principles, needed reforms. Students are strongly advised to take as preparatory or in conjunction with this course Economics 191-192, Public Finance; and Educational Psychology 126-127, Methods of Educational Research. MR. SWIFT.

180. THE JUNIOR COLLEGE. This institution as an upward extension of the secondary school. The forces giving rise to the movement, special purposes, sources of student body, financial responsibilities involved, curriculum, faculty, relationships to schools below and above. (Not offered in 1922-23.) MR. KOOS.

HISTORY AND PHILOSOPHY OF EDUCATION

COLLEGE OF EDUCATION

Professor FLETCHER H. SWIFT, Chairman; Assistant Professor ROSS L. FINNEY; Instructor JEAN H. ALEXANDER.

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

3. EDUCATIONAL SOCIOLOGY. This course is designed to explain from the sociological standpoint what the aims of education are, and what subjects are of most value. MR. FINNEY.

5. PUBLIC EDUCATION IN THE UNITED STATES. A brief survey of the factors determining the problem of public education in America, followed by a brief account of the development and organization of typical state school systems. MR. SWIFT, MISS ALEXANDER.

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

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

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

129-130. EDUCATIONAL CLASSICS. An intensive study of selected writings of educational leaders: first quarter, Plato, Aristotle, Quintilian, Comenius, Locke; second quarter, Rousseau, Pestalozzi, Herbart, Froebel, and Dewey. Students may register for either quarter. (Not offered in 1922-23.)

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

EDUCATIONAL PSYCHOLOGY

COLLEGE OF EDUCATION

Professors MELVIN E. HAGGERTY, Chairman; WILFORD S. MILLER; Assistant Professor MARVIN J. VAN WAGENEN; Professorial Lecturer FREDERICK KUHLMAN.

COURSES

106-107-108. ADVANCED EDUCATIONAL PSYCHOLOGY. Genetic psychology, origin and nature of human organism, development and control of instincts; methods of measuring rate of learning; typical learning experiments. Group and individual differences; their relations to educational practice. MR. VAN WAGENEN.

111. EDUCATIONAL DIAGNOSIS. The typical educational problems involving educational scales and standard tests. Nature of tests, methods of use, analysis of results obtained, and programs of remedial educational procedure based on the results of the tests. MR. VAN WAGENEN.

126. STATISTICAL METHODS OF EDUCATIONAL RESEARCH. A study of statistical and other methods as applied to educational investigation. This course is ordinarily required of all candidates for advanced degrees. MR. VAN WAGENEN.

127-128. ADVANCED STATISTICAL METHODS IN EDUCATIONAL RESEARCH. A survey of statistical studies in education with special reference to the methods employed and the reliability of the results obtained. MR. VAN WAGENEN.

134-135-136. MENTAL TESTS AND MENTAL DIAGNOSIS. Study of mental variation in children, its nature, degrees, causes, and effects. A laboratory course in the study of individual differences by means of mental tests. Methods of treating superior and subnormal children in schools.

138-139. EXPERIMENTAL EDUCATION. A laboratory course designed to train students in the use of experimental methods in the study of educational problems, particularly in the field of the psychology of learning. MR. MILLER, MR. VAN WAGENEN.

149-150-151. PSYCHO-EDUCATIONAL CLINIC. Conducted in coöperation with the Department of Sociology and the Medical School clinics in pediatrics and nervous and mental diseases. Students will receive systematic instruction in giving psychological examinations and in scientific interpretation of data. MR. HAGGERTY.

153-154-155. RESEARCH PROBLEMS. Intended for properly prepared students who desire to pursue special investigation in the field of educational psychology. MR. HAGGERTY, MR. VAN WAGENEN.

156. PSYCHOLOGY OF VOCATIONAL EDUCATION. A practical course covering psychological facts and principles involved in vocational education, and in industrial and commercial administration. Attention is given to matters of personnel, acquisition of skill, motivation of workers, and efficiency of administration.

ENGLISH

Professors ELMER E. STOLL, Chairman; RICHARD BURTON,[1] FREDERICK KLAEBER (Comparative Philology), JOSEPH M. THOMAS;[2] Associate Professors JOSEPH W. BEACH, CECIL A. MOORE, FRANK M. RARIG; Assistant Professors JAMES T. HILLHOUSE, ELIZABETH JACKSON, CHARLES W. NICHOLS, ANNA H. PHELAN, MARTIN B. RUUD,[2] EMERSON G. SUTCLIFFE; Professorial Lecturer KEMP MALONE; Instructors AMY E. ARMSTRONG, ELIZABETH ATKINS, CECIL C. BEAN, MURIEL B. CARR, MARY ELLEN CHASE, HELEN M. CONNOR, HAROLD L. COOK, FRANCES K. DEL PLAINE, WILLIAM P. DUNN, DONALD W. FISHER, MARGARET GABLE, KENNETH B. HUNTER, JOHN KIERZEK, MILDRED E. LAMBERT, CHARLES F. LINDSLEY, MARGARET E. MACGREGOR, ARIEL MACNAUGHTON, ETHEL MOORE, MARJORIE H. NICOLSON, EMMA F. POPE, GRACE E. RICHARDS, HARLOW C. RICHARDSON, HARRY W. ROBBINS, SELMA W. SCHNEIDER, GEORGE SHOLTS, LOIS WHITNEY; Teaching Assistants BRYAN A. GILKINSON, DOROTHY R. HUDSON, BENJAMIN MCCLURE, LEONE B. NUNAN, WENDELL O. ROGERS, ALFRED J. SCHWEPPE, ALPHEUS SMITH; Teaching Fellows ARTHUR BOUVIER, HELEN SCURR.

ENGLISH
COURSES

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

1-2-3. GENERAL SURVEY OF ENGLISH LITERATURE. Intended for students who have had work in composition equivalent to that of A-B-C, but who have not had the survey of English classics included in that course.

6. CHAUCER. Reading of tales from the Canterbury collection, with introduction dealing with the grammar and literary forms of fourteenth-century English. MR. RUUD, MR. MALONE.

8. SHAKESPEARE. Shakespeare's development as a poet and dramatist up to *King Lear*. MR. STOLL.

[1] Absent on leave, fall and winter quarters.
[2] Absent on leave.

40. THE BIBLE AS LITERATURE. Special attention to literary forms. (Not given in 1922-23.) MR. BURTON.

41. BROWNING AND TENNYSON. MR. BURTON.

44-45†. AMERICAN LITERATURE. MR. MOORE.

50. OLD ENGLISH. Old English prose and poetry. The relation to modern English is particularly emphasized. MR. RUUD, MR. MALONE.

51. SPENSER. The forms and literary influences in the Eliizabethan period illustrated in the poetry of Edmund Spenser, with brief readings from the minor poems and extended study of *The Faerie Queene*. (Not given in 1922-23.) MR. STOLL.

53. SEVENTEENTH-CENTURY LYRISTS. The tradition of the Elizabethan lyric traced in the work of the metaphysical and cavalier schools of poetry. MR. MOORE.

58-59†. NINETEENTH-CENTURY PROSE. The more important prose writers of the nineteenth century; their styles, personalities, opinions, and relations to their period. MR. BEACH.

60. HISTORY OF THE ENGLISH LANGUAGE. MR. KLAEBER.

62. MILTON. Milton, with some consideration of his contemporaries. MR. STOLL.

64. BACON. Bacon as an essayist and as a promoter of learning. (Not given in 1922-23.) MR. STOLL.

66. THE ENGLISH NOVEL. Principles and personalities in the evolution of the English novel. Written reports on selected novels. MR. BURTON.

70. MASTERPIECES OF ELIZABETHAN DRAMA. Elizabethan dramatic art aside from Shakespeare's. Special attention to the art of the chief writers—Marlowe, Jonson, Beaumont and Fletcher, Webster, and Massinger. MR. STOLL.

101. INTRODUCTION TO MIDDLE ENGLISH. An outline of Middle English grammar, including the interpretation of selected texts. MR. KLAEBER.

103. BEOWULF. An introduction to the Old English poem, with reading of considerable portions of the text. MR. KLAEBER.

105-106†. EIGHTEENTH-CENTURY POETRY. From Pope to Burns, with special reference to the rise and growth of naturalism and romanticism. (Not given in 1922-23.) MR. MOORE.

107-108†. EIGHTEENTH-CENTURY PROSE. Special study of fiction and the essay. MR. MOORE.

109-110†. THE ROMANTIC POETS OF THE NINETEENTH CENTURY. From Wordsworth to Keats and the influence of the French revolution. (Not given in 1922-23.) MR. BEACH.

111-112†. SEVENTEENTH-CENTURY PROSE. General survey of the prose of the century to 1660. History 3-4 is desirable as preparation for this course. (Not given in 1922-23.) MR. MOORE.

123-124-125†. STUDIES IN VICTORIAN NOVELISTS. George Meredith; or, in alternate years, Thomas Hardy and Henry James. Hardy and James in 1922-23. MR. BEACH.

129. MODERN DRAMA. Contemporary drama from 1870 to the present. MR. BURTON.

133. THE ENGLISH AND SCOTTISH POPULAR BALLADS. A study of a large number of traditional ballads, English and foreign, and of ballad style and origins. MR. STOLL.

136. ADVANCED SHAKESPEARE. Shakespeare's development traced to the end. A careful analysis of four plays. Problems in the interpretation of Shakespeare's dramatic methods. MR. STOLL.

140. ADVANCED CHAUCER. The more important of Chaucer's poems aside from *The Canterbury Tales;* the sources and chronology of Chaucer's work. MR. RUUD.

141-142-143†. HISTORICAL GRAMMAR OF THE ENGLISH LANGUAGE. This course is identical with Comparative Philology 141-142-143. (Not given in 1922-23.) MR. KLAEBER.

146-147†. THE METRICAL ROMANCES. The more important Middle English romances; an introduction to the great stories of love and chivalry current in the Middle Ages, particularly those connected with Arthur and the Round Table. MR. MALONE.

150. VICTORIAN POETRY. The poetry of the Victorian era, aside from Browning's and Tennyson's. The principal names are: Matthew Arnold, the Rossettis, Fitzgerald, Morris, Swinburne, and Meredith. MR. STOLL.

151. RECENT POETRY. Poetry in England and America since the death of Queen Victoria. The main tradition and tendencies now prevailing. (Not given in 1922-23.) MR. BEACH.

152. PRE-ELIZABETHAN DRAMA. The late medieval and the Renaissance drama, moralities, interludes, and farces up through the earlier years of the Elizabethan period. MR. STOLL.

155. THE AMERICAN NOVEL. The beginnings of the American novel and short-story and their development to about 1865. Among the writers included are Charles Brockden Brown, Irving, Cooper, Poe, Hawthorne, Thomas Bailey Aldrich. MR. MOORE.

COURSES PRIMARILY FOR GRADUATE STUDENTS

201. OLD ENGLISH. MR. KLAEBER.

202-203. OLD ENGLISH POETRY. MR. KLAEBER.

208. PIERS THE PLOWMAN.

228-229-230. SEMINARY IN EIGHTEENTH-CENTURY DRAMA. MR. MOORE.

234-235-236. SEMINARY IN MIDDLE ENGLISH LITERATURE. MR. MALONE.

RHETORIC
COURSES

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

4-5-6. COMPOSITION FOR TECHNICAL STUDENTS. Required in the College of Engineering, the School of Chemistry, in the seven-year course in Science and Medicine in the College of Science, Literature, and the Arts, and in the course in Art Education in the College of Education. Practical training in the art of writing; the principles of structure, and analysis of specimens of good prose.

11-12-13. DESCRIPTION, NARRATION, AND EXPOSITION. Short themes and fortnightly essays, with emphasis on planning and amplification; description, the first quarter; narration, the second; and literary criticism, the third. Number in each section limited to twenty.

15-16-17†. EXPOSITION AND ARGUMENT. Exposition during the first quarter, followed by argument. The study of a text and the analysis of specimens, accompanied by weekly essays, and shorter themes. Number in each section limited to twenty.

31. TECHNICAL WRITING. See program for College of Engineering.

63-64-65. STUDIES IN STRUCTURE AND STYLE. Analysis of standard English prose; themes based on personal observation, current readings, and investigation; preparation of essays with particular classes of readers in view.

67. 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 composition.

69-70†. SHORT-STORY WRITING. The technique of the short story accompanied by constructive work in story-writing.

100-101†. VERSIFICATION. The nature of poetry and a detailed analysis of English meters and the various English verse forms. The theory accompanied by criticism of current poetry and practice in writing verse. MR. NICHOLS.

111-112-113. ESSAY-WRITING. Practice in writing didactic, biographical, critical, informal essays. Extended composition. Individual aid in gathering of material, planning of papers, and criticism of essays. Analysis of a considerable body of modern essays. MR. SUTCLIFFE.

115-116-117. 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.

119-120-121. SEMINAR IN WRITING. Open to advanced students who write with facility and who desire personal direction. Criticism of manuscripts submitted. MR. THOMAS.

PUBLIC SPEAKING
COURSES

VOICE AND SPEECH CORRECTION. The Public Speaking staff conducts a speech clinic twice each week. Every student in Public Speaking 41-42-43 and 45-46 is required to attend this clinic at least three times each quarter. Instructors may also require any student in any course, who needs special attention to attend once each week until excused.

41-42-43. A GENERAL COURSE IN PUBLIC SPEAKING. Fundamentals of effective speaking; breathing, voice production, enunciation, and action; delivery of extracts from the works of well-known writers and speakers; principles underlying speech-making applied in both oral and written compositions. Each section limited to twenty-five. MR. RARIG, MR. LINDSLEY, MISS MACNAUGHTON.

45-46. A GENERAL COURSE IN PUBLIC SPEAKING. A five-credit course identical in subject-matter with 41-42-43.

55-56-57. ARGUMENTATION AND DEBATING. Analysis, gathering of evidence, briefing. Critical study of models, including Lincoln-Douglas debates. Principles governing persuasive speaking applied in practice debates. MR. LINDSLEY.

81-82-83. INTERPRETATIVE READING. Various forms of literature, such as the essay, prose narrative, lyric and narrative poetry, and the drama. MR. RARIG.

85-86-87. ADVANCED PUBLIC SPEAKING. The distinctive characteristics of oratorical style; analysis of the styles of representative orators. Written and extemporaneous speeches. Individual criticism and direction. Those desiring to prepare for the Pillsbury contest should register for this course. MR. RARIG.

91-92-93. PLAY PRODUCTION. Principles and practice of play production; studies of the various aspects, such as the reading of lines, characterization, action, stage business, settings, and lighting; the coaching of plays. MISS MACNAUGHTON.

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

GEOLOGY

Professors WILLIAM H. EMMONS, Head; FRANK F. GROUT, CLINTON R. STAUFFER; Instructors IRA S. ALLISON, JOHN W. GRUNER, GEORGE M. SCHWARTZ, GEORGE A. THIEL.

COURSES

1-2†.[1] GENERAL GEOLOGY. Open to those who have had some course in chemistry (high school chemistry sufficient). A synoptical treatment of materials of the earth and of geologic processes. Lectures, laboratory work, field excursions, and conferences outside of class hours. MR. EMMONS, MR. ALLISON, MR. THIEL.

4. GEOLOGY OF MINNESOTA. The physical geography and geologic history of Minnesota. The relations of industrial development to geological features. (Not offered in 1922-23.)

7-8. GENERAL GEOLOGY LABORATORY. Supplements Course 1-2 with study of rocks and ores, topographic and geologic maps, fossils, and reference reading. MR. ALLISON.

11-12†.[2] INTRODUCTION TO GEOLOGY. No prerequisites. A synoptical treatment of materials of the earth and of geologic processes. Physiographic, dynamic, structural, and historical geology. Lectures, laboratory work, field excursions, and conferences outside of class hours.

15. MINERALS AND ROCKS. An outline study of general principles of petrography; classification of minerals and rocks and practice in their identification. MR. GRUNER.

19. ELEMENTS OF PALEONTOLOGY. An introduction to the study of fossil organisms. Lectures supplemented by field excursions. MR. STAUFFER.

21-22†. ESSENTIALS OF MINERALOGY. Crystal systems, morphological, physical, and chemical character of minerals. Determinative work, blowpipe analysis, sight identification. MR. BRODERICK, MR. GRUNER.

23-24-25†. MINERALOGY. The crystal systems; morphological, physical, and chemical characters of minerals; occurrence, genesis, and uses of minerals; classification and description of common minerals; rock minerals, and common rocks. Determinative work in laboratory, blowpipe analysis, sight identification. MR. BRODERICK, MR. GRUNER.

27. OUTLINES OF MINERALOGY. A course designed especially for teachers. Methods of identification of minerals, laboratory practice, conferences, reference reading. MR. GRUNER.

[1] This course satisfies the Junior College requirement for science.
[2] This course does not satisfy the Junior College requirement for science.

29.[1] General Physiography. Principles of earth sculpture; physiographic changes in progress, and agencies causing them; hydrography and oceanography; planetary relations; climatology.

30.[1] Principles of Geography. A study of the life reactions to the major types of geographic environment; treats of the influence of climate, topography, soil, and mineral resources upon human affairs. (Not offered in 1922-23.)

34.[1] 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.

37.[1] Economic and Commercial Geography. A study of the geographic factors influencing production and trade. Natural resources in their relation to commerce and industry and the major trade routes will be emphasized.

51-52†. 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. Mr. Schwartz.

57-58-59. Paleontology. A study of fossil forms with special reference to those of geological importance. Faunas and their correlation. Mr. Stauffer.

61. Blowpipe Analysis. The determination of minerals by systematic blowpipe analysis. Mr. Broderick, Mr. Gruner.

65. Crystallography. Projection and geometric relations of crystal planes; crystal nomenclature; the relation of special properties to morphology. A study of crystal models, crystal drawing, identification of minerals from crystal measurements, and mathematical calculations. (Not offered in 1922-23.) Mr. Broderick.

67. Mineralogy of Chemical Materials. Methods of mineralogy; identification of the chief commercial minerals; the world's supply. Laboratory work. Mr. Grout.

85. Field Work. About two weeks in June are spent in geologic mapping of selected areas in the iron districts of Minnesota. Involves preparation of geologic maps and written reports. Mr. Gruner, Mr. Thiel.

91-92-93. Index Fossils of North America. A study of fossils and their uses in correlation. A course intended primarily for mining geologists. Mr. Stauffer.

101. Principles of Stratigraphy. The interpretation of sedimentary deposits in relation to paleography; field work. Mr. Allison.

[1] This course does not satisfy the Junior College requirement for science.

105. ROCK STUDY. The occurrence and genesis of rocks; their mineral and chemical composition and classification; their structure, texture, and alteration. MR. GROUT, MR. GRUNER, MR. THIEL.

106. PETROGRAPHY. The study of rocks by optical methods. MR. GROUT, MR. GRUNER, MR. THIEL.

107-108-109. 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. MR. STAUFFER.

111. ORE DEPOSITS. The nature, distribution, and genesis of ore deposits; relations of ore deposits to geologic structure; the deformation and superficial alteration of ore deposits. MR. EMMONS.

112. GEOLOGY OF PETROLEUM. The nature, origin, and distribution of petroleum. Discussion of the oil fields of the world. MR. EMMONS.

113. PROBLEMS IN ORE DEPOSITS. Field excursions, map work, lectures on field and laboratory methods. MR. EMMONS.

114. GEOGRAPHY OF NORTH AMERICA. The regional geography of the United States and Canada.

115. GEOGRAPHIC INFLUENCES. A study of the influence of geographic factors of location, topography, climate, and natural resources upon the economic, social, and political development of America. (Not offered in 1922-23.)

116. GEOGRAPHY OF SOUTH AMERICA. (Not offered in 1922-23.)

117. RESOURCES AND TRADE. Major commodities typical of the different sorts of national resources will be selected, and a detailed study of their occurrence, production, manufacture, and exchange made. (Not offered in 1922-23.)

118. GEOGRAPHY OF EUROPE. Regional geography of Europe; the geology, topography, climate, natural resources, people, industries, and trade of these countries. (Not offered in 1922-23.)

119. GEOGRAPHY OF ASIA. The regional geography of Asia in its physical, economic, commercial, and political aspects. (Not offered in 1922-23.)

124-125. STRUCTURAL AND METAMORPHIC GEOLOGY. The conditions, processes, and results of metamorphism; structural features resulting from deformation under varying conditions of load. MR. SCHWARTZ.

131-132-133. 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. MR. GROUT.

137. TESTING ECONOMIC MINERALS. Methods of determining quality of mineral deposits, described and illustrated by laboratory tests of coal, clay, oil, building stone, and metallic ores. MR. GROUT.

140-141. APPLIED PETROGRAPHY. Determination of ores and gangue minerals. Microscopic studies of paragenesis. Practical problems in mining and geology, settled by microscopic and optical examination. MR. GROUT.

144-145. CONSTRUCTION AND INTERPRETATION OF GEOLOGIC MAPS. Methods of geological examination; study and problems in construction and interpretation of geologic maps. MR. ALLISON.

150. FIELD GEOLOGY. Detailed, systematic work conforming with official surveys. Geologic maps, structure sections, reports; paragenesis of ores and their relations to geologic structures. Field for 1922, Black Hills, South Dakota. Reports to be written week before college opens in fall. MR. EMMONS, MR. SCHWARTZ.

151-152-153. ADVANCED GENERAL GEOLOGY. Geologic processes and their results; development of the North American continent. MR. STAUFFER.

166-167. MINERALOGRAPHY. Methods of studying opaque minerals and the application of the methods to problems in ore genesis and history. MR. BRODERICK, MR. SCHWARTZ.

GRADUATE COURSES

211. ADVANCED PALEONTOLOGY.

214. SEMINAR IN ORE DEPOSITS.

215. GEOLOGY AND ORE DEPOSITS OF THE WESTERN HEMISPHERE.

216. GEOLOGY AND ORE DEPOSITS OF THE EASTERN HEMISPHERE.

220. GLACIAL GEOLOGY.

241. FIELD COURSE IN GEOLOGY.

243-244. RESEARCH COURSE IN GEOLOGY.

246. PRE-CAMBRIAN GEOLOGY.

247. GEOLOGY AND EXPLORATION OF LAKE SUPERIOR REGION.

251-252. ORIGINAL PROBLEMS.

253-254. RESEARCH COURSE IN ORE DEPOSITS.

263-264. RESEARCH COURSE IN PETROLOGY.

289-290. RESEARCH COURSE IN GEOGRAPHY.

GERMAN

Professors CARL SCHLENKER, Chairman; FREDERICK KLAEBER (Comparative Philology); Assistant Professors OSCAR BURKHARD, JAMES DAVIES, SAMUEL KROESCH; Instructors HARRY S. CANNON, LYNWOOD G. DOWNS, RICHARD JENTE, GEORGE F. LUSSKY; Teaching Fellows ESTHER HENDRICKSON; Scholars ANNA HEILMAIER, EDGAR HEMMINGHAUS.

COURSES

1. BEGINNING. A. Pronunciation, conversation, grammar, and composition; selected readings in easy prose and verse.

2. BEGINNING. B. Continuation of Course 1.

3. BEGINNING. C. Selected texts from modern writers.

10. RAPID READING. Modern narrative prose.

11. ADVANCED RAPID READING. Continuation of Course 10. Representative works of the eighteenth and nineteenth centuries.

15. NARRATIVE PROSE FOR PRE-MEDICAL STUDENTS. Reading, grammar review.

24-25-26†. BEGINNING FOR CHEMISTS. Pronunciation, conversation, grammar, and composition; selected readings in easy prose.

27. NARRATIVE PROSE FOR CHEMISTS. Reading, grammar review.

28-29†. CHEMICAL GERMAN. Selections from more difficult works on chemistry.

31-32. MEDICAL GERMAN. Readings from general works on physiology, anatomy, and bacteriology.

50-51-52†. COMPOSITION. Aims to develop grammatical correctness. Translations from English selections. Essay-writing on assigned subjects. MR. JENTE.

56-57-58†. ESSAY-WRITING. Syntax, structure, and style; criticism of essays on assigned subjects. MR. LUSSKY.

62. NINETEENTH-CENTURY PROSE. Narrative readings from modern novelists. MR. CANNON.

63. MODERN DRAMA. Plays of modern dramatists, Hauptmann, Sudermann, Fulda, and others. MR. DAVIES, MR. DOWNS.

64. CLASSIC DRAMA. Plays of Lessing, Goethe, and Schiller, MR. DAVIES, MR. DOWNS.

65. SURVEY OF GERMAN LITERATURE THROUGH THE REFORMATION PERIOD. Lectures, assigned readings, reports. MR. KROESCH.

66. SURVEY OF GERMAN LITERATURE OF THE EIGHTEENTH CENTURY. Lectures, assigned readings, reports. MR. BURKHARD.

67. SURVEY OF GERMAN LITERATURE OF THE NINETEENTH CENTURY. Lectures, assigned readings, reports. MR. BURKHARD.

72. DRAMA SINCE 1880. The beginnings of the dramatic revival; Sudermann and others. (Not offered in 1922-23.) MR. SCHLENKER.

73. DRAMA SINCE 1880. Hauptmann, Wedekind, Halbe, Schnitzler, and others. (Not offered in 1922-23.) MR. SCHLENKER.

74. GERMAN POETS. Survey of German poetic literature. (Not offered in 1922-23.) MR. DAVIES, MR. DOWNS.

77. GOETHE'S FAUST, PART I. Reading and interpretation of the text; genesis of the work; the Faust legends, Faust books, puppet plays, Marlow's *Faustus*. MR. SCHLENKER.

100-101-102†. MIDDLE HIGH GERMAN. Phonology, morphology, and syntax. Translation into the modern German. MR. KROESCH.

107. HISTORICAL GERMAN GRAMMAR. Phonology, inflection, word formation, syntax. Intended primarily for prospective teachers of German. (Not offered in 1922-23.) MR. KROESCH.

108. COMPARATIVE PHONETICS. A study of speech sounds, and the nature of their production with special reference to English, French, and German. Open to students of the modern language. MR. KROESCH.

109-110-111†. HISTORY OF THE GERMAN LANGUAGE. Lectures, discussions, assigned readings. This course is identical with Comparative Philology 109-110-111. MR. KLAEBER.

150-151-152†. DIE NOVELLE. A study of the technique and development. Assigned readings and reports. MR. BURKHARD.

153-154-155†. ASPECTS OF GERMAN LITERATURE OF THE NINETEENTH CENTURY. The subject of the course will be announced from year to year. (Not offered in 1922-23.) MR. BURKHARD.

160-161-162†. LYRIC POETRY OF THE EIGHTEENTH AND NINETEENTH CENTURIES. Historical review of the best lyric poetry and chief writers. MR. DAVIES.

225-226-227. LITERARY PROBLEMS. Drama of the last half of the nineteenth century. MR. SCHLENKER.

GREEK

Professor CHARLES ALBERT SAVAGE, Chairman; Assistant DOROTHY B. STRONG.

COURSES

1-2†-3. BEGINNING GREEK. Grammar, composition, word-formations, oral exercises, and selected readings in simple prose and verse.

4-5-6. HISTORY AND EPIC POETRY. First quarter, selections from Xenophon's *Anabasis*, or from other historical prose; second quarter, selections from Herodotus; third quarter, selections from the *Iliad;* syntax, irregular verbs, dialectical forms. MR. SAVAGE, MISS STRONG.

7. EVERYDAY GREEK. A brief course in Greek sources of English words. The practical purpose is to enable students to trace the origin and feel the force of English words derived from Greek, and especially of scientific terms.

51. PHILOSOPHY. Plato's *Apology,* or selections from other dialogues of Plato and from Xenophon's *Memorabilia.* MR. SAVAGE.

52. ORATORY. Selections from Lysias and Demosthenes; study of the principles of Greek rhetoric and Greek oratory. MR. SAVAGE.

53. DRAMATIC POETRY. One play of Euripides; introductory course in the drama. MR. SAVAGE.

105. LYRIC POETRY. Selections from the elegiac, iambic, lyric, and bucolic poets. MR. SAVAGE.

106. ADVANCED DRAMA. Aeschylus, Sophocles, or Aristophanes. Special attention given to the development of the drama, and to the literary form and dramatic representation of the plays read. MR. SAVAGE.

107. ADVANCED PROSE. Selections from the Greek historians, or from Plato, or from the orators. Alternates with Course 106.

108. ADVANCED EPIC POETRY. A course of rapid readings in the *Iliad* or the *Odyssey.* MR. SAVAGE.

109. THE NEW TESTAMENT. Especially intended for those who are preparing for the ministry, or for some other form of religious work. Alternates with Course 108. MR. SAVAGE.

COURSES FOR WHICH NO KNOWLEDGE OF GREEK IS REQUIRED

42. GREEK SCULPTURE. Lectures, textbook work, assigned readings; stereopticon illustrations of the famous temples, statues, friezes, reliefs, and monuments of Greece. MR. SAVAGE.

43. GREEK DRAMA. Reading and interpretation of representative Greek plays; lectures dealing with the origin, growth, character, and influence of the Greek drama; stereopticon illustrations. Students taking this course may not receive credit for Course 44 without permission. MR. SAVAGE.

44. GREEK LITERATURE AND LIFE. Lectures, textbook work, illustrative and assigned readings; special lectures illustrated by stereopticon views. Recommended to those who intend to teach Greek, Latin, English, or ancient history. MR. SAVAGE.

45. GREEK MYTHOLOGY. Lectures, textbook work, and illustrative readings, supplemented by occasional stereopticon views. Recommended to those specializing in languages, literature, or philosophy. MR. SAVAGE.

HISTORY

Professors GUY STANTON FORD, Chairman; CLARENCE W. ALVORD, SOLON J. BUCK, WILLIAM S. DAVIS, NORMAN S. B. GRAS, ALBERT B. WHITE, QUINCY WRIGHT, (Political Science); Associate Professors AUGUST C. KREY, LESTER B. SHIPPEE, MASON W. TYLER; Assistant Professor GEORGE M. STEPHENSON.

JUNIOR COLLEGE COURSES

1-2†. THE MODERN WORLD, 1648-1918. A historical survey of the last three centuries. MR. FORD, MR. KREY, MR. TYLER.

3-4†. ENGLAND, 1066 TO THE PRESENT. General political history of England since the Norman Conquest. MR. WHITE.

5-6†. AMERICAN HISTORY. A general survey of the national period of American history. MR. ALVORD, MR. SHIPPEE.

7. EUROPE IN THE MIDDLE AGES. The emphasis is placed upon the political history of the period from 395 A.D. to 1648. MR. KREY.

9-10†. INTRODUCTION TO ECONOMIC HISTORY WITH SPECIAL EMPHASIS ON THE UNITED STATES. Lectures and section work. Primarily for business students, but open to others who have ten credits in history. MR. GRAS and others.

11-12-13†. MEDIEVAL HISTORY THROUGH THE REFORMATION. Primarily for music and architecture students, but open to others who have ten credits in the social science group. MR. KREY.

25. WORLD POLITICS. A study of the foreign policies and international relations of the leading European powers to-day. MR. TYLER.

33-34†. ENGLISH LEGAL INSTITUTIONS. Beginnings of legal institutions and ideas among the Teutonic peoples, and the development of courts and procedure in England. MR. WHITE.

40. RECENT AMERICAN HISTORY. A study of American development from 1876 to the present time. MR. SHIPPEE.

SENIOR COLLEGE COURSES

American History

112. HISTORY OF AMERICAN IMMIGRATION. Settlement and development of typical racial stocks in America. MR. STEPHENSON.

125. AMERICAN DIPLOMATIC HISTORY. Identical with Political Science 125. MR. WRIGHT.

127. AMERICAN FOREIGN RELATIONS. Identical with Political Science 127. MR. WRIGHT.

141. THE WEST IN AMERICAN HISTORY TO 1815. (Not offered in 1922-23.) MR. BUCK.

142. THE WEST IN AMERICAN HISTORY, 1815-65. This course, while offered separately, follows, and is calculated to form a natural sequence to History 141. (Not offered in 1922-23.) MR. SHIPPEE.

144-145†. HISTORY OF MINNESOTA. MR. BUCK.

146-147†. CONSTITUTIONAL HISTORY OF THE UNITED STATES. MR. SHIPPEE.

148-149-150†. BRITISH EMPIRE IN THE EIGHTEENTH CENTURY. A study of imperial politics, including the development of the English colonies in America and the American Revolution. MR. ALVORD.

153. THE WEST IN AMERICAN POLITICS SINCE 1865. Students will be expected to use material in the library of the Minnesota Historical Society, St. Paul. (Not offered in 1922-23.) MR. BUCK.

154. SELECTED TOPICS IN THE HISTORY OF MINNESOTA. Students will be expected to use material in the library of the Minnesota Historical Society, St. Paul. MR. BUCK.

155. THE UNITED STATES, 1850-65. (Not offered in 1922-23.) MR. SHIPPEE.

156. THE RECONSTRUCTION PERIOD. This course follows History 155 as a natural sequence. MR. SHIPPEE.

160. SELECTED TOPICS IN LATER AMERICAN COLONIAL HISTORY. MR. ALVORD.

166. SELECTED TOPICS IN THE HISTORY OF IMMIGRATION. MR. STEPHENSON.

208-209-210. SEMINAR IN AMERICAN HISTORY. MR. ALVORD, MR. BUCK, MR. SHIPPEE, MR. STEPHENSON.

See also 113-114-115† under Economic History; 121-122† under English History; and 111 under European History.

Ancient History

103. OLD ORIENT. MR. DAVIS.

105.[1] HISTORY OF ROME. MR. DAVIS.

133. POLITICAL HISTORY OF GREECE. MR. DAVIS.

134. ANCIENT CIVILIZATION: GREECE. MR. DAVIS.

135. ANCIENT CIVILIZATION: ROME. MR. DAVIS.

Economic History

113-114-115†. ECONOMIC HISTORY OF EUROPE AND THE UNITED STATES, 1750 TO THE PRESENT. MR. GRAS.

116-117-118†. ECONOMIC HISTORY OF EUROPE, 1300-1750. (Not offered in 1922-23.) MR. GRAS.

[1] Not open to students who took 135 in 1920-21, except by consent of instructor.

169. ECONOMIC HISTORY OF THE UNITED STATES SINCE THE CIVIL WAR. The chief emphasis is on the growth of manufacture and commerce, and government regulation. MR. GRAS.

205-206-207. SEMINAR IN ECONOMIC HISTORY. MR. GRAS.

English History

109. MODERN ENGLAND SINCE 1815. MR. BARNES.

121-122†. ENGLISH BACKGROUNDS AND THE AMERICAN COLONIES. Studies in the transfer of English civilization, and its early modifications and development in America. MR. WHITE.

162. THE BEGINNINGS OF PARLIAMENT. Demands knowledge of at least high school Latin. MR. WHITE.

172. ENGLISH HISTORY, 1715-1815. MR. BARNES.

183. THE STUART PERIOD. (Not given in 1922-23.)
See also 113-114-115† and 116-117-118† under Economic History.

European History

101-102. THE FRENCH REVOLUTION AND NAPOLEONIC ERA. Reading knowledge of French desirable. (Not offered in 1922-23.) MR. FORD.

104. THE NEAR EAST, MODERN. MR. DAVIS.

107-108. EUROPE, 1848-1914. A reading knowledge of French or German will be helpful. MR. TYLER.

111. EUROPEAN BACKGROUND OF AMERICAN IMMIGRATION. The history of the movement of population from Europe to America in the nineteenth century. MR. STEPHENSON.

119. THE RENAISSANCE AND THE REFORMATION. MR. KREY.

120. MEDIEVAL CIVILIZATION. A study of the social and intellectual development of Europe from the period of the German migrations to the end of the thirteenth century. MR. KREY.

131-132†. THE FORMATION AND FALL OF THE MODERN GERMAN EMPIRE. The principal emphasis is on the period since 1848, the work of Bismarck and the Empire under William II. MR. FORD.

158. SELECTED TOPICS IN NINETEENTH CENTURY HISTORY. A reading knowledge of French or German will be required. MR. TYLER.

164. STUDIES IN THE CRUSADES. Demands knowledge of at least high school Latin. MR. KREY.

201-202-203. HISTORICAL BIBLIOGRAPHY AND CRITICISM. MR. FORD, MR. WHITE, and others.
See also 113-114-115† and 116-117-118† under Economic History.

HOME ECONOMICS

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Associate Professors ALICE BIESTER, HARRIET GOLDSTEIN, MARION WELLER; Assistant Professors ALMA BINZEL, ALICE M. CHILD, AMY P. MORSE, E. MAUD PATCHIN, ETHEL L. PHELPS, LUCY A. STUDLEY; Lecturer in Hygiene MARTHA B. MOORHEAD; Instructors CARLOTTA BROWN, HALLY J. FISHER, VETTA GOLDSTEIN, AGNES KOLSHORN, RUTH LINDQUIST, MABEL C. MCDOWELL.

COURSES

3,4. 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. MISS WELLER.

11. GARMENT-MAKING. Instruction and laboratory practice in hand sewing, reading and adaptation of commercial patterns, use of the sewing machine, designing, cutting, and making simple outer garments from washable materials. MISS MCDOWELL.

13. DRESSMAKING. Quality, suitability, and cost of materials adapted to technique in construction of simple wool dresses; adaptation of art principles in selection of designs; construction of dress form; instruction and practice in methods of construction. MISS PATCHIN, MISS MCDOWELL.

17. ADVANCED CLOTHING CONSTRUCTION. Laboratory course involving the application of principles of costume-modeling in the construction of one high-grade garment, suit, coat, or dress. One day a week will be given to a millinery problem. MISS WELLER, MISS BROWN, MISS PATCHIN.

21. 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. MISS CHILD.

22. FOOD ECONOMICS. Cost and nutritive value of typical foods; the study of dietaries; preparation and serving of meals, the cost bearing a definite relation to the family budget. MISS CHILD.

34. HOME MANAGEMENT: OPERATION AND MAINTENANCE. Lectures. Discussion of management responsibilities of the home maker with special emphasis on budgets and household accounts. MISS STUDLEY.

37. HEALTH CARE OF THE FAMILY. (a) First aid; communicable diseases; their transmission and prevention; hygiene of infancy, maidenhood, maturity. (b) The care of the sickroom; observation and care of the patient; elementary symptomatology. MISS MOORHEAD, MISS FISHER.

51. DRAWING AND DESIGN. Composition, perspective; principles of design and color harmony applied to live and area designs, dress designs, and interiors. MISS HARRIET and MISS VETTA GOLDSTEIN.

52. ART HISTORY AND APPRECIATION. The historical development of art, architecture, decoration, furniture, and costume studied with special emphasis on design and influence upon modern styles. MISS HARRIET and MISS VETTA GOLDSTEIN.

53. ADVANCED DESIGN. Problems in design for house furnishings and for costume, including dress-modeling. MISS HARRIET and MISS VETTA GOLDSTEIN.

70. FOOD PREPARATION IN RELATION TO SOCIAL WORK. A study of the principles underlying cookery with special emphasis on the preparation of foods to be used in homes with limited incomes. MISS LINDQUIST.

71. ELEMENTARY DIETETICS FOR THE SOCIAL WORKER. Involves principles underlying adequate feeding. Food habits of different economic and racial groups forming the basis for actual planning and preparation of meals.

72. HOME MANAGEMENT PROBLEMS. Involves the making of sound budgets. Studies are based upon racial groups and the size of the family, together with the income. MISS LINDQUIST.

123. CLOTHING ECONOMICS. General consideration of the economic problems in clothing production; woman's responsibility for conditions in textiles and clothing industries; study of budget for clothing and household textiles, hygiene and standardization of dress. MISS WELLER.

131. HOME MANAGEMENT: HOUSE-PLANNING AND EQUIPMENT. House-planning, house-furnishing and equipment, and construction and furnishing budgets. Types of domestic architecture; site; floor plans; building materials; details of construction; heating; ventilating; lighting; plumbing; walls; rugs; furniture; color; hangings; pictures; gardens. MISS MORSE.

HUMAN ANATOMY

MEDICAL SCHOOL

Professors CLARENCE M. JACKSON, Director; JOHN B. JOHNSTON, THOMAS G. LEE, RICHARD E. SCAMMON; Associate Professors CHARLES A. ERDMANN, ANDREW T. RASMUSSEN; Assistant Professor HJALMAR L. OSTERUD.

For list of courses, see bulletin of the Medical School.

Students in this college may elect courses in human anatomy (see Medical School program) only by arrangement with the head of the Department of Anatomy.

HUMAN PHYSIOLOGY

MEDICAL SCHOOL

Professors ELIAS P. LYON, DEAN; JESSE F. MCCLENDON, FREDERICK H. SCOTT; Associate Professors RICHARD OLDING BEARD, FRANCIS B. KINGSBURY, CHAUNCEY J. V. PETTIBONE; Assistant Professor CHARLES C. GAULT; Instructors GERTRUDE I. THOMAS, WILLIAM W. SWANSON; Teaching Fellow CHARLES C. SHEPARD.

COURSES

4. HUMAN PHYSIOLOGY. A brief course for academic, home economics, and nursing students. Lectures and laboratory work.

57-58.[1] HUMAN PHYSIOLOGY. Intermediate course.

59.[1] PHYSIOLOGIC CHEMISTRY. Intermediate course.

100-101. PHYSIOLOGIC CHEMISTRY. The components of the animal body; foods, digestion, the excreta, and metabolism.

103. PHYSIOLOGY OF MUSCLE, NERVE, BLOOD, CIRCULATION, DIGESTION.

104. PHYSIOLOGY OF THE NERVOUS SYSTEM AND SPECIAL SENSES, RESPIRATION, METABOLISM, NUTRITION, AND EXCRETION.

108. SEMINAR IN PHYSIOLOGIC OPTICS.

110. PHYSIOLOGIC OPTICS. A laboratory course.

113. PROBLEMS IN PHYSIOLOGY. Arranged by instructors with qualified students. Each student will be assigned a topic for special laboratory study, leading in some cases to original investigation. Conferences and reading. May be taken one or more quarters.

131. ADVANCED PHYSIOLOGY OF MUSCLE, BLOOD, CIRCULATION, AND DIGESTION. Alterations due to physiologic conditions.

137. FOODS AND PRACTICAL DIETETICS. A study of human foods and food values; of caloric indices and balanced dietaries. Exercises in the practical preparation of foods.

153. PROBLEMS IN PHYSIOLOGIC CHEMISTRY. Course arranged by instructors with qualified students for special work. May be taken one or more quarters.

155. CHEMISTRY OF INFANT-FEEDING. Rôle of vitamines, proteins, and inorganic constituents in nutrition; preservation of food to preserve vitamines; effect of vitamine deficiency on mineral metabolism; chemistry of scurvy, beriberi, rickets and pellagra.

[1] Courses 57-58 and 59 constitute a sequence recommended for students who wish a knowledge of human physiology, but who do not desire the detailed consideration given in Courses 100-101, 103, and 104. A student can not receive credit for both of these sequences.

162. CHEMICAL ANALYSIS OF BLOOD. Laboratory work to determine the chemically important constituents. Lectures and reading.

163. METABOLISM. Lectures and laboratory work on special phases of metabolism.

JOURNALISM

13-14-15†. REPORTING. Gathering and writing of various kinds of news for daily papers; study of news values; exercises in journalistic style; analysis of newspapers. Students are required to cover one regular assignment for a Minneapolis paper each week.

51-52†. EDITING. Copy-reading, headline-writing, make-up, correcting proof, handling reporters, and general desk work; with practice in acting as city editor with a staff of reporters.

55-56-57†. NEWSPAPER AND MAGAZINE ARTICLES. Practice in writing special feature articles. Study of current magazines and the manuscript market.

61. EDITORIAL WRITING. Interpretation of current news. Practice in writing types of editorials. The editorial page and its problems.

65. NEWSPAPER PROBLEMS. Ethics of journalism; functions and purposes of the press; study of criticisms of the press.

67. PRACTICAL NEWSPAPER WORK. Practical work to be done for trade journals and Minneapolis and St. Paul newspapers.

LATIN

Professor JOSEPH B. PIKE, Head; Assistant Professor ROBERT V. CRAM.

JUNIOR COLLEGE COURSES

1-2†. BEGINNING LATIN. Ten weeks are spent in mastering inflections; the remainder of the course is devoted to reading easy Latin prose and the study of elementary syntax.

3. CAESAR. Selections from the Gallic Wars are read. Elementary Latin composition is taken in connection. Students entering with one year of Latin may select this course.

11. SELECTIONS FROM LATIN AUTHORS.

12. SELECTIONS FROM LATIN AUTHORS: SURVEY OF LATIN LITERATURE.

13. SELECTIONS FROM THE WORKS OF OVID. A continuation of Course 3. Students entering at third quarter with two or three years' preparation in Latin may select Course 13.

21. LIVY. Selections from Books 1 to 10.

22. PLAUTUS AND TERENCE. One play each of Plautus and Terence with a study of the beginnings of Roman drama. Students entering at second quarter with four years' preparation in Latin may select Course 22.

23. HORACE, ODES, SATIRES, AND EPISTLES. Selections from these works.

SENIOR COLLEGE COURSES

51. PLINY'S LETTERS. Selected letters of Pliny the Younger with a study of Roman society in his time.

52. ELEGIAC POETRY. Reading of Catullus, Tibullus, Propertius, and Ovid.

53. SUETONIUS. Lives of Tiberius, Caligula, Claudius, and Nero.

121. ADVANCED VERGIL. Selections from Books 7 to 12 of the *Aeneid*. Alternates with Course 131. (Not offered in 1922-23.)

122. CICERO'S LETTERS.

123. MEDIEVAL LATIN. Selected documents illustrating conflict between church and state in Middle Ages. Selections from history of Franks by Gregory of Tours. Aims to accustom students to handle medieval Latin easily for historical and literary purposes.

131. JUVENAL. Selected satires. Alternates with Course 121.

132. SENECA'S EPISTLES. Alternates with Course 122. (Not offered in 1922-23.)

133. PETRONIUS AND VULGAR LATIN. Selections from Petronius and the *Peregrinatio Sanctae Silviae*. The relation of vulgar to literary Latin will be discussed. Alternates with Course 123. (Not offered in 1922-23.)

201-202-203. TACITUS. Graduate seminar, but open to students who register for a major in Latin.

211-212-213. LUCRETIUS. Graduate seminar but open to students who register for a major in Latin. (Not offered in 1922-23.)

COURSES FOR WHICH NO KNOWLEDGE OF LATIN IS REQUIRED

41. ROMAN LITERATURE AND LIFE. Lectures, textbook work, and assigned reading in standard editions.

LIBRARY METHODS

Professor FRANK K. WALTER, Librarian; Associate Professor INA T. FIRKINS, Reference Librarian.

1. USE OF BOOKS AND LIBRARIES. Introductory study of reference books and library methods as applied to individual study and research. Lectures, examination of reference material and problems in its use. MR. WALTER, MISS FIRKINS.

MATHEMATICS

Professors WILLIAM H. BUSSEY, Chairman; DUNHAM JACKSON; Associate Professors RAYMOND W. BRINK, WILLIAM L. HART, ROYAL R. SHUMWAY, ANTHONY L. UNDERHILL; Instructors GLADYS E. C. GIBBENS, ELLA THORP.

COURSES

1. HIGHER ALGEBRA. A review and a collegiate treatment of the topics of elementary algebra for those who have had one year of elementary algebra. Not open to those who presented higher algebra for entrance.

6.[1] TRIGONOMETRY. Logarithms and plane trigonometry.

7.[1] COLLEGE ALGEBRA. Quadratic equations, equations in the quadratic form, simultaneous quadratic equations, graphical representation, progressions, mathematical induction, the binomial theorem, permutations, combinations, probability, determinants, and the theory of equations with special reference to graphical methods.

8.[1] COMMERCE ALGEBRA. Logarithms and selected topics in college algebra. A preparatory course for Mathematics of Investment, designed primarily for pre-business students.

20. THE MATHEMATICS OF INVESTMENT. First principles of the mathematical theory of interest, annuities, amortization, valuation of bonds, sinking funds and depreciation, etc., with brief discussion of probability and its application to life annuities and some problems in life insurance.

30. ANALYTIC GEOMETRY. The elements of plane analytic geometry including the geometry of the conic sections, with a brief introduction to solid analytic geometry.

50.[2] CALCULUS I. Differential calculus.

51.[2] CALCULUS II. Integral calculus.

52.[2] CALCULUS III. Selected topics in differential and integral calculus with special reference to infinite series, partial differentiation, multiple integrals and applications of the calculus.

[1] Courses 6 and 8 involve some duplication, and no student may take both without special permission. No student may receive credit for both of Courses 7 and 8. Students who elect mathematics to meet the requirement of 10 credits in mathematics or laboratory science in the pre-business course should take Courses 1 and 8 if they have not had high school higher algebra and Courses 8 and 20 if they have had high school higher algebra.

[2] Courses 50, 51, 52 constitute a course in differential and integral calculus in three parts. The course is so arranged that the student may discontinue it at the end of Calculus I or the end of Calculus II, but students who expect to do graduate work in mathematics, physics, or astronomy, ought to finish Calculus III.

62-63. THEORY OF EQUATIONS. Cubic and biquadratic equations, the solution of numerical algebraic equations, reciprocal equations and the construction of regular polygons, determinants and symmetric functions with applications to systems of linear equations and the theory of elimination.

70. HISTORY OF ELEMENTARY MATHEMATICS. A brief course in the history of arithmetic, algebra, and geometry intended primarily for those who are preparing to teach high school mathematics.

71. SOLID ANALYTIC GEOMETRY.

80-81-82. MECHANICS AND VECTOR ANALYSIS. An introduction to the methods and results of vector analysis, regarded at first as an expression of some of the fundamental relations of theoretical mechanics, and then as an independent branch of mathematics.

90-91-92. ADVANCED ANALYTIC AND SYNTHETIC GEOMETRY. Modern methods of studying the geometry of straight lines and conic sections; polar reciprocation; projection; inversion.

106-107-108. ADVANCED CALCULUS AND DIFFERENTIAL EQUATIONS. Selected topics in advanced differential and integral calculus and a study of the more common types of differential equations with emphasis on applications to geometry, elementary mechanics, and physics.

140. THE METHOD OF LEAST SQUARES. The same as Astronomy 140.

Some of the courses listed in the bulletin of the Graduate School are open to properly qualified juniors and seniors. For more information consult the chairman of the Department of Mathematics.

MILITARY SCIENCE AND TACTICS

Professor GIRARD STURTEVANT, Colonel, Infantry; Assistant Professors JAMES E. WARE, Lieutenant Colonel, Retired; HENRY H. RUTHERFORD, Lieutenant Colonel, Medical Corps; LAURENCE T. WALKER, Major, Coast Artillery Corps; LEE R. WATROUS, JR., Major, Coast Artillery Corps; FREDERICK R. WUNDERLICH, Major, Dental Corps; EDWARD G. SHERBURNE, Major, Infantry; JAMES E. WATSON, Captain, Signal Corps; NEWTON W. SPEECE, Captain, Infantry; ANDREW C. TYCHSEN, Captain, Infantry; RUSSELL C. THROCKMORTON, Captain, Infantry; LEO J. FARRELL, Captain, Infantry; HAL M. ROSE, Captain, Cavalry; Instructors JOSEPH HAVLICEK, Regimental Commissary Sergeant, Retired; CARL JENSEN, Regimental Supply Sergeant, Retired; JOHN MCWILLIAMS, 1st Sergeant, Retired; HENRY DAHL, 1st Sergeant, Retired; HARRY E. STRIDER, Technical Sergeant, Signal Corps; ALFRED BRANDT, Technical Sergeant, Infantry; AUBREY DUNKUM, Staff Sergeant, Coast Artillery Corps; CLARENCE E. LANGE, Sergeant, Field Artillery; JOE WEIR, Sergeant, Infantry; EDMUND T. MCCANN, Sergeant, Infantry; HENRY W. BROWN, Sergeant, Coast Artillery Corps; EARL J. BLONSCHINE, Private, 1st Class, Coast Artillery Corps.

COURSES

1-2-3. FIRST-YEAR BASIC COURSE R.O.T.C. INFANTRY. Practical and theoretical instruction in school of soldier squad and company; elementary subjects of military training; infantry weapons and equipment.

4-5-6. SECOND-YEAR BASIC COURSE R.O.T.C. INFANTRY. Practical instruction in school of platoon and company; military sketching and map-reading; infantry weapons including machine gun and automatic rifle; minor tactics.

51-52-53. FIRST-YEAR ADVANCED COURSE R.O.T.C. INFANTRY. Field engineering; infantry weapons, including trench mortars, 37 mm. gun, grenades, and pistol; minor tactics.

54-55-56. SECOND-YEAR ADVANCED COURSE R.O.T.C. INFANTRY. Minor tactics; administration; military law; musketry: military history and policy of the United States; rules of land warfare.

MUSIC

Professor CARLYLE SCOTT, Chairman; Assistant Professors DONALD N. FERGUSON, WILLIAM LINDSAY; Instructors THERESA M. COURTURE, GEORGE FAIRCLOUGH, THADDEUS GIDDINGS, GERTRUDE R. HULL, RICHARD LINDENHAHN, ABE PEPINSKY, GERTRUDE REEVES, KARL SCHEURER, HENRY WILLIAMS.

COURSES

NOTE: Courses in music are not open to freshmen and sophomores except those working for a major in music.

1-2-3. HARMONY. The study of chords, their construction, relations, and progressions. Written exercises on basses, the harmonization of given melodies. MR. SCOTT.

4-5-6. COUNTERPOINT. Strict counterpoint up to eight parts; free contrapuntal harmonization of chorales and composition of smaller contrapuntal forms as inventions. MR. FERGUSON.

7-8-9. EAR-TRAINING. MISS REEVES.

10-11-12. FIRST-YEAR ORGAN. MR. FAIRCLOUGH.

13-14-15. SECOND-YEAR ORGAN. MR. FAIRCLOUGH.

16-17-18. FIRST-YEAR PIANOFORTE. MR. SCOTT, MR. FERGUSON, MISS REEVES, MR. LINDSAY, MRS. COURTURE.

19-20-21. SECOND-YEAR PIANOFORTE. MR. SCOTT, MR. FERGUSON, MISS REEVES, MR. LINDSAY, MRS. COURTURE.

22-23-24. FIRST-YEAR VIOLIN. MR. SCHEURER.

25-26-27. SECOND-YEAR VIOLIN. MR. SCHEURER.

28-29-30. First-Year Vocal Training. Miss Hull.

31-32-33. Second-Year Vocal Training. Miss Hull.

34-35-36, 37-38-39, 74-75-76, 77-78-79. Other Orchestral Instruments.

40-41-42. Orchestra. Study of standard orchestral literature and accompaniment of vocal and instrumental soloists. This ensemble group is an ideal campus institution, supporting and inducing campus spirit and activities. Mr. Pepinsky.

43-44-45. University Choir. Open to juniors and seniors. May be taken only with the consent of the instructor. May be taken a second year with credit. Mr. Scott.

46-47-48. Appreciation of Music. A non-technical course.

50-51-52. Third-Year Organ. Mr. Fairclough.

53-54-55. Fourth-Year Organ. Mr. Fairclough.

56-57-58. Third-Year Pianoforte. Mr. Scott, Mr. Ferguson, Miss Reeves, Mr. Lindsay, Mrs. Courture.

59-60-61. Fourth-Year Pianoforte. Mr. Scott, Mr. Ferguson, Miss Reeves, Mr. Lindsay, Mrs. Courture.

62-63-64. Third-Year Violin. Mr. Scheurer.

65-66-67. Fourth-Year Violin. Mr. Scheurer.

68-69-70. Third-Year Vocal Training. Miss Hull.

71-72-73. Fourth-Year Vocal Training. Miss Hull.

86-87-88. Normal Piano. Special course offered to students desiring to teach pianoforte as a profession. Miss Reeves.

89-90-91. Advanced Normal Piano. Practice teaching. Miss Reeves.

101-102-103. Composition Orchestration. For those specializing in music. May be taken only with the consent of the instructor. Mr. Ferguson.

103-104-105. 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. Mrs. Courture.

106-107-108. 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. Mr. Ferguson.

109-110-111. BACH AND BEETHOVEN, WAGNER AND BRAHMS. Critical study of selections from master works of the four greatest composers. Biographical readings, topics, and analyses, giving historical and literary background to culminate periods in composition. MR. FERGUSON.

112-113-114, 115-116-117. ENSEMBLE PLAYING. Study and reading of chamber-music literature, embracing, compositions in the form of duos, trios, quartets, and other larger combinations for strings and wind instruments both with and without the pianoforte. MR. PEPINSKY.

121-122-123. ROMANTIC MOVEMENT. An analytical course covering the romantic movement with illustrations by the instructor. Papers assigned during the year. MR. LINDSAY.

124-125-126. ADVANCED HARMONY. Harmony 1-2-3 prerequisite. A course designed to develop more freedom in expression and in musical effect. Especial attention given to modulations. MR. SCOTT.

127-128-129. ADVANCED COUNTERPOINT. The fundamentals of double counterpoint and canon in strict and free styles, with application to the fugal and freer contrapuntal forms. MR. FERGUSON.

PHILOSOPHY

Professors NORMAN WILDE, Head; David F. SWENSON; Assistant Professor GEORGE P. CONGER.

COURSES

1. PROBLEMS OF PHILOSOPHY. A survey course in philosophy, in which the main fields of investigation are mapped out, the permanent problems indicated, and the chief methods employed in their solution discussed. MR. SWENSON, MR. CONGER.

2. LOGIC. The nature of knowledge, the laws of reasoning, the principles and methods of scientific proof. MR. SWENSON, MR. CONGER.

3. ETHICS. The principles of morals; sketch of the historical development of morality followed by an analysis of its meaning, and of its basis in human nature. MR. WILDE.

10. SCIENCE AND RELIGION. Religious problems as affected by the results of modern science. MR. CONGER.

50. ANCIENT AND MEDIEVAL PHILOSOPHY. An introduction to philosophy through a study of typical world views: Greek, Roman, medieval Christian, and Renaissance. MR. WILDE.

51. MODERN PHILOSOPHY. Sketch of the development of philosophy from the Renaissance to the present.

100-101-102. PHILOSOPHY OF RELIGION. Religion as an interpretation and evaluation of life. Fall quarter, a survey of historical and psychological phenomena of various religions; winter and spring quarters, a critical discussion of esthetic, ethical, and religious attitudes toward life. MR. SWENSON.

103. ESTHETICS. An introduction to the history and theory of esthetics, psychological analysis of beauty, and a discussion of the arts. (Not offered in 1922-23.) MR. SWENSON.

104. HISTORY OF ESTHETICS. A survey of the chief esthetic theories of ancient and modern thinkers. MR. SWENSON.

108-109. HISTORY OF ETHICS. A survey of the chief ideals of conduct and theories of life from Socrates to the present day. (Not offered in 1922-23.)

120. SCANDINAVIAN PHILOSOPHY. The philosophical thought of the nineteenth century in Scandinavian countries, including a comparative study of Boström and Kierkegaard. MR. SWENSON.

124. POLITICAL AND SOCIAL ETHICS. The fundamental aspects of society and the state, considered from the point of view of ethics. MR. WILDE.

129. MODERN POLITICAL THOUGHT. The state in modern political philosophy; its nature, basis, and authority. Individualism and socialism in the eighteenth and nineteenth centuries. MR. WILDE.

135-136. THE PHILOSOPHY OF PLATO. The reading and discussion of the principal dialogs with a view to understanding the problem and method of Greek philosophy as illustrated in the writings of Plato. (Not offered in 1922-23.) MR. CONGER.

141. METAPHYSICS. A critical study of the fundamental metaphysical concepts, ontological and cosmological, that constitute the framework of reality. (Not offered in 1922-23.) MR. SWENSON.

147. ADVANCED LOGIC. Different topics from year to year, including the organization of the sciences, the presuppositions of knowledge, recent mathematical and symbolic logic, and the pragmatic theory of logic. MR. SWENSON.

151-152. MODERN IDEALISM. Discussions of the place of mind in the world, based upon the works of philosophers from Kant to Royce. MR. CONGER.

161-162-163. SEMINAR IN PHILOSOPHY. MR. WILDE, MR. SWENSON, MR. CONGER.

PHYSICAL EDUCATION

FOR MEN

Professors FRED W. LUEHRING, Director; THOMAS N. METCALF; Associate Professor LOUIS J. COOKE, Assistant Director; Assistant Professor WILLIAM K. FOSTER; Instructors EDWIN S. BROWN, PERCY GLIDDEN, CARL B. ROEMER, FRED WHITTEMORE; Assistants FRANK GILMAN, HARRY GOLDIE.

The purpose of the department is to provide all men of the University opportunity for exercise in order to maintain and build up their general health. It also provides special training for the correction of physical defects and functional derangements.

A physical examination is required of all new matriculants, and of all others using the department privileges, at the beginning of the year, and as often during their college course as their physical condition may indicate. Students taking the required work in physical education are examined at the close of the year. A study of these records shows a marked improvement in the standard of health of the average student during his college course.

The gymnasium, swimming pool, and baths are open to all students of the University, who are free to use the apparatus and to pursue a course in physical training under the supervision of the director and his assistants.

Those students, taking the required course in physical education, who can not swim must make a reasonable effort, as determined by the department, to pass the swimming and life-saving requirements, and will be assigned special hours for instruction.

COURSES

1. PERSONAL HYGIENE. Two hours per week; first six weeks of each quarter. Examination at close of course.

2. GYMNASIUM AND SWIMMING. Two hours a week. Required qualification in swimming, life-saving, bar-vaulting, jumping, sprinting, running, and on heavy apparatus.

3. ADVANCED LEADERS. Three hours a week.

4. CORRECTIVE GYMNASTICS. Three to five hours per week instead of regular gymnasium or military drill in case of physical disability.

5, 6, 7, 8, 9. INTRAMURAL ATHLETICS. Students who meet all the requirements of Course 2 and show special ability may elect these courses instead of Course 2.

PHYSICAL EDUCATION

FOR WOMEN

Professor J. ANNA NORRIS, Director; Assistant Professors MAY S. KISSOCK, ALICE J. H. TOLG; Instructors GERTRUDE M. BAKER, HENRIETTA BROWNING, GRACE E. DENNY, GRACE M. ROCKWOOD.

This department aims primarily to promote the health of the women students. It gives physical examination and advice to all on entrance; plans

systematically to keep in close touch with them during their first two years in college; conducts yearly consultations with, and examines when necessary, all upper-class students; gives courses in hygiene; organizes physical work to meet the varying needs and physical tastes of students; coöperates closely with the Woman's Athletic Association in encouraging and organizing athletic sports; holds regular office hours for the purpose of consultation with all students who desire its advice.

Work in this department is required of all newly entering students (see Courses 1-2-3 and 4), of all sophomores, who are permitted as free a choice among the sophomore courses as their physical condition permits (see "sophomore" courses; students who can not swim must register for Course 22-23 during sophomore year), 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 are required annually of all students.

Elective classes are arranged in gymnastics, dancing, swimming, field-hockey, basket-ball, baseball, and other organized games.

For a special four-year professional course designed to prepare graduates for the responsible direction of physical education activities, see bulletin of the College of Education. Students desiring to enter the course should consult with the head of this department. They should be without organic disease or serious functional disorder, should have a keen sense of rhythm, and should possess qualities of personality which will win the coöperation of others.

Six credits is the maximum number that can be gained by taking courses in exercises (Courses 35, 40-41-42, 43-44-45, 66-67-68).

COURSES

Statement of fees.—Elementary physical training $2.50 a quarter. All other exercise courses, including swimming, $2 a quarter. Maximum fee paid by a student in physical education, $3.50 a quarter.

1-2-3. Elementary Physical Training. Lighter forms of gymnastics, apparatus work, orthopedic exercise, folk dancing, indoor and outdoor games. Individual health consultations. Miss Kissock, Dr. Tolg, Miss Browning, Miss Denny, Miss Rockwood.

4. Preliminary Hygiene. One lecture a week. The most essential aspects of the care of personal health. Dr. Norris.

7-8-9. Sophomore Physical Training. Floor work, apparatus, and indoor and outdoor games.

10-11-12. Sophomore Orthopedic Gymnastics. For those not able to take regular class work.

13-14-15. Sophomore Interpretive Dancing. An art and a phase of physical education designed to develop a sense of beauty and body control through rhythmic movements prompted by the imagination. Miss Baker.

16-17-18. SOPHOMORE GAMES AND FOLK DANCING. Suitable in strength for C-D girls. Conducted outdoors when weather permits.

19-20-21. SOPHOMORE MAJOR SPORTS. Hockey in autumn, basket-ball in winter, baseball in spring. Suitable in strength for A-B girls. MISS KISSOCK.

22-23. SOPHOMORE ELEMENTARY SWIMMING. 22, Elementary; 23, Low Intermediate.

28-29. SOPHOMORE ADVANCED SWIMMING. 28, High Intermediate; 29, Advanced.

32. PERSONAL HYGIENE. Care of the personal health; elements of anatomy and physiology. MISS BROWNING.

33. HYGIENE OF THE FAMILY. Eugenics, prenatal care, maternity, puberty, sex education. DR. NORRIS.

35. INTERMEDIATE PHYSICAL TRAINING. Gymnastics and apparatus work. Written abstracts of prescribed reading.[1] MISS ROCKWOOD.

37. GENERAL SWIMMING. For both beginners and advanced swimmers and divers. Shower bath tickets may be bought of the matron. No registration necessary.

40-41-42. INTERPRETIVE DANCING. Similar to 13-14-15. Written abstracts of prescribed reading.[1] Two hours. For academic students only. (Not offered in 1922-23.) MISS BAKER.

43-44. PLAY AND THE PLAYGROUND. Graded games, folk dances, and track for school and playground, two hours. A consideration of nature and function of play and practical conduct of playground, one hour.[1] MISS KISSOCK.

46-47-48. HOCKEY, BASKET-BALL, AND BASEBALL. Hockey in autumn, basket-ball in winter, baseball in spring. MISS KISSOCK, MISS ROCKWOOD.

66-67-68. INTERPRETIVE DANCING. Similar to 13-14-15. Three hours. MISS BAKER.

PHYSICS

Professors HENRY A. ERIKSON, Chairman; WILLIAM F. G. SWANN, JOHN T. TATE, ANTHONY ZELENY; Assistant Professor LOUALLEN F. MILLER; Instructors JOHN G. FRAYNE, ARCHIE POWER, JOSEPH VALASEK, HERMAN ZANSTRA.

INTRODUCTORY COURSES

1. ELEMENTS OF MECHANICS AND SOUND. First part of a general course, 1, 21, 31, 41. Course 2 should be taken in conjunction with this course. Three lectures, one quiz hour a week. MR. ERIKSON.

[1] If taken for no credit, no reading or written work will be required.

2. ELEMENTS OF MECHANICS AND SOUND LABORATORY. The laboratory part supplementing Course 1. One two-hour session in the laboratory a week. MR. ERIKSON.

9. ACOUSTICS. A study of the principles of sound. A course designed primarily for the students in the Department of Music. Open also to other students. Three lectures a week. MR. ERIKSON.

10. ACOUSTICS LABORATORY. The laboratory part supplementing Course 9. One two-hour session in laboratory a week. MR. ERIKSON.

21. HEAT. Course 22 should be taken in conjunction with this course. Three lectures, one quiz hour a week. MR. MILLER.

22. HEAT LABORATORY. The laboratory part supplementing Course 21. One two-hour session in the laboratory a week. MR. MILLER.

31. OPTICS. Course 32 should be taken in conjunction with this course. Three lectures, one quiz hour a week. MR. VALASEK.

32. OPTICS LABORATORY. The laboratory part supplementing Course 31. One two-hour session in the laboratory a week. MR. VALASEK.

35. OPTICS. A brief study of light phenomena. Designed for those who can not take the fuller course. Two lectures a week. MR. VALASEK.

41. MAGNETISM AND ELECTRICITY. Course 42 should be taken in conjunction with this course. Three lectures, one quiz hour a week. MR. ZELENY.

42. ELECTRICAL LABORATORY. The laboratory part supplementing Course 41. One two-hour session in the laboratory a week. MR. ZELENY.

INTERMEDIATE COURSES

101-103-105, 107-109-111. THEORETICAL PHYSICS. Intensive analytical survey of fundamental principles of mechanics, sound, heat, light, electricity, and magnetism, designed to supplement the general courses and to prepare students for more specialized graduate courses. Four lectures a week. MR. TATE.

102-104-106, 108-110-112. EXPERIMENTAL PHYSICS. A comprehensive course extending through two years' laboratory technique and standard methods of precise measurements as exemplified by representative experiments in mechanics, sound, heat, light, and electricity. MR. MILLER, MR. POWER, MR. TATE, MR. VALASEK, MR. ZELENY.

114-116-118. ELEMENTARY PHYSICAL INVESTIGATION. The experimental or theoretical study of physical phenomena the nature or laws of which are not as yet understood. MR. ERIKSON, MR. SWANN, MR. TATE, MR. ZELENY, MR. MILLER.

115-117-119. ELEMENTS OF MATHEMATICAL PHYSICS. A study of the fundamental principles and standard methods involved in the mathematical analysis of physical problems. Three lectures a week. MR. FRAYNE.

122. PYROMETRY AND HEAT. An experimental study of pyrometry, heat quantity, heat transfer, hygrometry, and gas liquefaction. One lecture, two three-hour sessions in the laboratory a week. MR. MILLER.

132. APPLIED OPTICS. Special experimental work in spectrometry, optical instruments, photometry, absorption, polarized light. Two three-hour laboratory periods a week. MR. VALASEK.

142. ELECTRICAL MEASUREMENTS. Devoted mainly to the study of potentiometer methods, capacity, inductance, magnetic flux. Three two-hour laboratory periods a week. MR. ZELENY.

145-147-148. RADIOACTIVITY. An analytical study of the theories and methods of investigation supplemented by laboratory technique. MR. ERIKSON.

146. 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. MR. ZELENY.

POLITICAL SCIENCE[2]

Professors CEPHAS D. ALLIN, Chairman; ROBERT E. CUSHMAN, QUINCY WRIGHT, JEREMIAH S. YOUNG, ROY G. BLAKEY[1] (Economics), SOLON J. BUCK (History), ALBERT B. WHITE (History), NORMAN WILDE (Philosophy); Associate Professors WILLIAM ANDERSON, ALVIN H. HANSEN (Economics), LESTER B. SHIPPEE (History), MASON W. TYLER (History); Assistant Professors MORRIS B. LAMBIE, HAROLD S. QUIGLEY[1]; Lecturers ABBOTT L. FLETCHER, BENJAMIN W. PALMER; Instructor HAROLD F. KUMM.

BEGINNING COURSE

1. AMERICAN NATIONAL GOVERNMENT.

INTERMEDIATE COURSES

3. COMPARATIVE EUROPEAN GOVERNMENT. MR. ALLIN, MR. WRIGHT.

7. AMERICAN STATE GOVERNMENT. MR. CUSHMAN.

11. MUNICIPAL GOVERNMENT IN THE UNITED STATES. MR. ANDERSON.

15. INTRODUCTION TO POLITICAL SCIENCE. Introductory presentation of the problem of government. The nature of the state, the forms and functions of government, the principles of politics.

25. WORLD POLITICS. A study of the foreign policies and international relations of the leading European powers to-day. MR. ALLIN, MR. TYLER.

33-34†. ENGLISH LEGAL INSTITUTIONS. Identical with History 33-34. MR. WHITE.

[1] Absent on leave, 1922-23.

[2] The courses in history and economics listed in the political science statement will be credited to the student as political science only with the approval of the chairman of the department and when taken in conjunction with political science courses.

ADVANCED COURSES

51-52-53. BUSINESS LAW. Principles governing ordinary business transactions. MR. YOUNG.

58. POLITICAL PARTIES. The nature, function, organization, and methods of political parties; legal control of parties and elections; public opinion as factor in popular government.

65. COLONIZATION. The economic and political factors in colonization; forms of government, commercial policies, and mandates. MR. ALLIN.

75. LAW OF PUBLIC UTILITIES. Historical and legal development of the rights and duties of public service companies. Regulation of rates and service. Methods of control. MR. KUMM.

107-108. EUROPE, 1848-1914. Identical with History 107-108. MR. TYLER.

109. MODERN ENGLAND. Identical with History 109.

115. MUNICIPAL PROBLEMS. A specialized course in modern legal, administrative, and functional problems of cities. MR. ANDERSON.

117. MUNICIPAL ENGINEERING. Identical with Civil Engineering 53.3. MR. BASS.

121-122. INTERNATIONAL LAW. Nature, sources, and sanction of international law. The law of peace, war, and neutrality, with especial attention to diplomatic and consular practice. MR. WRIGHT.

123. INTERNATIONAL ORGANIZATION. Systems of international relations, international administrative organizations, and political guarantees of the past with a detailed study of the League of Nations. (Not offered in 1922-23.) MR. WRIGHT.

124. PROBLEMS IN INTERNATIONAL LAW. Intensive study of the solution of selected international controversies by national and international courts, arbitration tribunals, and diplomatic conferences. MR. WRIGHT.

125. AMERICAN DIPLOMATIC HISTORY. Attention to the principles and policies guiding American diplomacy in its stages of development as well as to the methods pursued and the personalities of American diplomats. MR. WRIGHT.

127. AMERICAN FOREIGN RELATIONS. Such topics as the Monroe Doctrine, freedom of the seas, the "open door," arbitration, and disarmament will be considered with particular reference to the future policy of the United States. MR. WRIGHT.

129. FAR EASTERN POLITICS. The principal factors in the social and political life of Japan and China; their relations with each other and with western powers. (Not offered in 1922-23.) MR. QUIGLEY.

131-132. PUBLIC ADMINISTRATION. Source of administrative power; administrative areas; organization of departments; personnel, and related civil service problems including classification, training, appointment, promotion, salary determination, and superannuation; the budget; purchasing; control over administration; public service as a career. MR. LAMBIE.

133. PROBLEMS OF PUBLIC ADMINISTRATION. Organization of departments and distribution of functions relating to particular problems of public administration including public health, finance, education, public works, safety, welfare, commerce, and agriculture. MR. LAMBIE.

141. PROBLEMS IN STATE GOVERNMENT AND CONSTITUTIONAL LAW. A selected group of current problems in state government will be studied intensively in their constitutional and political aspects. MR. CUSHMAN.

145. LEGISLATIVE POWER AND METHODS. Source and scope of the legislative power; methods used by legislative bodies; current political questions; formulation and defense of legislative bills. MR. YOUNG.

146-147†. CONSTITUTIONAL HISTORY OF THE UNITED STATES. Identical with History 146-147. MR. SHIPPEE.

151. CONSTITUTIONAL LAW: THE AMERICAN FEDERAL SYSTEM. Judicial interpretation of the constitution; power of judicial review; separation of governmental powers; relation of state and national governments; construction of national powers; jurisdiction of courts. MR. CUSHMAN.

152. CONSTITUTIONAL LAW: FUNDAMENTAL RIGHTS AND IMMUNITIES. Privileges and immunities of citizenship; protection of civil and political rights; the obligation of contracts; due process of law and equal protection of the law. MR. CUSHMAN.

153. THE WEST IN AMERICAN POLITICS SINCE 1865. Identical with History 153. (Not offered in 1922-23.) MR. BUCK.

155. COMPARATIVE ADMINISTRATIVE LAW. Administration as a science; 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. (Not offered in 1922-23.) MR. YOUNG.

157. POLICE POWER. Nature of the police power; constitutional aspects of social and economic legislation, including safety, order, morals, and protection against business fraud and oppression; the fundamental rights under the police power. MR. YOUNG.

158. GOVERNMENT AND BUSINESS. Governmental powers; protection against fraud and oppression; restraint of trade and manipulation of prices; protection of debtors; business affected with a public interest; combinations of laborers; corporations; compulsory benefits; conservation of natural wealth; vested rights; confiscatory legislation. MR. YOUNG.

161. COMPARATIVE FEDERAL GOVERNMENT. Ancient and modern federal unions. MR. ALLIN.

165. THE GOVERNMENT OF ENGLAND. Legal and political aspects of the English constitution. MR. ALLIN.

166. GOVERNMENT OF THE BRITISH EMPIRE. Organization, working, and international status of the Imperial and Dominion governments. MR. ALLIN.

167. BRITISH POLITICS. Parties, party leaders, and policies. The relation of English and imperial politics. MR. ALLIN.

169. THE LABOR AND SOCIALIST MOVEMENT IN EUROPE. Identical with Economics 169. MR. HANSEN.

171. MUNICIPAL CORPORATIONS. The legal basis of municipal government; the relation of the city to the state; home rule. The city as a legal entity; its powers, duties, and liability for torts. MR. ANDERSON.

181. MODERN POLITICAL THOUGHT. Same as Philosophy 129. MR. WILDE.

185. POLITICAL AND SOCIAL ETHICS. Same as Philosophy 124. MR. WILDE.

191-192. PUBLIC FINANCE. Identical with Economics 191-192.

193. STATE AND LOCAL TAXATION. Identical with Economics 193.

GRADUATE COURSES. CONSULT GRADUATE SCHOOL BULLETIN

201-202-203. SEMINAR IN PUBLIC LAW. MR. YOUNG and others.

211-212-213. SEMINAR IN MODERN GOVERNMENT AND POLITICAL THEORY. MR. ALLIN and others.

221-222-223. SEMINAR IN LOCAL GOVERNMENT AND ADMINISTRATION. MR. ANDERSON and others.

PSYCHOLOGY

Associate Professors RICHARD M. ELLIOTT, Chairman; WILLIAM S. FOSTER, KARL S. LASHLEY, DONALD G. PATERSON, HERBERT WOODROW; Lecturer HARRY M. JOHNSON; Instructors CHARLES BIRD, KATHERINE LUDGATE.

COURSES

1-2†. GENERAL PSYCHOLOGY. An introductory survey of psychology; its material, fundamental laws, applications, and relations to other sciences. Two lectures, one recitation per week. MR. ELLIOTT, MR. FOSTER.

1-6†. General Psychology for Business Students. Offered only to business and pre-business students. Mr. Elliott, Mr. Foster, Mr. Paterson.

3. Psychology Applied to Daily Life. Measurement of mental traits, development of intelligence, organization of personality, with applications to selected problems in medicine, law, education, sociology, and daily life. Mr. Elliott, Mr. Paterson.

4-5†. Introductory Laboratory Psychology. Simple experiments providing the beginner illustrative material and training in the methods of laboratory psychology. Required for all advanced courses in general psychology. Four laboratory hours per week. Mr. Foster and others.

7. Introductory Laboratory Psychology. Identical with 4-5 combined. Eight laboratory hours per week. Mr. Foster and others.

9. Animal Behavior. An account of the evolution of instinct, habit, and intelligence in animals. The application of animal studies to problems of human psychology. Lectures, demonstrations, and reading on assigned topics. Mr. Lashley.

56. Psychology of Advertising. Psychological analysis of advertising. Intensive study of national and local advertising from the standpoint of attention, association, memory, desire, and action. Assigned readings, observation, experiments, reports. Mr. Paterson.

60. Employment Psychology. Psychology as applied to the selection and retention of a stabilized personnel. The standardized interview; principles and technique of employment tests; methods of judging character qualities; the rating scale; personnel classification methods. Mr. Paterson.

101-102†-103. Experimental Psychology. The theory and technique of the leading methods of experimental investigation in human psychology. Individual minor research problems in the third quarter. One lecture, four laboratory hours per week. Mr. Woodrow, Mr. Johnson.

108-109†. Advanced General Psychology. A systematic presentation of the laws of the normal adult mind, based upon the study of experimental results. Lectures, recitations, and reports. Mr. Johnson.

114-115†. Human Behavior. An analysis of the development and organization of human behavior. Consciousness or mind, as properties of the living body, are discussed in their dependence upon response. Mr. Elliott.

121-122†-123. Neuropsychology. Functions of the nervous system in behavior. Neural basis of reflex, instinct, habit. Physiology of motivation. Individual investigation of special problem in third quarter. One lecture and six laboratory hours per week. Mr. Lashley.

124. PSYCHOLOGY OF LEARNING. Critique of current theories concerning the nature of the learning process. Problems and methods bearing upon the physiology of learning. Not open to students who take Neuropsychology. MR. LASHLEY.

125-126†. PSYCHOLOGY OF INDIVIDUAL DIFFERENCES. Experimental and statistical study of influence of sex, race, immediate ancestry, environment, and maturity, in causation of individual differences in mental traits. Each student participates in investigation of definite problems and in analysis of results. MR. PATERSON.

127. PSYCHOLOGICAL ANALYSIS OF SOCIAL INSTITUTIONS. An examination of the behavior of men in groups, and of some important social institutions, as determined by human motives and traditions. MR. BIRD.

135-136†. DYNAMIC PSYCHOLOGY. The constituents of character; their development, their interrelationship, and their rôle in the determination of human affairs. MR. WOODROW.

144-145†. ABNORMAL PSYCHOLOGY. Systematic review of psychiatry in relation to normal behavior. Types of social maladjustment; delinquency, criminality, fanaticism. Psychology of creative ability. The organization of personality as revealed by studies in psychopathology. MR. LASHLEY.

GRADUATE COURSES. CONSULT GRADUATE SCHOOL BULLETIN

200-201†. SEMINAR IN THE HISTORY OF PSYCHOLOGY.

205. ADVANCED DIFFERENTIAL PSYCHOLOGY.

206-207-208. RESEARCH IN ANIMAL BEHAVIOR.

210-211-212. RESEARCH PROBLEMS.

215-216-217†. SEMINAR IN PHYSIOLOGICAL PSYCHOLOGY.

220-221-222†. JOURNAL CLUB AND SEMINAR IN CONTEMPORARY TRENDS IN PSYCHOLOGY.

PUBLIC HEALTH AND PREVENTIVE MEDICINE

For courses see special bulletin.

ROMANCE LANGUAGES

Professors EVERETT W. OLMSTED, Head; IRVILLE C. LECOMPTE, COLBERT SEARLES; Associate Professor RUTH S. PHELPS; Assistant Professors FRANCIS B. BARTON,[1] JULES T. FRELIN, JOSEPH E. GILLET, EUGENE F. PARKER, EDWARD H. SIRICH, GUSTAVE VAN ROOSBROECK; Professorial Lecturer ANTONIO HERAS; Instructors NELSON F. COBURN, ANTONY CONSTANS, W. IRVING CROWLEY, ROBERT A. GUINN, MARGUERITE GUINOTTE, PAUL C. KING, OLAF K. LUNDEBERG, ARTURO TORRES-RIOSECO, GEORGE B. WATTS.

[1] Absent on leave, 1922-23.

FRENCH

1-2†. BEGINNING FRENCH.

3-4. INTERMEDIATE FRENCH.

8-9-10. SCIENTIFIC FRENCH. (Pre-medical students.) Readings from general works on scientific subjects.

20. ORAL AND WRITTEN FRENCH.

21-22-23†. SURVEY OF FRENCH LITERATURE. An outline of the history of French literature from 1600 to the present. MR. SEARLES, MR. LECOMPTE, MR. VAN ROOSBROECK.

24-25†. SURVEY OF FRENCH LITERATURE. Same as 21-22-23, except that it is a five-hour course extending through two quarters. MR. LECOMPTE, MR. WATTS.

50-51-52†. FRENCH CONVERSATION. MR. FRELIN, MISS PHELPS.

53-54-55†. FRENCH COMPOSITION. MR. FRELIN, MISS PHELPS.

56-57-58†. ADVANCED FRENCH CONVERSATION. MR. SIRICH, MISS GUINOTTE.

59-60-61†. ADVANCED FRENCH COMPOSITION. MR. PARKER, MR. COBURN, MISS GUINOTTE.

62. PRACTICAL FRENCH PHONETICS. Drill in pronunciation. Recitation of passages in prose and verse. Exercises on the phonograph. MR. CONSTANS.

80-81-82†. FRENCH LITERATURE: NINETEENTH CENTURY. A study of the romantic and realistic movements as manifested in the novel, drama, and poetry. Assigned texts and collateral reading. The course is conducted entirely in French. MISS PHELPS, MR. SIRICH.

100-101†. DICTION FRANÇAISE. Dissertations litteraires par le discours. Leçons sur des textes en prose et en vers. Exercises oraux de diction, de syntaxe et de vocabulaire. MR. CONSTANS.

103-104-105†. FRENCH SYNTAX AND COMPOSITION. Special studies in characteristic problems of French syntax. MR. SIRICH.

115-116-117†. FRENCH LITERATURE: SEVENTEENTH CENTURY. Influence of the literary salons. Development of French prose. Perfection of French dramatic art by Corneille, Racine, and Molière. Reading, discussions, reports based upon collateral reading. MR. SEARLES.

118-119-120†. FRENCH LITERATURE: EIGHTEENTH CENTURY. Philosophic movement: Bayle, Fontenelle, Montesquieu, Voltaire, L'Encyclopédie, Rousseau. Literature: poetry, tragedy, comedy, novel. Reading, discussions, reports based upon collateral reading. MR. PARKER.

121-122-123†. FRENCH LITERATURE: SIXTEENTH CENTURY. Forerunners of the Renaissance: Marot and L'École Lyonnaise. The Renaissance movement and the Reformation, Rabelais, Calvin and the Pléiade and its successors; Montaigne; the situation at the close of the century. (Not offered in 1922-23.)

141-142-143†. REALISTIC NOVEL: NINETEENTH CENTURY. A study of realism with especial reference to the novel. Flaubert, Maupassant, Zola, etc. MR. LECOMPTE.

150-151-152†. FRENCH DRAMATIC LITERATURE. A study of the development of dramatic literature in France from the classical period to the present time. Alternates with 153-154-155. MR. OLMSTED.

153-154-155†. FRENCH LYRIC POETRY. Principles of French prosody. A study of the evolution of French lyric poetry. Alternates with 150-151-152. (Not offered in 1922-23.)

159-160-161†. FRENCH CRITICISM. A study of the masters of French criticism. Alternates with 141-142-143. (Not offered in 1922-23.)

171-172-173†. EXPLICATION DE TEXTES. An analytical and critical study of French texts, in which particular attention is given to style, thought, and diction. The course is conducted in French. (Not offered in 1922-23.)

174-175-176†. LECTURES IN FRENCH. Le roman français contemporain. MR. VAN ROOSBROECK.

191-192-193†. RESEARCH METHODS AND MATERIAL. MR. VAN ROOSBROECK.

ITALIAN

1-2†. BEGINNING ITALIAN. Pronunciation, grammar, oral exercises, translation. MISS PHELPS.

80. SURVEY OF ITALIAN LITERATURE: RENAISSANCE PERIOD. Alternates with 81. (Not offered in 1922-23.)

81. SURVEY OF ITALIAN LITERATURE: ROMANTIC PERIOD. Alternates with 80. MISS PHELPS.

159-160-161†. DANTE, PETRARCH, BOCCACCIO. An introduction to their works. The three cantiche of the *Divina Commedia* are read, one each year in rotation, together with a number of the canqoni, and sonnets of Petrarch, and portions of the *Decameron*. MISS PHELPS.

162-163-164†. DANTE IN ENGLISH. Lectures: reading and discussion of the *New Life*, and two cantiche of the *Divine Comedy* not read in 159-160-161. Private reading of one other work. MISS PHELPS.

SPANISH

1-2†. BEGINNING SPANISH.

3-4. INTERMEDIATE SPANISH.

20. ORAL AND WRITTEN SPANISH.

50-51-52†. SPANISH CONVERSATION. MR. COBURN.

53-54-55†. SPANISH COMPOSITION. MR. COBURN.

56-57-58†. ADVANCED SPANISH CONVERSATION. MR. HERAS.

59-60-61†. ADVANCED SPANISH COMPOSITION. MR. HERAS.

62-63-64†. PRACTICAL SPANISH PHONETICS Drill in pronunciation. Recitation of passages in prose and verse. (Not offered in 1922-23.)

65-66-67†. SURVEY OF SPANISH LITERATURE. An outline of the history of Spanish literature from 1500 to the present day. MR. GILLET.

68-69†. SURVEY OF SPANISH LITERATURE. Same as above, except that it is a five-hour course extending through two quarters. MR. TORRES.

70-71-72†. SOUTH AMERICAN LIFE AND INSTITUTIONS. A practical course intended to give a general view of South American ideals and institutions. Lectures and assigned readings. MR. TORRES.

73-74-75†. SPANISH COMMERCIAL CORRESPONDENCE. (Not offered in 1922-23.)

80-81-82†. SPANISH LITERATURE: NINETEENTH CENTURY. A study of the principal literary movements. Assigned texts and collateral reading. Lectures in Spanish. MR. HERAS.

83-84-85†. SPANISH-AMERICAN LITERATURE. An outline of South American literary history. Reading of representative authors. Lectures in Spanish. (Not offered in 1922-23.)

100-101-102†. SPANISH ORAL DICTION. Oral dissertations on assigned subjects. Exercises in diction, syntax, and vocabulary. (Not offered in 1922-23.)

103-104-105†. SPANISH SYNTAX. Special studies in characteristic problems of Spanish syntax. MR. OLMSTED.

115-116-117†. SPANISH LITERATURE: SEVENTEENTH CENTURY. Alternates with 156-157-158. MR. GILLET.

141-142-143†. SPANISH NOVEL. The development of Spanish fiction from the picaresque novel to that of the present day. (Not offered in 1922-23.)

150-151-152†. SPANISH DRAMATIC LITERATURE. A general survey of Spanish dramatic literature with special attention to the Golden Age. (Not offered in 1922-23.)

156-157-158†. SPANISH LITERATURE: SIXTEENTH CENTURY. Intensive reading of texts; and study of literary influences. Alternates with 115-116-117. (Not offered in 1922-23.)

159-160-161†. CERVANTES. A study of his life and works. Attention will be centered upon *Don Quixote* and the *Novelas Exemplares*. (Not offered in 1922-23.)

174-175-176†. LECTURES IN SPANISH. Spanish civilization.

GRADUATE COURSES. CONSULT GRADUATE SCHOOL BULLETIN

201-202-203. OLD FRENCH PHONOLOGY AND MORPHOLOGY. MR. LECOMPTE.

204-205-206. READINGS IN OLD FRENCH LITERATURE. MR. LECOMPTE.

207-208-209. OLD PROVENÇAL. MR. LECOMPTE.

222-223-224. SEMINAR IN MODERN FRENCH LITERATURE. MR. SEARLES.

241-242-243. OLD SPANISH PHILOLOGY. MR. GILLET.

244-245-246. OLD SPANISH LITERATURE. MR. GILLET.

250-251-252. SPANISH SEMINAR. MR. OLMSTED.

259-260-261. RESEARCH IN ROMANCE LANGUAGES.

SCANDINAVIAN

Professors GISLE C. J. BOTHNE, Head; ANDREW A. STOMBERG.

COURSES

1-2. BEGINNING NORWEGIAN. Grammar, composition, select readings in easy prose and poetry.

3. INTERMEDIATE NORWEGIAN. Grammar, composition, conversation, elementary history of literature, and select works of modern authors.

4-5. ADVANCED NORWEGIAN (SURVEY). Prose and poetry. MR. BOTHNE.

7-8. BEGINNING SWEDISH. Grammar, composition, conversation, reading of selected prose texts. MR. STOMBERG.

9. INTERMEDIATE SWEDISH. Reading selected works in prose and verse. MR. STOMBERG.

10-11. ADVANCED SWEDISH (Survey). Brief survey of the history of Swedish literature, reading of Tegner's *Fritiofs Saga,* Runeberg's *Fänrik Ståls Sägner,* and selected texts in Swedish history. MR. STOMBERG.

12. ANCIENT AND MEDIEVAL SCANDINAVIAN HISTORY. The antiquities of Scandinavian formation of states, the Viking expeditions, medieval culture. Knowledge of Scandinavian not required. MR. STOMBERG.

45. SCANDINAVIAN MYTHOLOGY. Lectures, textbook, and illustrated reading. Knowledge of Scandinavian languages not required. MR. STOMBERG.

101-102-103. MODERN NORWEGIAN LITERATURE. Norwegian literature from 1814 to the present day. MR. BOTHNE.

104-105. MODERN SCANDINAVIAN HISTORY. Religious, political, and economic changes in the north, military enterprises, growth and liberalism, material progress. Knowledge of Scandinavian not required. MR. STOMBERG.

107-108-109. MODERN SWEDISH LITERATURE. The Swedish novel. Study of a selected list of Swedish classics. MR. STOMBERG.

110. IBSEN. Lectures, reading, and interpretation. MR. BOTHNE.

111-112-113. OLD NORSE (ICELANDIC). Grammar and reading. Gunnlaug's *Saga Ormstungu.* (Not offered in 1922-23.) MR. BOTHNE.

114. STRINDBERG. Lectures, reading, and interpretation. MR. STOMBERG.

117. EARLY NORWEGIAN LITERATURE. History of literature. Saga period. Norwegian and Danish folk songs. Holberg. Oplysningstiden. MR. BOTHNE.

130-131-132. DANISH LITERATURE OF THE NINETEENTH CENTURY. From Oehlenschläger to the end of the century. MR. BOTHNE.

134-135. THE LANDSMAAL MOVEMENT AND LITERATURE. From Aasen to Garborg. (Not offered in 1922-23.) MR. BOTHNE.

136. BJÖRNSON. A study of his activity as a central figure in modern Norway. MR. BOTHNE.

GRADUATE COURSES. CONSULT GRADUATE SCHOOL BULLETIN

201-202-203. SEMINAR IN HISTORY OF SCANDINAVIAN LANGUAGES, INCLUDING SEMASIOLOGY. MR. BOTHNE.

204-205-206. SEMINAR IN OLD NORWEGIAN. The Elder Edda. (Not offered in 1922-23.) MR. BOTHNE.

209-210. SEMINAR IN MODERN SWEDISH LANGUAGES AND LITERATURE. MR. STOMBERG.

215-216-217. SEMINAR IN MODERN NORWEGIAN LITERATURE. MR. BOTHNE.

SOCIOLOGY AND SOCIAL WORK

Lecturer FRANK J. BRUNO, Acting Chairman; Professor LUTHER L. BERNARD; Associate Professor MANUEL C. ELMER; Assistant Professors ROSS L. FINNEY, GUSTAV A. LUNDQUIST, MILDRED D. MUDGETT; Lecturers KATHERINE A. BRANNICK, OTTO W. DAVIS, WILLIAM W. HODSON, ELIZABETH A. SEEBERG; Instructors LOUIS A. BOETTIGER, HUGH S. CARTER, CHARLES R. HOFFER, LEE O. LANTIS, GEORGE S. H. ROSSOUW.

COURSES

1. INTRODUCTION TO SOCIOLOGY. A study of the origin and development of human societies: various agencies which have determined the type of social life: social organization, institutions, and progress; bearing of sociology upon other social sciences and arts. MR. BERNARD, MR. FINNEY, MR. LUNDQUIST, MR. BOETTIGER, MR. CARTER, MR. HOFFER, MR. LANTIS, MR. ROSSOUW.

3. EDUCATIONAL SOCIOLOGY. This course is designed to explain, from the sociological standpoint, what the aims of education are, and what subjects are of most value. MR. FINNEY.

6. MODERN SOCIAL REFORM MOVEMENTS. A survey of attempts to overcome certain social maladjustments; child labor, the city, bad housing, poverty, degeneracy; movements for public health, industrial democracy, social insurance, protection in infancy and youth, public recreation, etc. MR. ELMER, MR. FINNEY, MR. BOETTIGER, MR. ROSSOUW.

14. RURAL SOCIOLOGY. The background and evolution of country life; rural conveniences, communication, coöperation; rural social institutions, especially the family, school, church, and social center; rural leadership, surveys, organization, social agencies. MR. BERNARD, MR. LUNDQUIST, MR. HOFFER, MR. LANTIS.

45-46. ELEMENTS OF SOCIAL HYGIENE AND COMMUNITY PROTECTIVE WORK. (Not offered in 1922-23.)

51. THE OCCURRENCE OF THE SOCIALLY INADEQUATE. The significance of the socially inadequate in contemporary and industrial societies and the description of the methods used in their care.

52. ELEMENTARY SOCIAL CASE WORK. The methods of case work as applied to the treatment of the socially inadequate.

53. ELEMENTS OF CRIMINOLOGY. The causes of crime; nature of the criminal; criminal procedure; methods of treatment (prisons, reformatories, parole, probation); the juvenile offender; juvenile courts; preventive methods. MR. ELMER.

55. HOUSING PROBLEMS. An examination of housing evils and their causes; the various movements for the prevention or improvement of bad housing; town- and city-planning; garden cities. Lectures, readings, field work, and essay. MR. DAVIS.

60. 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. MR. HODSON.

90. ELEMENTARY FIELD WORK. Designed to give first-hand knowledge of the conditions out of which dependency develops by field work with a social service agency. MRS. MUDGETT.

91. ELEMENTARY FIELD WORK. Designed for students who have taken 90 and aiming to give practice to the methods of treatment outline in Course 52. MRS. MUDGETT.

92. ELEMENTARY FIELD WORK. Field work on special research problems, principally in the field of child welfare, depending upon proficiency attained in 90 and 91.

97-98-99. ADVANCED FIELD WORK. This is a course in technique open to such students as wish to strengthen their experience in case work. MRS. MUDGETT.

100. SOCIAL PSYCHOLOGY. The social attitudes; their development and modification under social pressures; the interactions of individuals and groups. MR. BERNARD.

101. SOCIAL ORGANIZATION. The organization and structure of social groups; the selection of group types and values; the disorganization and reorganization of institutions; purposive social organization. MR. BERNARD.

102. SOCIAL CONTROL. Nature, purpose, and methods of social control; institutional and non-institutional controls; the evolution of sanctions in social control; the revision of the social controls under the influence of modern science. MR. BERNARD.

103. SOCIOLOGY OF CONFLICT. (Not offered in 1922-23.)

104. STATE CARE OF DEPENDENTS, DEFECTIVES, AND DELINQUENTS IN MINNESOTA. (Not offered in 1922-23.)

110. METHODS OF COMMUNITY ORGANIZATION AND SOCIAL WORK IN SMALL TOWNS AND COUNTRY. Concrete problems and methods are emphasized. MR. BERNARD.

114. RURAL SOCIAL INSTITUTIONS. A detailed study of the problems of organization and efficiency of selected rural institutions, especially religious, educational, civic, and recreational. For advanced students. Lectures, discussion, reports. MR. LUNDQUIST.

119. THE FAMILY. The evolution of the family; its various forms and their relation to other social institutions; the service of the family in social evolution; contemporary problems of the family (standards of living, birth rate, feminism, etc.). MR. ELMER.

120. SOCIAL PROGRESS. A study of the basis for social progress in human nature; analysis of fundamental social institutions with regard to their contributions to human advance; necessary social readjustments to convert drift into progress. MR. BERNARD.

122. METHODS OF SOCIAL INVESTIGATION. Methods of gathering and presenting community facts; social statistics; social surveys. Lectures, problems, and field work. MR. ELMER.

123. SOCIAL STATISTICS. A study and analysis of social statistics and their bearing upon group life. The course is especially designed to give social workers and public health officials the training necessary to carry on their work successfully. MR. ELMER.

125-126-127. SETTLEMENT AND COMMUNITY CENTER WORK. (Not offered in 1922-23.)

128. CHARITABLE ADMINISTRATION, FINANCE, AND PUBLICITY. A technical study of methods of organizing charitable agencies, of financing them, and of making the public aware of their work. Lectures and practice work. MR. DAVIS.

130. ADVANCED SOCIAL CASE WORK. The method of case work in some special applications to specific problems presented by the socially inadequate; conducted by case conferences and case studies.

132. JUVENILE COURTS AND PROBATION. Primarily a course in probation practice work, but prefaced by lectures on the social and legal aspects of the juvenile court and probation. (Not offered in 1922-23.)

133. MEDICAL SOCIAL SERVICE. A course open only to students who are properly grounded in case work and who wish to specialize in this field. DR. BRANNICK.

134. LEGAL PROTECTION OF THE CHILD. A study of the relation of law to child welfare. A survey of existing children's protective legislation, of its administration and its future development. MR. HODSON.

135. FIELD PRACTICE IN LEGAL PROTECTION OF THE CHILD. Designed to meet the individual needs of students in the course on Legal Protection of the Child. MRS. MUDGETT.

138-139. MENTAL CASE WORK. A study of mental abnormality and its treatment through case work. Lectures and clinical instruction. MISS SEEBERG.

140. HISTORY OF SOCIAL THEORY. A rapid survey of the leading social theories from the time of the Greeks, with special reference to the more recent development of sociology. The theories are related to their social backgrounds. MR. BERNARD.

141. CONTEMPORARY SOCIAL THEORY. An intensive study of developments in the social theory of the late nineteenth and twentieth centuries. MR. BERNARD.

150. SEMINAR. Subject for fall quarter: the literature of social protest. Open to qualified students in either English or sociology. (Not offered in 1922-23.)

151. SEMINAR. Subject for winter quarter: social aspects of the labor problem. (Not offered in 1922-23.)

152. SEMINAR. Subject for spring quarter: problems of institutional administration and reconstruction. (Not offered in 1922-23.)

180-181-182. SEMINAR IN EDUCATIONAL SOCIOLOGY. Investigation of specific problems in the social aspects of education, selection of problems to be determined in part by the student's interests. Sociological foundation of educational theory. MR. FINNEY.

200-201-202. SEMINAR IN APPLIED SOCIOLOGY. See Graduate School bulletin. MR. ELMER.

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

TABULAR STATEMENT AND PROGRAM OF COURSES

1922-1923

DIRECTORY OF ADMINISTRATIVE AND DEPARTMENTAL OFFICES

J. B. Johnson, Dean of the College of Science, Literature, and the Arts	119F
J. M. Thomas, Assistant Dean for the Senior College	221F
W. H. Bussey, Assistant Dean for the Junior College	106F
R. R. Shumway, Assistant Dean for Students' Work	119F

Animal Biology	308AB	Home Economics	202HE
Anthropology	11F	Human Anatomy	204IA
Astronomy	123F	Human Physiology	110MH
Bacteriology	228MH	Latin	118F
Botany	105AB	Mathematics	121F
Chemistry	127C	Military Science and Tactics	A
Comparative Literature	111F	Music	Mu
Comparative Philology	216F	Philosophy	323F
Drawing and Descriptive Geometry	208ME	Physical Education for Men	110A
Economics	113MA	Physical Education for Women	101WGym
Education	103Ed	Physics	20Ph
English	221F	Political Science	101MA
Geology and Mineralogy	108P	Psychology	112Psy
German	211F	Public Health and Preventive Medicine	MH
Greek	112F	Romance Languages	200F
History	216Lib	Scandinavian	218F
		Sociology and Social Work	17F

EXPLANATIONS

Course numbering.—A course is designated by a department name, a number, and a letter. It has the same number in whatever quarter it is offered. The quarter is indicated by the letter (f, fall; w, winter; s, spring; su, summer).
Examples:

1f-2w, a two-quarter course given in the fall and winter.
1w-2s, the same course given in the winter and spring.
3f,w,s, a one-quarter course given each quarter.
(1s)-2f, a two-quarter course completed in the fall of 1922.
1s-(2f), a two-quarter course begun in the spring of 1923.

Junior College courses (primarily for freshmen and sophomores) are numbered from 1 to 49. Senior College courses are numbered as follows: courses primarily for juniors and seniors, from 50 to 99; for juniors, seniors, and graduates, from 100 to 199; for graduates only, from 200 up. This system is not uniformly followed by departments in other colleges than Science, Literature, and the Arts.

Statement of credits.—The number of credits stated for two- and three-quarter courses is the number for the entire course, not the number for each quarter.

Buildings.—A, Armory; AB, Animal Biology; Adm(F), Administration, University Farm; C, Chemistry, Main Campus; Ch, Chemistry, University Farm; D, Dentistry; Ed, Education; En(F), Engineering, University Farm; Farm, University Farm (consult bulletin of the College of Agriculture, Forestry, and Home Economics); F, Folwell;

G, Greenhouse; HE, Home Economics, University Farm; Lib, Library; LitTh, Little Theater; MA, Mechanic Arts; ME, Main Engineering; MechE, Mechanical Engineering; MH, Millard Hall; Mu, Music; P, Pillsbury; Ph, Physics; PP, Plant Pathology, University Farm; Psy, Psychology; St, Stock Pavilion, University Farm; WH, Woman's Hall, University Farm; WGym, Women's Gymnasium.

OTHER ABBREVIATIONS AND SYMBOLS

I, II, III, etc.	First hour (8:30 to 9:20), second hour (9:30 to 10:20), third hour (10:30 to 11:20), fourth hour (11:30 to 12:20), fifth hour (12:30 to 1:20), sixth hour (1:30 to 2:20), seventh hour (2:30 to 3:20), eighth hour (3:30 to 4:20), ninth hour (4:30 to 5:20). (At the University Farm, first hour, 8:15 to 9:05; second hour, 9:15 to 10:05, etc.)
Ar.	To be arranged or assigned.
cred.	Credits.
Lab.	Laboratory.
Lect.	Lecture.
MTWThFS	Monday, Tuesday, etc.
prereq.	Prerequisite.
Rec.	Recitation.

A parenthetical statement after the title of each course gives the following information: the number of credits the course carries, the classes to whom it is open, and the courses prerequisite to it. *Abbreviated statement:* (5 cred.; jr., sr.; prereq., 6). *Expanded statement:* This course carries five credits, is open to juniors and seniors only, and has for a prerequisite, Course 6 in the same department.

ANIMAL BIOLOGY

Major Advisers

Professors Nachtrieb, Downey, and Riley; Associate Professor Lund; Assistant Professor Chapman.

Major Sequences

A. In ecology, 109-110, 183; 117-118-119; 197-198-199. (Prerequisites, 1-2, 37-38-39.)

B. In embryology, 181-182, 183; 197-198-199 or Mammalian Embryology; and at least 9 additional credits in approved courses. (Prerequisite, 1-2, 9-10, 19 or 46-47†.)

C. In entomology, 125-126-127 or 139-140; 144-145-146 or 197-198-199; 197-198-199 or 9 more credits in approved courses. (Prerequisite, 1-2, 37-38-39, 19 or 11 or 9-10.)

D. In physiology, 109-110, 183; 197-198-199. In addition the student should get 10 or 12 credits early in his course in one of the following: Human Physiology 100-101, Physical Chemistry 140-141-142, Organic Chemistry 35-36. (Prerequisite 1-2, 9-10.)

E. In hematology, 109-110 or Human Physiology 103, 104 or Animal Biology 181-182; 149-150-151; 154-155 or 197-198-199. (Prerequisite, 1-2, 9-10, Anatomy 103.)

F. In histology, 181-182, 183; 197-198-199. (Prerequisite, 1-2, 9-10, 11.)

Courses in human anatomy and mammalian embryology may be arranged for with the head of the Department of Anatomy.

Courses in human physiology may be arranged for with Dean Lyon.

Courses in psychology may be arranged for with Mr. Elliott.

Modification of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

No.	Title		Hour	Day	Bldg.	Instructor
1f-2w†	General Zoology.....					
	(10 cred.; all; no prereq.)					
	Sec. 1	Lab.	III, IV	MWF	101AB	Ar
	(Limit, 150)	Lect.	III	TThS		
			IV	T	313AB	Ar
	Sec. 2	Lab.	VI, VII	MWF	101AB	Ar
	(Limit, 150)	Lect.	VI, VII	TTh	313AB	Ar
1w-2s†	General Zoology.....					
	(See 1f-2w)					
	Sec. 1	Lab.	I, II	MWF	101AB	Ar
		Lect.	I	T		
			II	TThS	313AB	Ar
1s-(2su† or 2w†)	General Zoology.....					
	(See 1f-2w)					
		Lab.	VI, VII, VIII	WF	101AB	Ar
		Lect.	VI, VII	MTh	313AB	Ar
5f-6w-7s†	General Zoology.....					
	(12 cred.; pre-medical and pre-dental students; no prereq.)					
	Sec. 1	Lab.	I, II	TS	101AB	Ar
	(Pre-dental)	Lect.	I	MWF	313AB	Ar
	Sec. 2	Lab.	III, IV	TS	101AB	Ar
	(Pre-medical)	Lect.	IV	MWF	313AB	Ar
		Lect.	(Spring: III, IV	WF		
		Lab.	IV	MTS)		

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
9f-10w†	Histology ..... (10 cred.; soph., jr., sr.; prereq., 1-2)	III, IV	MTWFS	201,211AB	Mr. Downey
11s	Cytology and Technique..... (5 cred.; fr., soph., jr., sr.; prereq., 1-2)	III, IV	MTWFS	201,211AB	Mr. Nachtrieb
14f-15w-16s†	General Zoology..... (9 cred.; Agr., For., H.E.; no prereq.)	See College of Agriculture bulletin			
17f	General Physiology..... (5 cred.; soph., jr., sr.; prereq., 15 cr. in an. biol. or 10 cr. in an. biol. and 10 cr. in chem. or physics)	VI, VII, VIII VI, VII, VIII, IX	MW F	10AB	Mr. Lund
18w	General Physiology..... (5 cred.; soph., jr., sr.; prereq., as for 17)	VI, VII, VIII VI, VII, VIII, IX	MW F	10AB	Mr. Lund
19s	Principles of Animal Behavior.. (5 cred.; soph., jr., sr.; prereq., 15 cred. in an. biol., or 10 cr. in an. biol. and 10 cr. in chem. or phys. or psy.)	VI, VII, VIII VI, VII, VIII, IX	MW F	10AB	Mr. Lund
37f-38w-39s†	General Entomology..... (9 cred.; soph., jr., sr.; prereq., 1-2)	I, II	MWF	204AB	Mr. Oestlund
44f,s	Animal Parasites..... (3 cred.; fr., soph., jr., sr.; prereq., 1-2)	VI, VII, VIII	WF	202AB	Mr. Riley
45w	Insects and Disease..... (3 cred.; fr., soph., jr., sr.; prereq., 1-2)	VI, VII, VIII	TTh	202AB	Mr. Riley
46w-47s†	Ornithology ..... (6 cred.; soph., jr., sr.; prereq., 1-2)	VI, VII, VIII	MW	211,314AB	Mr. Roberts
48s	General Ecology..... (5 cred.; fr., soph., jr., sr.; prereq., 1-2)	VI, VII, VIII VI, VII, VIII, IX	MW F	204AB	Mr. Chapman
75s	Nature Study..... (3 cred.; jr., sr.; prereq., 20 cred. incl. 1-2)	VI, VII, VIII	TTh	213AB	Mr. Sigerfoos
107s	Protozoology ..... (3 cred.; jr., sr., grad.; prereq., 15 cred. incl. 1-2)	I, II	MWF	211,213AB	Mr. Sigerfoos
109f-110w-111s	General Physiology..... (15 cred.; jr., sr., grad.; prereq., 20 cred. in an. biol.)	VI, VII, VIII VI, VII, VIII, IX	MW F	10AB	Mr. Lund
117f-118w-119s†	Ecology of Insects..... (9 cred.; jr., sr., grad.; prereq., 15 cred. incl. 1-2)	VI, VII, VIII	TTh	202AB	Mr. Chapman
124su	Advanced Ecology..... (5 cred.; jr., sr., grad.; prereq., 117-118-119)	Ar	Ar	Ar	Ar
125f-126w-127s†	Advanced Entomology..... (9 cred.; jr., sr., grad.; prereq., 1-2 and 37-38-39)	III, IV	TThS	204AB	Mr. Oestlund
130w	Biology Aphididae..... (3 cred.; jr., sr., grad.; prereq., 20 cred. incl. 1-2)	III, IV	MWF	204AB	Mr. Oestlund

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
139f-140w†	Histol. and Develop. of Insects.. (6 cred.; jr., sr., grad.; prereq., 1-2 and 37-38-39)	II, III, IV	TTh	324Ad(F)	Mr. Riley
144f-145w-146s	Animal Parasites and Parasitism (9 cred.; jr., sr., grad.; prereq., 1-2 and 5 add. cred.)	VI, VII, VIII	WF	202AB	Mr. Riley
149f-150w-151s†	Blood of Vertebrates..... (9 cred.; sr., grad.; prereq., histol. and embryol.; reading knowledge of French and German)	VII, VIII	Ar	201,211AB	Mr. Downey
154w-155s†	Hematology ..... (6 cred.; jr., sr., grad.; prereq., histol., embryol.)	VI, VII, VIII	TTh	201,211AB	Mr. Downey
181f-182w†	Embryology ..... (6 cred.; jr., sr., grad.; prereq., 1-2 and 11 or equiv.)	VI, VII	MWF	201,211AB	Mr. Nachtrieb
183s	Genetics and Eugenics..... (3 cred.; jr., sr., grad.; prereq., 1-2 and 5 other cred. in an. biol. or botany)	IV	MWF	211AB	Mr. Nachtrieb
197f-198w-199s	Problems ..... (9 or 18 cred.; sr., grad.; prereq., 1-2 and special requirements)	Ar	Ar	Ar	Ar

ENTOMOLOGY AND ECONOMIC ZOOLOGY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
3f,w	Economic Entomology..... (3 cred.; soph., jr., sr.; prereq., an. biol. 9 cred.)	VI, VII, VIII	WF	306Ad	Mr. Ruggles
4f	Economic Vertebrate Zoology... (3 cred.; jr., sr.; prereq., an. biol. 9 cred.)	Ar	Ar	Ar	Mr. Washburn
8f	Varieties and Habits of Fur-Bearing Animals..... (3 cred.; soph. jr., sr.; prereq., an. biol. 9 cred.)	Ar	Ar	Ar	Ar
12w	Forest Zoology..... (3 cred.; jr., sr.; prereq., an. biol. 9 cred.)	Ar	Ar	Ar	Mr. Washburn
150f,su	Insecticides and Their Action.. (3 or 6 cred.; jr., sr.; prereq., 37-38-39, Agr. Biochem. 7-8, or equiv.)	Ar	Ar	Ar	
197f,w,s,su	Introduction to Research..... (5 or more cred.; sr.; prereq., 37-38-39 or 44-45 and other work as prescribed by the division)	Ar	Ar	Ar	Mr. Oestlund, Mr. Ruggles, Mr. Chapman, Mr. Riley, Mr. Washburn

† The entire course must be completed before credit is received for any quarter.

ANTHROPOLOGY AND AMERICANIZATION TRAINING

Major Adviser

Professor Jenks.

Major Sequence

At least 24 credits selected from the following courses: 80, 108, 110, 112, 113, 114, 115, 123-124; Educational Psychology 111; History 121-122, 166. In addition, Psych. 125-126 is required. (Prerequisites: Animal Biology 1-2; Psychology 1-2, and 4-5 or 7; Anthropology 1 and two other courses.)

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

No.	Title	Hour	Day	Bldg.	Instructor
1f	Introd. to Anthropology..... (5 cred.; 3d qu. fr., soph., jr., sr.; no prereq.)	II VI	MWThFS MTWThF	15F 15F	Mr. Jenks
1w	Introd. to Anthropology..... (See 1f)	VI	MTWThF	15F	
1s	Introd. to Anthropology..... (See 1f)	II VI	MWThFS MTWThF	15F 15F	
4w	Cultural Anthropology..... (3 cred.; soph., jr., sr.; prereq., 1)	II	MWF	25F	Mr. Jenks
5f,w,s	General Immigration..... (3 cred.; soph., jr., sr.; prereq., 1)	III	TThS	15F	
1zf,w,s	Ethnology ..... (3 cred.; soph., jr., sr.; prereq., 1)	II	TThS	25F	Miss Speaker
57f-58w-59s	Race Leaders and Programs.... (9 cred.; jr., sr.; prereq., three courses)	I	TThS	25F	Miss Speaker
70f¶	Food Preparation..... (3 cred.; soph., jr., sr.; prereq., An. Biol. 1-2)	VI, VII	MWF	HE	Miss Lindquist
71w	Elementary Dietetics..... (3 cred.; soph., jr., sr.; prereq., 70, Physiol. 3, or parallel)	VI, VII	MWF	HE	Miss Mumford
72s	Home Management..... (3 cred.; soph., jr., sr.; prereq., 71, Econ. 7, (Col. of Agr.) or parallel)	VI, VII	MWF	HE	Miss Lindquist
80w	The American Indian..... (3 cred.; jr., sr., prereq., three courses incl. 12)	IV	MWF	15F	
108s	Philippine Peoples..... (3 cred.; jr., sr., grad.; prereq., three courses)	II	MWF	25F	Mr. Jenks
110	*Physical Anthropology and Amalgamation* ..... (3 cred.; jr., sr., grad.; prereq., 1 and An. Biol. 1-2)	*Not offered in 1922-23*			

¶ Does not count as a Senior College course. Not open to sophomores under the rule on p. 21.

No.	Title	Hour	Day	Bldg.	Instructor
112f	The American Negro..... (3 cred., jr., sr., grad., prereq., three courses)	IV	MWF	15F	Mr. Jenks
113f	Older Immigrants..... (3 cred.; jr., sr., grad.; prereq., three courses)	III	MWF	15F	Mr. Jenks
114w	Newer Immigrants..... (3 cred.; jr., sr., grad.; prereq., three courses)	III	MWF	15F	Mr. Jenks
115s	Americanisms and Assimilation.. (3 cred.; jr., sr., grad.; prereq., three courses)	III	MWF	15F	Mr. Jenks
117w	Immigrant Woman..... (3 cred.; jr., sr., grad.; prereq., three courses)	III	TThS	9F	Miss Speaker
118f	Government and the Immigrant.. (3 cred.; jr., sr., grad.; prereq., three courses incl. 5)	IV	MWF	Ar	
123w-124s	Problems in Anthropology..... (6 cred.; jr., sr., grad.; prereq., three courses)	Ar	Ar	Ar	Mr. Jenks
128f,s	Technique of Teaching Adults.. (3 cred.; jr., sr., grad.; prereq., 3 courses)	I	MWF	12F	
129w	Methods of Americanization.... (3 cred.; jr., sr., grad.; prereq., 128)	I	MWF	12F	Mr. Jenks
130s	Org. and Admin. of Americanization Work..... (3 cred.; jr., sr., grad.; prereq., 128)	I	MWF	25F	Mr. Jenks, Miss Speaker
131f-132w-133s	Supervised Amer. Work..... (9 cred.; jr., sr., grad.; prereq., 128)	VII	T and Ar	12F 12F	Miss Speaker
141f	Principles of Adult Elementary Education ..... (3 cred.; jr., sr., grad.; prereq. 128)	II	MWF	12F	
142w	Adult Elementary Learning Process ..... (3 cred.; jr., sr., grad.; prereq., 141)	II	MWF	12F	
143s	Adult Elementary Teaching Process ..... (3 cred.; jr., sr., grad.; prereq., 142)	II	MWF	12F	
150f-151w-152s	Field Problems in Americanization ..... (6 cred.; jr., sr., grad.; prereq., 128)	IV	MW	12F	

ARCHITECTURE

COLLEGE OF ENGINEERING AND ARCHITECTURE

Major Adviser

Professor Mann.

Major Sequence

Courses 34-35-36, 14-15-16, 17-18-19, 161; Philosophy 103 or 104.

JUNIOR COLLEGE COURSES

No.	Title	Hour	Day	Bldg.	Instructor
14-15-16	History of Architecture..... (6 cred.; jr., sr.; prereq., 31-32-33)	IV III	M Th	320ME	Mr. Forsythe
17-18-19	History of Architecture..... (6 cred.; jr., sr.; prereq., 14-15-16)	III	TTh	320ME	Mr. Mann
21f-22w†-23s	Freehand Drawing..... (6 cred.; soph., jr., sr.; prereq., soph. standing)				
	Sec. 1	II, III	MWF	402ME	Mr. Johnson
	2	VII, VIII	MWF		
31f-32w†-33s	Elements of Architecture..... (12 cred.; soph., jr., sr.; prereq., soph. standing)				
	Sec. 1	IV	T	320ME	Mr. R. T. Jones
		II	S	320ME	Mr. Forsythe
		II, III, IV	MWF	309ME	Mr. Hammett
	2	IV	T	320ME	Mr. R. T. Jones
		II	S	320ME	Mr. Forsythe
		VII,VIII,IX	MWF	309ME	Mr. Hammett
34-35-36	Architectural Design..... (12 cred.; jr., sr.; prereq., 31-32-33, 23)	VI,VII,VIII	MTThF	402ME	Mr. R. C. Jones

SENIOR COLLEGE COURSES

51f-52w-53s	Elements of Construction..... (6 cred.; soph., jr., sr.; prereq., 31-32-33)	II	TTh	320ME	Mr. R. T. Jones
81f	Color and Design..... (2 cred.; stud. of dram.; no prereq.)	VI, VII, VIII	TTh	402ME	Mr. Burton
161	History of Sculpture and Painting ..... (2 cred.; jr., sr.; prereq., 14-15-16)	II	MTh	320ME	Mr. Burton
181w-182s	Decoration and Allied Arts..... (6 cred.; sr.; prereq., 17-18-19)	IV	MWF	401ME	Mr. Mann

† The entire course must be completed before credit is received for any quarter.

ASTRONOMY

Major Adviser

Professor Leavenworth.

Major Sequence

Courses 51-52-53, 101-102-103, and Mathematics 50, 51, 52. (Prerequisites: Mathematics 1-6-7 or physical science and Mathematics 6.)

Modification of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

No.	Title	Hour	Day	Bldg.	Instructor
4f-5w‡*	Introd. to Astronomy..... (10 cred.; 3d qu. fr., soph., jr., sr.; prereq., trigonometry)	I	TWThFS	124F	Mr. Beal
4w-5s‡*	Introd. to Astronomy..... (See 4f-5w)	VI	MTWThF	124F	Mr. Beal
7f	Navigation ..... (3 cred.; soph., jr., sr.; prereq., trigonometry)	II	TThS	124F	Mr. Leavenworth
11f§*	Descriptive Astronomy..... (5 cred.; 3d qu. fr., soph., jr., sr.; no prereq.)	III	MTThFS	124F	Mr. Beal
11w§*	Descriptive Astronomy..... (See 11f)				
	Sec. 1	III	MTThFS	124F	Mr. Beal
	2	IV	MTWFS	124F	Mr. Leavenworth
11s§*	Descriptive Astronomy..... (See 11f)				
	Sec. 1	I	TWThFS	124F	Mr. Beal
	2	III	MTThFS	124F	Mr. Leavenworth
25s§*	Stellar Astronomy..... (3 cred.; soph., jr., sr.; prereq., 11)	IV	MWF	124F	Mr. Leavenworth
51f-52w-53s*	General Astronomy..... (9 cred.; jr., sr.; prereq., Math. 1, 6, 7, or phys. sci. and Math. 6)	II	MWF	124F	Mr. Leavenworth
62f	Elements of Practical Astron... (3 cred.; jr., sr.; prereq., Astron. 4 or 11 or 51, and Math. 6, 7)	III	MWF	123F	Mr. Leavenworth
101f-102w-103s	Practical Astronomy..... (9 or 18 cred.; jr., sr., grad.; prereq., Astron. 4 or 11 or 51, and Math. 50)	III	MWF	123F	Mr. Leavenworth
111f-112w-113w	Celestial Mechanics..... (9 cred.; sr., grad.; prereq., Math. 51)	Ar	Ar	123F	Mr. Beal
140w	Method of Least Squares..... (3 cred.; jr., sr., grad.; prereq., Math. 51)	II	TThS	124F	Mr. Leavenworth

‡ Satisfies the Junior College requirement for science.

§ Does not satisfy the Junior College requirement for science.

* Courses 4-5, 11-25, and 51-52-53 cover much the same field. No student is advised to take more than one of these sequences.

BACTERIOLOGY

MEDICAL SCHOOL

Major Advisers

Professor Larson; Associate Professor Henrici.

Major Sequences

Sequence A. For work in medical or public health bacteriology. Courses 101, 114, 116, 117, 119-120, 150-151. (Prerequisites: besides the necessary courses in this department, Animal Biology 144-145-146 and Physiology 100-101 or Biochemistry 111-112.)

Sequence B. For work in industrial bacteriology. Courses 103, 105, 114, 118, 119-120, 150-151. (Prerequisites: besides the necessary courses in this department, Physiology 100-101 or Biochemistry 111-112.)

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

No.	Title	Hour	Day	Bldg.	Instructor
1f,w,s,su	General Bacteriology..... (5 cred.; soph., jr., sr.; prereq., chem. 10 cred. and biol. 10 cred.)	VI, VII, VIII	MWF	MH	Ar
101f,su	Special Bacteriology for Medical Students ..... (4 cred.; jr., sr.; prereq., 1)	I, II	MWF	MH	Ar
103w	Special Bacteriology for Students of Agriculture..... (4 cred.; jr., sr.; prereq., 1)	III, IV	TThS	MH	Ar
105f	Household Bact..... (3 cred.; jr., sr.; prereq., 1)	VII, VIII	TTh	MH	Ar
114s	Higher Bacteria ..... (3 cred ; jr., sr.; prereq., 101 or 103)	VII, VIII	TTh	MH	Ar
116w	Immunity ..... (3 cred.; jr., sr.; prereq., 101 or 103)	VII, VIII	TTh	MH	Ar
117s	Pathogenic Protozoa..... (3 cred.; jr., sr.; prereq., 101 or 103)	VII, VIII	TTh	MH	Ar
118f	Morphology and Taxonomy of Bacteria ..... (3 cred.; jr., sr.; prereq., 101 or 103)	VII, VIII	TTh	MH	Ar
119f-120w	Bacteriological Chemistry..... (4 cred.; jr., sr.; prereq., 101 or 103; Physiology 100-101-102 or Agric. Biochem. 111-112)	VI, VII, VIII	TTh	MH	Ar
150f-151w or 150w-151s	Advanced Bacteriology..... (3 cred.; jr., sr.; prereq., see instructor)	VII, VIII	TTh	MH	Ar

BOTANY

Major Advisers

Professors Rosendahl, Knight, Tilden; Associate Professor Butters; Assistant Professor Cooper.

Major Sequences

Courses 62, 63, 113, 114, 118, 124, nine credits from one of the following groups, and five credits from another group:

A. In ecology, Courses 131, 132, 133.

B. In physiology, Courses 141, 142, 143, 144.

C. In morphology, Courses 107, 108, 110, 123, 125, 126, 127, and Plant Pathology 105-106-107.

(Prerequisite: 20 credits from courses numbered below 50.)

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

No.	Title		Hour	Day	Bldg.	Instructor
1f-2w	General Botany..... (10 cred.; all; no prereq.)					
	Sec. 1	Lab.	I, II	MWF	212,214,220P	Mr. Durand in charge
		Quiz	I	T	212,214,220P	
		Lect.	II	TThS	210P	
	Sec. 2	Lab.	VI, VII	MWF	212,214,220P	
		Quiz	VII	Th	210P	
		Lect.	VI, VII	T	210P	
			VI	Th	210P	
1w-2s	General Botany..... (See 1f-2w)					
		Lab.	III, IV	MWF	212,214,220P	Mr. Durand in charge
		Quiz	IV	T	212,214,220P	
		Lect.	III	TThS	210P	
1s-(2f)	General Botany..... (See 1f-2w)					
		Lab.	I, II	TThS	212,214,220P	Mr. Durand in charge
		Quiz	I	W	212,214,220P	
		Lect.	II	MWF	210P	
(1s)-2f	General Botany..... (See 1f-2w)					
		Lab.	I, II	TThS	212,214,220P	Mr. Durand in charge
		Quiz	I	W	212,214,220P	
		Lect.	II	MWF	210P	
7s	Taxonomy of Flowering Plants.. (5 cred.; all; prereq., 2)					
		Lab.	VI, VII	MWF	212,214,220P	Mr. Rosendahl, Mr. Johnson
		Quiz	VIII	W	210P	
		Lect.	VIII	MF	210P	
12f	Morphology of Algae..... (3 cred.; all; prereq., 2)		I, II	TThS	213AB	Miss Tilden
13w	Morphology of Fungi..... (3 cred.; all; prereq., 2)		I, II	TThS	213AB	Mr. Johnson
21s	Elementary Ecology..... (5 cred.; all; prereq., 2)		III, IV	MTWFS	G	Mr. Cooper
22f,s	Elementary Plant Physiol..... (5 cred.; all; prereq., 2)		III, IV	MTWFS	G	Mr. Knight

No.	Title	Hour	Day	Bldg.	Instructor
48f	Plant Industry..... (5 cred.; jr., sr.; no prereq.)	VIII	MTWThF	Ar	Mr. Rosendahl, Mr. Freeman in charge
51f	Histological Methods..... (3 cred.; jr., sr.; prereq., 15 cred.)	I, II	MWF	213AB	Mr. Rosendahl
62w	Bryophytes and Pteridophytes... (3 cred.; jr., sr.; prereq., 15 cred.)	VI, VII, VIII	TTh	Ar	Mr. Huff
63s	Gymnosperms and Angiosperms.. (3 cred.; jr., sr., grad.; prereq., 7 or 62)	VI, VII, VIII	TTh	Ar	Mr. Butters
107w	Bryophytes ..... (5 cred.; jr., sr., grad.; prereq., 7 and 62)	Ar	Ar	106AB	Mr. Durand
108	*Pteridophytes* ..... (5 cred.; jr., sr., grad.; prereq., 7 and 62)	*Not offered in 1922-23*			
110w	Gymnosperms ..... (5 cred.; jr., sr., grad.; prereq., 7 and 63)	Ar	Ar	4AB	Mr. Butters
113f-114w-115s	Adv. Taxonomy..... (9 cred.; jr., sr., grad.; prereq., 15 cred. incl. 7)	VI, VII	MWF	213AB	Mr. Rosendahl
118w	Cytology ..... (3 cred.; jr., sr., grad.; prereq., 18 cred.)	VI, VII, VIII	TTh	213AB	Mr. Rosendahl
123	*Algae: Blue-Green*..... (3 cred.; jr., sr., grad.; prereq., 15 cred. incl. 12)	*Not offered in 1922-23*			
124f	Algae: Green..... (3 cred.; jr., sr., grad.; prereq., 15 cred. incl. 12)	VI, VII, VIII	TTh	104AB	Miss Tilden
125w	Algae: Brown..... (3 cred.; jr., sr., grad.; prereq., 15 cred. incl. 12)	VI, VII, VIII	TTh	104AB	Miss Tilden
126s	Algae: Red..... (3 cred.; jr., sr., grad.; prereq., 15 cred. incl. 12)	VI, VII, VIII	TTh	104AB	Miss Tilden
127s	Anatomy of Vascular Plants.... (5 cred.; jr., sr., grad.; prereq., 18 cred.)	III, IV	MTWFS	213AB	Mr. Butters
131f	Field Ecology..... (5 cred.; jr., sr., grad.; prereq., 21)	Ar	Ar	G	Mr. Cooper
132w	Ecological Anatomy..... (5 cred.; jr., sr., grad.; prereq., 21)	III, IV	MTWFS	G	Mr. Cooper
133s	Forest Geography of North America ..... (5 cred.; jr., sr., grad.; prereq., 21)	VI, VII	MWF	G	Mr. Cooper
141f	Physical Phases of Plant Physiology ..... (5 cred.; sr., grad.; prereq., 22 and gen. org. chem.)	I, II	MTWThF	G	Mr. Knight, Mr. Harvey

No.	Title	Hour	Day	Bldg.	Instructor
142w	Plant Metabolism..... (5 cred.; sr., grad.; prereq., 22 and gen. org. chem.)	I, II	MTWThF	G	Mr. Knight, Mr. Harvey
143s	Plant Metabolism and Growth.. (5 cred.; sr., grad.; prereq., 22 and gen. org. chem.)	I, II	MTWThF	G	Mr. Knight, Mr. Harvey
144s	Plant Microchemistry..... (5 cred.; sr., grad.; prereq., 22 and gen. org. chem.)	III, IV	MTWFS	G	Mr. Harvey

PLANT PATHOLOGY AND BOTANY

COLLEGE OF AGRICULTURE, FORESTRY AND HOME ECONOMICS

Introductory Courses

No.	Title	Hour	Day	Bldg.	Instructor
1f,su	Plant Pathology..... (5 cred.; jr., sr.; prereq., bot. 9 cred.)	VI, VII, VIII, IX	MWF	1,2PP	Mr. Stakman, Mr. Leach, Mr. Seal
7w-8s	Weeds and Grasses..... (6 cred.; soph., jr., sr.; prereq., bot. 9 cred.)	VI, VII, VIII	WF	3PP	Mr. Larson
9f,su	Weeds and Seed-Testing..... (3 cred.; soph., jr., sr.; prereq., bot. 9 cred.)	VI, VII, VIII	WF	3,4PP	Mr. Larson
10f	Forest Pathology..... (5 cred.; soph., jr., sr.; prereq., bot. 9 cred.)	VI, VII, VIII, IX	MWF	1,2PP	Mr. Stakman, Mr. Leach, Mr. Seal
12w	Seed Problems..... (3 cred.; jr., sr.; prereq., 9)	Ar	Ar	Ar	Mr. Larson
14s	Plant Disease Control..... (5 cred.; jr., sr.; prereq., 1, Entom. 3)				

Advanced Courses

No.	Title	Hour	Day	Bldg.	Instructor
105f-106w-107s	Mycology ..... (9 cred.; jr., sr.; prereq., Bot. 7, 11, or equiv.)	III, IV	MWF	1,32PP	Miss Dosdall
108f	Methods ..... (3 cred.; jr., sr.; prereq., 1 or 10, Bact. 1)	I, II	MWF	1,30PP	Mr. Leach
110w	Principles of Pathology..... (3 cred.; jr., sr.; prereq., 1 or 10, Bact. 1)	I, II	MWF	1,30PP	Mr. Stakman, Mr. Barker
111w,su	Diseases of Field Crops..... (3 cred.; jr., sr.; prereq., 1 or 10)	VI, VII	MWF	1,2PP	Mr. Stakman, Mr. Barker

CHEMISTRY

SCHOOL OF CHEMISTRY

Major Advisers

Professor Hunter; Associate Professor Sneed.

Major Sequence

Courses 20-21, 35-36, 140-141, and any one of 37, 102, 103, 123, 124, 131, 142. (Prerequisites: 6-7-8 or 9-10, 12-13.)

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

NOTE: Courses 20-21, 27, 31-32, 35-36-37, and all courses numbered above 50 count as Senior College courses.

Division of General and Inorganic Chemistry

No.	Title		Hour	Day	Bldg	Instructor
1f-2w-3s†	Gen. Inorg. Chemistry (for pre-med. and pre-dent.)..... (12 cred.; pre-dent., pre-medic.; no prereq.)					
	Sec. 1	Lect.	VI	MWF	225C	Ar
		Lab.	VI, VII	TTh	210C	Ar
	2		VIII, IX	TTh	210C	Ar
4f-5w†	Gen. Inorg. Chemistry (for pre-med. and pre-dent.)..... (8 cred.; pre-dent., pre-medic. only; prereq., entrance cred. in chem.)					
	Sec. 1	Lect.	VI	MWF	100C	Ar
		Lab.	VI, VII	TTh	210C	Ar
	2		VIII, IX	TTh	210C	Ar
6f-7w†-8s	Gen. Inorg. Chemistry..... (15 cred.; those entering without chem.; no prereq.)					
		Lect.	II	MWF	225C	Ar
		Lab.	I, II, III	ThS	210C	Ar
9f-10w†	Gen. Inorg. Chemistry..... (10 cred.; all; prereq., entr. cred. in chem.)					
		Lect.	II	MWF	100C	Ar
		Lab.	I, II, III	ThS	210C	Ar
9w-10s†	Gen. Inorg. Chemistry..... (See 9f-10w)					
		Lect.	IV	MWF	225C	Ar
		Lab.	VIII-IX	MWF	290C	Ar
11f	Qual. Chemical Anal. (for pre-med. and pre-dent.)..... (4 cred.; pre-med. and pre-dent. only; prereq., 3 or 5)					
		Lect.	IV	MWF	225C	Miss Cohen
		Lab.	VI, VII	MW	290C	Miss Cohen and assistants
11s	Qual. Chemical Anal. (for pre-med. and pre-dent)..... (See 11f)					
	Sec. 1	Lect.	VI	MWF	100C	Mr. Henderson
		Lab.	VI, VII	TTh	210C	Mr. Henderson,
	2		VIII, IX	TTh	210C	Mr. Fosse

† The entire course must be completed before credit is received for any quarter.

No.	Title		Hour	Day	Bldg.	Instructor
12f-(13w)†	Qual. Chemical Anal..... (10 cred.; all; prereq., 8 or 10)					
		Lect.	I	TThS	115C	Mr. Fosse
		Lab.	VI, VII, VIII	MW	290C	Mr. Fosse
(12f)-13w†	Qual. Chemical Anal..... (See 12f-(13w))					
		Lect.	I	TTh	115C	Mr. Fosse
		Lab.	VI,VII,VIII	MWF	290C	Mr. Fosse
12s-(13f)†	Qual. Chemical Anal..... (See 12f-(13w))					
		Lect.	II	MWF	100C	Mr. Sneed
		Lab.	I, II, III	ThS	290C	Mr. Sneed and assistants
(12s)-13f†	Qual. Chemical Anal..... (See 12f-(13w))					
		Lect.	VI	MW	111C	Mr. Sneed
		Lab.	VII,VIII,IX	MW	290C	Mr. Sneed and assistants
			VI,VII,VIII	F		
101s	History of Chemistry..... (2 cred.; sr., grad.; prereq., 36)		Ar	Ar	Ar	Miss Cohen
102w	Adv. Qual. Chemical Anal..... (2 or 3 cred.; jr., sr., grad.; prereq., 21, 36)		Ar	Ar	Ar	Mr. Sneed
103f,104w,105s	Adv. Inorg. Chemistry..... (3 to 9 cred.; jr., sr., grad.; prereq., 21, 36)		II	TThS	111C	Mr. Sneed

Division of Analytical Chemistry

20w-21s	Quant. Analysis..... (10 cred.; soph., jr., sr.; prereq., 12-13)					
		Lect.	VI	M	325C	Mr. Geiger
		Rec.	VI	F	315C	Mr. Geiger
		Lab.	VII-IX	MF	310C	Mr. Sidener, Mr. Geiger
			VI-IX	W	310C	Mr. Sarver
27f,w	Quant. Analysis (for pre-med.).. (4 cred.; pre-med. only; prereq., 11 or 13)					
		Lect.	VI	M	325C (fall) 315C (winter)	Mr. Brinton
		Lab.	VII, VIII	M	310C	Mr. Sidener, Mr. Brinton, Mr. Geiger
			VI-IX	WF	310C	Mr. Sarver
123f,124w,125s	Adv. Analytical Chemistry..... (3 to 9 cred.; jr., sr., grad.; prereq., 21 or 27)					
		Lect.	VI	T	315C	Mr. Sidener
		Lab.	VII-IX	T	310C	Mr. Sidener
			VI-IX	Th	310C	Mr. Geiger, Mr. Sarver
127f-128w-129s	Chemistry of Rare Elements.... (9 cred.; jr., sr., grad.; prereq., 21)		Ar	Ar	Ar	Mr. Brinton

† The entire course must be completed before credit is received for any quarter.

Division of Organic Chemistry

31w-32s†	Elem. Organic Chemistry..... (8 cred.; premed.; prereq., 11)				
	Lect.	IV	MWF	100C	Mr. Smith
	Sec. 1 Lab.	VI-VIII	TTh	390C	Mr. Smith,
	2	VI-VIII	WF		
	3	I-III	WF		
35f-36w†-37s	Organic Chemistry..... (10 or 15 cred.; jr., sr.; prereq., 15 cred. in college chem.)				
	Lect.	III	MWF	325C	Mr. Hunter
	Rec.	III	Th	111C	Mr. Lauer
	Lab.	VI-VIII	TTh	390C	Mr. Lauer
131s	Organic Analysis..... (3 cred.; jr., sr.; prereq., 21, 37)				
	Lect.	Ar	Ar	Ar	Mr. Lauer
	Lab.	Ar	Ar	Ar	
133f	Reagents in Organic Chemistry.. (3 cred.; jr., sr.; prereq., 37)	Ar	Ar	Ar	Mr. Smith
134w	The Terpenes..... (2 cred.; jr., sr.; prereq., 37)				
	Lect.	Ar	Ar	Ar	Mr. Frankforter
138,139f,w,s	Adv. Organic Chemistry Lab. Work ..... (4 to 10 cred.; jr., sr.; prereq., 37)	Ar	Ar	390C	

Division of Physical Chemistry

140f-141w†-142s	Physical Chemistry..... (9, 12, or 15 cred.; jr., sr., grad.; prereq., 2 yrs. col. chem., 1 yr. col. phys.)				
	Lect.	IV	MWF	325C	Mr. MacDougall
	Lab.	VI-VIII	F	15C,117C	Mr. MacDougall, Mrs. Lund
	Rec.	IV	S	215C	Mr. MacDougall
143-144-145	*Thermodynamics and Chemistry* (9 cred.; sr., grad.; prereq,. 142 and calculus)	*Not offered in 1922-23*			
146f,147w,148s	Kinetic Theory and Atomistics.. (3 to 9 cred.; sr., grad.; prereq., 142 and calculus)	II	TThS	315C	Mr. MacDougall
149s	Princ. of Colloidal Chem..... (2 cred.; sr., grad.; prereq., 141)	Ar	Ar	ArC	Mr. Reyerson
150	*Appl. of Colloidal Chemistry*.... (2 cred.; sr., grad.; prereq., 141)	*Not offered in 1922-23*			
151s	Radiochemistry ..... (2 cred.; sr., grad.; prereq., 141)	Ar	Ar	ArC	Mr. Henderson
152f,w,s	Radiochemistry Lab..... (cred. ar.; sr., grad.; to accompany 151)	Ar	Ar	ArC	Mr. Henderson

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
153f-154w-155s	Adv. Physical Chem. Lab..... (cred. ar.; sr., grad.; prereq., 142)	Ar	Ar	ArC	Mr. MacDougall
156w	Appl. of Phys. Chem. to Org. Chem. ..... (3 cred.; sr., grad.; 37 and 142)	Ar	Ar	ArC	Mr. Henderson
	Technological Chemistry				
161f-162w-163s	Food Analysis..... (9 cred.; jr., sr., grad.; prereq., 21)				
	Lect.	II	F	215C	Mr. Harding
	Lab.	VI, VII, VIII, IX	F	217C	Mr. Harding
		I, II	W		Mr. Brewer

AGRICULTURAL BIOCHEMISTRY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Introductory Courses

No.	Title	Hour	Day	Bldg.	Instructor
3f,w,s,su	Types of Carbon Compounds.... (6 cred.; soph., jr., sr.; prereq., chem. 10 cred.)	I	MTWThFS	201Ch	Mr. Anderson
7f-8w	General Agricultural Biochemistry (10 cred.; soph., jr., sr.; prereq., chem. 10 cred.)				
	Lect.	II	TThS	201Ch	Mr. Anderson
	Lab.	VI, VII, VIII	MW	203Ch	Mr. Anderson
7w-8s	General Agricultural Biochemistry (10 cred.; soph., jr., sr.; prereq., chem. 10 cred.)				
	Lect.	III	TThS	201Ch	Mr. Anderson
	Lab.	VI, VII, VIII	MF	203Ch	Mr. Anderson
15f,s	Principles of Animal Nutrition.. (3 cred.; jr., sr.; prereq., 7-8)	III	MWF	3St	Mr. Palmer
	Advanced Courses				
101f,su-102w,su	Agricultural Quantitative Analysis ..... (6 cred.; jr., sr.; prereq., 7-8)	VI,VII,VIII	MWF	105Ch	Mr. Morrow
103s	Dairy Chemistry..... (5 cred.; jr., sr.; prereq., 7-8)				
	Lect.	VI	MWF	251Ch	Mr. Palmer
	Lab.	VI, VIII, IX	MWF	7Ch	Mr. Palmer
106f	Chem. Tech. of Agricultural Products ..... (5 cred.; sr.; prereq., 101-102)	Ar	Ar	Ar	Mr. Bailey
108s,su	Chemistry of Wheat and Wheat Products ..... (3 cred.; jr., sr.; prereq., 7-8)	II	MWF	201Ch	Mr. Bailey
110s,su	Flour Laboratory Methods..... (5 cred.; jr., sr.; prereq., same as 109)	VI, VII, VIII, IX	MWF	7Ch	Mr. Bailey
111f,su-112w,su	Phytochemistry ..... (6 cred.; sr.; prereq., biol. 9 cred., org. chem.)	III	MWF	201Ch	Mr. Morrow

No.	Title	Hour	Day	Bldg.	Instructor
113f,su-114w,su	Biochemical Laboratory Methods (4 cred.; sr.; prereq., quant. anal., parallel 111-112)	VI, VII, VIII	TTh	7Ch	Mr. Morrow
116w	Advanced Animal Nutrition..... (2 cred.; jr., sr.; prereq., 15 or equiv.)	III	TTh	351Ch	Mr. Palmer, Miss Kennedy
117f,w,s,su	Laboratory Problems in Animal Nutrition ..... (3 to 5 cred.; jr., sr.; prereq., 116, permission of instructor)	Ar	Ar	Ar	Mr. Palmer, Miss Kennedy
118f,w,s,su	Laboratory Problems in Biochemistry	Ar	Ar	Ar	Ar

COMPARATIVE LITERATURE

No.	Title	Hour	Day	Bldg.	Instructor
101f-102w-103s†	Drama ..... (9 cred.; jr., sr., grad.; prereq., Jun. Col. requirement in Eng. and for. lang.)	III	TThS	113F	Mr. Firkins
105f-106w-107s†	Criticism ..... (9 cred.; jr., sr., grad.; prereq., Jun. Col. requirement in Eng. and for. lang.)	VI	MWF	113F	Mr. Firkins
110w	Romantic Movement..... (3 cred.; sr., grad.; prereq., permission of instructor)	II	TThS	113F	Mr. Firkins

COMPARATIVE PHILOLOGY

No.	Title	Hour	Day	Bldg.	Instructor
101f-102w†	Science of Language..... (4 cred.; jr., sr., grad.; prereq., see note)	VII	TTh	205F	Mr. Klaeber
103f	Universal Language..... (2 cred.; jr., sr., grad.; prereq., see note)	IV	TS	205F	Mr. Klaeber
105s	Life of Words..... (2 cred.; jr., sr., grad.; prereq., see note)	VII	TTh	205F	Mr. Klaeber
108f	Comparative Phonetics..... (3 cred.; jr., sr., grad.; prereq., see note)	Ar	Ar	Ar	Mr. Kroesch
109-110-111†	*History of German Lang.....* (6 cred.; jr., sr., grad.; prereq., see note)	*Not offered in 1922-23*			
141-142-143†	*Hist. Gram. of Eng. Lang.....* (6 cred.; jr., sr., grad.; prereq., see note)	*Not offered in 1922-23*			

NOTE: Prerequisites for all courses, one of the following groups: (1) five years foreign language; four may be in high school and one in college; (2) two years foreign language in college; (3) 4 credits in Old English.

† The entire course must be completed before credit is received for any quarter.

DRAWING AND DESCRIPTIVE GEOMETRY

COLLEGE OF ENGINEERING AND ARCHITECTURE

No.	Title	Hour	Day	Bldg.	Instructor
30f	Projection and Shadows..... (3 cred.; soph. in interior decoration; no prereq.)	III	TThS	203ME	Mr. Kirchner
41-42-43f,w,s	Technical Drawing..... (6 cred.; all; no prereq.)				
	Sec. 1	I, II	MWF	455C	Mr. Schuck, Mr. Cederberg
	2	III, IV	MWF		
	3	VII, VIII	MWF		
		VII, VIII	MF	(spring)	
		VIII, IX	T		
44f,w,s¶	Lettering ..... (1 cred.; all; no prereq.)				
	Sec. 1	IV	T	217ME	Ar
	2	II	Th	107ME	
45f,w,s	Alphabets ..... (2 cred.; soph., jr., sr.; no prereq.)	II	TTh	217ME	Mr. Schuck
47-48-49f,w,s	Drawing, Engraving, and Decoration ..... (9 cred.; jr., sr.‖; no prereq.)	II	MWF	217ME	Mr. Kirchner

ECONOMICS

SCHOOL OF BUSINESS

Major Adviser

Professor Garver.

Major Sequence

In the junior year, Courses 143-144, 155, 161; in the senior year, 72 or 154, 103-104, 149, 191-192. (Prerequisites: Economics 1-2, and 3-4; for a minor in history, History 1-2, or 3-4, 5-6; in political science, Political Science 1 and 7 or 11; in sociology, Sociology 1 and one other course.)

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	Introd. to Economic History.... (10 cred.; fr. pre-bus. and major in econ.; no prereq.)				Mr. Gras and others
	Lect.	III	TThS	Mu Aud	
	Sec. 1	I	MW	6F	
	2	I	MW	109MA	
	3	I	MW	213MA	
	4	II	MW	6F	
	5	II	MW	303F	
	6	II	MW	311½F	
	7	III	MW	Ar	

† The entire course must be completed before credit is received for any quarter.

¶ Students may enter at any quarter.

‖ Not a Senior College course. Not open to sophomores under the rule on page 21.

No.	Title		Hour	Day	Bldg.	Instructor
	(Sections limited to 25 students each)	8	IV	MW	Ar	
		9	IV	MW	Ar	
		10	V	MW	202MA	
		11	VI	TTh	209MA	
		12	VI	TTh	202MA (fall) 213MA (winter)	
		13	VII	TTh	102MA	
		14	VII	TTh	209MA	
		15	VIII	TTh	202MA (fall) 102MA (winter)	
		16	VIII	TTh	109MA	
(1s)-2f†	Introd. to Economic History.... (See 1f-2w)					Mr. Smith and others
		Lect.	III	TThS	202MA	
		Sec. 1	I	MW	303F	
		2	II	MW	209MA	
	(Sections limited to 25 students each)	3	III	MW	213MA	
		4	VI	TTh	102MA	
		5	VII	TTh	109MA	
1s-(2f)†	Introd. to Economic History.... (See 1f-2w)					Mr. Smith and others
		Lect.	III	TThS	301F	
		Sec. 1	I	MW	213MA	
		2	I	MW	109MA	
	(Sections limited to 25 students each)	3	II	MW	202MA	
		4	II	MW	109MA	
		5	III	MW	Ar	
		6	IV	MW	Ar	
		7	VI	TTh	209MA.	
		8	VII	TTh	113F	
3f-4w†*	Principles of Economics..... (10 cred.; soph., jr., sr.; no prereq.)					Mr. Hansen and others
		Lect.	I	Th	Lit Th	
		Sec. 1	I	TWFS	101F	
		2	II	TThFS	109F	
	(Sections limited to 25 students each)	3	III	TThFS	213MA (fall) 301F (winter)	
		4	IV	MWFS	2F	
		5	VI	MWThF	5F	
		6	VII	MWThF	202MA	
(3s)-4f†	Principles of Economics..... (See 3f-4w)					Mr. Hansen and others
		Lect.	III	F	Lit Th	
		Sec. 1	I	TThFS	109MA	
		2	II	TThFS	209MA	
	(Sections limited to 25 students each)	3	IV	MTWS	209MA	
		4	VI	MWThF	104F	
		5	VIII	MWThF	102MA	
3w-4s†	Principles of Economics..... (See 3f-4w)					Mr. Hansen and others
		Lect.	II	T	Lit Th	
		Sec. 1	I	TThFS	109MA	
		2	I	TThFS	213MA	
		3	II	MWFS	2F	

† The entire course must be completed before credit is received for any quarter.
* Open to pre-business students only.

No.	Title		Hour	Day	Bldg.	Instructor
	(Sections limited to 25 students each)	4	II	MWFS	Ar	
		5	III	MWFS	204F	
		6	IV	MWFS	125F	
		7	V	MWFS	102MA	
		8	VI	MWThF	2F	
		9	VI	MWThF	Ar	
		10	VII	MWThF	2F	
		11	VII	MWThF	Ar	
		12	VIII	MWThF	202MA (winter) 109MA (spring)	
3s-(4f)†	Principles of Economics..... (See 3f-4w)					Mr. Hansen and others
		Lect.	III	W	Lit Th	
		Sec. 1	I	MTThS	114F	
		2	II	TThFS	202MA	
	(Sections limited to 25 students each)	3	III	TWThS	109MA	
		4	IV	MWFS	15F	
		5	VI	MWThF	109MA	
		6	VII	MWThF	206F	
14s	Elements of Statistics..... (5 cred.; soph.; prereq., 3-4)					Mr. Mudgett and others
		Lect.	III	MW	Mu Aud	
		Sec. 1	VI, VII	MTh	301MA	
		2	VIII, IX	MTh	301MA	
		3	VI, VII	TF	301MA	
		4	VIII, IX	TF	301MA	
		5	I, II	MTh	301MA	
		6	III, IV	TF	301MA	
		7	I, II	TF	301MA	
		8	VI, VII	W	301MA	
			III, IV	S	301MA	
		9	I, II	WS	301MA	
25f-26w†	Principles of Accounting..... (8 cred.; soph., jr., sr.; prereq., 3-4, or concurrently with 3-4)					Mr. Heilman and others
		Lect.				
		Sec. 1	I	MWF	301MA	
		2	I	TThS	301MA (fall)	
		3	II	MWF	301MA	
	(Sections limited to 30 each)	4	II	TThS	301MA	
		5	III	MWF	301MA	
		6	III	TThS	301MA	
		7	IV	MWF	301MA	
		8	V	MWF	301MA	
		9	VI	MWF	301MA	
		10	II	MWF	303MA (fall)	
		Lab. Sec. 1	VI, VII	M	303MA	
		2	I, II	T	303MA	
		3	VI, VII	W	303MA	
		4	VI, VII	Th	303MA	
		5	VI, VII	F	303MA	

† The entire course must be completed before credit is received for any quarter.

No.	Title		Hour	Day	Bldg.	Instructor
	(Sections limited to 18 each)	6	VII, VIII	M	301MA	
		7	VII, VIII	T	301MA	
		8	VII, VIII	W	301MA	
		9	VII, VIII	Th	301MA	
		10	VII, VIII	F	301MA	
		11	VIII, IX	T	303MA	
		12	VIII, IX	W	303MA	
		13	III, IV	T	303MA	
		14	II, III	Th	303MA	
		15	III, IV	S	303MA	
		16	III, IV	F	303MA	
25w-26s†	Principles of Accounting..... (See 25f-26w)					Mr. Heilman and others
	Lect. Sec.	1	II	MWF	303MA	
		2	I	TThS	301MA (winter) 303MA (spring)	
		3	III	MWF	102MA	
		4	IV	MWF	209MA (winter) 303MA (spring)	
		5	VI	MWF	109MA (winter) 303MA (spring)	
	Lab. Sec.	1	VI, VII	T	303MA	
		2	III, IV	W	303MA (winter) 301MA (spring)	
		3	VIII, IX	M	303MA	
		4	VIII, IX	M	2F	
		5	II, III	S	Ar	
		6	VII, VIII	F	Ar	
(25s)-26f†	Principles of Accounting..... (See 25f-26w)					Mr. Heilman and others
	Lect.		III	MWF	102MA	
	Lab.		VI, VII	T	303MA	
27s	Principles of Accounting..... (3 cred.; soph., jr., sr.; prereq., 25-26. Required of all students who intend to specialize in accounting)					Mr. Heilman and others
			I	TThS	209MA	
			VI	MWF	209MA	
51f-52w-53s†	Business Law.....		See Political Science 51-52-53†			
62w	Social Insurance..... (3 cred.; jr., sr.; prereq., 3-4)		III	TThS	202MA	Mr. Mudgett
65w	Colonization		See Political Science 65w			
72f	Economics of Transportation.... (3 cred.; jr., sr.; prereq., 3-4)		VI	MWF	202MA	Mr. Cummings
74s	Transportation Problems..... (3 cred.; jr., sr.; prereq., 72)		VI	MWF	213MA	Mr. Cummings
85f	Principles of Marketing..... (3 cred.; jr., sr.; prereq., 3-4)					
	Lect.		I	S	202MA	Mr. Nelson
	Sec.	1	I	TTh	202MA	
		2	I	WF	209MA	
90s	Economics of Consumption.....		See College of Agriculture bulletin			
103f-104w†	Value and Distribution..... (6 cred.; jr., sr., grad.; prereq., 3-4)		VII	MWF	102MA	Mr. Garver, Mr. Working
105s	History of Econ. Ideas..... (3 cred.; jr., sr., grad.; prereq., 103-104)		VIII	MWF	102MA	Mr. Garver

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
106s	Land Economics..... (5 cred.; sr., grad.; prereq., 3-4)	2:30-4:00	TTh	202MA	Mr. Black
107s††	Land Tenure.....	See College of Agriculture bulletin			
108w	Marketing of Farm Products.... (3 cred.; jr., sr.; prereq., 85)	VII	MWF	209MA	Mr. Price
113w	Theory of Statistics..... (3 cred.; jr., sr., grad.; prereq., 14)	II	TThS	213MA	Mr. Mudgett
118f-119w-120s	Econ. Hist. of Europe.....	See History 113-114-115			
121f-122w-123s†	Econ. Hist. of Europe, 1300-1750	See History 116-117-118			
143f-144w†	The Financial System..... (8 cred.; jr., sr., grad.; prereq., 3-4)				Mr. Dowrie and others
	Lect.	IV	T	Lit Th	
	Sec. 1	VIII	MTW	209MA	
	2	II	MWF	109MA	
	3	III	MWF	202MA	
	4	II	TThS	311F	
	5	III	TThS	209MA	
	6	VI	MWF	209MA	
	7	III	MWF	302D	
	8	II	MWF	322F	
143w-144s†	The Financial System..... (See 143f-144w)	IV	MWFS	Ar	Mr. Dowrie,
		IX	MTW		Mr. Farmer
149w	Business Cycles..... (3 cred.; jr., sr., grad.; prereq., 143-144, 155)			209MA	Mr. Ebersole
149s	Business Cycles..... (See 149w)	VIII	MTW	209MA	Mr. Ebersole
153w	Trust Problem..... (3 cred.; jr., sr., grad., prereq., 155)	II	MWF	213MA	Mr. Nelson
154s	Public Utilities..... (3 cred.; jr., sr., grad.; prereq., 155)	I	MWF	102MA	Mr. Reighard
155s	Corporation Finance..... (3 cred.; jr., sr.; prereq., 143-144)				
	Lect.	III	S	Mu Aud	Mr. Stehman
	Sec. 1	II	TTh	109MA	
	2	III	TTh	102MA	
	3	III	MW	202MA	
	4	IV	MW	209MA	
	5	VI	TTh	213MA	
	6	VII	TTh	102MA	
157f	Police Power.....	See Political Science 157f			
158s	Government and Business.....	See Political Science 158s			
160s	Economic Motives..... (3 cred.; jr., sr., grad.; prereq., 3-4, Psy. 1-2-3)	VII	MWF	202MA	Mr. Dickinson
161f	Labor Problems and Trade Unionism ..... (3 cred.; jr., sr., grad.; prereq., 3-4)				
	Lect.	IV	MW	202MA	Mr. Hansen
	Sec. 1	IV	F	202MA	
	2	IV	F	209MA	
	3	IV	T	102MA	

† The entire course must be completed before credit is received for any quarter.
†† Given at University Farm.

No.	Title	Hour	Day	Bldg.	Instructor
161w	Labor Problems and Trade Unionism ..... (See 161f)	III	TThS	302D	Mr. Hansen
162w	Labor Movement in America and England ..... (3 cred.; jr., sr., grad.; prereq., 161)	IV	MWF	202MA	Mr. Hansen
167w	Industrial Relations..... (3 cred.; jr., sr., grad.; prereq., 161)	II	TThS	209MA	Mr. Dickinson
168s	Personnel Management..... (3 cred.; jr., sr., grad.; prereq., 167)	II	TThS	209MA	Mr. Dickinson
169s	Labor and Socialist Movement in Europe ..... (3 cred.; jr., sr., grad.; prereq., 161)	IV	MWF	202MA	Mr. Hansen
176f	Commercial Policies..... (3 cred.; jr., sr., grad.; prereq., 3-4)	I	MWF	202MA	Mr. Blakey
176s	Commercial Policies..... (See 176f)	I	MWF	202MA	Mr. Blakey
191f-192w†	Public Finance..... (6 cred.; jr., sr., grad.; prereq., 3-4)	III	MWF	209MA	Mr. Blakey
193s	State and Local Taxation..... (3 cred.; jr., sr., grad.; prereq., 191-192)	III	MWF	209MA	Mr. Blakey

EDUCATIONAL ADMINISTRATION AND SUPERVISION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
119w	School Curriculum..... (3 cred.; sr., grad.; prereq., 1 and 3)	I	MWF	Ar	Mr. Neale
124f	Educational Administration..... (9 cred.; sr., grad.; prereq., 10 cred.)	IX	MWF	205Ed	Mr. Neale
125w-126s	City School Administration..... (6 cred.; sr., grad.; prereq., 124f, Ed. Psy. 111)	IX	MWF	205Ed	Mr. Neale
164w	Problems of High School Admin. (3 cred.; sr., grad.; prereq., 1 and 3)	III	TThS	Ar	Mr. Koos
167f	Junior High School..... (3 cred.; sr., grad.; prereq., Educ. 1, 3)	II	TThS	Ar	Ar
167w-168s	Junior High School..... (4 cred.; sr., grad.; prereq., Educ. 1 and 3)	IX, X	Th	112Ed	Ar
174w	Public School Finance..... (2 cred.; sr., grad.; prereq., consult instructor)	VII	TTh	205Ed	Mr. Swift
180	*The Junior College*.....	*Not offered in 1922-23*			

† The entire course must be completed before credit is received for any quarter.

HISTORY AND PHILOSOPHY OF EDUCATION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
1f	Brief Course in History of Education ..... (5 cred.; jr., sr.*; prereq., psych. 6 cred.)				
	Sec. 1	I	MTWThF	Ar	Miss Alexander
	2	II	MTWThF	205Ed	Miss Alexander
	3	IV	MTWFS	205Ed	Miss Alexander
1w,s	Brief Course in History of Education ..... (See 1f)	II	MTWThF	205Ed	Miss Alexander
3f	Educational Sociology..... (5 cred.; jr., sr.*; prereq., psych. 6 cred.)				
	Sec. 1	II	MWF	205Ed	Mr. Finney
	2	III	MWF	205Ed	Mr. Finney
3w,s	Educational Sociology..... (See 3f)	III	MWF	205Ed	Mr. Finney
5s	Public Education in the U. S. (Offered at Univ. Farm.)..... (3 cred.; jr., sr.*; prereq., 6 cred. in psych.)	VI	MWF	Farm	Miss Alexander
101f	Found. of Modern Education... (3 cred.; jr., sr.; prereq., 6 cred. in psych. and 6 cred. in hist.)	VIII	MWF	205Ed	Mr. Swift
102w	Hist. of Modern Secondary and Higher Education..... (3 cred.; jr., sr., grad.; prereq., see 101f)	VIII	MWF	205Ed	Mr. Swift
103s	Hist. of Modern Elem. Education ..... (3 cred.; jr., sr., grad.; prereq., see 101f)	VIII	MWF	205Ed	Mr. Swift
129-130‖	*Educational Classics*..... (6 cred.; jr., sr., grad.; prereq., 1 or 101-102-103)	*Not offered in 1922-23*			
131w-132s‖	Comparative School Systems..... (6 cred.; jr., sr., grad.; prereq., 1 or 101-102-103)	III	MWF	Ar	Miss Alexander

EDUCATIONAL PSYCHOLOGY

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
106f-107w-108s	Adv. Educ. Psychology..... (9 cred.; jr., sr., grad.; prereq., 10 cred. in psych. and educ. psych.)	III	MWF	Psy Ar	
111s	Educational Diagnosis..... (3 cred.; jr., sr., grad.; prereq., 10 cred. in psych. and educ. psych.)	II	MWF	Psy	Mr. Van Wagenen

* Does not count as a Senior College course. Not open to sophomores under the rule on p. 21.
‖ Students may register for either quarter.

No.	Title	Hour	Day	Bldg.	Instructor
126f	Statistical Meth. in Educ. Research ..... (2 cred.; jr., sr., grad.; prereq., permission of instructor)	IX, X	T	Psy	Mr. Van Wagenen
127w-128s	Adv. Statistical Meth. in Educ. Research ..... (4 cred.; jr., sr., grad.; prereq., 126)	IX, X	T	Psy	Mr. Van Wagenen
134f-135w-136s	Mental Tests and Mental Diagnosis ..... (6 cred.; jr., sr., grad.; prereq., 10 cred. in psych. and educ. psych.)	VII, VIII	MW	Psy	Mr. Miller
138w-139s	Experimental Education..... (4 cred.; sr., grad.; prereq., 10 cred. in psych. and educ. psych.)	IX, X	MW	Psy	Mr. Van Wagenen
149f-150w-151s	Psycho-Educ. Clinic..... (3 to 9 cred.; jr., sr., grad.; prereq., Ed. 134-135 or equiv.)	IV, V	MWF	MH	Ar
153f-154w-155s	Research Problems..... (cred. ar.; sr., grad.; prereq., consult instructor)	Ar	Ar	Psy	Mr. Haggerty, Mr. Van Wagenen
156s	Psych. of Vocational Education (2 cred.; jr., sr., grad.; prereq., 10 cred. in psych. and educ. psych.)	I, II	S	Psy	Ar

ENGLISH

Major Advisers

Professor Stoll; Associate Professors Beach and Moore; Assistant Professors Hillhouse and Ruud.

Major Sequences

Courses 6 (Chaucer) and 8 (Shakespeare) are prerequisite to all major sequences in English.

A. Medieval. Courses 50; 51 or 136; 101 or 103; 133; 140; 109-110 or 105-106 or 107-108; 141-142-143 or 146-147 or German 100-101-102 or Latin 123 and 121. (Prerequisites: Courses 6, 8.)

B. Renaissance. Courses 136; 62; 152 or 51; 111-112 or 53 and 64; 50 or 109-110 or 107-108 or 70 and 133 or 146-147; French 150-151-152 or 121-122-123 or Italian 159-160-161 or Latin 121 and 132. (Prerequisites: Courses 6, 8.)

C. Drama. Courses 50 or 62 or 133; 136; 129; 152 or 70; 123-124-125 or 146-147 and 140 or Public Speaking 91-92-93 or Rhetoric 115-116-117; French 150-151-152 or German 72 and 73 and 77 or Spanish 150-151-152. (Prerequisites: Courses 6, 8.)

D. Poetry. Courses 62; 51 and 53 or Rhetoric 100-101; 150 or 151; 136 or 140 or 133; 50 or 105-106 or 109-110 or 111-112 or 107-108; 146-147 or Italian 159-160-161 or French 153-154-155 or German 160-161-162. (Prerequisites: Courses 6, 8.)

E. Prose. Courses (1 out of 3) 66, 155, 64; (2 out of 4) 58-59, 107-108, 111-112, 123-124-125; (1 out of 7) 50, 51, 62, 140, 151, 150, 105-106; Rhetoric 63-64-65 or Rhetoric 67 and Rhetoric 69-70 or Rhetoric 111-112-113. (Prerequisites: Courses 6, 8, Rhetoric 11-12-13 or 15-16-17.)

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

No.	Title		Hour	Day	Bldg.	Instructor
A-B-C	Freshman English (See Rhetoric)					
1-2-3*	English Survey					
	(9 cred.; soph., jr., sr.; prereq., 9 cred. in rhet.)					
	Sec. 1	Lect.	II	M	Mu Aud	
		Rec.	II	WF	114F	
	2	Lect.	II	M or		
			IV	T	Mu Aud	
		Rec.	III	WF	311F	
	3	Lect.	VII	T	Mu Aud	
		Rec.	VII	MF	205F	
6f	Chaucer		VII	MWThF	204F	Mr. Malone
	(4 cred.; soph., jr., sr.; prereq., A-B-C or equiv. See note 1)					
6w	Chaucer		IV	MWFS	205F	Ar
	(See 6f)					
6s	Chaucer		II	TWThS	204F	Mr. Malone
	(See 6f)					
8f	Shakespeare		I	TWFS	204F	Mr. Stoll
	(4 cred.; soph., jr., sr.; prereq., A-B-C or equiv. See note 1)		VI	MTThF	204F	Ar
8w	Shakespeare		I	TWFS	204F	Mr. Stoll
	(See 8f)		VI	MTThF	204F	Ar
8s	Shakespeare		I	TWFS	204F	Ar
	(See 8f)		IV	MWFS	204F	Ar
40	*Bible as Literature*.....		*Not offered in 1922-23*			
	(4 cred.; soph., jr., sr.; prereq., A-B-C or equiv. See note 1)					
41s	Browning and Tennyson.....					
	(4 cred.; soph., jr., sr.; prereq., A-B-C or equiv. See note 1)					
		Lect.	III	MW	301F	Mr. Burton
	Sec. 1	Rec.	II	F	204F	
	2		III	F	301F	
	3		III	Th	305F	
	4		II	T	301F	
	5		IV	T	311F	
	6		VI	T	303F	
44f-45w†	American Literature.....		IV	MWF	301F	Mr. Moore
	(6 cred.; soph., jr., sr.; prereq., A-B-C or equiv. See note 1)					
50w	Old English.....		VI	MTThF	205F	Mr. Malone
	(4 cred.; jr., sr.; prereq., A-B-C or equiv. See note 1)					
51	*Spenser*		*Not offered in 1922-23*			
	(3 cred.; jr., sr.; prereq., A-B-C or equiv. See note 1)					
53f	Seventeenth-Century Lyrists.....		III	MTThF	204F	Mr. Moore
	(4 cred.; jr., sr.; prereq., A-B-C or equiv. See note 1)					
58f-59w†	Nineteenth-Century Prose.....		II	TThS	205F	Mr. Beach
	(6 cred.; jr., sr.; prereq., A-B-C or equiv. See note 1)					
60w	History of English Language...		IX	TTh	204F	Mr. Klaeber
	(2 cred.; jr., sr.; prereq., 50)					

† The entire course must be completed before credit is received for any quarter.
* Students may enter any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
62w	Milton ..... (4 cred.; jr., sr.; prereq., A-B-C or equiv. See note 1)	VII	MTWF	204F	Mr. Stoll
64	*Bacon* ..... (3 cred.; jr., sr.; prereq., A-B-C or equiv. See note 1)	*Not offered in 1922-23*			
66s	English Novel..... (4 cred.; jr., sr.; prereq., A-B-C or equiv. See note 1)				
	Lect.	IV	MWF	301F	Mr. Burton
	Sec. 1 Rec.	IV	T	301F	
	2	III	T	303F	
	3	IV	S	301F	
	4	III	Th	303F	
70s	Elizabethan Drama..... (4 cred.; jr., sr.; prereq., 8)	VII	MTWF	204F	Mr. Stoll
101f	Middle English..... (2 cred.; jr., sr., grad.; prereq., 6 and 50)	VI	TTh	212F	Mr. Klaeber
103s	Beowulf ..... (3 cred.; jr., sr., grad.; prereq., 50 and either 6 or 8)	VI	MWF	205F	Mr. Klaeber
105-106†	*Eighteenth-Century Poetry*..... (6 cred.; jr., sr., grad.; prereq., see note 2)	*Not offered in 1922-23*			
107w-108s†	Eighteenth-Century Prose..... (6 cred.; jr., sr., grad.; prereq., see note 2)	VIII	MWF	204F	Mr. Moore
109-110†	*Romantic Poets*..... (6 cred.; jr., sr., grad.; prereq., see note 2)	*Not offered in 1922-23*			
111-112†	*Seventeenth-Century Prose*..... (6 cred.; jr., sr., grad.; prereq., see note 2)	*Not offered in 1922-23*			
123f-124w-125s†	Victorian Novelists..... (9 cred.; jr., sr., grad.; prereq., see note 2)	4 to 6 o'clock	T	205F	Mr. Beach
129s	Modern Drama..... (4 cred.; jr., sr., grad.; prereq., 8, and one other course numbered above 5)	II	MWThF	301F	Mr. Burton
133f	Ballads ..... (3 cred.; jr., sr., grad.; prereq., see note 2)	III	TThS	205F	Ar
136s	Advanced Shakespeare..... (4 cred.; jr., sr., grad.; prereq., grade of B in Eng. 8)	I	MTThF	205F	Mr. Stoll
140s	Advanced Chaucer..... (4 cred.; jr., sr., grad.; prereq., 6, and one other course numbered above 5. See note 3)	IV	MWFS	205F	Mr. Malone
141-142-143†	*Historical Grammar*..... (6 cred.; sr., grad.; prereq., see note 2)	*Not offered in 1922-23*			

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
146f-147w†	Metrical Romances..... (6 cred.; jr., sr., grad.; prereq., 6, and one other course numbered above 5)	VIII	MWF	205F	Mr. Malone
150f	Victorian Poetry..... (4 cred.; jr., sr., grad.; prereq., see note 2)	VII	MTWF	212F	Mr. Stoll
151	*Recent Poetry*..... (4 cred.; jr., sr., grad.; prereq., see note 2)	*Not offered in 1922-23*			
152w	Pre-Elizabethan Drama..... (4 cred.; jr., sr., grad.; prereq., 8, and one other course numbered above 5)	III	MTThF	205F	Ar
155s	American Novel..... (4 cred.; jr., sr., grad.; prereq., 44-45 and either 6 or 8)	VI	MTWF	204F	Mr. Moore

NOTE 1: A-B-C, as a prerequisite, has for its equivalent any two quarters of English 1-2-3 and 9 credits in rhetoric.

NOTE 2: Courses 6 and 8, or either 6 or 8 and one other course numbered above 5.

NOTE 3: Open without further prerequisites to students receiving B in English 6.

RHETORIC

Major Advisers

Professor Thomas; Assistant Professor Nichols.

Major Sequences

Courses 119-120-121 and one of the following: English 50, 58-59, 107-108, 111-112, in addition to one of the following five groups of courses:

a. Courses 100-101 and a minimum of eight credits from English 51, 53, 62, 140, 150, 151, 109-110.

b. Courses 63-64-65 and English 58-59 or 107-108 or 111-112.

c. Courses 67 and 69-70 and English 58-59 or 107-108 or 111-112.

d. Courses 111-112-113 and English 58-59 or 107-108 or 111-112.

e. Courses 115-116-117 and English 129, and either English 136 or Public Speaking 91-92-93.

(Prerequisites: 11-12-13 or 15-16-17.)

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

No.	Title		Hour	Day	Bldg.	Instructor
(Aw-Bs)-Cf	Freshman English..... (15 cred.; all; no prereq.)					
		Lect.	III	W	Lit Th	
		Rec.	II	MTThS	Ass'd on registration	
			III	MTThS		
			VI	MTThF		
			VIII	MTThF		

† The entire course must be completed before credit is received for any quarter.

No.	Title		Hour	Day	Bldg.	Instructor
Af-Bw-Cs	Freshman English.....					
	(See (Aw-Bs)-Cf)					
		Lect.	II	M	Mu Aud	
		Rec.	I	TThFS	Ass'd on registration	
			II	TThFS		
		Lect.	IV	T	Mu Aud	
		Rec.	III	MWFS	Ass'd on registration	
			IV	MWFS		
		Lect.	VII	T	Mu Aud	
		Rec.	V	MTWF	Ass'd on registration	
			VI	MWThF		
			VII	MWThF		
			VIII	MWThF	(fall, winter)	
				MTThF	(spring)	
Aw-Bs-(Cf)	Freshman English.....					
	(See (Aw-Bs)-Cf)					
		Lect.	III	W	Lit Th	
		Rec.	II	MTThS	Ass'd on registration	
			III	MTThS		
			VI	MTThF		
			VIII	MTThF		
4f-5w-6s	Composition for Technical Students		I	MWF	311F	
	(9 cred.; all; no prereq.)		II	MWF	311F	
			III (Chemists only)	MWF	215C	
			I	TThS	306F	
4w-5s-(6su)	Composition for Technical Students		II	TThS	Ass'd on registration	
	(9 cred.; all; no prereq.)					
(4s)-5f-6w	Composition for Technical Students (dental hygienists only)		I	MWF	Ass'd on registration	
	(See 4f-5w-6s)					
4s-(5f-6w)	Composition for Technical Students (dental hygienists only)		I	MWF	Ass'd on registration	
	(See 4f-5w-6s)					
11f-12w-13s	Description, Narration, and Exposition					
	(9 cred.; soph., jr., sr.; prereq., A-B-C, or 4-5-6)					
		Sec. 1	II	MWF	110F	Mr. Sutcliffe
		2	II	MWF	306F	Mrs. Del Plaine
		3	III	MWF	306F	Mr. Hillhouse
		4	IV	MWF	306F	Miss Whitney
		5	VI	MWF	304F	Miss Chase
		6	VII	MWF	306F	Miss Carr
		7	II	TThS	304F	Miss Nicolson
		8	III	TThS	306F	Mrs. Phelan
15f-16w-17s†	Exposition and Argument.....		II	MWF	304F	Mr. Robbins
	(9 cred.; soph., jr., sr.; prereq., A-B-C or 4-5-6)					
31w	Technical Writing.....		Consult College of Engineering bulletin			
63f-64w-65s	Studies in Structure and Style..		VII	MWF	304F	Ar
	(9 cred.; jr., sr.; prereq., 11-12-13, or 15-16-17)					

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
67f	Imitative Writing..... (4 cred.; jr., sr.; prereq., see note 1)	IV	MTWF	304F	Miss Chase
69w-70s†	Short-Story Writing..... (6 cred.; jr., sr.; prereq., see note 1)	IV	MWF	304F	Miss Chase
100w-101s†	Versification ..... (6 cred.; jr., sr., grad.; prereq., see note 2)	IV	TS and Ar	304F	Mr. Nichols
111f-112w-113s	Essay-Writing ..... (9 cred.; jr., sr., grad.; prereq., 11-12-13, or 15-16-17)	III	MWF	304F	Mr. Sutcliffe
115f-116w-117s	Dramatic Technique..... (9 cred.; jr., sr., grad.; prereq., see note 3)	III	TThS	304F	Ar
119f-120w-121s	Seminar in Writing..... (9 cred.; sr., grad.; prereq., see note 4)	VI, VII	Th	304F	Mr. Beach

NOTE 1: 67, 69-70. Open to those who have taken 11-12-13 or 15-16-17 and received a grade of A or B in one quarter.

NOTE 2: 100-101. Open to those who have taken 11-12-13 or 15-16-17, and who have taken or are taking nine hours in the historical study of English poetry.

NOTE 3: 115-116-117. Open to those who have taken 11-12-13 and have taken or are taking English 129.

NOTE 4: 119-120-121. Open with special permission to seniors and graduates. Prerequisites 11-12-13, and nine additional credits in rhetoric.

PUBLIC SPEAKING

Major Adviser

Associate Professor Rarig.

Major Sequences

Either of groups A and B and either of groups C and D.

A. Debate. Course 55-56-57; Economics 143-144 or 103-104 or History 113-114-115 or Political Science 125, and either 127 or 115.

B. Advanced Public Speaking. Course 85-86-87; Philosophy 50 and 51 or 124 or 129 and either Sociology 100 or 120.

C. Interpretative Reading. Course 81-82-83; Philosophy 103 or 104; English 109-110 or English 150.

D. Play Production. Courses 91-92-93; English 129 or 136; Architecture 81. (Prerequisites: 41-42-43 or 45-46.)

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

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
41f-42w-43s	Public Speaking..... (9 cred.; soph., jr., sr.; prereq., Rhet. A-B-C, or 4-5-6)				
	Sec. 1	I	MWF	308F	Ar
	2	II	MWF	308F	Ar
	3	III	TThS	308F	Ar
	4	VII	MWF	308F	Miss Macnaughton
	5	I	TThS	308F	Ar
	6	II	TThS	308F	Ar
45f-46w	Public Speaking..... (10 cred.; soph., jr., sr.; prereq., Rhet. A-B-C, or 4-5-6)				
	Sec. 1	IV	MTWFS	3F	Ar
	2	VII	MTWThF	109F	Mr. Rarig
	3	VIII	MTWThF	308F	Ar
45s-(46f)	Public Speaking..... (See 45f-46w)				
	Sec. 1	IV	MTWFS	3F	Ar
	2	VII	MTWThF	109F	Ar
	3	VIII	MTWThF	308F	Ar
(45s)-46f	Public Speaking..... (See 45f-46w)	VI	MTWThF	308F	Mr. Lindsley
45w-46s	Public Speaking..... (See 45f-46w)				
	Sec. 1	VI	MTWThF	308F	Mr. Lindsley
	2	I	TWThFS	301F	Ar
55f-56w-57s	Arg. and Debating..... (9 cred.; jr., sr.; prereq., 41-42-43, or 45-46)	VII	MWF	102F	Mr. Lindsley
81f-82w-83s	Interp. Reading..... (9 cred.; jr., sr.; prereq., 41-42-43, or 45-46)	IV	MWF	308F	Mr. Rarig
85f-86w-87s	Adv. Public Speaking..... (9 cred.; jr., sr.; prereq., 41-42-43, or 45-46)	III	MWF	308F	Mr. Rarig
91f-92w-93s	Play Production..... (9 cred.; jr., sr.; prereq., 81-82-83, Eng. 8)	VIII	MWF	212F	Miss Macnaughton
97f,w	Adv. Debate and Oratory..... (3 cred.; jr., sr.; prereq., see note 1)	Ar	Ar	308F	Mr. Rarig, Mr. Lindsley

NOTE 1: Open to intercollegiate debaters and orators.

GEOLOGY AND MINERALOGY

Major Advisers

Professors Emmons (economic geology), Stauffer (general geology and paleontology), and Grout (mineralogy and petrography).

Major Sequences

Sequence A. For general geologist, Federal and state surveys, etc. Courses 51-52, 57-58-59, 144-145 or 124-125, 85.

Sequence B. For petroleum geologist. Courses 91-92-93 or 57-58-59, 101, 105, 111, 112, 137, 144-145 or 124-125.

Sequence C. For mining geologist and mineralographer. Courses 51-52, 101, 112, 113, 137, 124-125 or 144-145, 85, 166-167.

Sequence D. For paleontologist. Courses 57-58-59, 107-108-109, 150, 151-152-153.

Sequence E. For mineral statistician and geographer. Courses 51-52, 114, 105, 111, 112, 116, 117. Economics 14.

Sequence F. For foreign trade service. Courses 114, 116, 117, 118 or 119. Economics 176, 143-144. Political Science 121-122. Courses 114, 51-52, 67 and 6 additional credits as approved by the major adviser.

Sequence G. For mineralogist. Courses 61, 105, 106, 111, 112, 131-132-133, 137, 166-167, 85 or 150.

Sequence H. For petrographer. Courses 105, 106, 111, 112 or 124-125, 131-132-133, 140-141, 85 or 150.

Modification of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†‡	General Geology.....	I	TWThFS	210P	Mr. Thiel
	(10 cred.; 3d qu. fr., soph., jr.,	III	MTThFS	110P	Mr. Emmons
	sr.; prereq., course in chem.	VII	MTWThF	110P	Mr. Allison
	May be accompanied by 7-8 for 2 additional credits)				
1w-2s†‡	General Geology.....	II	MWThFS	210P	
	(See 1f-2w)				
1s-(2f)†‡	General Geology.....	III	MTThFS	110P	
	(See 1f-2w)				
(1s)-2f†‡	General Geology.....	III	MTThFS	110P	
	(See 1f-2w)				
4	*Geology of Minnesota*.....	*Not offered in 1922-23*			
	(3 cred.; soph., jr., sr.; prereq., Geol. 1)				
7f,w,s-8f,w,s	General Geology Lab.....	Ar	Ar	112P	Mr. Allison
	(2 cred.; 3d qu. fr., soph., jr., sr.; with or after 1-2)				
11f-12w†§	Introd. to Geology.....	VIII	MTWThF	200aP	
	(8 cred.; 3d qu. fr., soph., jr., sr.; no prereq.)				
15s¶	Minerals and Rocks.....	Ar	Ar	100P	Mr. Gruner
	(1 cred.; jr., sr.; prereq., 1 or 29)				
19s	Elements of Paleontology.....	I	TWThFS	110P	Mr. Stauffer
	(5 cred.; soph., jr., sr.; prereq., 1-2)				
21w-22s†	Essentials of Mineralogy.....				
	(6 cred.; soph., jr., sr.; prereq., course in chem.)				
	Lect.	IV	MWF	210P	Mr. Gruner
	Sec. 1 Lab.	VII, VIII, IX	F	100P	
	2	III	MWF	100P	
23f-24w-25s†	Elem. of Mineralogy.....	Consult Mines program			
	(9 cred.; soph., jr., sr.; prereq., course in chem.)				
27s¶	Outlines of Mineralogy.....	Ar	Ar	100P	Mr. Gruner
	(1 cred.; jr., sr., no prereq.)				

† The entire course must be completed before credit is received for any quarter.

¶ Does not count for a Senior College course. Not open to sophomores under the rule on p. 21.

‡ Satisfies the Junior College requirement for science.

§ Does not satisfy the Junior College requirement for science.

No.	Title	Hour	Day	Bldg.	Instructor
29f§	General Physiography..... (5 cred.; soph., jr., sr.; no prereq.)	III	MTThFS	210P	Ar
30§	*Principles of Geog*..... (5 cred.; soph., jr., sr.; no prereq., 1 or 29 are desirable)	*Not offered in 1922-23*			
34w§	Meteorology ..... (5 cred.; soph., jr., sr.; no prereq.)	III	MTThFS	210P	Ar
37s	Econ. and Comm. Geog..... (5 cred.; soph., jr., sr.; no prereq.)	III	MTThFS	210P	Ar
51f-52w†	Economic Geology..... (6 cred.; jr., sr.; prereq., 1-2)	II	MWF	210P	Mr. Schwartz
57f-58w-59s	Paleontology ..... (9 cred.; jr., sr.; prereq., 1-2)	II, III	TThS	105P	Mr. Stauffer
61f	Blowpipe Analysis..... (3 cred.; jr., sr.; prereq., 22 or 25)	Consult Mines program			
65	*Crystallography* ..... (3 cred.; jr., sr.; prereq., 22)	*Not offered in 1922-23*			
67w	Mineralography of Chemical Materials ..... (3 cred.; jr., sr.; prereq., Chem. 21 and industrial chemistry)	Consult Chem. program			
85su	Field Work in Northern Minnesota ..... (6 cred.; jr., sr.; prereq., 2)	Ar	Ar	Ar	Mr. Gruner, Mr. Thiel
91f-92w-93s	Index Fossils of North America (9 cred.; jr., sr.; prereq., 1-2)				
	Lect.	I	F	105P	Mr. Stauffer
	Lab.	VI, VII	MW	105P	Mr. Stauffer
101f	Princip. of Stratig..... (3 cred.; jr., sr., grad.; prereq., 24-25)	Ar	Ar	Ar	Ar
105f	Rock Study..... (3 cred.; jr., sr., grad.; prereq., 22 or 25)				
	Lect.	VI	TTh	110P	Mr. Grout
	Sec. 1 Lab.	VII, VIII	T	200P	
	2	VII, VIII	Th	200P	
106w	Petrography ..... (3 cred.; jr., sr., grad.; prereq., 105)	VII, VIII	MF	200P	Mr. Grout
107f-108w-109s	Paleontologic Practice..... (9 cred.; jr., sr., grad.; prereq., 57-58-59)	Ar	Ar	105P	Mr. Stauffer
111f	Ore Deposits..... (3 cred.; jr., sr., grad.; prereq., 2, 105)	I	TThS	110P	Mr. Emmons
112w	Geology of Petroleum..... (3 cred.; sr., grad.; prereq., 111)	I	TThS	110P	Mr. Emmons
113s	Prob. in Ore Deposits..... (3 cred.; sr., grad.; prereq., 112)	VI-IX	Th	104P	Mr. Emmons

† The entire course must be completed before credit is received for any quarter.
§ Does not satisfy the Junior College requirement for science.

No.	Title	Hour	Day	Bldg.	Instructor
114f	Geog. of North America..... (5 cred.; jr., sr.; prereq., 34 or 37)	I	TThS	200aP	Ar
115	*Geographic Influences*..... (3 cred.; jr., sr.; prereq., 114)	*Not offered in 1922-23*			
116	*Geog. of South America*..... (3 cred.; jr., sr., grad.; prereq., 114)	*Not offered in 1922-23*			
117	*Resources and Trade*..... (3 cred.; jr., sr., grad.; prereq., 37, 116 or 117)	*Not offered in 1922-23*			
118	*Geography of Europe*..... (3 cred.; jr., sr., grad.; prereq., 114)	*Not offered in 1922-23*			
119	*Geography of Asia*..... (3 cred.; jr., sr., grad.; prereq., 116 or 118)	*Not offered in 1922-23*			
124w-125s	Struct. and Met. Geol..... (6 cred.; sr., grad.; prereq., 2, 105)	VI	MWF	200aP	Mr. Schwartz
131f-132w-133s	Adv. Petrology..... (9 cred.; jr., sr., grad.; prereq., 106)				
	Lect.	III	TThS	200P	Mr. Grout
	Lab.	VI, VII, VIII	F	200P	
137w	Testing Econ. Minerals..... (3 cred.; jr., sr., grad.; prereq., 2, 105)				
	Lect.	VI	T	200P	Mr. Grout
	Lab.	VIII, IX	MW	200P	Mr. Grout
140w-141s	Applied Petrography..... (6 cred.; jr., sr., grad.; prereq., 131)				
	Lect.	II	F	200P	Mr. Grout
	Lab.	I, II	MW		
144w-145s	Const. and Inter. of Geologic Maps ..... (6 cred.; jr., sr., grad.; prereq., 2)	VI-VIII	TTh	104P	Mr. Allison
150s	Field Geol. (Black Hills)..... (cred. ar.; jr., sr., grad.; see members of department)	Ar	Ar	Ar	Mr. Emmons, Mr. Schwartz
151f-152w-153s	Adv. General Geology..... (9 cred.; jr., sr., grad.; prereq., 2)	III	MWF	200aP	Mr. Stauffer
166w-167s	Mineralography ..... (6 cred.; sr., grad.; prereq., 111)	Ar	Ar	103P	Mr. Schwartz

GERMAN

Major Advisers

Professor Schlenker; Assistant Professor Kroesch.

Major Sequence

Courses 50-51-52; any two quarters of 62, 63, 64; any two quarters of 65, 66, and 67; 18 additional credits from courses numbered above 50.

Sequence of Courses

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

For academic students.—Without entrance German, 1, 2, 3, 10, 11, 62 or 63, other courses numbered 50 or above. With one year entrance German, 2, 3, 10, 11, 62, or 63, other courses numbered 50 or above. With two years entrance German, 10, 11, 62, or 63, other courses numbered 50 or above. With three years entrance German, 11, 62 or 63, other courses numbered 50 or above. With four years entrance German, 62 or 63, other courses numbered 50 or above.

For pre-medical students.—Without entrance German, 1, 2, 3, 10, 31-32. With one year entrance German, 2, 3, 10, 31-32. With two years entrance German, 15, 31-32. With more than two years entrance German, 31-32.

For chemists.—Without entrance German, 24-25-26, 27, 28-29. With one year entrance German, 27, 25-26. With two years entrance German, 27 or 10, 28-29. With more than two years entrance German, 28-29.

No.	Title	Hour	Day	Bldg.		Instructor
1f	Beginning A.....	I	TWThFS	207F	Ar	
	(5 cred.; all; no prereq.)	III	MTThFS	207F	Ar	
		IV	MTWFS	207F	Ar	
		VI	MTWThF	207F	Ar	
1w	Beginning A.....	II	MWThFS	207F	Ar	
	(See 1f)	VII	MTWThF	207F	Ar	
1s	Beginning A.....	II	MWThFS	209F	Ar	
	(See 1f)	VI	MTWThF	209F	Ar	
2f	Beginning B.....	II	MWThFS	212F	Ar	
	(5 cred.; all; prereq., 1, or 1 yr. prep. German)	VII	MTWThF	209½F	Ar	
2w	Beginning B.....	I	TWThFS	207F	Ar	
	(See 2f)	III	MTThFS	207F	Ar	
		IV	MTWFS	207F	Ar	
		VI	MTWThF	207F	Ar	
2s	Beginning B.....	II	MWThFS	207F	Ar	
	(See 2f)	VII	MTWThF	207F	Ar	
3f	Beginning C.....	III	MTThFS	209F	Ar	
	(5 cred.; all; prereq., 2)	VII	MTWThF	209F	Ar	
3w	Beginning C.....	II	MWThFS	212F	Ar	
	(See 3f)	VI	MTWThF	209½F	Ar	
3s	Beginning C.....	I	TWThFS	207F	Ar	
	(See 3f)	III	MTThFS	207F	Ar	
		IV	MTWFS	207F	Ar	
		VI	MTWThF	207F	Ar	
10f	Rapid Reading.....	II	MWThFS	209F	Ar	
	(5 cred.; all; prereq., 3, or 2 yrs. prep. German)	III	MTThFS	212F	Ar	
		VI	MTWThF	209F	Ar	
10w	Rapid Reading.....	III	MTThFS	209F	Ar	
	(See 10f)	VII	MTWThF	209F	Ar	
10s	Rapid Reading.....	II	MWThFS	212F	Ar	
	(See 10f)	VII	MTWThF	209½F	Ar	
11f	Adv. Rapid Reading.....	II	MWThFS	209½F	Ar	
	(5 cred.; all; prereq., 10, or 3 yrs. prep. German)					
11w	Adv. Rapid Reading.....	II	MWThFS	209F	Ar	
	(See 11f)	VI	MTWThF	209F	Ar	
11s	Adv. Rapid Reading.....	III	MTThFS	209F	Ar	
	(See 11f)					

No.	Title	Hour	Day	Bldg.	Instructor
15f	Narr. Prose for Pre-Medics..... (4 cred.; pre-med.; prereq., 2 yrs. prep. German)	I	MTWTh	212F	Ar
24f-25w-26s†	Begin. for Chemists..... (9 cred.; chem., miners; no prereq.)	IV	MTWF	209½F	Ar
27f	Narr. Prose for Chemists..... (3 cred.; chemists; prereq., 6, or 2 yrs. prep. German)	IV III	TS Th	5F 3F	Ar
28w-29s†	Chemical German..... (6 cred.; chem., miners; prereq., 27)	IV III	TS Th	5F 3F	Ar
(31s)-32f†	Medical German..... (6 cred.; pre-med.; prereq., 10 or 15)	I	MWF	209½F	Ar
31f-32w†	Medical German..... (See (31s)-32f)	I	MWF	209F	Ar
31w-32s†	Medical German..... (See (31s)-32f)	I	TThS	209F	Ar
31s-(32f)†	Medical German..... (See (31s)-32f)	I	MWF	209F	Mr. Jente
50f-51w-52s†	Composition ..... (6 cred.; jr., sr.; prereq., 11, or 4 yrs. prep. German)	IV	TS	209F	Mr. Jente
56f-57w-58s†	Essay-Writing ..... (6 cred.; jr., sr.; prereq., 52)	IV	TS	212F	Mr. Lussky
62s	Nineteenth-Century Prose..... (5 cred.; jr., sr.; prereq., 11, or 4 yrs. prep. German)	II	MWThFS	209½F	Mr. Davies
63f	Modern Drama..... (3 cred.; jr., sr.; prereq., 11)	IV	MWF	209F	Mr. Downs
64w	Classic Drama..... (3 cred.; jr., sr.; prereq., 62 or 63)	IV	MWF	209F	Mr. Downs
65s	Survey through Reformation.... (3 cred.; jr., sr; prereq., 3 cred. above 60)	III	TThS	209½F	Mr. Kroesch
66f	Eighteenth-Century Survey..... (3 cred.; jr., sr.; prereq., 3 cred. above 60)	III	TThS	209½F	Mr. Burkhard
67w	Nineteenth-Century Survey..... (3 cred.; jr., sr.; prereq., 3 cred. above 60)	III	TThS	209½F	Mr. Burkhard
72	*Drama since 1880 (Sudermann)* (3 cred.; jr., sr.; prereq., 8 cred. above 60)	*Not offered in 1922-23*			
73	*Drama since 1880 (Hauptmann)* (3 cred.; jr., sr.; prereq., 8 cred. above 60)	*Not offered in 1922-23*			
74	*German Poets*..... (3 cred.; jr., sr.; prereq., 62 or 63 or 64)	*Not offered in 1922-23*			
77s	Faust I..... (3 cred.; jr., sr.; prereq., 6 cred. above 60)	IV	MWF	209F	Mr. Schlenker
100f-101w-102s†	Middle High German..... (9 cred.; sr., grad.; prereq., 65 and 11 cred. above 60)	Ar	Ar	Ar	Mr. Kroesch

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
107	*Historical German Grammar*.... (3 cred.; sr., grad.; prereq., 11 cred. above 60)	*Not offered in 1922-23*			
108w	Phonetics ..... (3 cred.; sr., grad.; prereq., 9 Senior College cred. in mod. lang.)	Ar	Ar	Ar	Mr. Kroesch
109f-110w-111s†	Hist. of German Lang..... (9 cred.; sr., grad.; prereq., see statement under Comp. Phil., page 131)	Ar	Ar	Ar	Mr. Klaeber
150f-151w-152s†	Novelle ..... (3 cred.; sr., grad.; prereq., 67 and 11 cred. above 60)	VII, VIII, IX	Th	Ar	Mr. Burkhard
153-154-155†	*Aspects: Hebbel, Ludwig, Anzengruber* ..... (9 cred.; sr., grad.; prereq., 67 and 11 cred. above 60)	*Not offered in 1922-23*			
160f-161w-162s†	Lyric Poetry..... (9 cred.; sr., grad.; prereq., 66 or 67, and 11 cred. above 60)	VII, VIII, IX	F	Ar	Mr. Davies
225f-226w-227s†	Lit. Problems..... (9 cred.; grad., sr. with major in Ger.; prereq., major in German)	VII, VIII, IX	T	Ar	Mr. Schlenker

NOTE: Courses numbered 50 to 100 are open without petition to students who have the prerequisites and who satisfy the requirements given on p. 21.

GREEK

Major Adviser

Professor Savage.

Major Sequences

Sequence A. Courses 51, 52, 53; 105, 106 or 107, 108 or 109; Latin 51, 52, 53.

Sequence B. Courses 51, 52, 53; 105, 106 or 107, 108 or 109; History 133, 134, 135.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†-3s	Beginning Greek..... (10 or 15 cred.; all; no prereq.)	IV	MTWFS	114F	Mr. Savage, Miss Strong
4f-5w-6s	History and Epic Poetry..... (5, 10 or 15 cred.; all; prereq., 1-2-3)	III	MTThFS	115F	Mr. Savage, Miss Strong
7f,w	Everyday Greek..... (3 cred.; soph., jr., sr.; prereq., 1 yr. of language)	VIII	MWF	114F	Mr. Savage
51f	Philosophy ..... (3 cred.; jr., sr.; prereq., 4-5, or 4-6, or 5-6)	Ar	Ar	115F	Mr. Savage
52w	Oratory ..... (3 cred.; jr., sr.; prereq., 4-5, or 4-6, or 5-6)	Ar	Ar	115F	Mr. Savage

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
53s	Dramatic Poetry..... (3 cred.; jr., sr.; prereq., 51 or 52)	Ar	Ar	115F	Mr. Savage
105f	Lyric Poetry..... (3 cred.; sr., grad.; prereq., 53)	Ar	Ar	112F	Mr. Savage
106w*	Advanced Drama..... (3 cred.; sr., grad.; prereq., 53 or 105)	Ar	Ar	112F	Mr. Savage
107s*	Advanced Prose..... (3 cred.; sr., grad.; prereq., 51-52, or 51-53, or 52-53)	Ar	Ar	112F	Mr. Savage
108s†	Advanced Epic Poetry..... (3 cred.; sr., grad.; prereq., 105 or 106)	Ar	Ar	112F	Mr. Savage
109s†	New Testament..... (3 cred.; jr., sr., grad.; prereq., 51 and 52)	Ar	Ar	112F	Mr. Savage

Courses for which no knowledge of Greek is required.

No.	Title	Hour	Day	Bldg.	Instructor
42s¶	Greek Sculpture..... (2 cred.; jr., sr.; no prereq.)	VII	TTh	114F	Mr. Savage
43f¶	Greek Drama..... (2 cred.; jr., sr.; no prereq.)	VII	TTh	114F	Mr. Savage
44w¶	Greek Literature and Life..... (2 cred.; jr., sr.; no prereq.)	VII	TTh	114F	Mr. Savage
44s¶	Greek Literature and Life..... (See 44w)	I	WF	114F	Mr. Savage
45f¶	Greek Mythology..... (2 cred.; jr., sr.; no prereq.)	I	MW	114F	Mr. Savage
45w¶	Greek Mythology..... (See 45f)	I	WF	114F	Mr. Savage

HISTORY

Major Advisers

Professors Buck, Davis, Gras, and White; Associate Professors Krey, Shippee and Tyler.

General statement.—A student electing a major sequence in history will take a minimum of twenty-five (25) credits in Junior College courses in history and political science and a minimum of thirty (30) credits in Senior College courses in history distributed as indicated below.

Students electing a major sequence in history will be expected to have taken History 1-2 or History 3-4, also History 5-6 and Political Science 1.

Students who enter from other institutions, or who for acceptable reasons have not met these requirements, may be permitted by their advisers to make up during the junior year not more than 15 credits from the above courses.

† Courses 108 and 109 are offered alternately.
* Courses 106 and 107 are offered alternately.
¶ Does not count as a Senior College course. Not open to sophomores under the rule on p. 21.

Major Sequence

During the junior year the student majoring in history will take: (A) one of the following: 105, 133, 134, 135, 116-117-118, or 119; and (B) if History 1-2 has not been taken, either History 101-102 or 107-108; if History 3-4 has not been taken, either 109 or 121-122.

During the senior year the student will elect ten credits from courses numbered 151 to 200.

During the junior and senior years, the student will elect additional courses in history from those numbered above 51 sufficient to make a total of at least 30 credits.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	Modern World.....				
	(10 cred.; all; no prereq.)				
	Lect.	II	MWF	Lit Th	Mr. Ford, Mr. Krey, Mr. Tyler
	Sec. 1	I	TTh	306D	
	2	II	TTh	107F	
	3	III	TTh	6F	
	4	III	TTh	305F	
	5	VI	TTh	107F	
	6	VI	TTh	113F	
	7	VII	TTh	112Lib	
	8	VII	TTh	107F	
	9	VIII	TTh	111Lib	
	10	VIII	TTh	112Lib	
1w-2s†	Modern World.....				
	(See 1f-2w)				
	Lect.	III	TThS	Lit Th	Mr. Tyler
	Sec. 1	I	MW	3F	
	2	II	MW	111Lib	
	3	V	MW	111Lib	
	4	VI	MW	112Lib	
	5	VII	MW	112Lib	
3f-4w†	England, 1066 to Present.....				
	(10 cred.; all; no prereq.)				
	Lect.	VII	MWF	Lit Th	Mr. White
	Sec. 1	I	TTh	112Lib	
	2	III	TTh	303F	
	3	IV	TS	112Lib	
	4	VI	TTh	111Lib (fall) 112Lib (winter)	
	5	VII	TTh	306F	
	6	VII	TTh	101F	
3s-(4w)†	England, 1066 to Present.....				
	(See 3f-4w)				
	Lect.	III	MWF	306D	Mr. White
	Sec. 1	III	TTh	311½F	
	2	IV	TS	112Lib	
	3	IV	TS	124F	
	4	VI	TTh	112Lib	
	5	VII	TTh	112Lib	

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
5f-6w†	American History..... (10 cred.; 3d qu. fr., soph., jr., sr.; prereq. for fr., 10 cred.; for others, no prereq.)				
	Lect.	VII	MWF	301F	Mr. Alvord, Mr. Shippee
	Sec. 1	VII	TTh	102F	
	2	I	TS	209F	
	3	IV	TS	111Lib	
	4	III	TTh	311½	
(5s)-6f†	American History..... (See 5f-6w)	III	MTThFS		Mr. Shippee
5s-(6f)†	American History..... (See 5f-6w)				
	Lect.	III	MWF		Mr. Alvord
	Sec. 1	III	TS		
	2	IV	TS	306F	
	3	VII	TTh	111Lib	
7s	Europe in the Middle Ages..... (5 cred.; all; prereq., 10 cred. in history if taken by fr.)	I	TWThFS	112Lib	Mr. Krey
9f-10w†	Introd. to Econ. History..... (10 cred.; 3d qu. fr., soph., jr., sr.; prereq., 10 cred.)				
	Lect.	III	TThS	Mu Aud	Mr. Gras and others
	Sections	See Economics 1-2,		Economics	program
9s-(10f)†	Introd. to Econ. History..... (See 9f-10w)				
	Lect.	III	TThS	301F	Mr. Smith and others
	Sections	See Economics 1-2,		Economics	program
11f-12w-13s†	Medieval History..... (10 cred.; 3d qu. fr., soph., jr., sr.; prereq., 10 cred., except for mus. and int. dec.)	IV	MWF (fall, winter) MWF and Ar (spring)	111Lib	Mr. Krey
25f	World Politics..... (5 cred.; 3d qu. fr., soph., jr., sr.; prereq., 10 cred. and Pol. Sci. 1)	VI	MTWThF	112Lib	Mr. Tyler
25w,s	World Politics..... (See 25f)	VII	MTWThF	206F	Mr. Allin
33w-34s†	Eng. Leg. Institutions..... (5 cred.; soph., jr., sr.; prereq., Hist. 3-4)	II	MW (winter) MWF (spring)	112Lib	Mr. White
40s	Recent American History..... (5 cred.; all; prereq. 10 cred. in history if taken by fr.)	I	TWThFS	111Lib	Mr. Shippee
101-102	*French Revolution: Napoleonic Era* ..... (6 cred.; jr., sr., grad.; prereq., 15 cred. in hist. or 20 cred. in soc. sci. incl. 10 cred. in hist.)	*Not offered in 1922-23*			
103f	Near East: Old Orient..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	VIII	MWF	111Lib	Mr. Davis

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
104s	Near East: Modern..... (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	III	MTWThFS	111Lib	Mr. Davis
105w‡	History of Rome..... (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	III	MTThFS	111Lib	Mr. Davis
107f-108w	Europe, 1848-1914..... (8 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in history)	VII	MTThF	111Lib	Mr. Tyler
109s	Modern Engiand..... (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	IV	MTWFS	2F	Mr. Barnes
111w	European Background and American Immigration..... (4 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	VI	TWThF	111Lib	Mr. Stephenson
112s	American Immigration..... (4 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	VI	TWThF	111Lib	Mr. Stephenson
113f-114w-115s†	Econ. Hist. of Europe and U. S. (9 cred.; jr., sr., grad.; prereq., 20 cred. in hist., econ., or both)	II	TThS	111Lib	Mr. Gras
116-117-118†	*Econ. Hist. of Eur., 1300-1750....* (9 cred.; jr., sr., grad.; prereq., 20 cred. in hist., econ., or both)	*Not offered in 1922-23*			
119s	Renaissance and Reformation.... (5 cred.; jr., sr., grad.; prereq., 20 cred.)	III	MTWFS	112Lib	Mr. Krey
120f	Medieval Civilization..... (5 cred.; jr., sr., grad.; prereq., 20 cred.)	III	MTWFS	112Lib	Mr. Krey
121w-122s†	English Background of American Colonization ..... (6 cred.; jr., sr., grad.; prereq., 20 cred. in hist. or pol. sci.)	II	TThS	112Lib	Mr. White
125w	American Diplomatic Hist..... (4 cred.; jr., sr., grad.; prereq., 20 cred. incl. Hist. 5-6 or 10 cred. in pol. sci.)	III	MTWF	213MA	Mr. Wright
127s	American Foreign Relations.... (4 cred.; jr., sr., grad.; prereq., 20 cred. incl. Hist. 5-6 or 10 cred. in pol. sci.)	III	MTWF	213MA	Mr. Wright
131f-132w†	Modern German Empire..... (6 cred.; jr., sr., grad.; prereq., 15 cred. in hist. or 20 cred. in soc. sci. incl. 10 cred. in hist.)	I	MWF	112Lib	Mr. Ford

† The entire course must be completed before credit is received for any quarter.
‡ Not open to students who took 135 in 1920-21, except by consent of instructor.

No.	Title	Hour	Day	Bldg.	Instructor
133f	Pol. Hist.: Greece..... (5 cred.; jr., sr., grad.; prereq., 20 cred., or major in Greek or Latin)	III	MTThFS	111Lib	Mr. Davis
134w	Ancient Civilization: Greece..... (3 cred.; jr., sr., grad.; prereq., 20 cred. incl. 133, or equiv., or major in Greek or Latin and consent of instr.)	VIII	MWF	111Lib	Mr. Davis
135s	Ancient Civilization: Rome..... (3 cred.; jr., sr., grad.; prereq., 20 cred. incl. 105, or equiv., or major in Greek or Latin and consent of instr.)	VIII	MWF	111Lib	Mr. Davis
141	*West in Amer. Hist. to 1815....* (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist. incl. 5-6)	*Not offered in 1922-23*			
142	*West in Amer. Hist., 1815-1865..* (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist. incl. 5-6)	*Not offered in 1922-23*			
144f-145w†	Hist. of Minnesota..... (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. hist. 5-6, or consent of instr.)	VIII	MWF	112Lib	Mr. Buck
146w-147s†	Constitutional Hist. of U. S.... (6 cred.; jr., sr., grad.; prereq., 15 cred. in hist. or 10 cred. in hist. and 10 cred. in soc. sci. incl. Pol. Sci. 1)	IV	MWF	112Lib	Mr. Shippee
148f-149w-150s†	British Empire in 18th Century (9 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 cred. in hist.)	II	MWF	218aLib	Mr. Alvord
153	*Topics, West since 1865.....* (5 cred.; sr., grad.; prereq., 20 cred. incl. 5-6)	*Not offered in 1922-23*			
154s	Topics, Minnesota..... (5 cred.; sr., grad.; prereq., 20 cred. incl. 5-6)	VII, VIII	WF	218aLib	Mr. Buck
155	*United States, 1850-1865.....* (5 cred.; sr., grad.; prereq., 20 cred. incl. 5-6)	*Not offered in 1922-23*			
156f	U. S.: Reconstruction..... (5 cred.; sr., grad.; prereq., 20 cred. incl. 5-6)	VII, VIII	WF	218aLib	Mr. Shippee
158s	Topics, 19th Century..... (5 cred.; sr., grad.; prereq., 20 cred. incl. 107-108 or 101-102)	VII, VIII	TTh	218aLib	Mr. Tyler
160w	Topics, American Colonial..... (5 cred.; sr., grad.; prereq., 20 cred. incl. 5-6 or 148-149-150)	VIII, IX	MW	Ar	Mr. Alvord
162f	Begin. of Parliament..... (5 cred.; sr., grad.; prereq., 20 cred., knowledge of high school Latin)	VIII, IX	TTh	218aLib	Mr. White

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
164w	Studies in Crusades..... (5 cred.; sr., grad.; prereq., 20 cred., knowledge of high school Latin)	VIII, IX	TTh	218aLib	Mr. Krey
166f	Topics, Hist. of Immigration.... (5 cred.; sr., grad.; prereq., 20 cred., consent of instr.)	VII, VIII	TTh	Ar	Mr. Stephenson
169s	Econ. Hist. U. S. since 1865.... (3 cred.; sr., grad.; prereq., 20 cred. in hist. or econ.)	III	TThS	218aLib	Mr. Gras
172s	English History, 1715-1815..... (3 cred.; sr., grad.; prereq., 20 cred. hist.)	Ar	Ar	Ar	Mr. Barnes
183	*Stuart Period*..... (5 cred.; sr., grad.; prereq., 20 cred., incl. 3-4)	*Not offered in 1922-23*			

HOME ECONOMICS

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

NOTE: Only courses with 15 credits prerequisite will count as Senior College courses.

Junior College Courses

No.	Title		Hour	Day	Bldg.	Instructor
3f,w,s	Textiles ..... (5 cred.; no prereq.)					
		Sec. 1	I, II	MTWThF	211,307HE	Miss Weller, Miss Phelps
	(Sections limited to 20 students each)	2	III, IV	MTWFS	211,307HE	Miss Weller, Miss Phelps
4f,w,s	Textiles (S. L. & A.)..... (3 cred.; no prereq.; not open to students in H. E.) (Limited to 20)		VI, VII	MWF	211,307HE	Miss Phelps
11f,w,s	Garment-Making ..... (3 cred.; no prereq.)					
		Sec. 1	I, II	MWF	304HE	Miss McDowell, Miss Ebersole
	(Limited to 20 each)	2	I, II	TThS	304HE	Miss McDowell, Miss Ebersole
		3	VI, VII, VIII	TTh	304HE	Miss McDowell, Miss Ebersole
13f,s	Dressmaking ..... (5 cred.; soph., jr., sr.; prereq., 3, 11, 51, home pract. in garment-making)					
		Sec. 1	III, IV	MTWFS	304HE	Miss McDowell, Miss Patchin
	(Limited to 20 each)	2	I, II	TWThFS	112HE	Miss McDowell, Miss Patchin
13w	Dressmaking ..... (Same as 13f,s) (Limited to 20)		III, IV	MTWFS	304HE	Miss McDowell, Miss Patchin

No.	Title		Hour	Day	Bldg.	Instructor
21f,w	Foods and Cookery..... (5 cred.; soph., jr., sr.; prereq., chem. 10 cred., Physiol. 4 parallel)					
		Sec. 1	VI, VII	MTWThF	209HE	Miss Child
	(Limited to 20)	2	III, IV	MTWFS	209HE	Miss Child
21s	Foods and Cookery..... (Same as 21f,w) (Limited to 20)		VI, VII	MTWThF	209HE	Miss Child
22f	Food Economics..... (5 cred.; soph., jr., sr.; prereq., 21) (Limited to 20)		III, IV	MTWFS	205,207HE	Miss Child
22w,s	Food Economics..... (Same as 22f)					
		Sec. 1	III, IV	MTWFS	205,207HE	Miss Child
	(Limited to 20 each)	2	VI, VII	MTWThF	104,105,106HE	Ar
37f,s,su	Health Care of the Family..... (3 cred.; jr., sr.; prereq., chem. 5 cred., Bact. 1)					
		Lect.	I	S	213HE	Miss Moorhead
		Sec. 1 Lab.	VI, VII	TTh	WH	Miss Fisher
	(Lab. sections limited to 30)	2	VI, VII	MF	WH	Miss Fisher
51f,w,s	Drawing and Design..... (3 cred.; no prereq.)					
		Sec. 1	I, II	MWF	401HE	Miss Bacon, Miss V. Goldstein
	(Limited to 20 each)	2	I, II	TThS	401HE	Miss Bacon, Miss V. Goldstein
		3	VI, VII, VIII	TTh	402HE	Miss Bacon, Miss V. Goldstein
52f,s	Art History and Appreciation... (3 cred.; jr., sr.; prereq., 51)					
		Sec. 1	II	MWF	309HE	Miss V. Goldstein
		2	VIII	MWF	309HE	Miss V. Goldstein
52w	Art History and Appreciation... (Same as 52f,s)		VIII	MWF	309HE	Miss H. Goldstein
53f,s	Advanced Design..... (4 cred.; jr., sr.; prereq., 51)					
		Sec. 1	VI,VII,VIII	MWF	402HE	Miss H. Goldstein, Miss V. Goldstein
	(Limited to 20 each)	2	I, II	MWThF	402HE	Miss H. Goldstein, Miss V. Goldstein
53w	Advanced Design..... (Same as 53f,s) (Limited to 20)		I, II	MWThF	402HE	Miss H. Goldstein, Miss Patchin, Miss V. Goldstein
70w	Food Preparation in Relation to Social Work..... (3 cred.; soph.,‡ jr., sr.; prereq., An. Biol. 1-2, 10 cred. in chem. advised)		VI, VII	MWF	107HE	Miss Lindquist

‡ Open to sophomores only in their third quarter. Not open to students in Home Economics except by special permission of the head of the division.

Senior College Courses

No.	Title	Hour	Day	Bldg.	Instructor
17f,w,su	Advanced Clothing Construction (3 cred.; sr.; prereq., 13, 53)	III, IV	MWF	305HE	Miss McDowell, Miss Patchin, Miss C. Brown
17s	Advanced Clothing Construction (See 17f,w,su)				
	Sec. 1	III, IV	MWF	305HE	
	2	I, II	TThS	305HE	
34f,w,s,su	Home Management: Operation and Maintenance..... (3 cred.; jr., sr.; prereq., 22, 35 parallel, Econ. 5 or parallel)	VIII	MWF	203HE	Miss Studley
71s	Elementary Dietetics for Social Workers ..... (3 cred.; soph.,‡ jr., sr.; prereq., 70, Physiol. 4 or parallel)	VI, VII	MWF	107HE	
72f	Home Management Problems.... (3 cred.; soph.‡, jr., sr.; prereq., 71, Econ. 5 or parallel)	VI	MWF	106HE	Miss Lindquist
123w,s	Clothing Economics..... (2 cred.; jr., sr.; prereq., 13, Econ. 5)				
	Sec. 1	III (for teachers)	TTh	313HE	Miss Weller
	2	III, IV	S		Miss Weller
131f,w,s	Home Management: House Planning and Equipment..... (5 cred.; sr.; prereq., 52, 53) (Limited to 20)	III, IV	MTWFS	401HE	Miss Morse

HUMAN ANATOMY

MEDICAL SCHOOL

Students in this college may elect courses in human anatomy (see Medical School program) only by arrangement with the head of the Department of Anatomy.

HUMAN PHYSIOLOGY

MEDICAL SCHOOL

Major Advisers

Professors Scott and McClendon.

Major Sequences

Sequence A. Physiology. 100-101; 103; 104; 6 credits in courses numbered 113 to 140, or Animal Biology, 109-110.

Sequence B. Physiologic chemistry. 100-101; 103; 104; 6 credits in courses numbered 138-164, or suitable courses in agricultural biochemistry approved by the major adviser.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

‡ Open to sophomores only in their third quarter. Not open to students in Home Economics except by special permission of the head of the division.

COURSES

No.	Title	Hour	Day	Bldg.	Instructor
4f,w,s,su	Human Physiology..... (5 cred.; all; prereq., 1 qu. biol., 1 qu. chem.)				
	Lect.	IV	MWF	315MH	Dr. Beard and
		III	Th		others
	Dem.	III, IV	T		
	Lab.	II, III, IV	S		
57f-58w,57su, 58su	Human Physiology..... (8 cred.; jr., sr.; prereq., Biol. 1-2, or 5-6-7; Chem. 1-2-3 or 4-5)				
		I	TThS	301MH	Dr. Lyon, Dr.
	Lab. Div. A	II, III, IV.	T		Gault, and
	B	VI, VII, VIII	W		others
59s,su	Physiol. Chemistry..... (4 cred.; jr., sr.; prereq., same as 57-58)				
		I	TThS	310MH	Mr. Pettibone
	Lab. Div. A	II, III, IV	T		and others
	B	VI, VII, VIII	W		
100f-101w,100su, 101su	Physiol. Chemistry..... (12 cred.; jr., sr.; prereq., biol., org. chem., and physics)				
		IV	MWF	310MH	Mr. McClendon,
	Lab. Div. A	I, II, III	TTh		Mr. Pettibone,
	B	I, II, III	FS		Mr. Kingsbury
103f,su	Physiology of Muscles, etc..... (8 cred.; jr., sr.; prereq., same as 100-101)	IV, VI, VII, VIII	MWF	301MH	Mr. Scott and others
104w,su	Physiol. of Nervous System, etc. (8 cred.; jr., sr.; prereq., same as 100-101)	IV, VI, VII, VIII	MWF	301MH	Mr. Lyon, Mr. Scott, and others

For other courses see Medical School bulletin.

JOURNALISM

No.	Title	Hour	Day	Bldg.	Instructor
13f-14w-15s†	Reporting ..... (9 cred.; soph., jr., sr.; prereq., one year rhet.)	I	MWF	Ar	Ar
51f-52w†	Editing ..... (6 cred.; jr., sr.; prereq., 13-14-15)	VI	MWF	Ar	Ar
55f-56w-57s	Newspaper and Magazine Articles (6 cred.; jr., sr.; prereq., 13-14-15)	IV	TS	Ar	Ar
61f	Editorial Writing..... (3 cred.; sr.; prereq., Econ. 3-4, Pol. Sci. 1, Hist. 1-2, Soc. 1)	II	MWF	Ar	Ar
65w	Newspaper Problems..... (3 cred.; sr.; prereq., 51-52)	II	MWF	Ar	Ar
67s	Practical Newspaper Work..... (1, 2, or 3 cred.; sr.; prereq., 13-14-15)	Ar	Ar	Ar	Ar

† The entire course must be completed before credit is received for any quarter.

LATIN

Major Adviser

Professor Pike.

Major Sequence

Courses 51, 52, 53; 131, 132, 133; 201-202-203 or 211-212-213 or Greek 51, 52, 53. (Prerequisites: any two of 21, 22, and 23. Students entering with two or three years of Latin will take any two of 11, 12, and 13 in their first year and any two of 21, 22, 23, in their second year. Students entering with no Latin will take 1-2 and 3 in their first year, 11, 12, and 13 in their second year, and any two of 21, 22, and 23 in their third year.)

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

Junior College Courses

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	Beginning Latin..... (10 cred.; all; no prereq.)	IV	MTWFS	109F	Mr. Cram
3s	Caesar ..... (5 cred., all; prereq., 1-2 or 1 yr. Latin)	IV	MTWFS	109F	Mr. Cram
11f	Selections ..... (5 cred.; all; prereq., 1-2, 3, or 2 or 3 yrs. Latin)	III	MTThFS	109F	Mr. Cram
12w	Selections: Survey..... (5 cred.; all; prereq., 1-2, 3, or 2 or 3 yrs. Latin)	III	MTThFS	109F	Mr. Cram
13s	Ovid ..... (5 cred.; all; prereq., 1-2, 3, or 3 yrs. Latin)	III	MTThFS	109F	Mr. Cram
21f	Livy ..... (5 cred.; all; prereq., any 2 of 11, 12, 13, or 4 yrs. Latin)	IV	MTWFS	107F	Mr. Pike
22w	Plautus and Terence..... (5 cred.; all; prereq., any 2 of 11, 12, 13, or 4 yrs. Latin)	IV	MTWFS	107F	Mr. Pike
23s	Horace ..... (5 cred.; all; prereq., any 2 of 11, 12, 13, or 4 yrs. Latin)	IV	MTWFS	107F	Mr. Pike

Students entering second quarter.—Students with two or three years of Latin may elect 12w. Students with four years of Latin may elect 22w.

Students entering third quarter.—Students with two or three years of Latin may elect 13s. Students with four years of Latin may elect 23s.

Senior College Courses

51f	Pliny's Letters..... (3 cred.; jr., sr.; prereq., any 2 of 21, 22, 23, or equiv.)	I	MWF	107F	Mr. Cram
52w	Elegiac Poets..... (3 cred.; jr., sr.; prereq., any 2 of 21, 22, 23, or equiv.)	I	MWF	107F	Mr. Cram
53s	Suetonius, Selected Lives..... (3 cred.; jr., sr.; prereq., any 2 of 21, 22, 23, or equiv.)	I	MWF	107F	Mr. Cram

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
121	*Advanced Virgil*..... (3 cred.; jr., sr., grad.; prereq., any one of 51, 52, 53, or equiv.)	*Not offered in 1922-23*			
122w	Cicero's Letters..... (3 cred.; jr., sr., grad.; prereq., any 2 of 51, 52, 53, or equiv.)	II	MWF	107F	Mr. Pike
123s	Medieval Latin..... (3 cred.; jr., sr., grad.; prereq., any 2 of 51, 52, 53, or equiv.)	II	MWF	107F	Mr. Pike
131f	Juvenal ..... (3 cred.; jr., sr., grad.; prereq., any 2 of 51, 52, 53, or equiv.)	II	MWF	107F	Mr. Pike
132	*Seneca's Epistles*..... (3 cred.; jr., sr., grad.; prereq., any 2 of 51, 52, 53, or equiv.)	*Not offered in 1922-23*			
133	*Petronius and Vulgar Latin*.... (3 cred.; jr., sr., grad.; prereq., any 2 of 51, 52, 53, or equiv.)	*Not offered in 1922-23*			
201f-202w-203s	Grad. Seminar: Tacitus..... (3 cred.)	Ar	Ar	108F	Mr. Pike
211-212-213	*Grad. Seminar: Lucretius*..... (3 cred.)	*Not offered in 1922-23*			
	Courses for which no knowledge of Latin is required				
41s	Roman Literature..... (3 cred.; jr., sr.*; no prereq.)	VI	MWF	109F	Mr. Cram

NOTE: Courses 51, 52, and 53 are open without petition to sophomores who have the prerequisites and who satisfy the requirements given on page 21.

LIBRARY METHODS

No.	Title	Hour	Day	Bldg.	Instructor
1f,w,s	Use of Books and Libraries.... (2 cred.; fr., soph.; no prereq.)				
	Sec. 1	II	MW	206Lib	Miss Firkins
	2	VI	MW	206Lib	Mr. Walter

MATHEMATICS

Major Advisers

Professor Jackson; Associate Professors Brink, Hart, and Underhill.

Major Sequence

Courses 50, 51, 52, 62-63, 71, and either 80-81-82 or 90-91-92 or 106-107-108 or Physics 101-103-105.

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

*Not a Senior College course. Not open to sophomores under the rule on page 21.

No.	Title	Hour	Day	Bldg.	Instructor
1f	Higher Algebra.....				
	(5 cred.; all; prereq., 1 yr. elem. alg.)				
	Sec. 1	II	MWThFS	104F	Ar
	2	IV	MTWFS	104F	Ar
	3	VI	MTWThF	125F	Ar
	4	VIII	MTWThF	104F	Ar
1w	Higher Algebra.....				
	(See 1f)				
	Sec. 1	VI	MTWThF	105F	Ar
	2	VIII	MTWThF	105F	Ar
1s	Higher Algebra.....				
	(See 1f)				
	Sec. 1	III	MTThFS	101F	Ar
	2	VII	MTWThF	104F	Ar
6f¶	Trigonometry				
	(5 cred.; all; prereq. 1, or prep. high. alg.)				
	Sec. 1	I	TWThFS	102F	Ar
	2	II	MWThFS	105F	Ar
	3	VII	MTWThF	104F	Ar
	4	VIII	MTWThF	105F	Ar
6w¶	Trigonometry				
	(See 6f)				
	Sec. 1	I	TWThFS	104F	Ar
	2	II	MWThFS	102F	Ar
	3	IV	MTWFS	104F	Ar
	4	VIII	MTWThF	104F	Ar
6s¶	Trigonometry				
	(See 6f)				
	Sec. 1	I	TWThFS	105F	Ar
	2	II	MWThFS	101F	Ar
	3	VI	MTWThF	104F	Ar
	4	VIII	MTWThF	105F	Ar
7f¶	College Algebra.....	IV	MTWFS	105F	Miss Gibbens
	(5 cred.; all; prereq., 6)				
7w¶	College Algebra.....				
	(See 7f)				
	Sec. 1	I	TWThFS	102F	Ar
	2	VII	MTWThF	104F	Ar
7s¶	College Algebra.....				
	(See 7f)				
	Sec. 1	II	MWThFS	102F	Ar
	2	IV	MTWFS	104F	Ar
8f¶	Commerce Algebra.....	I	TWThFS	105F	Ar
	(5 cred.; pre-bus. stud.; prereq., 1, or prep. high. alg.)				
8w¶	Commerce Algebra.....				
	(See 8f)				
	Sec. 1	II	MWThFS	104F	Ar
	2	VI	MTWThF	125F	Ar
8s¶	Commerce Algebra.....	VI	MTWThF	105F	Ar
	(See 8f)				

¶ Courses 6 and 8 involve some duplication of material, and no student may take both without special permission. No student may receive credit for both of Courses 7 and 8. Pre-business students who elect mathematics to meet the requirement of 10 credits in mathematics or laboratory science, should take 1 and 8 if they have not had high school higher algebra, and 8 and 20 if they have had high school higher algebra.

No.	Title	Hour	Day	Bldg.	Instructor
20w	Mathematics of Investment..... (5 cred.; all; prereq., 8, or 6 and 7)	I	TWThFS	105F	Mr. Hart
20s	Mathematics of Investment..... (See 20w)	II	MWThFS	104F	Mr. Hart
30f	Analytical Geometry..... (5 cred.; all; prereq., 6 and 7)	III	MTThFS	104F	Mr. Brink
30w	Analytical Geometry..... (See 30f)	IV	MTWFS	105F	Miss Gibbens
30s	Analytical Geometry..... (See 30f)	I	TWThFS	102F	Mr. Shumway
	Senior College Courses				
50f	Calculus I..... (5 cred.; jr., sr.; prereq., 30)	III	MTThFS	102F	Mr. Jackson
50w	Calculus I..... (See 50f)	III	MTThFS	104F	Mr. Brink
50s	Calculus I..... (See 50f)	IV	MTWFS	105F	Miss Gibbens
51w	Calculus II..... (5 cred.; jr., sr.; prereq., 50)	III	MTThFS	102F	Mr. Jackson
51s	Calculus II..... (See 51w)	III	MTThFS	104F	Mr. Brink
52f	Calculus III..... (5 cred.; jr., sr.; prereq., 51)	III	MTThFS	101F	Miss Gibbens
52s	Calculus III..... (See 52f)	III	MTThFS	102F	Mr. Jackson
62w-63s	Theory of Equations..... (6 cred.; jr., sr.; prereq., 50)	VII	MWF	101F	Mr. Hart
70s	Hist. of Elem. Math..... (3 cred.; jr., sr.; prereq., 30)	I	MWF	104F	Mr. Bussey
71f	Solid Analytical Geometry..... (3 cred.; jr., sr.; prereq., 50)	VII	MWF	101F	Mr. Hart
80f-81w-82s	Mechanics and Vector Analysis.. (9 cred.; jr., sr.; prereq., 50 and 51§)	II	MWF	125F	Mr. Jackson
90-91-92	*Adv. Anal. and Synth. Geom...* (9 cred.; jr., sr., grad.; prereq., 50)	*Not offered in 1922-23*			
106f-107w-108s	Adv. Calculus and Diff. Equations (9 cred.; jr., sr., grad.; prereq., 52)	III	MWF	105F	Mr. Hart
140w‡	Method of Least Squares..... (3 cred.; jr., sr., grad.; prereq., Math. 51)	See Astronomy program			

NOTE: Courses 50, 51, and 52 are open without petition to sophomores who have the prerequisites and who satisfy the requirements given on page 21.

Some of the courses listed in the Graduate School bulletin are open to properly qualified juniors and seniors. For more information consult the chairman of the Department of Mathematics.

§ Course 80-81-82 may be taken simultaneously with Course 50-51.

‡ Identical with Astronomy 140.

MILITARY SCIENCE AND TACTICS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w	First-Year Basic Course.....	II	MWF	A	Ar
	(no cred.; fr.; no prereq.)	IV	MWF	A	Ar
		V	MWF		
		VI	MWF	A	Ar
		VII	MWF	A	Ar
		IX	MWF	A	Ar
3s	First-Year Basic Course.....	VII, VIII,			
	(no cred.; fr.; prereq., 1f-2w)..	IX	T or W	A	Ar
4f-5w	Second-Year Basic Course.....	I	MWF	A	Ar
	(no cred.; soph.; no prereq.)	III	MWF	A	Ar
		VIII	MWF	A	Ar
6s	Second-Year Basic Course.....	VII, VIII,			
	(no cred.; soph.; prereq., 4f-5w)	IX	T or W	A	Ar
51f-52w	First-Year Adv. Course.....	VII, VIII, IX	Th	A	Ar
	(cred.§; jr.; prereq., 4f-5w-6s‡)	III	TS	A	Ar
53s	First-Year Adv. Course.....	VII, VIII,			
	(cred.§; jr.; prereq., 51f-52w)	IX	T or W	A	Ar
		III	TS	A	Ar
54f-55w	Second-Year Adv. Course.....	VII, VIII, IX	Th	A	Ar
	(cred.§; sr.; prereq., 51f-52w-53s)	IV	TS	A	Ar
56s	Second-Year Adv. Course.....	VII, VIII,			
	(cred.§; sr.; prereq., 54f-55w)	IX	T or W	A	Ar
		IV	TS	A	Ar

MUSIC

Courses in music are not open to freshmen and sophomores except those working for a major in music.

Students may enter courses in practical music any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s†	Harmony				
	(9 cred.; fr. mu.; no prereq.)				
	Sec. 1	II	MWF	Mu	Mr. Scott
	2	VI	MWF	Mu	Mr. Scott
1w-2s-(3su)†	Harmony	IV	MWF	Mu	Mr. Scott
	(See 1f-2w-3s)				
4f-5w-6s†	Counterpoint	III	TTh	Mu	Mr. Ferguson
	(6 cred.; soph. mu.; prereq., 1-2-3)				
7f-8w-9s	Ear-Training				
	(Cred., see note*; soph. mu.; prereq., 1-2-3)				
	Sec. 1	VI	T	Mu	Ar
	2	VII	Th	Mu Aud	
10f-11w-12s	First-Year Organ.....	Ar	Ar	Mu	Ar
	(6 or 12 cred.; fr. mu.)				
13f-14w-15s	Second-Year Organ.....	Ar	Ar	Mu	Ar
	(6 or 12 cred.; soph. mu.; prereq., 10-11-12)				
16f-17w-18s	First-Year Piano.....	Ar	Ar	Mu	Ar
	(6 or 12 cred.; fr. mu.)				

† The entire course must be completed before credit is received for any quarter.

* Course 7-8-9 carries 3 credits for freshmen; none for sophomores.

‡ Must be legally eligible for enrolment in Reserve Officers' Training Corps. Consult P.M.S.T.

§ The University allows three credits per quarter for advanced R.O.T.C. work, with a maximum of eighteen credits for the two years' work. The number of credits which can be counted toward the bachelor of arts degree is six. See page 30.

No.	Title	Hour	Day	Bldg.	Instructor
19f-20w-21s	Second-Year Piano..... (6 or 12 cred.; soph. mu.; prereq., 16-17-18)	Ar	Ar	Mu	Ar
22f-23w-24s	First-Year Violin..... (6 or 12 cred.; fr. mu.)	Ar	Ar	Mu	Ar
25f-26w-27s	Second-Year Violin..... (6 or 12 cred.; soph. mu.; prereq., 22-23-24)	Ar	Ar	Mu	Ar
28f-29w-30s	First-Year Vocal Training..... (6 or 12 cred.; fr. mu.)	Ar	Ar	Mu	Ar
31f-32w-33s	Second-Year Vocal Training.... (6 or 12 cred.; soph. mu.; prereq., 28-29-30)	Ar	Ar	Mu	Ar
34f-35w-36s	First-Year of Other Orchestral Instruments ..... (6 or 12 cred.; fr. mu.)	Ar	Ar	Mu	Ar
37f-38w-39s	Second-Year of Other Orchestral Instruments ..... (6 or 12 cred.; soph. mu.; prereq., 37-38-39)	Ar	Ar	Mu	Ar
40f-41w-42s	Orchestra ..... (3 cred.; jr., sr.)	Ar	Ar	Mu	Ar
43f-44w-45s	University Choir..... (3 cred.; jr., sr.)	IX	M	Mu	Ar
46f-47w-48s	Appreciation of Music..... (3 cred.; jr., sr.)	VI	M	Mu	Ar
50f-51w-52s	Third-Year Organ..... (6 or 12 cred.; jr.; prereq., 13-14-15)	Ar	Ar	Mu	Ar
53f-54w-55s	Fourth-Year Organ..... (6 or 12 cred.; sr.; prereq., 50-51-52)	Ar	Ar	Mu	Ar
56f-57w-58s	Third-Year Piano..... (6 or 12 cred.; jr.; prereq., 19-20-21)	Ar	Ar	Mu	Ar
59f-60w-61s	Fourth-Year Piano..... (6 or 12 cred.; sr.; prereq., 56-57-58)	Ar	Ar	Mu	Ar
62f-63w-64s	Third-Year Violin..... (6 or 12 cred.; jr.; prereq., 25-26-27)	Ar	Ar	Mu	Ar
65f-66w-67s	Fourth-Year Violin..... (6 or 12 cred.; sr.; prereq., 62-63-64)	Ar	Ar	Mu	Ar
68f-69w-70s	Third-Year Vocal Training..... (6 or 12 cred.; jr.; prereq., 31-32-33)	Ar	Ar	Mu	Ar
71f-72w-73s	Fourth-Year Vocal Training.... (6 or 12 cred.; sr.; prereq., 68-69-70)	Ar	Ar	Mu	Ar
74f-75w-76s	Third Year of Other Orchestral Instruments ..... (6 or 12 cred.; jr.; prereq., 37-38-39)	Ar	Ar	Mu	Ar
77f-78w-79s	Fourth Year of Other Orchestral Instruments ..... (6 or 12 cred.; sr.; prereq., 74-75-76)	Ar	Ar	Mu	Ar

No.	Title	Hour	Day	Bldg.	Instructor
86f-87w-88s	Normal Piano..... (6 cred.; jr.; prereq., 2 yrs. piano)	VII	MWF	Mu	Miss Reeves
89f-90w-91s	Adv. Normal Piano..... (6 cred.; sr.; prereq., 86-87-88)	VIII	MWF	Mu	Miss Reeves
100f-101w-102s	Composition-Orchestration ..... (9 cred.; jr., sr.; prereq., 1-2-3, 4-5-6)	Ar	Ar	Mu	Mr. Ferguson
103f-104w-105s	Analysis ..... (3 cred.; jr., sr.; prereq., 1-2-3, 4-5-6)	IV	W	Mu	Mrs. Courture
106f-107w-108s	History of Music..... (9 cred.; jr., sr.; prereq., 1-2-3, 4-5-6)	II	MWF	Mu	Mr. Ferguson
109f-110w-111s	Bach and Beethoven..... (9 cred.; sr.; prereq., 106-107-108)	VI, VII	TTh	Mu	Mr. Ferguson
112f-113w-114s	Ensemble ..... (6 cred.; jr.)				
	Sec. 1	Ar	Ar	Mu	Mr. Pepinsky
	2 (For voice students)	Ar	Ar	Mu	Miss Hull
115f-116w-117s	Advanced Ensemble..... (6 cred.; sr.; prereq., 112-113-114)				
	Sec. 1	Ar	Ar	Mu	Mr. Pepinsky
	2 (For voice students)	Ar	Ar	Mu	Miss Hull
121f-122w-123s	Romantic Movement..... (6 cred.; jr., sr.; prereq., 106-107-108)	VII	WF	Mu	Mr. Lindsay
124f-125w-126s	Advanced Harmony..... (6 cred.; jr.; prereq., 4-5-6)	Ar	Ar	Mu	Mr. Scott
127f-128w-129s	Advanced Counterpoint..... (6 cred.; sr.; prereq., 4-5-6)	Ar	Ar	Mu	Mr. Ferguson

PHILOSOPHY

Major Adviser

Professor Swenson.

Major Sequence

From 27 to 36 credits in Senior College courses, including Courses 100-101-102 or 124, 135-136 or 151-152, 141 or 147.

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

Nine credits in psychology will be accepted as prerequisites in philosophy, except where "cr. in phil." are required.

No.	Title	Hour	Day	Bldg.	Instructor
1f	Problems of Philosophy..... (5 cred.; soph., jr., sr.; no prereq.)	VII	MTWThF	322F	Mr. Conger
1w	Problems of Philosophy..... (See 1f)	III	MTThFS	321F	Mr. Swenson

No.	Title	Hour	Day	Bldg.	Instructor
1s	Problems of Philosophy..... (See 1f)	VI	MTWThF	322F	Mr. Conger
2f	Logic ..... (5 cred.; soph., jr., sr.; no prereq.)				
	Sec. 1	III	MTThFS	321F	Mr. Swenson
	2	IV	MTWFS	321F	Mr. Conger
2w	Logic ..... (See 2f)				
	Sec. 1	VII	MTWThF	322F	Mr. Conger
	2	IV	MTWFS	321F	Mr. Conger
2s	Logic ..... (See 2f)				
	Sec. 1	III	MTThFS	5F	Mr. Swenson
	2	IV	MTWFS	321F	Mr. Conger
3f	Ethics ..... (5 cred.; soph., jr., sr.; no prereq.)	IV	MTWFS	322F	Mr. Wilde
3s	Ethics ..... (See 3f)	I	TWThFS	322F	Mr. Wilde
10s	Science and Religion..... (2 cred.; soph., jr., sr.; prereq., 10 cred. in phil. or a science)	VII	TTh	301F	Mr. Conger
50w	Ancient and Medieval Philosophy (5 cred.; jr., sr.; prereq., 10 cred.; or 15 cred. in phil. and soc. sci.)	IV	MTWFS	322F	Mr. Wilde
51s	Modern Philosophy..... (5 cred.; jr., sr.; prereq. 10 cred.; or 15 cred. in phil. and soc. sci.)	IV	MTWFS	322F	Mr. Wilde
100f-101w-102s	Philosophy of Religion..... (9 cred.; jr., sr., grad.; prereq., 10 cred.)	II	TThS	322F	Mr. Swenson
103	*Esthetics* ..... (3 cred.; jr., sr., grad.; prereq., 10 cred.)	*Not offered in 1922-23*			
104s	History of Esthetics..... (3 cred.; jr., sr., grad.; prereq., 10 cred.)	II	MWF	322F	Mr. Swenson
108-109	*History of Ethics*..... (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil.)	*Not offered in 1922-23*			
120w	Scandinavian Philosophy..... (3 cred.; jr., sr., grad.; prereq., 10 cred.)	2-3:20	TTh	316F	Mr. Swenson
124f	Political and Social Ethics..... (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil.)	I	TWThFS	322F	Mr. Wilde
129w	Modern Political Thought..... (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil.)	I	TWThFS	322F	Mr. Wilde
135-136	*Philosophy of Plato*..... (4 cred.; jr., sr., grad.; prereq., 10 cred.)	*Not offered in 1922-23*			

No.	Title	Hour	Day	Bldg.	Instructor
141	*Metaphysics* ..... (3 cred.; jr., sr., grad.; prereq., 10 cred. in phil. incl. 2)	*Not offered in 1922-23*			
147f	Advanced Logic..... (3 cred.; jr., sr., grad.; prereq., 10 cred. in phil. incl. 2)	2-3:20	TTh	316F	Mr. Swenson
151f-152w	Modern Idealism..... (4 cred.; sr., grad.; prereq., 15 cred. in phil.)	VIII	TTh	316F	Mr. Conger
161f-162w-163s	Seminar in Philosophy..... (9 cred.; sr., grad.; prereq., 20 cred. in phil. and consent of instructor)	Ar	Ar	316F	Mr. Wilde, Mr. Conger, Mr. Swenson

PHYSICAL EDUCATION

FOR MEN

NOTE: Course 1 continues for six weeks of the fall quarter. Course 2 continues throughout fall, winter, and spring.

No.	Title	Hour	Day	Bldg.	Instructor
1f,2f,w,s	Personal Hygiene and Gymnasium and Swimming..... (no cred.; fr.; no prereq.)				
	Sec. 1	II	TTh	A	Dr. Cooke, Mr. Roemer, Mr. Glidden
	2	III	TTh	A	
	3	VI	TTh	A	
	4	VII	TTh	A	
	5	VIII	TTh	A	
1w,s	Personal Hygiene and Gymnasium and Swimming..... (See 1-2)	IV	TS	A	
3	Advanced Leaders.....	Consult department			
4	Corrective Gymnastics.....	Consult department			
5,6,7,8,9	Intramural Athletics.....	Consult department			

PHYSICAL EDUCATION

FOR WOMEN

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s‡	Elem. Physical Train..... (no cred.; required of all new students; no prereq.)	IV	MWF	3,151,153WGym	Ar
		VI	MWF	3,151,153WGym	Ar
		VII	MWF	3,151,153WGym	Ar
		VIII	MWF	3,151,153WGym	Ar
		III	TThS	3,151,153WGym	Ar
4f	Preliminary Hygiene..... (no cred.; required of all new students; no prereq.)	I	M	201WGym	Dr. Norris
		II, IV	T	201WGym	
		III	W	201WGym	
		VI	Th	201WGym	
7f-8w-9s‡	Sophomore Physical Training.... (no cred.; soph.; prereq., 1-2-3)	IV	TS	3,153WGym	
		VI	TTh	3,153WGym	
10f-11w-12s	Sophomore Orthopedic Gymnastics ..... (no cred.; soph.; prereq., 1-2-3)	IV	TS	3,153WGym	Dr. Tolg
		VI	TTh	3,153WGym	Miss Denny

‡ The third quarter is open to students who have not taken the preceding quarters.

No.	Title	Hour	Day	Bldg.	Instructor
13f,s-14w	Sophomore Interpretive Dancing	VIII	TTh	151WGym	Miss Baker
	(no cred.; soph.; prereq., 1-2-3)	IX	TTh	151WGym	Miss Baker
16f-17w-18s*	Sophomore Games and Folk Dancing	III	MF	151WGym	Miss Browning
	(no cred.; soph.; prereq., 1-2-3)				
19f-20w-21s*	Sophomore Major Sports.....	IX	MW	151WGym	Ar
	(no cred.; soph.; prereq., 1-2-3)				
22f,s-23w¶	Sophomore Elem. Swimming....	IV	MW	51WGym	Ar
	(no cred.; soph.; prereq., 1-2-3)	VII	MW	51WGym	Ar
		II	TTh	51WGym	Ar
		III	WF	51WGym	Ar
		IV	TS	51WGym	Ar
		VII	TTh	51WGym	Ar
		VIII	TTh	51WGym	Ar
28f,s-29w¶	Sophomore Adv. Swimming.....	VIII	MW	51WGym	Ar
	(no cred.; soph.; prereq., 1-2-3, swimming test)	III	TTh	51WGym	Ar
32s	Personal Hygiene.....	III	MWF	201WGym	Miss Browning
	(3 cred.; soph., jr., sr.; prereq., Biol., 1-2)				
33s	Hygiene of the Family.....	IV	MWF	201WGym	Dr. Norris
	(3 cred.; jr., sr., prereq., Biol., 1-2)				
35w§	Intermed. Physical Training....	VII	TTh	153WGym	Miss Kissock
	(1 cred.; jr., sr.; prereq., 6 qu.)				
40-41-42	*Interpretive Dancing*.....	*Not offered in 1922-23*			
	(3 cred.; jr., sr.; prereq., 6 qu.)				
43f-(44s)†	Play and the Playground.....	VI	TThF	151WGym	Miss Kissock
	(1 cred. fall, 2 cred. spring; jr., sr.; prereq., 6 qu.)				
(43f)-44s†	Play and the Playground.....	VI	TThF	151WGym	Miss Kissock
	(See 43f-(44s))	II	W		
	(3 cred.; jr., sr.; prereq., 6 qu.)	VII	MW		
66f-67w-68s†	Interpretive Dancing.....	III	MWF	151WGym	Miss Baker
	(3 cred.; jr., sr.; prereq., 6 qu.)				
	Courses for which no registration is required				
37f,w,s	General Swimming.....	IX	MTThF	51WGym	No instr.
	(no cred.; all; no prereq.)				
46f-47w-48s*	Hockey, Basket-Ball and Baseball	IX	TTh	151WGym	Ar
	(no cred.; fr., jr., sr.; prereq., permission of director)				

PHYSICS

Major Advisers

Professors Erikson, Tate, and Zeleny.

Major Sequences

Courses 101-103-105; 102-104-106, and Mathematics 50, 51, and 52.

Courses 1, 2, 21, 22, 31, 32, 41, 42 comprise a general course in physics extending through four quarters. Those who intend to teach physics in secondary schools are

† The entire course must be completed before credit is received for any quarter.

* The second or third quarter is open to students who have not taken the preceding quarters

¶ No student may register for more than two quarters of swimming without permission.

§ To be given if elected by twenty students.

advised to take Courses 101-103-105 and 102-104-106 in addition to the above general courses. Those who enter the field of industrial research are advised to take all the intermediate courses in addition to the general course.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

Introductory Courses

No.	Title	Hour	Day	Bldg.	Instructor
1f,w	Elem. of Mechanics and Sound (3 cred.; all; prereq., Math. 6, or equiv.)				
	Lect.	VIII	MWF	30Ph	Mr. Erikson
	Quiz.	IX	F	100C	Mr. Erikson
1s	Elem. of Mechanics and Sound (See 1f,w)				
	Lect.	III	TThS	30Ph	Mr. Erikson
	Quiz.	IX	F	100C	Mr. Erikson
2f,w,s	Elem. of Mechanics Lab..... (1 cred.; all; prereq., 1 or reg. in 1)				
	Sec. 1	VI, VII	T	16Ph	Mr. Erikson and assistants
	2	VIII, IX	T	16Ph	
	3	VIII, IX	Th	16Ph	
9s	Acoustics ..... (3 cred.; all; no prereq.)	Ar	Ar	30Ph	Mr. Erikson
10s	Acoustics Lab..... (1 cred.; all; prereq., 9 or reg. in 9)	Ar	Ar	30Ph	Mr. Erikson
21f	Heat ..... (3 cred.; all; prereq., 1)				
	Lect.	III	TThS	30Ph	Mr. Miller
	Quiz.	IX	W	30Ph	Mr. Miller
21w	(For schedule of hours, see Physics 23w, Engineering program)				
22f	Heat Laboratory..... (1 cred.; all; prereq., 2, 21, or reg. in 21)				
	Sec. 1	VI, VII	M	23Ph	Mr. Miller and assistants
	2	VIII, IX	M	23Ph	
	3	VI, VII	T	23Ph	
	4	VIII, IX	T	23Ph	
22w	(For schedule of hours, see Physics 24w, Engineering program)				
31f,s	Optics ..... (3 cred.; all; prereq., 1)				
	Lect.	I	TThS	30Ph	Mr. Valasek
	Quiz.	IX	M	30Ph	Mr. Valasek
32f,s	Optics Laboratory..... (1 cred.; all; prereq., 2, 31, or reg. in 31)				
	Sec. 1	VI, VII	Th	23Ph	Mr. Valasek
	2	VIII, IX	Th	23Ph	Mr. Valasek
	3	VI, VII	F	23Ph	Mr. Valasek
	4	VIII, IX	F	23Ph	Mr. Valasek

No.	Title	Hour	Day	Bldg.	Instructor
35s	Optics ..... (2 cred.; all; prereq., 1)				
	Lect.	VI	TTh	30Ph	Mr. Valasek
41w	Magnetism and Electricity..... (3 cred.; all; prereq., 1)				
	Lect.	III	TThS	30Ph	Mr. Zeleny
	Quiz.	IX	W	30Ph	Mr. Zeleny
41s	(For schedule of hours, see Physics 43s, Engineering program)				
42w	Electrical Laboratory..... (1 cred.; all; prereq., 2, 41, or reg. in 41)				
	Sec. 1	VI, VII	T	31Ph	Mr. Zeleny and assistants
	2	VIII, IX	T	31Ph	
	3	VI, VII	Th	31Ph	
	4	VI, VII	W	31Ph	
42s	(For schedule of hours, see Physics 44s, Engineering program)				

Intermediate Courses

101f-103w-105s, 107f-109w-111s	Theoretical Physics..... (4 cred.; jr., sr., grad.; prereq., 12 cred. in phys.; Math. 51)	IV	MTWF	18Ph	Mr. Tate
102f-104w-106s, 108f-110w-112s	Experimental Physics..... (3 cred.; jr., sr., grad.; prereq., 12 cred. in phys.; Math. 51)				
	Sec. 1	VI-VIII	MW	2Ph	Mr. Power
	2	VI-VIII	TTh	2Ph	Mr. Power
114f-116w-118s	Elem. Phys. Investigation..... (3 cred.; jr., sr., grad.; prereq., 106, Math. 51)	Ar	Ar	1Ph	Mr. Swann
115f-117w-119s	Elem. of Math. Physics..... (3 cred.; jr., sr., grad.; prereq., 105, Math. 51)	Ar	Ar	18Ph	Ar
122s	Pyrometry and Heat..... (3 cred.; jr., sr., grad.; prereq., 21 and 22)	VI-VIII	MWF	9Ph	Mr. Miller
132w	Applied Optics..... (3 cred.; jr., sr., grad.; prereq., 31 and 32)	Ar	Ar	3Ph	Mr. Valasek
142f	Elect. Measurements..... (3 cred.; jr., sr., grad.; prereq., 41 and 42)	See Engineering program		31Ph	Mr. Zeleny
146w	Elect. Meas. of Precision..... (3 cred.; jr., sr., grad.; prereq., 142)	Ar	Ar	12Ph	Mr. Zeleny
145f-147w-148s	Radioactivity ..... (3 cred.; jr., sr., grad.; prereq., 106)	Ar	Ar	15Ph	Mr. Erikson

NOTE: Credits stated are *credits per quarter.*

POLITICAL SCIENCE[1]

Major Advisers

Professors Allin, Cushman, Wright, and Young; Associate Professor Anderson.

Major Sequences

Sequence A. American government. Course 151; 152 or 157 or 158; 141; 125 or 127; History 146-147; additional courses from the preceding list and the following to make 33 credits: 145, 131-132; 133, 155, 161, 181, History 153, and Economics 154, 162, 176, 191-192, and 193.

Sequence B. Public law. Courses 121-122; 151; 152; 155 or 157; 141; additional courses from the preceding list and the following to make 30 credits: 123, 145, 161, 165, 166, 171, and History 146-147.

Sequence C. Comparative government and political theory. Courses 161; 165; 166; 167; 181; Economics 169; 176; additional courses from the following list to make 33 credits; 129, 131-132, 155, 185; Economics 118-119-120; History 107-108, and 109; and Sociology 140, 141.

Sequence D. Local government and administration. Courses 141; 115; 117; 131-132, 155; 171; 193; additional courses from the preceding list and the following to make 33 credits: 133, 145; Economics 154, 161, and 191-192; Education 124, 125-126; History 144-145 and 153; and Sociology 55.

Sequence E. Diplomatic and consular service. Courses 121-122; 125; Economics 112,[2] 143-144, 145,[2] 176, 177;[2] additional courses from the following list to make 33 credits; 65, 123, 127, 129; History 113-114-115, 104, 107-108, and 109, and Geology 117.

Sequence F. National and state administration. Courses 141, 151, 157 or 158, 131-132, 133 or 155; Economics 154; additional courses from the preceding list and the following to make 33 credits: Economics 72, 161, 191-192, and 193; and History 113-114-115, 146-147, and 153.

Prerequisites: at least 10 credits in history and 15 credits in political science. In addition, the student is urged to take History 5-6 (American History), or 9-10 (Economic History), or Economics 3-4 (Principles of Economics). Students from other colleges and those who for any other reason are deficient in prerequisites may be required to make up their deficiencies in Junior College courses.

Professional courses.—The attention of those who are preparing themselves for the public service is called to the special training courses outlined on pages 29 and 32 of the bulletin. Further information may be had from the chairman of the department.

Bureau for Research in Government.—This bureau is organized to conduct and direct special investigations into practical political and administrative problems, national, state, and local. Mr. Anderson will act as director, but all members of the staff will take part in the work of the bureau. Advanced and graduate students are strongly urged to take advantage of its facilities.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

[1] The courses in history and economics listed in the Political Science statement will be credited to the student as political science only with the approval of the chairman of the department and when taken in conjunction with political science courses.

[2] See School of Business bulletin.

No.	Title	Hour	Day	Bldg.	Instructor
1f,w,s	American Government..... (5 cred.; soph., jr., sr., and fr. with 10 cred. in hist.; no prereq.)				
	Sec. 1	IV	MWF	LitTh	Ar
		Ar	TS	Ar	
	2	VII	MWF	306D (fall, winter) LitTh (spring)	Ar
		Ar	TTh	Ar	
3f	Compar. European Government.. (5 cred.; soph., jr., sr.; prereq., 1)	III	MTThFS	306D	Mr. Wright
3w,s	Compar. European Government. (See 3f)	III	MTThFS	306D (winter) 302D (spring)	
7f,w,s	State Government..... (5 cred.; soph., jr., sr.; with or after 1)	VI	MTWThF	306D (fall) 202MA (winter, spring)	Mr. Cushman
11f	Municipal Government..... (5 cred.; soph., jr., sr.; prereq., 1)	I	TWThFS	111Lib	Mr. Anderson
11w	Municipal Government..... (See 11f)	II	MWThFS	202MA	Mr. Anderson
11s	Municipal Government..... (See 11f)	I	TWThFS	2F	Mr. Anderson
15f,w	Introd. to Political Science..... (5 cred.; soph., jr., sr.; prereq., 1)	IV	MTWFS	109MA	Ar
25f	World Politics..... (5 cred.; soph., jr., sr.; prereq., 1 and 10 cred. in hist.)	VI	MTWThF	109MA	Mr. Tyler
25w,s	World Politics..... (See 25)	VII	MTWThF	206F (winter) 109MA (spring)	Mr. Allin
33w-34s†	English Legal Institutions.....	See History statement			
51f-52w-53s†	Business Law..... (9 cred.; jr., sr.; prereq., 10 cred. in pol. sci., or 10 cred. in econ., or 5 cred. in each)				
	Lect.	II	WF	301F LitTh (spring)	Mr. Young
	Sec. 1	I	M	102F	
	2, 3, 4	II	M	3F, 2F, 321F	
	5	VII	M	205F	
	6, 7	Ar	Ar	Ar	
58f	Political Parties..... (5 cred.; jr., sr.; prereq., 10 cred.)	VII	MTWThF	Ar	
65w	Colonization ..... (3 cred.; jr., sr.; prereq., 10 cred., or 15 cred. in soc. sci.)	III	TThS	102MA	Mr. Allin
75w	Law of Public Utilities..... (3 cred.; jr., sr.; prereq. Econ. 155 or 15 cred. in pol. sci.)	III	TThS	101F	Mr. Kumm
107f-108w	Europe: 1848-1914.....	See History statement			
109s	Modern England.....	See History statement			
115s	Municipal Problems..... (3 cred.; jr., sr., grad.; prereq., 11, or 15 cr.)	II	MWF	213MA	Mr. Anderson

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
117s	Municipal Engineering..... (3 cred.; jr., sr., grad.; no prereq.)	See Civil Engineering 53.3s			
121f-122w	International Law..... (8 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 cred. in pol. sci. or Hist. 107-108)	IV	MTWF	213MA	Mr. Wright
123	*International Organization*..... (4 cred.; jr., sr., grad.; prereq., 121-122 or 127)	*Not offered in 1922-23*			
124s	Problems in International Law.. (4 cred.; jr., sr., grad.; prereq., 121-122)	IV	MTWF	213MA	Mr. Wright
125w	Amer. Diplomatic History..... (4 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 cred. in pol. sci. or Hist. 5-6)	III	MTWF	213MA	Mr. Wright
127s	American Foreign Relations.... (4 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 cred. in pol. sci. or Hist. 5-6)	III	MTWF	213MA	Mr. Wright
128	*Far Eastern Politics*..... (4 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. Course 25; or 10 cred. in pol. sci. and Hist. 107-108)	*Not offered in 1922-23*			
131f-132w	Public Administration..... (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 cred. in pol. sci.)	IV	MWF	Ar	Mr. Lambie
133s	Problems in Administration..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 1 Senior College course)	IV	MWF	Ar	Mr. Lambie
141f	Problems in State Government.. (3 cred.; jr., sr., grad.; prereq., 20 cred.)	VII	MWF	213MA	Mr. Cushman
145w	Legislative Power and Meth.... (3 cred.; jr., sr., grad.; prereq., 15 cred.)	II	TThS	102MA	Mr. Young
146w-147s†	Const. Hist. of U. S.....	See History statement			
151w	Constitutional Law: The American Federal System..... (4 cred.; jr., sr., grad.; prereq., 15 cred. incl. 1 Senior College course)	VII	MWThF	109MA	Mr. Cushman
152s	Constitutional Law: Fundamental Rights and Immunities..... (4 cred.; jr., sr., grad.; prereq., 15 cred. incl. 1 Senior College course)	VII	MWThF	209MA	Mr. Cushman
153s	*West in Amer. Politics since 1865*	*See History statement*			
155	*Compar. Administrative Law*.... (3 cred.; jr., sr., grad.; prereq., 15 cred.)	*Not offered in 1922-23*			

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
157f	Police Power..... (3 cred.; jr., sr., grad.; prereq., 15 cred. in pol. sci. or econ.)	II	TThS	102MA	Mr. Young
158s	Government and Business..... (3 cred.; jr., sr., grad.; prereq., 15 cred. in pol. sci. or in econ.)	II	TThS	124F	Mr. Young
161w	Comparative Federal Government (4 cred.; jr., sr., grad.; prereq., 20 cred.)	IV	MTWF	Ar	Mr. Allin
165f	Law and Custom of the English Const. ..... (3 cred.; jr., sr., grad.; prereq., 15 cred. or Hist. 109)	II	MWF	Ar	Mr. Allin
166w	Gov't. of the British Empire.... (3 cred.; jr., sr., grad.; prereq., 15 cred. or Hist. 109)	II	MWF	Ar	Mr. Allin
167s	British Politics..... (3 cred.; jr., sr., grad.; prereq., 15 cred. or Hist. 109)	II	MWF	Ar	Mr. Allin
169s	Labor and Socialist Movement in Europe.....	See Economics statement			
171f	Municipal Corporations..... (3 cred.; jr., sr., grad.; prereq., 15 cred.)	II	MWF	213MA	Mr. Anderson
181w	Modern Political Thought..... (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci., or 10 cred. in philos.)	I	TWThFS	322F	Mr. Wilde
185f	Political and Social Ethics..... (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in philos.)	I	TWThFS	322F	Mr. Wilde
191f-192w†	Public Finance.....	See Economics statement			
193s	State and Local Taxation.....	See Economics statement			

PSYCHOLOGY

Major Advisers

Associate Professors Elliott and Foster.

Major Sequences

A. General psychology. Courses 101-102; 125-126; 108-109 and 12 additional credits in Senior College courses, excepting 56 and 60.

B. Human and animal behavior. Courses 114-115; 121-122-123; 144-145 and either 125-126 or 135-136 or Animal Biology 109-110.

C. Differential psychology. Courses 101-102; 125-126; 135-136; either 144-145 or 124 and 127; Educational Psychology 134-135. (Prerequisites for Sequence A and Sequence C: 1-2 and 4-5 or 7. Course 3 is recommended. Prerequisites for Sequence B: 9 credits in psychology.)

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	General Psychology..... (6 cred.; soph., jr., sr.; no prereq.)				
	Lect.	I	MW	Mu Aud	Mr. Elliott, Mr. Foster
	Rec. (one hour)	I	Th or F or S	Psy	
		II	Th or F or S	Psy	
		VII	Th or F	Psy	
		VIII	Th or F	Psy	
1f-6w†	General Psychology for Business Students ..... (6 cred.; bus. and pre-bus., soph., jr., sr.; no prereq.)				
	Lect.	III	MW	Mu Aud	Mr. Elliott, Mr. Foster, Mr. Paterson
	Rec. (one hour)	III	Th or F or S	Psy	
		IV	F or S	Psy	
1w-2s†	General Psychology..... (See 1f-2w) (Sections limited to 25)				
	Sec. 1	V	MWF	Psy Amph	
	2	VI	MWF	Psy Amph	
	3	VII	MWF	Psy Amph	
3s	Psychology Applied to Daily Life (3 cred.; soph., jr., sr.; prereq., 1-2)				
	Lect.	I	MW	Mu Aud	Mr. Elliott, Mr. Paterson
	Rec. (one hour)	I	Th or F or S	Psy	
		II	Th or F or S	Psy	
4f-5w†	Introd. Lab. Psychology..... (4 cred.; soph., jr., sr.; with or after 1-2, or 1-6 by permission) (Sections limited to 40)				
	Sec. 1	I, II	TTh	211Psy	Mr. Foster and others
	2	III, IV	TS	211Psy	
	3	VI, VII	TTh	211Psy	
	4	VIII, IX	TTh	211Psy	
7s	Introd. Lab. Psychology..... (See 4f-5w) (Identical with 4f-5w combined)				
	Sec. 1	VI, VII	MTWF	211Psy	
	2	III, IV	MTWF	211Psy	
9s	Animal Behavior..... (3 cred.; soph., jr., sr.; prereq., 1-2 or 1-6)	III	MWF	109Psy	Mr. Lashley
56w	Psych. of Advertising..... (3 cred.; jr., sr.; prereq., 1-2 or 1-6, Econ. 3-4)	VII	MWF	115Psy	Mr. Paterson
60f	Employment Psychology..... (3 cred.; jr., sr.; prereq., 1-2 or 1-6, Econ. 3-4)	VII	MWF	115Psy	Mr. Paterson

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
101f-102w†-103s	Experimental Psychology..... (6 or 9 cred.; jr., sr., grad.; prereq., 1-2, and 4-5 or 7 or 8 cred. in physics)	VII VIII	MWF WF	116Psy	Mr. Woodrow
108f-109w†	Adv. General Psychol..... (6 cred.; sr., grad.; prereq., 101-102, or 121-122, or by permission)	VIII, IX IX	M W	116Psy	Mr. Johnson
114w-115s†	Human Behavior..... (6 cred.; jr., sr., grad.; prereq., 1; 2 or 6; 4-5 or 7, or Biol. 1-2)	II	TThS	109Psy	Mr. Elliott
121f-122w†-123s	Neuro-Psychology ..... (6 or 9 cred.; jr., sr., grad.; prereq., 1; 2 or 6; 4-5 or 7 or Biol. 1-2)	VII, VIII	MWF	109Psy	Mr. Lashley
124f	Psychology of Learning..... (3 cred.; jr., sr., grad.; prereq., 1; 2 or 6; 4-5 or 7)	IV	MWF	109Psy	Mr. Lashley
125f-126w†	Psych. of Individual Differences (6 cred.; jr., sr., grad.; prereq., 1; 2 or 6; 4-5 or 7, or Ed. Psy. 126-127)	II	MWF	109Psy	Mr. Paterson
127s	Psychological Anal. of Social Institutions ..... (3 cred.; jr., sr., grad.; prereq., 1; 2 or 6; 4-5 or 7 or Biol. 1-2 or 10 cred. in soc.)	II	MWF	109Psy	Mr. Bird
135f-136w†	Dynamic Psychology..... (6 cred.; jr., sr., grad.; prereq., 1; 2 or 6; 4-5 or 7 or Biol. 1-2 or 10 cred. in soc.)	III	TThS	109Psy	Mr. Woodrow
144w-145s†	Abnormal Psychology..... (6 cred.; jr., sr., grad.; prereq., 1; 2 or 6; 4-5 or 7, or Biol. 1-2 or 10 cred. in soc.)	IV	MWF	109Psy	Mr. Lashley

PUBLIC HEALTH AND PREVENTIVE MEDICINE

COLLEGE OF MEDICINE

For courses see special bulletin.

ROMANCE LANGUAGES

Major Advisers

Professors Olmsted, Searles, and LeCompte; Associate Professor Phelps; Assistant Professors Barton, Sirich, Parker, Gillet, and van Roosbroeck.

Major Sequences

FRENCH

One course in conversation and composition (except French 20).

One century course, and in addition credits chosen from courses numbered 50 or above to make a minimum of 27 credits.

† The entire course must be completed before credit is received for any quarter.

ITALIAN

Course 80; 81; 159-160-161; 162-163-164; and at least 10 additional credits chosen from the following: English 140, 145, 146-147; Greek 103, 51; History 133-134-135, 102-103-104; Latin 123, 127, 132; French 121-122-123, 153-154-155.

SPANISH

One course in conversation and composition (except Spanish 20).

One literary course, and in addition enough credits chosen from courses numbered 50 or above to make a minimum of 27 credits.

MIXED (French, Italian, and Spanish)

One course in conversation and composition (except French 20 or Spanish 20).

One literary course above 50, and in addition enough credits chosen from courses in any of the three languages numbered 50 or above to make a minimum of 27 credits.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

Certificate of aptitude.—The department grants a certificate of aptitude to those students who have completed in a satisfactory manner certain prescribed courses destined to fit them for teaching French or Spanish in secondary schools. For details, consult bulletin at Room 200, Folwell Hall.

Courses in French or Spanish conversation.—May be taken only when accompanied by the corresponding courses in composition. No credit will be given for work done in a course in conversation unless the course in composition is passed also. Courses in composition may be taken separately.

Prerequisites for teachers' courses.—In addition to Course 21-22-23 or Courses 24-25 (or Spanish equivalent, Course 65-66-67 or Course 68-69) one conversation-composition course and one literary course.

Admission to advanced courses.—No student will be allowed to elect courses more advanced than intermediate French or Spanish, who has not received an average grade of C in the intermediate courses.

Combined Junior College courses.—French 21-22-23 or French 80-81-82 may be combined with French 50-51-52 and French 53-54-55 or French 56-57-58 and French 59-60-61 to form five-hour unit courses for Junior College students. In like manner Spanish 65-66-67 or 80-81-82 may be combined with Spanish 50-51-52 and 53-54-55 or 56-57-58 and 59-60-61.

Freshmen entering with three years of high school French will take Course 20. If they take additional work in the department, they will elect Course 24-25. In like manner, students entering with three years high school Spanish will register for Spanish 20, and if they take additional work in the department, for Spanish 68-69.

Pre-medical students may satisfy the language requirement of the Medical School by completing any two quarters of French 8-9-10, or, if they have completed French 3 or equivalent with an average of C, by passing a special reading examination. Such examinations will be given the first Saturday of the winter and spring quarters, the third day after the Science, Literature, and Arts finals in June and the Friday preceding the opening of the University in September.

ROMANCE LANGUAGES

FRENCH

No.	Title	Hour	Day	Bldg.	Instructor
(1s)-2f†	Beginning French.....	I	TWThFS	202F	Ar
	(See 1f-2w)	VI	MTWThF	213F	Ar
1f-2w†	Beginning French.....	I	TWThFS	213F	Ar
	(10 cred.; all; no prereq.)	II	MWThFS	227F	Ar
		III	MTThFS	226F	Ar
		IV	MTWFS	201F	Ar
		VI	MTWThF	226F	Ar
		VII	MTWThF	202F	Ar
1w-2s†	Beginning French.....	IV	MTWFS	202F	Ar
	(See 1f-2w)	VI	MTWThF	202F	Ar
1s-(2f)†	Beginning French.....	I	TWThFS	212F	Ar
	(See 1f-2w)	VII	MTWThF	209F	Ar
(3s)-4f	Intermediate French.....	II	MWThFS	207F	Ar
	(See 3f-4w)	III	MTThFS	301F	Ar
		IV	MTWFS	125F	Ar
		VI	MTWThF	202F	Ar
3f-4w	Intermediate French.....	I	TWThFS	205F	Ar
	(10 cred.; all; prereq., 1-2, or 2	II	MWThFS	204F	Ar
	yrs. high school French)	III	MTThFS	213F	Ar
		VII	MTWThF	213F	Ar
		VIII	MWThF	201F	Ar
3w-4s	Intermediate French.....	I	TWThFS	202F	Ar
	(See 3f-4w)	VI	MTWFS	213F	Ar
3s-(4f)	Intermediate French.....	I	TWThFS	213F	Ar
	(See 3f-4w)	II	MWThFS	227F	Ar
		III	MTThFS	226F	Ar
		IV	MTWFS	201F	Ar
		VI	MTWThF	226F	Ar
		VII	MTWThF	202F	Ar
8f-9w-10s¶	Scientific French (Pre-medic.)..	I	MWF	109F	Ar
	(9 cred.; pre-med.; prereq., 3 or equiv.)				
20f‡	Oral and Written French.....	III	MTThFS	125F	Mr. Frelin
	(5 cred.; all; prereq., 3-4 or 3	VII	MTWThF	206F	Mr. King
	yrs. high school French)				
20s‡	Oral and Written French.....	I	TWThFS	15F	Ar
	(See 20f)	II	MWThFS	109F	Ar
		III	MTThFS	213F	Ar
		VII	MTWThF	213F	Ar
21f-22w-23s†	Survey of French Lit.....	II	TThS	107F	Mr. LeCompte
	(9 cred.; all; prereq., 3-4 or 3	III	TThS	105F	Mr. van Roos-
	yrs. high school French)				broeck
		VII	MWF	107F	Mr. Searles
24w-25s†	Survey of French Lit.....	III	MTThFS	125F	Ar
	(10 cred.; all; prereq., 3-4 or	VII	MTWThF	105F	Ar
	3 yrs. high school French)				
50f-51w-52s†	French Conversation††.....	III	MW	201F	Miss Phelps
	(3 cred.; jr., sr.*; prereq., 3-4)	VI	MW	107F	Mr. Frelin

† The entire course must be completed before credit is received for any quarter.

†† Courses in conversation may be taken only when accompanied by the corresponding courses in composition. Courses in composition may be taken separately.

* Open without petition to sophomores who have the prerequisites and who satisfy the requirements given on page 21.

‡ See departmental requirements, note on freshmen entering with three years of high school French (or Spanish). No student may receive credit for both Course 210 and Courses 50-51-52 and 53-54-55.

¶ Students may enter any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
53f-54w-55s†	French Composition.....	III	F	201F	Miss Phelps
	(3 cred.; jr., sr.*; prereq., 3-4)	VI	F	107F	Mr. Frelin
56f-57w-58s†	Adv. French Conversation††....	II	MW	113F	Mr. Sirich
	(3 cred.; jr., sr.*; prereq., 20 or	III	MW	4F	Miss Guinotte
	50-51-52)	VI	MW	113F	Miss Guinotte
59f-60w-61s†	Adv. French Composition.....	II	F	113F	Mr. Parker
	(3 cred.; jr., sr.*; prereq., 20 or	III	F	4F	Mr. Coburn
	53-54-55)	VI	F	4F	Miss Guinotte
62f	Practical French Phonetics.....	VIII	MWF	4F	Mr. Constans
	(3 cred.; jr., sr.*; prereq., 21-22-23 and 20, or 50-51-52 and 53-54-55)				
80f-81w-82s†	French Lit.: 19th Century.....	IV	MWF	101F	Mr. Sirich
	(9 cred.; jr., sr.*; prereq., 21-22-23 or 24-25)	VII	MWF	114F	Miss Phelps
100w-101s†	French Oral Diction.....	VIII	MWF	4F	Mr. Constans
	(6 cred.; jr., sr., grad.; prereq., 56-57-58)				
103f-104w-105s†	French Syntax and Comp.....	VI	F	203F	Mr. Sirich
	(3 cred.; jr., sr., grad.; prereq., 59-60-61)				
115f-116w-117s†	French Lit.: 17th Century.....	III	TThS	201F	Mr. Searles
	(9 cred.; jr., sr., grad.; prereq., 21-22-23, or 24-25)				
118f-119w-120s†	French Lit.: 18th Century.....	III	MWF	113F	Mr. Parker
	(9 cred.; jr., sr., grad.; prereq., 21-22-23, or 24-25)				
121-122-123†	*French Lit.: 16th Century*.....	*Not offered in 1922-23*			
	(9 cred.; jr., sr., grad.; prereq., 80-81-82, or 115-116-117 or 118-119-120)				
141f-142w-143s†	Realistic Novel: 19th Century...	VII	TTh	203F	Mr. LeCompte
	(6 cred.; jr., sr., grad.; prereq., 80-81-82)				
150f-151w-152s†	French Dramatic Lit.....	III	TTh	203F	Mr. Olmsted
	(6 cred.; jr., sr., grad.; prereq., 20-21-22 or 24-25)				
153-154-155†	*French Lyric Poetry*.....	*Not offered in 1922-23*			
	(6 cred.; jr., sr., grad.; prereq., 20-21-22, or 24-25)				
159-160-161†	*French Criticism*.....	*Not offered in 1922-23*			
	(6 cred.; jr., sr., grad.; prereq., 80-81-82)				
171-172-173†	*Explication de Textes*.....	*Not offered in 1922-23*			
	(6 cred.; sr., grad.; prereq., 56-57-58, 59-60-61, and 115-116-117 or 118-119-120)				
174f-175w-176s†	Lectures in French.....	IX	TTh	201F	Mr. van Roosbroeck
	(6 cred.; jr., sr., grad.; prereq., 50-51-52, 53-54-55; (or 20) and 80-81-82)				
191f-192w-193s†	Research Meth. and Material...	IX	M	201F	Mr. van Roosbroeck
	(3 cred.; sr., grad.; prereq., consent of instr.)				

† The entire course must be completed before credit is received for any quarter.

†† Courses in conversation may be taken only when accompanied by the corresponding courses in composition. Courses in composition may be taken separately.

* Open without petition to sophomores who have the prerequisites and who satisfy the requirements given on page 21.

ITALIAN

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	Beginning Italian..... (10 cred.; soph., jr., sr.; no prereq.)	II	MWThFS	4F	Miss Phelps
80	*Italian Survey: Renaissance Period* ..... (5 cred.; jr., sr.; prereq., 1-2)	*Not offered in 1922-23*			
81s	Italian Survey: Romantic Period (5 cred.; jr., sr.; prereq., 1-2)	II	MWThFS	4F	Miss Phelps
159f-160w-161s†	Dante, Petrarch, Boccaccio..... (6 cred.; jr., sr., grad.; prereq., 80 or 81)	IV	MW	4F	Miss Phelps
162f-163w-164s†	Dante (in English)..... (3 cred.; jr., sr., grad.; prereq., 4 cred. in Eng. besides A-B-C, or Fr. 21-22-23. Req. of students taking 159-160-161)	IV	F	4F	Miss Phelps

SPANISH

No.	Title	Hour	Day	Bldg.	Instructor
(1s)-2f†	Beginning Spanish.....	I	TWThFS	201F	Ar
	(See 1f-2w)	VII	MTWThF	201F	Ar
1f-2w†	Beginning Spanish.....	I	TWThFS	15F	Ar
	(10 cred.; all; no prereq.)	II	MWThFS	226F	Ar
		III	MTThFS	227F	Ar
		IV	MTWFS	226F	Ar
		VI	MTWThF	201F	Ar
		VII	MTWThF	226F	Ar
		VIII	MTWThF	202F	Ar
1w-2s†	Beginning Spanish.....	II	MWThFS	202F	Ar
	(See 1f-2w)	III	MTThFS	212F	Ar
		VII	MTWThF	125F	Ar
1s-(2f)	Beginning Spanish.....	II	MWThFS	201F	Ar
	(See 1f-2w)	VI	MTWThF	209½F	Ar
(3s)-4f	Intermediate Spanish.....	I	TWThFS	301F	Ar
	(See 3f-4w)	II	MWThFS	202F	Ar
		III	MTThFS	2F	Ar
		IV	MTWFS	202F	Ar
		VI	MTWThF	227F	Ar
3f-4w	Intermediate Spanish.....	II	MWThFS	201F	Ar
	(10 cred.; all; prereq., 1-2 or 2 yrs. high school Spanish)	III	MTThFS	202F	Ar
		VI	MTWThF	109F	Ar
3w-4s	Intermediate Spanish.....	I	TWThFS	201F	Ar
	(See 3f-4w)	VII	MTWThF	201F	Ar
3s-(4f)	Intermediate Spanish.....	I	TWThFS	226F	Ar
	(See 3f-4w)	II	MWThFS	226F	Ar
		III	MTThFS	227F	Ar
		IV	MTWFS	226F	Ar
		VI	MTWThF	201F	Ar
		VII	MTWThF	227F	Ar
20s‡	Oral and Written Spanish.....	III	MTThFS	202F	Ar
	(5 cred.; all; prereq., 3-4, or 3 yrs. high school Spanish)	VII	MTWThF	226F	Ar

† The entire course must be completed before credit is received for any quarter.

†† Courses in conversation may be taken only when accompanied by the corresponding courses in composition. Courses in composition may be taken separately.

* Open without petition to sophomores who have the prerequisites and who satisfy the requirements given on page 21.

‡ See departmental requirements, note on freshmen entering 3 years of high school Spanish. No student may receive credit for both Course 20 and courses 50-51-52 and 53-54-55.

No.	Title	Hour	Day	Bldg.	Instructor
50f-51w-52s†	Spanish Conversation†† (3 cred.; jr., sr.*; prereq. 3-4)	II	MW	205F	Mr. Coburn
53f-54w-55s†	Spanish Composition (3 cred.; jr., sr.*; prereq., 3-4)	II	F	205F	Mr. Coburn
56f-57w-58s†	Adv. Spanish Conversation†† (3 cred.; jr., sr.*; prereq., 50-51-52)	VI	MW	4F	Ar
59f-60w-61s†	Adv. Spanish Composition (3 cred.; jr., sr.*; prereq., 53-54-55)	VI	F	4F	Ar
62-63-64†	*Practical Spanish Phonetics* (6 cred.; jr., sr.*; prereq., 65-66-67, and 20, or 50-51-52 and 53-54-55)	*Not offered in 1922-23*			
65f-66w-67s†	Survey of Spanish Lit. (9 cred.; jr., sr.*; prereq., 3-4)	II	TThS	125F	Mr. Gillet
68w-69s†	Survey of Spanish Lit. (10 cred.; jr., sr.*; prereq., 3-4)	VI	MTWThF	227F	Mr. Torres
70f-71w-72s†	South Amer. Life and Institutions (6 cred.; jr., sr.*; prereq., 20, or 50-51-52 and 53-54-55)	VII	MW	4F	Mr. Torres
73-74-75†	*Span. Commer. Correspond.* (3 cred.; jr., sr.*; prereq., 20, or 53-54-55)	*Not offered in 1922-23*			
80f-81w-82s†	Spanish Lit.: 19th Century (9 cred.; jr., sr.*; prereq., 65-66-67, or 68-69)	IV	MWF	227F	Ar
83-84-85†	*Spanish American Lit.* (6 cred.; jr., sr.*; prereq., 65-66-67 or 68-69 or 20 or 50-51-52 and 53-54-55)	*Not offered in 1922-23*			
100-101-102†	*Spanish Oral Diction* (6 cred.; jr., sr., grad.; prereq., 56-57-58)	*Not offered in 1922-23*			
103f-104w-105s†	Spanish Syntax (3 cred.; jr., sr., grad.; prereq., 59-60-61)	VIII	M	203F	Mr. Olmsted
115f-116w-117s†	Spanish Lit.: 17th Century (6 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	IV	TS	227F	Mr. Gillet
141-142-143†	*Spanish Novel* (6 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	*Not offered in 1922-23*			
150-151-152†	*Spanish Dramatic Lit.* (6 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	*Not offered in 1922-23*			
156-157-158†	*Spanish Lit.: 16th Century* (6 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	*Not offered in 1922-23*			
159-160-161†	*Cervantes* (6 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	*Not offered in 1922-23*			
174f-175w-176s†	Lectures in Spanish (6 cred.; jr., sr., grad.; prereq., 20 (or 50-51-52 and 53-54-55) and 65-66-67)	IX	TTh	202F	Ar

† The entire course must be completed before credit is received for any quarter.

†† Courses in conversation may be taken only when accompanied by the corresponding courses in composition. Courses in composition may be taken separately.

* Open without petition to sophomores who have the prerequisites and who satisfy the requirements given on page 21.

SCANDINAVIAN

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w	Beginning Norwegian..... (10 cred.; all; no prereq.)	I	TWThFS	206F	Mr. Bothne
3s	Intermediate Norwegian..... (5 cred.; all; prereq., 1-2, or 1 yr. high school)	I	TWThFS	206F	Mr. Bothne
4f-5w	Adv. Norwegian (Survey)..... (10 cred.; soph., jr., sr.; prereq., 1-2-3 or 2 yrs. high school)	III	MTThFS	206F	Mr. Bothne
7f-8w	Beginning Swedish..... (10 cred.; all; no prereq.)	II	MWThFS	206F	Mr. Stomberg
9s	Intermediate Swedish..... (5 cred.; all; prereq., 7-8 or 1 yr. high school)	II	MWThFS	206F	Mr. Stomberg
10f-11w	Adv. Swedish..... (10 cred.; soph., jr., sr.; prereq., 7-8-9 or 2 yrs. high school)	I	TWThFS	110F	Mr. Stomberg
12s	Ancient and Medieval Scandinavian History..... (5 cred.; soph., jr., sr.; prereq., 10-11, or 4-5, or Hist. 1-2)	I	TWThFS	110F	Mr. Stomberg
45s	Scandinanvian Mythology..... (3 cred.; jr., sr., grad.*; prereq., none)	IV	MWF	206F	Mr. Stomberg
101f-102w-103s	Modern Norwegian Lit..... (9 cred.; jr., sr., grad.; prereq., 4-5)	II	TThS	110F	Mr. Bothne
104f-105w	Mod. Scand. History..... (6 cred.; jr., sr., grad.; prereq., 10-11-12, or 4-5, or 15 cred. in hist.)	IV	MWF	206F	Mr. Stomberg
107f-108w-109s	Modern Swedish Lit..... (9 cred.; jr., sr., grad.; prereq., 10-11-12)	VI	MWF	206F	Mr. Stomberg
110w	Ibsen ..... (3 cred.; sr., grad.; prereq., 101-102-103)	IV VI	T TTh	206F 206F	Mr. Bothne
111-112-113	*Old Norse (Icelandic)*..... (6 cred.; sr., grad.; prereq., consent of instructor)	*Not offered in 1922-23*			
114f	Strindberg ..... (3 cred.; sr., grad.; prereq., 107-108-109)	Ar	Ar	Ar	Mr. Stomberg
117s	Earlier Norwegian Lit..... (5 cred.; jr., sr., grad.; prereq., 4-5)	III	MTThFS	206F	Mr. Bothne
130f-131w-132s	Danish Lit. of the 19th Century (9 cred.; jr., sr., grad.; prereq., 4-5)	Ar	Ar	206F	Mr. Bothne
134-135	*The Landsmaal Movement*..... (6 cred.; sr., grad.; prereq., 101-102-103, or 130-131-132)	*Not offered in 1922-23*			
136s	Björnson ..... (3 cred.; sr., grad.; prereq., 101-102-103, or 130-131-132)	IV VI	T TTh	 206F	 Mr. Bothne

* Does not count as a Senior College course. Not open to sophomores under the rule on page 21.

SHOP PRACTICE

11f-12w-13s	Shop Practice..... (6 cred.*; pre-dent. only; no prereq.)	VII, VIII, IX	MW MF	MechE (fall, winter) (spring)	Mr. Shipley

SOCIOLOGY AND SOCIAL WORK

Major Advisers

Professor Bernard; Associate Professor Elmer, Lecturer Bruno.

Major Sequences

Sequence A. General sociology. Courses 51, 52, 53, 55 or 60, 110 or 114 or 128 or 134, two of 100, 101 or 102, 119 or 130 or 132, 120 or 141, 122 or 123 (for students who have had the equivalent of 122).

Sequence B. Social theory. Courses 51, 52, 53, 100, 101, 102, 119, 120, 140, 141.

Sequence C. Rural sociology. Courses 51, 52, 53, 60, 90, 91, 100, 101 or 102 or 120, 110 or 114, 122, 123 or 119.

Sequence D. Rural social work. Courses 51, 52, 60, 90, 91, 110, 114, 122, 128; Agricultural Education 54 and 161; Political Science 157 or 158; Pathology and Public Health (Medical School) 103.

Sequence E. Medical social service. Courses 51, 52, 53, 60; Psychology 125-126 or 144-145; Pathology and Public Health (Medical School) 103; Bacteriology 1; Sociology 90-91-92; 133 and 138-139.

Sequence F. General social service. Courses 51, 52, 53, 55, 60, 90-91-92, 100 or 120, 122, 128 or 130 or 132.

Sequence G. Industrial relations. (To be arranged later.)

Prerequisites: A total of 25 credits from among the following departments: Sociology, Animal Biology, Economics, Education, History, Philosophy, Political Science, and Psychology. Students who are deficient in prerequisites may be required to make up their deficiencies in Junior College courses.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

No.	Title	Hour	Day	Bldg.	Instructor
1f	Introd. to Sociology..... (5 cred.; soph., jr., sr., and 3d qu. fr.; no prereq.)				
	Sec. 1	I	TWThFS	9F	
	2	III	MTThFS	5F	
	3	IV	MTWFS	9F	
	4, 5	VI	MTWThF	9F	
	6	VII	MTWThF	5F	
	7 (Farm, 3 cred.)	II	MWF	105En(F)	Mr. Lundquist
1w	Introd. to Sociology..... (See 1f)				
	Sec. 1	I	TWThFS	9F	
	2	III	MTThFS	5F	
	3	IV	MTWFS	9F	
	4, 5	VI	MTWThF	9F	
	6	VII	MTWThF	9F	
	7	II	MWF	5F	
	8 (Farm, 3 cred.)	VIII	MTWThF	105En(F)	Mr. Lundquist

* Does not carry credit except for pre-dental students.

No.	Title	Hour	Day	Bldg.	Instructor
1s	Introd. to Sociology.....				
	(See 1f)				
	Sec. 1	I	TWThFS	9F	
	2	II	MWThFS	5F	
	3	III	MTThFS	9F	
	4	IV	MTWFS	9F	
	5, 6	VI	MTWThF	9F	
	7	VII	MTWThF	5F	
	8	VIII	MTWThF	9F	
	9 (Farm, 3 cred.)	II	MWF	105En(F)	Mr. Lundquist
3f	Educational Sociology.....				
	(3 cred.; jr., sr.; prereq., 1)				
	Sec. 1	II	MWF	Ed	Mr. Finney
	2	III	MWF	Ed	Mr. Finney
3w,s	Educational Sociology.....				
	(See 3f)	III	MWF	Ed	Mr. Finney
6f,w,s	Modern Social Reform Movements				
	(3 cred.; soph., jr., sr.; prereq., 1)				
	Sec. 1	II	TThS	5F (fall, winter) 113 (spring)	Ar
	2	IV	MWF	5F	Ar
	3	VI	MWF	6F	Ar
14f,w	Rural Sociology.....				
	(3 cred.; soph., jr., sr.; prereq., 1)				
	Sec. 1	III	MWF	9F	Mr. Hoffer
	2	VI	MWF	25F	Mr. Lantis
	(Farm) 3	II	TThS	105En(F)	Mr. Lundquist
14s	Rural Sociology.....				
	(See 14f,w)				
	Sec. 1	III	MWF	25F	Ar
	2	VI	MWF	25F	Ar
45-46	*Elements of Social Hygiene and Community Protective Work..*	*Not offered in 1922-23*			
	(2 cred.; jr., sr.; prereq., 1)				
51f,w,s	The Occurrence of the Socially Inadequate	I	MWF	5F	Mr. Bruno
	(3 cred.; jr., sr.; prereq., 10 cred. in soc.; or Soc. 1 and 10 cred. in soc. sci. or psych.)				
52f,w,s	Elementary Case Work.....	I	TThS	5F	Mr. Bruno
	(3 cred.; jr., sr.; prereq., 51)				
53f,w,s	Elements of Criminology.....	III	MWF	209½F	Mr. Elmer
	(3 cred.; jr., sr.; prereq., same as for 51)				
55w	Housing Problems.....	I	MWF	25F	Mr. Davis
	(3 cred.; jr., sr.; prereq., same as for 51)				
60f,w	Child Welfare.....	IX	MWF	9F	Mr. Hodson
	(3 cred.; jr., sr.; prereq., 51 and 52)				
90,91,92f	Elementary Field Work.....				
	(2, 4, or 6 cred.; jr., sr.; prereq., same as for 51)				
	Sec. 1	I, II, III	MW		Mrs. Mudgett
	2	I, II, III	WF		
	3	VI, VII, VIII	MW		
	4	VI, VII, VIII	WF		
	5	VI, VII, VIII	TTh		

No.	Title	Hour	Day	Bldg.	Instructor
90,91,92w	Elementary Field Work..... (See 90, 91, 92f)				
	Sec. 1	II, III, IV	MW		Mrs. Mudgett
	2	II, III, IV	WF		
	3	VI, VII, VIII	MW		
	4	VI, VII, VIII	WF		
	5	VI, VII, VIII	TTh		
90,91,92s	Elementary Field Work..... (See 90, 91, 92f)				
	Sec. 1	VI, VII, VIII	MW		Mrs. Mudgett
	2	VI, VII, VIII	WF		
	3	II, III, IV	TTh		
	4	VI, VII, VIII	TTh		
97f-98w-99s	Advanced Field Work..... (3, 6, or 9 cred.; jr., sr.; prereq., 90 and 91)	Ar	Ar	Ar	Mrs. Mudgett
100f	Social Psychology..... (3 cred.; primarily for sociology students; jr., sr., grad.; prereq., Soc. 1, Psych. 1-2, and 11 cred. in soc. sci., educ., philos., and psych.)	II	TThS	9F	Mr. Bernard
101w	Social Organization..... (3 cred.; jr., sr., grad.; prereq., 4 courses in soc., or Soc. 1 and 15 cred. in soc. sci., educ., philos., or psych.)	II	TThS	9F	Mr. Bernard
102s	Social Control..... (3 cred.; jr., grad.; prereq., same as for 101)	II	TThS	9F	Mr. Bernard
103	*Sociology of Conflict*..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	*Not offered in 1922-23*			
104	*State Care of Dependents, Defectives, and Delinquents in Minn.* (2 cred.; jr., sr., grad.; prereq., 51, 52, and 53 or 60)	*Not offered in 1922-23*			
110w	Community Organization and Social Work in Small Towns and Country ..... (2 cred.; jr., sr., grad.; prereq., same as for 101)	VIII, IX	Th	5F	Mr. Bernard
114s	Rural Social Institutions..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	I	MWF	105En(F)	Mr. Lundquist
119f	The Family..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	III	TThS	9F	Mr. Elmer
120f	Social Progress..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	II	MWF	9F	Mr. Bernard
122w	Methods of Social Investigation. (3 cred.; jr., sr., grad.; prereq., same as for 101)	VIII	MWF	9F	Mr. Elmer
123s	Social Statistics..... (3 cred.; jr., sr., grad.; prereq., 122)	VIII	MWF	9F	Mr. Elmer

No.	Title	Hour	Day	Bldg.	Instructor
125-126-127	*Settlement and Community Center Work* ..... (4 cred.; sr., grad.; prereq., consent of director)	*Not offered in 1922-23*			
128s	Charitable Administration, Finance and Publicity..... (2 cred.; jr., sr., grad.; prereq., same as for 101)	VIII, IX	Th	5F	Mr. Davis
130s	Advanced Case Work..... (2 cred.; jr., sr., grad.; prereq., same as for 101 incl. 51 and 52)	VIII, IX	Th	15F	Mr. Bruno
132	*Juvenile Courts and Probation*.. (2 cred.; jr., sr., grad.; prereq., 51, 52, 53)	*Not offered in 1922-23*			
133f	Medical Social Service..... (3 cred.; jr., sr., grad.; prereq., same as for 130)	IX and Ar	WF and Ar	5F	Dr. Brannick
134s	Legal Protection of the Child.. (3 cred.; jr., sr., grad.; prereq., same as for 101 incl. 60)	IX	MWF	5F	Mr. Hodson
135s	Field Practice in Legal Protection of the Child..... (2 cred.; jr., sr., grad.; prereq., open to students taking 134)	Ar	Ar	Ar	Mrs. Mudgett
138w-139s	Mental Case Work..... (3 cred.; jr., sr., grad.; prereq., same as for 130)	IX	Th and Ar	9F	Miss Seeberg
140w	History of Social Theory..... (3 cred., jr., sr., grad.; prereq., same as for 101)	II	MWF	5F	Mr. Bernard
141s	Contemp. Social Theory..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	II	MWF	5F	Mr. Bernard
150	*Seminar: Social Aspects of the Labor Problem*..... (2 cred.; sr., grad.; prereq., consent of director)	*Not offered in 1922-23*			
151	*Seminar: Social Aspects of the Labor Problem*..... (2 cr.; sr., grad.; prereq., consent of director)	*Not offered in 1922-23*			
152	*Seminar: Problem of Institutional Administration and Reconstruction* ..... (2 cred.; sr., grad.; prereq., consent of director)	*Not offered in 1922-23*			
180f-181w-182s	Seminar in Educ. Sociology..... (6 cred.; jr., sr., grad.; prereq., 1, 6, 120)	IX, X	M	Ed	Mr. Finney

COURSES IN OTHER COLLEGES

These courses are open to election by seniors, subject to the regulations on page 27.

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

The following divisions of this college offer courses to students in the College of Science, Literature, and the Arts who can meet the prerequisites:

Agricultural Biochemistry	Farm Engineering
Agricultural Education	Forestry
Agronomy and Farm Management	Home Economics
Animal Husbandry	Horticulture
Bee Culture	Plant Pathology and Botany
Dairy Husbandry	Soils
Entomology and Economic Zoology	Veterinary Medicine

Descriptions of the courses will be found in the bulletin of the College of Agriculture, Forestry, and Home Economics. The hour schedule will be found in the program issued each quarter.

SCHOOL OF BUSINESS

Students in the College of Science, Literature, and the Arts are limited to courses in economics announced in this bulletin.

COLLEGE OF EDUCATION

DEPARTMENT OF PHYSICAL EDUCATION FOR WOMEN

		Credits
77	Anatomy and Kinesiology	3

For description of these courses see bulletin of the College of Education.

LAW SCHOOL

First Quarter	*Second Quarter*	*Third Quarter*
*Contracts (3)	*Contracts (3)	*Contracts (3)
*Property (5)	*Property (3)	*Property (3)
*Torts (3)	*Torts (3)	*Torts (3)

SCHOOL OF MINES

1w	Assaying
2w	Assay Laboratory
3f	General Metallurgy
4w	Metallurgy of Pig Iron
5s	Metallurgy of Wrough Iron and Steel
105f	Metallurgy of the Base Metals
106w	Continuation of Course 105f
107s	Metallurgy of the Precious Metals
153f,154w,155s	Metallography

* The entire course must be completed before credit is received for any quarter.

INDEX

The Bulletin *of the* University *of* Minnesota

Public Health Courses Announcement for the Year 1922-1923

Vol. XXV No. 21 June 5 1922

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ANNOUNCEMENT OF PUBLIC HEALTH COURSES AND CURRICULA

The knowledge as to the way in which health may be preserved and disease avoided is no longer of interest to the medical profession alone. Teachers, parents, and citizens are realizing that health is a community problem in which each and every one must do his part and the public is beginning to shoulder its share of the responsibility. In order to do this, trained teachers and leaders are necessary and general education is essential.

In response to this increasing demand on the part of the public for health education and for trained leaders in the various fields of public health work the Board of Regents at its meeting on April 26, 1922, authorized the establishment of a Department of Preventive Medicine and Public Health. This department is in the Medical School but it will offer courses which will be available to students in all colleges and schools of the University.

Various departments of the University already have been offering courses which are necessary for the education of sanitarians, health officials, teachers, etc. Those courses which were not previously available will now be offered by this new department. So henceforth, by properly choosing majors, minors, and electives in accordance with the curriculum provisions of the college in which the student is registered, such a student may obtain training for the various phases and specialties of health work.

The director and instructors of the Department of Preventive Medicine and Public Health will be glad to advise students who are thinking of public health work as a career. There is a need for trained workers in this field at the present time.

General courses, elementary and more advanced, will be offered to medical students, teachers, social service workers, and students of the colleges of Education, Home Economics, Science, Literature, and the Arts, etc. These courses will carry credits towards graduation as indicated, subject to the curriculum requirements of the college in which the student is registered.

INSTRUCTORS AND LECTURERS

The personnel of the department has not yet been definitely determined, but it will include:

HAROLD S. DIEHL, M.A., M.D., Director—also Director of Students' Health Service

ALBERT J. CHESLEY, M.D., Executive Officer, State Board of Health

F. E. HARRINGTON, B.S., M.D., LL.D., Director, Minneapolis Board of Health

ORIANNA MCDANIEL, M.D., Director, Division of Preventable Diseases, State Board of Health

H. A. WHITTAKER, B.A., Director, Division of Sanitation, State Board of Health

E. M. WADE, M.A., Director of Laboratories, State Board of Health

WILLIAM F. WILD, M.D., C.P.H., Executive Secretary, Minnesota Public Health Association

MABEL ULRICH, M.D., Executive Secretary, Hennepin County Public Health Association

L. W. FEEZER, B.A., LL.B., Assistant Director, Division of Venereal Diseases, State Board of Health

ANNA JONES, B.A., R.N., Instructor in Public Health Nursing

ALMA HAUPT, B.A., R.N., Director, Visiting Nurses' Association, Minneapolis

E. A. MEYERDING, M.D., Director of Department of Hygiene, St. Paul Public Schools

RUTH E. BOYNTON, B.A., M.D., Assistant Director, Students' Health Service

WILLIAM P. SHEPARD, B.S., M.B., Assistant Director, Students' Health Service

LEONARD W. LARSON, M.S., M.B., Physician, Students' Health Service

O. C. PIERSON, Director, Division of Records, State Board of Health

R. W. ARCHIBALD, V.M.D., Bacteriologist, Division of Sanitation, State Board of Health

ALICE FULLER, B.A., R.N., Supervisor of Instruction, Visiting Nurses' Association of Minneapolis

HALLY J. FISHER, R.N., Instructor in Home Nursing

Special lecturers will be obtained from other departments of the University and from various official and voluntary health institutions and organizations in the Twin Cities and the state.

DEPARTMENT OF PREVENTIVE MEDICINE AND PUBLIC HEALTH

SUBCOLLEGIATE COURSES

1f. HOME NURSING AND HYGIENE I. (Identical with A33.) Home nursing equipment and methods practicable in the household. Communicable diseases, methods of prevention, control, and disinfection. No prerequisites. For Agricultural School students. 2 credits. DR. BOYNTON, MISS FISHER.

2w. HOME NURSING AND HYGIENE II. (Identical with A34.) Hygiene requirements during infancy, childhood, womanhood, maturity. Household emergencies, preparation for maternity, care of infant. No prerequisites. For Agricultural School students. 2 credits. Dr. BOYNTON, MISS FISHER.

COLLEGE COURSES

10f,w,s. PERSONAL HYGIENE. An elementary course on the care of the human body for students of all colleges. 12 hours. No prerequisites. Staff.

11w. FIRST AID. (Identical with H.E.38.) Offered to women in physical education. Laboratory demonstrations and practice. General care and observation of patients. Emergencies and first aid treatment. Prerequisites: Animal Biology 9 credits. 1 credit. MISS FISHER.

12w. HYGIENE AND FIRST AID TO THE SICK AND INJURED. For freshman engineers. One hour per week during the winter quarter. No prerequisites. DR. DIEHL, DR. COOKE, DR. BROWN.

50w,su. PUBLIC AND PERSONAL HEALTH. Intended primarily for teachers and for academic students. Presents the fundamental principles underlying health promotion and disease prevention. Lectures, demonstrations, laboratory work, discussions, inspection trips, and directed reading. Prerequisites: Biology 1-2 and Psychology 1-2. 48 hours. 3 credits. DR. DIEHL, DR. SHEPARD, DR. BOYNTON, DR. LARSON.

51f. ELEMENTS OF PREVENTIVE MEDICINE. Primarily for public health nurses, students of physical education, and home economics. Methods for prevention and control of disease; value and limitations of personal hygiene and of physical education; relative importance of persons and environment. Prerequisites: Biology 1-2; Physiology 4 or 57-58; Bacteriology 1 or equivalent. 48 hours; 3 credits. DR. DIEHL, DR. CHESLEY, and others.

52f,s. HEALTH CARE OF THE FAMILY. (Identical with H.E.37.) First aid; communicable diseases; their transmission and prevention; hygiene of infancy, maidenhood, maturity. The care of the sick room; observation

and care of the patient. Elementary symptomatology. Open only to juniors and seniors who have had some bacteriology. 3 credits. Dr. Boynton, Miss Fisher.

54w. Public Health Organizations. Purpose, scope, activities, organization, and operation of various public health agencies. Lecturers from the organizations. Prerequisite: 50 or 51 or 55. 24 hours; 2 credits.

55f. Preventive Medicine and General Hygiene. Personal and public factors which favor occurrence of disease among individuals and communities; modes of transmission and importance of environment in the spread of disease. Practicing physicians' responsibilities in health work. Fifth-year medical students. 33 hours; 3 credits. Dr. Diehl and staff.

56f,w,s,su. Public Health Administrative and Field Work. Demonstrations of health agencies at work; boards of health, laboratories, filtration, pasteurization, and garbage disposal plants. Presentation of actual public health problems. Groups of 10 to 15 students for 8 weeks. Prerequisite: 55. 32 hours; 2 credits. Dr. Diehl and staff.

58w. Child Study. The maternal welfare program; importance of breast-feeding; origin and conduct of infant welfare clinics in cities and rural communities; consideration of child of pre-school and school age as to malnutrition, physical defects, cardiac and nervous disorders. Prerequisite: 50 or 51. 18 hours; 1½ credits. Dr. Adair, Dr. Huenekens, Dr. Tolg, Dr. Patterson, Dr. Pearce, Dr. Seham.

59. Social Hygiene. Relation to public health. Sex development to age of twelve; adolescence; sex incorrigibility. Methods of education in schools. Responsibility of public health nurse. Prevention and control of venereal disease; clinics; follow-up system. Prerequisite: 50 or 51. Dr. Ulrich.

60w. The Tuberculosis Problem. History of tuberculosis movement and campaign in the United States of America. Early diagnosis and sanatorium treatment. Tuberculosis in children. The psychology of tuberculosis; supervision of returned sanatoria patients. State program for the eradication of tuberculosis; legislation. Prerequisite: 50 or 51. 18 hours; 1½ credits. Dr. Wittich, Dr. Seham, Dr. Elmer, Dr. Davis, and others.

61w. Mental Hygiene. History of movement; factors underlying mental disease; diagnosis of feeblemindedness and border-line cases; institutional treatment; insanity; its relation to social work and to the institution; the importance of psychiatric nursing. Prerequisites: 50 or 51 and Psychology 1-2. 12 hours; 1 credit. Dr. Nixon, Dr. Dvorak, Miss Haupt, Miss Seeberg.

62f. Principles of Public Health Nursing. Its historical development; principles of organization; methods of administration; general visiting nursing; special branches of public health nursing; financing; system of records; special lectures and observation excursions. Prerequisite: 51. 36 hours; 3 credits. Miss Jones.

63f,w,s,su. FIELD PRACTICE IN VISITING NURSING. Lectures, demonstrations, supervision, and field practice in bedside care of general and maternity patients; communicable disease, tuberculosis and mental cases with special emphasis upon recognition of social problems, coöperation with social agencies and accurate record-keeping. Prerequisite: 62. 176 hours; 5 credits. MISS HAUPT, MISS FULLER.

64f,w,s,su. FIELD PRACTICE IN INFANT WELFARE NURSING. Supervised practice in teaching the value of breast-feeding; of determining the eligibility for clinic; of keeping complete records. Practice in the conduct of infant welfare and pre-school age clinics with necessary follow-up visits. Prerequisites: 62 and 58. 132 hours; 3 credits. MISS JONES.

65f,w,s,su. FIELD PRACTICE IN SCHOOL NURSING. Contact with medical school inspection with the physicians; routing inspections with the nurse; general sanitary inspections, home visits, visits to special classes as sight-saving, defective speech and hearing, subnormal, open air, and tuberculosis schools. Prerequisite: 62. 80 hours; 2 credits. DR. HARRINGTON, DR. MEYERDING.

66f,w,s,su. FIELD PRACTICE IN COUNTY NURSING. The student nurse observes and assists the nurse on her rounds in the county, in the routine physical inspection of school children, the home calls, the health talks and classes in home nursing, as well as the organizing, advertising, and conducting of the rural clinic. Prerequisite: 62. 80 hours; 2 credits. MISS JONES.

67f,w,s,su. FIELD PRACTICE IN A TUBERCULOSIS SANATORIUM. Observation and practical care of pulmonary, osseous, laryngeal tuberculosis; tuberculosis enteritis; general sanatorium treatment; special treatment; exercise; laboratory; occupational therapy and the reading of literature on tuberculosis. Prerequisites: 60 and 62. 2 credits. DR. MARIETTE.

100. SCHOOL HYGIENE AND MEDICAL INSPECTIONS. Physical examinations; posture; immunity reactions; vaccination; physical exercise; sanitation; lighting; ventilation; medical, nursing, and dental service. Open only to graduate medical students. Credits arranged. DR. MEYERDING, DR. HARRINGTON, and others.

101. INDUSTRIAL HYGIENE AND INDUSTRIAL DISEASES. Physical examinations; working conditions—lighting, ventilation, noise, dust; industrial poisons; accidents; recreation; education; economic conditions; medical and nursing service, industrial insurance. Open only to fifth- and sixth-year medical students and graduates. To be arranged.

102. SANITATION. Food, water, and milk analyses and control; sanitary inspections and surveys. Prerequisites: Bacteriology 101; Chemistry 126; Physiology 100-101. Credits arranged. MR. WHITTAKER, DR. ARCHIBALD.

103. PUBLIC HEALTH BACTERIOLOGY. Modern methods of a public health laboratory in making diagnoses; in the preparation of vaccines, and in research. Prerequisites: Bacteriology 101, 106. Credits arranged. MISS WADE.

104. EPIDEMIOLOGY. Lectures on principles and methods of epidemiological investigation. Analysis of data; methods of reaching conclusions; individual field work; collateral reading. Open only to graduate medical students. Credits arranged. DR. CHESLEY, DR. MCDANIEL.

105. VITAL STATISTICS. Application of statistical methods to morbidity and mortality figures; births and deaths; the drawing of conclusions; preparation of tables and graphs; measurement of effectiveness of health activities; calculation of expectancy; actual experience with the State Board of Health. Prerequisites: 51 and Econ. 14. Credits arranged. MR. FEEZER, MR. PIERSON.

106. PUBLIC HEALTH ADMINISTRATION. Organization of state, municipal, and voluntary health activities; preparation of budgets; procedures in enforcing quarantine; in correcting unsanitary conditions; in controlling tuberculosis and venereal diseases; value of sanitary surveys, food inspections, etc. Prerequisite: 54 or 56. Credits arranged. DR. DIEHL, DR. CHESLEY, DR. HARRINGTON, DR. WILD, DR. ULRICH.

107. SANITARY LEGISLATION. Studies of federal, state, and municipal quarantine laws; of the health laws of the various states, particularly of Minnesota, and of the local municipalities. Prerequisite: 106. To be arranged.

108. PUBLIC HEALTH EXPERIENCE. This will consist of actual health work, under supervision, in one or more of the approved public health organizations. The time, assignment, and credits will be arranged. Prerequisite: 104 or 106.

200. RESEARCH. Opportunities will be offered by the University and by the various coördinated organizations for qualified students to pursue research work.

ADDITIONAL COURSES

Other courses offered in the University which will be included in curricula leading to degrees in public health:

SCHOOL OR DEPARTMENT	COURSE TITLE	COURSE NUMBER
Animal Biology	General Zoology	1-2; 5-6-7
Animal Biology	Animal Parasites	49
Animal Biology	Insects and Disease	45
Animal Biology	Protozoology	107
English	Public Speaking	41-42-43
Economics	Principles of Economics	3-4
Economics	Elements of Statistics	14
Economics	Social Insurance	62
Economics	Life Insurance	59
Economics	Theory of Statistics	113
Chemistry	Sanitary Water Analysis	126
Political Science	State Government	7
Political Science	Municipal Government	11
Political Science	Government of Minnesota	111
Psychology	General Psychology	1-2
Psychology	Social Psychology	127
Sociology	Rural Sociology	14
Sociology	Background of Dependency and Defectiveness	51

School or Department	Course Title	Course Number
Sociology	Treatment of Dependents and Defectives	52
Sociology	Methods of Social Investigation	122
Sociology	Social Statistics	12
Education	Child-Training	40
Education	Elementary Educational Psychology	139
Education	Mental Tests and Mental Diagnosis	135-136
Anatomy	Human Anatomy	2 or 3 or 5
Physiology	Physiology	4 or 57-58 or 101-102-103-104
Pathology	Pathology	4 or 101-102
Bacteriology and Immunology	General Bacteriology	1
Bacteriology and Immunology	Special Bacteriology	101
Bacteriology and Immunology	Household Bacteriology	105
Bacteriology and Immunology	Higher Bacteria	114
Bacteriology and Immunology	Immunity	116
Engineering	Water Supply Engineering	162
Engineering	Sanitary Engineering	163
Engineering	Water and Sewage Purification	261
Home Economics Education	Child-Training	40
Entomology	Home Economics Entomology	20

CURRICULA AND DEGREES

By the choice of appropriate studies students may prepare themselves to follow various careers in public health work. In undergraduate years sequences may be pursued which will prepare the student for one of several vocations. He may become qualified to undertake the chemical and bacteriological examination of water, sewage, foods, excretions, blood, etc., to assume certain minor executive positions in public health organizations; to become a teacher of elementary health subjects; to carry on welfare work with a full appreciation of the social and economic importance of disease; or to do statistical work with health departments or insurance companies.

Graduate students with the proper qualification may prepare themselves to serve as specialists in certain fields of public health work or they may procure a thoro general training with a certain amount of practical experience in public health.

A special circular on public health nursing will be sent on request to the registrar.

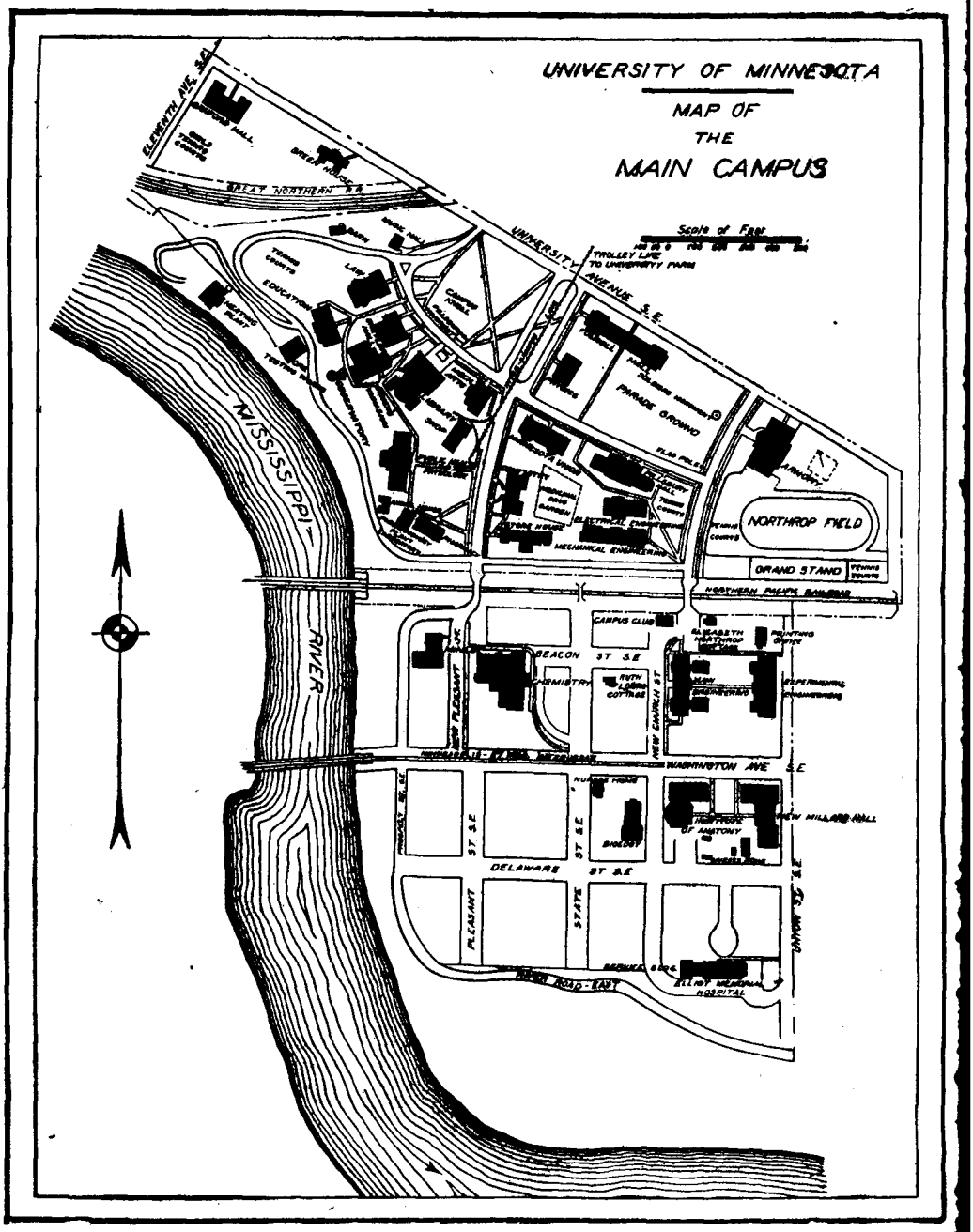
Such undergraduate and graduate students as satisfactorily fulfill the requirements of the University will be granted appropriate degrees.

Further inquiries concerning the above mentioned courses and curricula should be addressed to Dr. H. S. Diehl, Millard Hall. University of Minnesota.

THE COLLEGE OF ENGINEERING AND ARCHITECTURE

ANNOUNCEMENT OF COURSES
FOR THE YEAR

1922-1923



Area of Main Campus, 108.5 acres

1922

JULY

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	..	1
2	3	**4**	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	**28**	29
30	31	..	..	..	..	..

AUGUST

Su	Mo	Tu	W	Th	Fr	Sa
..	..	1	2	3	4	5
6	**7**	8	9	10	11	12
13	14	15	16	17	18	19
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SEPTEMBER

Su	Mo	Tu	W	Th	Fr	Sa
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10	11	12	13	14	15	16
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24	25	26	**27**	28	29	30
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OCTOBER

Su	Mo	Tu	W	Th	Fr	Sa
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NOVEMBER

Su	Mo	Tu	W	Th	Fr	Sa
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5	**6**	7	8	9	10	**11**
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DECEMBER

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31	..	..	..	..	..	..

1923

JANUARY

Su	Mo	Tu	W	Th	Fr	Sa
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FEBRUARY

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MARCH

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APRIL

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MAY

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JUNE

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JULY

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AUGUST

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26	**27**	28	29	30	31	..
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SEPTEMBER

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OCTOBER

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28	29	30	31	..	..	..
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NOVEMBER

Su	Mo	Tu	W	Th	Fr	Sa
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25	26	27	28	29	30	..
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DECEMBER

Su	Mo	Tu	W	Th	Fr	Sa
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16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	..	..	..	..	..

UNIVERSITY CALENDAR

1922-23

1922			
September	16	Saturday	Payment of fees closes, except for new students
September	19-26		Examinations for removal of conditions and entrance examinations Physical examinations for all new students
September	19-23		Registration period, colleges of Science, Literature, and the Arts, and Agriculture, Forestry, and Home Economics
September	25	Monday	First semester evening extension classes begin
September	25-26		Registration days for all colleges not indicated above
September	26	Tuesday	Payment of fees for new students closes
September	27	Wednesday	Fall quarter begins, 8:30* a.m.
October	14	Saturday	Class Scrap Day; classes dismissed the third and fourth hours
October	26	Thursday	Senate meeting, 4:30 p.m.
November	4	Saturday	Home Coming Day; classes dismissed the third and fourth hours
November	7	Tuesday	General Election Day; a holiday
November	11	Saturday	Armistice Day; a holiday
November	30	Thursday	Thanksgiving Day; a holiday
December	14	Thursday	Senate meeting, 4:30 p.m.
December	20	Wednesday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
1923			
January	3	Wednesday	Registration for winter quarter in College of Engineering and Architecture
January	4	Thursday	Christmas vacation ends, winter quarter begins, 8:30* a.m.
January	19	Friday	First semester evening extension classes close
January	29	Monday	Second semester evening extension classes begin
February	12	Monday	Lincoln's Birthday; a holiday
February	15	Thursday	Senate meeting, 4:30 p.m.
February	22	Thursday	Washington's Birthday; a holiday
March	23	Friday	Winter quarter ends, spring vacation begins, 5:20 p.m.
April	3	Monday	Registration for spring quarter in College of Engineering and Architecture

April	4	**Tuesday**	**Spring vacation ends, spring quarter begins, 8:30* a.m.**
May	17	**Thursday**	Senate meeting, 4:30 p.m.
May	18	**Friday**	**Second semester evening extension classes close**
May	30	**Wednesday**	**Memorial Day; a holiday**
June	17	Sunday	Baccalaureate service
June	20	Wednesday	Fifty-first annual commencement
June	20	Wednesday	Spring quarter closes, 5:20 p.m.
June	23-25		Registration days for Summer Session
June	26	Tuesday	Summer Session and summer quarter begin
July	4	Wednesday	Independence Day; a holiday
August	3	Thursday	Summer Session closes
September	7	Friday	Summer quarter closes

* First hour classes begin at 8:15 at University Farm.

*Schedule of Condition Examinations, 1922**

Friday,	September 22	9 a.m.	Physics
		2 p.m.	Chemistry and Civil Engineering
Saturday,	September 23	9 a.m.	Mathematics and Mechanics, Electrical Engineering and Economics
		2 p.m.	Drawing and Descriptive Geometry and Mechanical Engineering
Monday,	September 25	9 a.m.	Rhetoric
		2 p.m.	Architecture

Condition examinations are ordinarily held in the classrooms of the respective departments. The fee is $1. Students purposing to take such examinations are to notify the departments concerned in advance, and make all arrangements with the particular instructors. Where conflicts occur in examination periods, new arrangements should be made with the instructors concerned. Condition examinations will also be held in the first month of the winter and spring quarters for the subjects of the preceding quarter.

Condition examinations at times other than those scheduled require faculty authorization as special examinations, and involve a fee of $5.

* Spring quarter subjects only, except for students not in college in the winter or spring quarter of 1921-22.

COLLEGE OF ENGINEERING AND ARCHITECTURE

FACULTY AND STAFF

LOTUS DELTA COFFMAN, Ph.D., President

WILLIAM WATTS FOLWELL, LL.D., President Emeritus

ORA MINER LELAND, B.S., C.E., Dean of the College of Engineering and Architecture, and the School of Chemistry

CEPHAS D. ALLIN, LL.B., M.A., Professor of Political Science

WILLIAM R. APPLEBY, M.A., Professor of Metallurgy, Dean of the School of Mines

LEON ARNAL, Architecte Diplôme Government France, Professor of Architectural Design

FREDERIC H. BASS, B.S., Professor of Municipal and Sanitary Engineering

ROY G. BLAKEY[1], Ph.D., Professor of Economics

PAUL H. M.-P. BRINTON, Ph.D., Professor of Analytical Chemistry

WILLIAM E. BROOKE, B.C.E., M.A., Professor of Mathematics and Mechanics

SAMUEL C. BURTON, M.A., Assistant Professor of Freehand Drawing and Painting

PETER CHRISTIANSON, B.S., E.M., Professor of Metallurgy

LOUIS J. COOKE, M.D., Associate Professor of Physical Education and Assistant Director of Physical Education and Athletics for Men

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Z. CLARK DICKINSON, Ph.D., Assistant Professor of Economics

HAROLD S. DIEHL, M.A., M.D., Assistant Professor of Public Health and Director of Health Service

GEORGE W. DOWRIE, Ph.D., Professor of Economics, Dean of the School of Business

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HENRY A. ERIKSON, B.E.E., Ph.D., Professor of Physics

LEO J. FARRELL, Captain Infantry, U.S.A., Assistant Professor of Military Science and Tactics

JOHN J. FLATHER, Ph.B., M.M.E., Professor of Mechanical Engineering

JAMES H. FORSYTHE, M.A. (Arch.), Associate Professor of Architecture

ROBERT W. FRENCH, B.S. (C.E.), Assistant Professor of Drawing and Descriptive Geometry

ROBERT N. FRYE, Captain Infantry, U.S.A., Assistant Professor of Military Science and Tactics

ISAAC W. GEIGER, Ph.D., Assistant Professor of Analytical Chemistry

OSCAR E. HARDER, Ph.D., Associate Professor of Metallography

EVERHARD P. HARDING, Ph.D., Associate Professor of Technological Chemistry

[1] Leave of absence, 1922-23.

CARL A. HERRICK, M.E., Assistant Professor of Mathematics and Mechanics
RAYMOND R. HERRMANN, E.E., Assistant Professor of Mathematics and Mechanics
WILLIAM F. HOLMAN, Ph.D., Professor of Mathematics and Mechanics
C. MOREAU JANSKY, JR., M.A., Assistant Professor of Radio Engineering
JACOB O. JONES, B.S. (C.E.), M.C.E., Associate Professor of Hydraulics
ROBERT T. JONES, B.S. (Arch.), Assistant Professor of Architectural Construction
ROY C. JONES, M.S. (Arch.), Assistant Professor of Architectural Design
RAYMOND E. KIRK, M.S., Assistant Professor of General Inorganic Chemistry
WILLIAM H. KIRCHNER, B.S., Professor of Drawing and Descriptive Geometry
MAURICE B. LAGAARD, C.E., Assistant Professor of Structural Engineering
FRED C. LANG, C.E., Assistant Professor of Highway Engineering
FRANCIS P. LEAVENWORTH, M.A., Professor of Astronomy
WILLIAM M. MCCLINTOCK, M.A., Assistant Professor of Mathematics and Mechanics
GEORGE A. MANEY, C.E., M.S., Assistant Professor of Structural Engineering
CHARLES A. MANN, Ph.D., Professor of Chemical Engineering
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GEORGE H. MONTILLON, M.S., Assistant Professor of Chemical Engineering
HOWARD D. MYERS, B.S. (C.E.), Assistant Professor of Drawing and Descriptive Geometry
HOWARD S. NOBLE, B.A., M.B.A., Assistant Professor of Accounting
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FRANK M. RARIG, M.A., Associate Professor of Public Speaking
JOHN J. REIGHARD, M.A., Assistant Professor of Accounting
BURTON J. ROBERTSON, E.E., Assistant Professor of Mechanical Engineering and Assistant Director of the Experimental Engineering Laboratories
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JOHN H. ROWEN, M.A., Associate Professor of Power Plant Engineering
FRANK B. ROWLEY, B.S., M.E., Professor of Mechanical Engineering and Director of the Experimental Engineering Laboratories
WILLIAM T. RYAN, E.E., Associate Professor of Electric Power Engineering
GEORGE D. SHEPARDSON, M.A., M.E., D.Sc., Professor of Electrical Engineering
EDWARD G. SHERBURNE, Major, Infantry, U.S.A., Assistant Professor of Military Science and Tactics

S. Carl Shipley, B.S., M.E., Professor of Machine Construction and Superintendent of Shops

Charles F. Shoop, B.S., B.S.(M.E.), Associate Professor of Steam Engineering

Charles F. Sidener, B.S., Professor of Analytical Chemistry

Roderick W. Siler, B.S., Assistant Professor of Mathematics and Mechanics

M. Cannon Sneed, Ph.D., Associate Professor of General Inorganic Chemistry

Newton W. Speece, Captain Infantry, U.S.A., Assistant Professor of Military Science and Tactics

Frank W. Springer, E.E., Professor of Electrical Engineering

J. Warren Stehman, M.A., Assistant Professor of Economics

Elmer E. Stoll, Ph.D., Professor of English

Girard Sturtevant, Colonel Infantry, U.S.A., Professor of Military Science and Tactics

W. Francis G. Swann, D.Sc., Professor of Physics

John T. Tate, Ph.D., Professor of Physics

Russell C. Throckmorton, Captain Infantry, U.S.A., Assistant Professor of Military Science and Tactics

Andrew C. Tychsen, Captain Infantry, U.S.A., Assistant Professor of Military Science and Tactics

Laurence T. Walker, Major, Coast Artillery Corps, U.S.A., Assistant Professor of Military Science and Tactics

James E. Ware, Lieutenant Colonel, U.S.A., Retired, Assistant Professor of Military Science and Tactics

Lee R. Watrous, Jr., Major Coast Artillery Corps, U.S.A., Assistant Professor of Military Science and Tactics

James T. Watson, Jr., Captain Signal Corps, U.S.A., Assistant Professor of Military Science and Tactics

Hugh B. Wilcox, B.S. (E.E.), M.S., Assistant Professor of Mathematics and Mechanics

Frederick R. Wunderlich, D.D.S., Major Dental Corps, U.S.A., Assistant Professor of Military Science and Tactics

Jeremiah S. Young, Ph.D., Professor of Military Science

Otto S. Zelner, B.S. (C.E.), Assistant Professor of Surveying

Anthony Zeleny, Ph.D., Professor of Physics

Paul C. Gauger, B.S. (Arch.), Lecturer in Architecture

Charles L. Jamison, B.A., Lecturer in Economics

Arthur R. Nichols, B.S., Lecturer in Architecture

Benjamin W. Palmer, M.A., LL.B., Lecturer in Economics

Leon Archibald, B.Sc., Instructor in Drawing and Descriptive Geometry

William O. Beal, M.A., M.S., Assistant Astronomer

Louis M. Becker, B.S., M.E., Instructor in Mathematics and Mechanics

Earl J. Blonshine, Private, First Class, D.E.M.L., Instructor in Military Science and Tactics

CHARLES BOEHNLEIN, B.S., M.E., Instructor in Mathematics and Mechanics

LEONARD F. BOON, E.E., Instructor in Civil Engineering

ALFRED BRANDT, Technical Sergeant, D.E.M.L., Instructor in Military Science and Tactics

EDWIN S. BROWN, M.D., Instructor in Physical Education for Men

HENRY W. BROWN, Sergeant, D.E.M.L., Instructor in Military Science and Tactics

JOHN O. CEDERBERG, JR., Instructor in Drawing and Descriptive Geometry

HAROLD L. COOK, B.A., Instructor in English

JOSEPH E. CUMMINGS, M.A., Instructor in Economics

HENRY DAHL, First Sergeant, D.E.M.L., Retired, Instructor in Military Science and Tactics

RALPH L. DOWDELL, Met.E., Instructor in Metallography

AUBREY R. DUNKUM, Staff Sergeant, D.E.M.L., Instructor in Military Science and Tactics

HENRY C. T. EGGERS, E.E., Instructor in Drawing and Descriptive Geometry

RALPH H. FARMER, B.A., Instructor in Economics

EDMUND B. FELDMAN, B.C.E., Instructor in Civil Engineering

JOHN E. FINLEY, C.E., Instructor in Drawing and Descriptive Geometry

SIDNEY A. FRELLSEN, E.M., Instructor in Drawing and Descriptive Geometry

VICTOR GAUVREAU, Diplôme École, Instructor in Machine Design

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JOSEPH HAVLICEK, Regimental Commissary Sergeant, D.E.M.L., Instructor in Military Science and Tactics

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CARL JENSEN, Regimental Supply Sergeant, U.S.A., Retired, Instructor in Military Science and Tactics

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JOHN MCWILLIAMS, First Sergeant, D.E.M.L., Instructor in Military Science and Tactics

JOHN H. MOFFETT, Met.E., Instructor in Foundry Practice

MILTON N. NELSON, Ph.D., Instructor in Economics

JOSEPH W. NILSON, Instructor in Machine Shop Practice

HARRY J. OSTLUND, B.A., Instructor in Accounting

NORVILLE C. PERVIER, Ph.D., Instructor in Chemistry

ARTHUR P. PETERSON, B.S. (E.E.), Instructor in Drawing and Descriptive Geometry

ORRIN W. POTTER, E.M., Instructor in Drawing and Descriptive Geometry

ARCHIE D. POWER, M.A., Instructor in Physics

EDWARD P. QUIGLEY, Instructor in Forging

CLAYTON M. REASONER, B.S., M.E., Instructor in Metallography

PAUL W. RHAME, M.E., Instructor in Mechanical Engineering

WILLIAM H. RICHARDS, Instructor in Woodworking

HARLOW C. RICHARDSON, B.A., Instructor in English

ROBERT F. SCHUCK, B.S. (E.E.), Instructor in Drawing and Descriptive Geometry

GEORGE M. SCHWARTZ, M.A., Instructor in Geology and Mineralogy

ALPHEUS W. SMITH, B.A., Instructor in English

HARRY E. STRIDER, Technical Sergeant, D.E.M.L., Instructor in Military Science and Tactics

GEORGE W. SWENSON, B.S.E., Instructor in Telephone and Telegraph Engineering

MILO E. TODD, B.A., E.E., Instructor in Electric Power Engineering

GEORGE L. TUVE, B.S., M.E., Instructor in Mechanical Engineering

JOSEPH VALASEK, B.S., Instructor in Physics

JOE WIER, Sergeant D.E.M.L., Instructor in Military Science and Tactics

WILLIAM S. WILLIAMS, B.S. (E.E.), Instructor in Drawing and Descriptive Geometry

ASSISTANTS AND FELLOWS

HARRY W. DIXON, Engineer, Assistant in Power Plant Operation

HENRY C. FORBES, B.S. (E.E.), Assistant in Electrical Engineering

LUDVIG C. LARSON, B.S. (E.E.), Teaching Fellow in Electrical Engineering

EMANUEL C. MANDERFELD, B.S. (E.E.), Teaching Fellow in Electrical Engineering

HARRY MARTINSON, Assistant in Machine Shop Practice

CHARLES F. OLMSTEAD, B.S. (M.E.), Research Fellow in the Engineering Experiment Station

CARL PETERSON, Assistant in Woodworking

FRED TEAL, Assistant in Forging

JOHN A. WIDING, Assistant in Foundry Practice

GENERAL INFORMATION

HISTORY

The College of Engineering and Architecture had its beginning in the College of Agriculture and the Mechanic Arts which was authorized by the legislative act of 1868. Courses in civil and mechanical engineering were first offered in 1871. In the reorganization of the University, in 1872, the College of the Mechanic Arts was established. It became the College of Engineering, Metallurgy, and the Mechanic Arts in 1892, and the College of Engineering and the Mechanic Arts in 1897. A course in Electrical Engineering was first offered in 1887. Architecture and Architectural Engineering were announced in 1912. In 1916 the college received its present name.

THE PURPOSE OF THE COLLEGE

The purpose of this college is to give the students a broad foundation in the fundamental principles of engineering and architecture, together with sufficient knowledge of professional practice to enable them to apply them. It is not possible in college to educate a fully trained engineer, as the application of the principles to the practice of engineering is to be learned through experience. There are certain subjects, such as surveying and drafting, in which some proficiency is required. This enables a student upon graduation to fill satisfactorily a subordinate position while obtaining a basis for growth and advancement.

It is intended that all of the technical courses given in this college shall be taught by men who have had practical experience in their respective fields in addition to their professional training.

The field of engineering is very broad and is continually becoming more extensive. From the technical lines of design, construction, maintenance, and operation of engineering works, which have always belonged to him, the trained engineer has been drawn into the business world to occupy positions of an executive character. To meet the demand for such service, this college recognizes the importance of the broader training of engineers in economic and commercial principles and industrial relations.

Withal, it is intended that the young graduate shall have obtained material assistance in developing those traits of character which will make him a loyal and exemplary citizen and a true gentleman.

DEGREES

The College of Engineering and Architecture offers four-year courses of study in Civil, Mechanical, Electrical and Architectural Engineering, and Architecture. These courses lead to the degree of Bachelor of Science in Civil, Mechanical, Electrical, or Architectural Engineering, or in Architecture.

This college also offers work in the Graduate School leading to the degree of Master of Science in the appropriate branch of Engineering or in Architecture.

The professional degree of Civil, Mechanical, or Electrical Engineer will be conferred upon those who have received the degree of Bachelor of Science in Civil, Mechanical, or Electrical Engineering, after four years of engineering experience in positions of responsibility, who complete the equivalent of one year's college work either in residence or in absentia under the direction of the faculty, and who present a satisfactory thesis.

Students who entered the college prior to the fall of 1919 may obtain the Engineer degree upon the satisfactory completion of one year's post-graduate study, including a thesis. This arrangement will be discontinued after 1923.

Candidates for the Engineer degrees register in the Graduate School.

FEES AND EXPENSES

The annual fee for students in this college is $90 for residents and $120 for non-residents, one third of which is due at the beginning of each quarter. Fellows, scholars, assistants, and instructors are not required to pay University fees or tuition when they are regularly enrolled in the Graduate School.

FEES

Tuition fee (per quarter):	
Residents of Minnesota	$30.00
Non-residents	40.00
Deposit (first quarter only)	5.00
Military deposit (required of all students taking military drill)	15.00
Health fee (per quarter)	2.00
Minnesota Union or Sheviin Hall (per quarter)	1.00
Post-office box (per quarter)	.20
Special fees:	
Examination for removal of conditions	1.00
Examinations for credit (after the first quarter in residence)	5.00
Special examinations	5.00
Chemistry deposit	5.00

PENALTY FEES:

Registration penalties.—A penalty fee for late registration, late change of registration, or late payment of fees shall be two dollars ($2) and one dollar ($1) additional for each day of delay after classes begin, provided that no student shall pay more than twelve dollars ($12) of penalty in any given quarter.

ENTRANCE REQUIREMENTS

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

2. Mathematics, elementary algebra, one unit; plane geometry, one unit; higher algebra, one half unit; and 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.

For all students who intend to enter the College of Engineering and Architecture, it is very desirable that physics as well as chemistry be included in the high school course. Students entering the course in Architecture without chemistry must take this subject in the University.

* See Note, below.

No students will be admitted to this college at the beginning of the winter quarter unless they present the complete entrance requirements including algebra, solid geometry, and chemistry.

NOTE.—Students desiring to enter this college who have not the specified credits in higher algebra and solid geometry, but who present the full fifteen acceptable units will be admitted subject to their taking the necessary course or courses for the satisfaction of these requirements during their first quarter, and without credit. They must expect, however, to attend the University Summer Session in the following summer in order to obtain the regular third quarter's work in mathematics or in mathematics and drawing. To avoid this irregularity in their courses, students are urged to obtain the required higher algebra and solid geometry in high school or the University Summer Session or Extension Division before entering this college.

LIST OF ENTRANCE REQUIREMENTS

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 week for a period of thirty-six weeks. In laboratory, drawing, and other manual courses, twice this amount of time is required for one unit.

GROUP A. ENGLISH: 3 or 4 units.

GROUP B. LANGUAGE: Latin, Greek, German, French, Spanish, Scandinavian, 1 to 4 units each.

GROUP C. HISTORY AND SOCIAL SCIENCES: European history, 1 or 2 units; 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; sociology, commercial geography and history of commerce, one half unit each.

GROUP D. MATHEMATICS: Elementary algebra and plane geometry, 1 unit each; unified mathematics, 2 units; higher algebra, solid geometry, and trigonometry, 1 unit each.

GROUP E. NATURAL SCIENCES: Physics and chemistry, 1 unit each; botany and zoology, one half or 1 unit each; physiology, astronomy, geology and physiography, one half unit each.

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

SPECIAL STUDENTS

In exceptional cases applicants are admitted to the college as special students without fulfilling the complete entrance requirements and without registering for a degree. Such students must be of mature years, and must give satisfactory evidence of ability to do with credit the work applied for. Admission of students of this class requires in each specific case the approval of the Students' Work Committee and the dean.

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.

REGISTRATION

All undergraduate students are required, at the beginning of each quarter of residence, to pay the prescribed fees to the University cashier, to fill and file at the Main Engineering Building the necessary classification blanks showing the courses they expect to pursue during the quarter, and to enroll for their various classes.

All students entering the college for the first time must present their credentials to the Registrar at the University, who will notify the applicant with regard to his admission. Before registering all new matriculants are required to take a physical examination.

Students should consult the University calendar in regard to registration dates and the *Handbook for Students in the College of Engineering and Architecture* for the procedure of registration.

Students will not be allowed to register for less than 14 or more than 19 credit hours without the approval of the Students' Work Committee.

No change in registration will be permitted later than 10 days after the beginning of the quarter.

CREDIT HOURS

In all of the above courses a credit is such an amount of work as will require three hours a week of a student's time. One hour of recitation is assumed to require two hours of outside preparation. In the case of laboratory work (drawing, surveying, and shopwork) which does not require outside preparation, three hours of work count for one credit. The credit allowed for lectures varies from one third to one credit a lecture a week, depending upon the amount of outside preparation required of the student for the lecture.

CREDIT FOR OUTSIDE WORK

Credit for certain courses, as a result of work done outside of the regular classes, may be obtained by satisfactorily passing comprehensive examinations.

Work done outside of class includes work done by correspondence, by the aid of a private tutor, by individual study, through practical experience, or otherwise.

The comprehensive examination will be of such thoro and searching character as to determine whether the student has done all the work of the course. It should require at least three times the work of the usual final or condition examination and will be conducted by a committee of three, appointed by the head of the department in which the course is given.

Permission to take the examination must be obtained from the Students' Work Committee, and the usual fee of $5 for a special examination must be paid unless it be taken within six weeks after first entering the University.

EXTENSION COURSES

Certain courses in engineering and architecture are offered by the Extension Division of the University in evening classes and by correspondence. Persons who are unable to attend the regular University courses may obtain instruction in this manner. Definite information regarding extension work will be found in the bulletins of the General Extension Division.

ATTENDANCE

It is expected that all students registered in this college will be regular in attendance at all class exercises and that they will do all the work of the course. Neglect of work, as indicated by irregularity in attendance or low scholarship, will be sufficient reason for exclusion from class. "Any student who has unexcused absences equal to the number of credits in a course, but in no case less than two, shall be dropped from the class with a record of failure in the course." *Senate, May 11, 1921.*

SCHOLARSHIP

Every student in this college must complete all the mathematics and physics of the sophomore year before he will be allowed to register for any junior courses.

REQUIREMENTS FOR GRADUATION

To be recommended for the Bachelor's degree from this college, the student must complete all of the courses prescribed in the corresponding curriculum together with sufficient electives to make a total of at least 204 credits.

Students entering the College of Engineering and Architecture with advanced standing from other colleges or universities must spend at least one year in residence in this college before they will be recommended for graduation. If the term of residence is only one year it must be the senior year; and in any case such a student must spend two "quarters" of his senior year in residence.

SCHOLARSHIPS AND PRIZES

For scholarships and prizes in this college, see the bulletin of general information.

In the Engineering Experiment Station there are two research fellowships which are open to engineering graduates, including Chemical Engineers. Each of these bears an annual stipend of $750. The holder is required to give twelve hours per week to such research service as may be assigned to him. In addition he is expected to carry work in the Graduate School towards an advanced degree.

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.

COURSES OF STUDY

CIVIL, ELECTRICAL, AND MECHANICAL ENGINEERING

The freshman year is the same for all engineering courses. The freshman year for courses in Architecture and Architectural Engineering is found on pages 24 to 26.

FRESHMAN YEAR

(Civil, Electrical, Mechanical Engineering)

(For students who enter with credit in both higher algebra and solid geometry.)

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 11	College Algebra	5	5	..	..
Chem. 4* or	General Inorganic Chemistry	4	..	3	3
Chem. 14	General Inorganic Chemistry	5	..	3	6
Draw. 1	Engineering Drawing	3	..	..	8
M. E. 11, 12, or 13	Shop Practice	2	..	..	6
G. E. 11	Orientation	0	..	1	..
Mil. 1	Military Drill	0	..	..	3
	Winter Quarter				
M. & M. 12	Trigonometry	5	5	..	..
Chem. 5* or	General Inorganic Chemistry	4	..	3	3
Chem. 15	General Inorganic Chemistry	5	..	3	6
Draw. 2	Engineering Drawing	3	..	..	8
M.E. 11, 12, or 13	Shop Practice	2	..	..	6
G. E. 12	Orientation	0	..	1	..
Mil. 2	Military Drill	0	..	..	3
	Spring Quarter				
M. & M. 13	Analytical Geometry	5	5	..	..
Chem. 16	Qualitative Analysis	5	..	3	6
Draw. 3	Descriptive Geometry	3	..	..	8
M. E. 11, 12, or 13	Shop Practice	2	..	..	6
P. H. 2	Hygiene and First Aid	0	..	1	..
Mil. 3	Military Drill	0	..	..	3

FRESHMAN YEAR

(Civil, Electrical, Mechanical Engineering)

(For students who enter without credit in both higher algebra and solid geometry.)

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 9	Higher Algebra	0	3	..	..
M. & M. 10	Solid Geometry	0	3	..	..
Chem. 4* or	General Inorganic Chemistry	4	..	3	3
Chem. 14	General Inorganic Chemistry	5	..	3	6
M. E. 11, 12, or 13	Shop Practice	2	..	..	6
G.E. 11	Orientation	0	..	1	..
Mil. 1	Military Drill	0	..	..	3

* Students who enter without credit in high school chemistry must register for Chemistry 14, 15, and 16 instead of 4, 5, and 16.

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Winter Quarter				
M. & M. 11	College Algebra	5	5	..	..
Chem. 5* or	General Inorganic Chemistry	4	..	3	3
Chem. 15	General Inorganic Chemistry	5	..	3	6
Draw. 1	Engineering Drawing	3	..	..	8
M. E. 11, 12, or 13	Shop Practice	2	..	..	6
G. E. 12	Orientation	0	..	1	..
Mil. 2	Military Drill	0	..	..	3
	Spring Quarter				
M. & M. 12	Trigonometry	5	5	..	..
Chem. 16	Qualitative Analysis	5	..	3	6
Draw. 2	Engineering Drawing	3	..	..	8
M. E. 11, 12, or 13	Shop Practice	2	..	..	6
P. H. 2	Hygiene and First Aid	0	..	1	..
Mil. 3	Military Drill	0	..	..	3
	Summer Session				
M. & M. 13	Analytical Geometry	5	10	..	..
Draw. 3	Descriptive Geometry	3	..	..	18

FRESHMAN YEAR

(Civil, Electrical, Mechanical Engineering)

(For students who enter without credit in higher algebra, only.)

Course No	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 9	Higher Algebra	0	3	..	..
Chem. 4* or	General Inorganic Chemistry	4	..	3	3
Chem. 14	General Inorganic Chemistry	5	..	3	6
Draw. 1	Engineering Drawing	3	..	..	8
M. E. 11, 12, or 13	Shop Practice	2	..	..	6
G. E. 11	Orientation	0	..	1	..
Mil. 1	Military Drill	0	..	..	3
	Winter Quarter				
M. & M. 11	College Algebra	5	5	..	..
Chem. 5* or	General Inorganic Chemistry	4	..	3	3
Chem. 15	General Inorganic Chemistry	5	..	3	6
Draw. 2	Engineering Drawing	3	..	..	8
M. E. 11, 12, or 13	Shop Practice	2	..	..	6
G. E. 12	Orientation	0	..	1	..
Mil. 2	Military Drill	0	..	..	3
	Spring Quarter				
M. & M. 12	Trigonometry	5	5	..	..
Chem. 16	Qualitative Analysis	5	..	3	6
M. E. 11, 12, or 13	Shop Practice	2	..	..	6
P. H. 2	Hygiene and First Aid	0	..	1	..
Mil. 3	Military Drill	0	..	..	3
	Summer Session				
M. & M. 13	Analytical Geometry	5	10	..	..
Draw. 3	Descriptive Geometry	3	..	..	18

* Students who enter without credit in high school chemistry must register for Chemistry 14, 15, and 16 instead of 4, 5, and 16.

FRESHMAN YEAR

(Civil, Electrical, Mechanical Engineering)

(For students who enter without credit in solid geometry, only.)

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 10	Solid Geometry	0	3	..	..
M. & M. 11	College Algebra	5	5	..	..
Chem. 4* or	General Inorganic Chemistry	4	..	3	3
Chem. 14	General Inorganic Chemistry	5	..	3	6
M. E. 11, 12, or 13	Shop Practice	2	..	..	6
G. E. 11	Orientation	0	..	1	..
Mil. 1	Military Drill	0	..	..	3
	Winter Quarter				
M. & M. 12	Trigonometry	5	5	..	..
Chem. 5* or	General Inorganic Chemistry	4	..	3	3
Chem. 15	General Inorganic Chemistry	5	..	3	6
Draw. 1	Engineering Drawing	3	..	..	8
M. E. 11, 12, or 13	Shop Practice	2	..	..	6
G. E. 12	Orientation	0	..	1	..
Mil. 2	Military Drill	0	..	..	3
	Spring Quarter				
M. & M. 13	Analytical Geometry	5	5	..	..
Chem. 16	Qualitative Analysis	5	..	3	6
Draw. 2	Engineering Drawing	3	..	..	8
M. E. 11, 12, or 13	Shop Practice	2	..	..	6
P. H. 2	Hygiene and First Aid	0	..	1	..
Mil. 3	Military Drill	0	..	..	3
	Summer Session				
Draw. 3	Descriptive Geometry	3	..	..	18

CIVIL ENGINEERING

(Four-year course leading to the degree of Bachelor of Science in Civil Engineering, B.S. (C.E.).

For freshman year, see pages 15 to 17.

In addition to the prescribed courses in each curriculum, sufficient electives must be taken to complete a total of at least 204 credits for graduation. This is an average of 17 credits per quarter.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 24	Differential Calculus	5	5	..	..
Phys. 3	Mechanics and Sound	3	1	3	..
Phys. 4	Mechanics Laboratory	1	..	..	2
Rhet. 4	Rhetoric and Composition	3	3	..	.
Draw. 21	Drafting	2	..	..	6
C. E. 11	Surveying	3	1	..	8
Mil. 4	Military Drill	0	..	..	3

* Students who enter without credit in high school chemistry must register for Chemistry 14, 15, 16 instead of 4, 5, and 16.

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Winter Quarter				
M. & M. 25	Integral Calculus	5	5	..	..
Phys. 23	Heat	3	1	3	..
Phys. 24	Heat Laboratory	1	..	..	2
Rhet. 5	Rhetoric and Composition	3	3	..	..
Draw. 22	Drafting	2	..	..	6
C. E. 12	Surveying	3	1	..	8
Mil. 5	Military Drill	0	..	..	3
	Spring Quarter				
M. & M. 26	Technical Mechanics (Statics)	5	5	..	..
Phys. 43	Magnetism and Electricity	3	1	3	..
Phys. 44	Electrical Laboratory	1	..	..	2
Rhet. 6	Rhetoric and Composition	3	3	..	..
Draw. 23	Drafting	2	..	..	6
C. E. 13	Surveying	3	..	1	7
Mil. 6	Military Drill	0	..	..	3

JUNIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 128	Strength of Materials	5	5	..	..
M. & M. 141	Materials Laboratory	1	..	..	3
C. E. 31	Stresses in Structures	3	..	1	6
C. E. 14	Surveying	3	..	..	8
C. E. 51	Highways and Pavements	3	..	1	8
	* One or more electives.				
	Winter Quarter				
M. & M. 129	Hydraulics	4	4	..	..
M. & M. 143	Hydraulics Laboratory	1	..	..	3
C. E. 15	Surveying	2	..	4	..
C. E. 21	Railway Engineering	2	1	..	4
C. E. 32	Stresses in Structures	3	..	1	6
C. E. 52	Highways and Pavements	3	..	1	6
	* One or more electives.				
	Spring Quarter				
M. & M. 127	Technical Mechanics (Dynamics)	5	5	..	..
C. E. 16	Surveying	2	..	4	..
C. E. 22	Railway Engineering	2	1	..	4
C. E. 33	Structural Design	3	..	1	6
C. E. 53	Municipal Engineering	3	1	2	..
	* One or more electives.				
	Summer Camp				
C. E. 23	Summer camp is held in the vacation preceding the senior year for 6 weeks beginning about August 10. Nine credits. Required of all students taking the course in Civil Engineering.				

* For list of elective courses, see pages 30 to 32.

SENIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
C. E. 121	Railway Engineering	3	..	1	6
C. E. 131	Bridge Analysis	3	1	..	6
C. E. 141	Reinforced Concrete	3	1	1	3
C. E. 161	Hydrology	3	2	..	3
C. E. 146	Concrete Laboratory	3	..	1	6
or					
C. E. 164	Water Power	3	..	1	6
	*Elective	3			
	Winter Quarter				
C. E. 142	Reinforced Concrete Design	3	1	..	6
C. E. 162	Water Supply Engineering	3	..	1	6
C. E. 132	Bridge Design	3	1	..	6
C. E. 124	Transportation	3	3	..	..
E. E. 42	Electric Power	4	3	..	3
or					
M. E. 149	Heat Engines	4	3	..	4
	*Elective	3			
	Spring Quarter				
C. E. 134	Statically Indeterminate Structures	3	..	1	6
E. E. 42	Electric Power	4	3	..	3
or					
M. E. 149	Heat Engines	4	3	..	4
	*Electives	12			

SENIOR YEAR†

Course No	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
	(For students who have completed Courses C.E. 23, 131, 132, 141.†)				
	Required:				
C. E. 161	Hydrology	3	2	..	3
M. E. 149	Heat Engines	4	3	..	4
C. E. 121	Railway Engineering	3	..	1	6
C. E. 162	Water Supply Engineering	3	..	1	6
C. E. 142	Reinforced Concrete Design	3	1	..	6
	*Elective	3			
	Winter Quarter				
E. E. 42	Electric Power	4	3	..	3
C. E. 134	Statically Indeterminate Structures	3	..	1	6
C E. 124	Transportation	3	3	..	..
	*Electives	9			

* For list of elective courses, see pages 30 to 32.

† Courses C. E. 131, 132, and 141 may not be offered in the Summer Session of 1923.

ELECTRICAL ENGINEERING

Four-year course leading to the degree of Bachelor of Science in Electrical Engineering, B.S. (E.E.)

For freshman year, see pages 15 to 17.

In addition to the prescribed courses in each curriculum, sufficient electives must be taken to complete a total of at least 204 credits for graduation. This is an average of 17 credits per quarter.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 24	Differential Calculus	5	5	..	..
Phys. 3	Mechanics and Sound	3	1	3	..
Phys. 4	Mechanics Laboratory	1	..	..	2
Rhet. 4	Rhetoric and Composition	3	3	..	..
Draw. 26	Drafting	2	..	..	6
E. E. 11	Elements of Electrical Engineering	3	2	..	2
Mil. 4	Military Drill	0	..	..	3
	Winter Quarter				
M. & M. 25	Integral Calculus	5	5	..	..
Phys. 23	Heat	3	1	3	..
Phys. 24	Heat Laboratory	1	..	..	2
Rhet. 5	Rhetoric and Composition	3	3	..	..
Draw. 27	Drafting	2	..	..	6
E. E. 13	Elements of Electrical Engineering	3	2	..	2
Mil. 5	Military Drill	0	..	..	3
	Spring Quarter				
M. & M. 26	Technical Mechanics (Statics)	5	5	..	..
Phys. 43	Magnetism and Electricity	3	1	3	..
Phys. 44	Electrical Laboratory	1	..	..	2
Rhet. 6	Rhetoric and Composition	3	3	..	..
M. E. 16	Machine Shop	2	..	..	6
E. E. 15	Elements of Electrical Engineering	3	2	..	2
Mil. 6	Military Drill	0	..	..	3

JUNIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 129	Hydraulics	4	4	..	..
M. & M. 143	Hydraulics Laboratory	1	..	..	3
E. E. 111	Direct Current Machinery	3	3	..	..
E. E. 112	Direct Current Machinery Laboratory	2	..	..	4
Phys. 144	Electrical Measurements	3	1	..	6
	*One or more electives.				
	Winter Quarter				
M. & M. 127	Technical Mechanics (Dynamics)	5	5	..	..
E. E. 113	Direct Current Machinery	3	3	..	..
E. E. 114	Direct Current Machinery Laboratory	2	..	..	4
M. E. 33	Mechanism and Kinematics	3	2	..	3
	*One or more electives.				

* For list of elective courses, see pages 30 to 32.

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Spring Quarter				
M. & M. 128	Strength of Materials	5	5	..	..
M. & M. 141	Materials Laboratory	1	..	..	3
E. E. 115	Direct Current Machinery	3	3	..	..
E. E. 116	Direct Current Machinery Laboratory	2	..	..	4
M. E. 37	Machine Design	3	..	..	..
	*One or more electives.				

SENIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
E. E. 121	Alternating Currents	3	3	..	..
E. E. 122	Alternating Currents Laboratory	2	..	..	4
E. E. 132	Electrical Design†	2	2	..	4
M. E. 144	Heat Engines†	3	2	..	3
	*One or more electives.				
	Winter Quarter				
E. E. 123	Alternating Currents	3	3	..	..
E. E. 124	Alternating Currents Laboratory	2	..	..	4
E. E. 134	Electrical Design	2	2	..	4
M. E. 145	Heat Engines†	3	2	..	3
	*One or more electives.				
	Spring Quarter				
E. E. 125	Alternating Currents	3	3	..	..
E. E. 126	Alternating Currents Laboratory	2	..	..	4
E. E. 136	Electrical Design†‡	2	2	..	4
M. E. 146	Heat Engines†	3	2	..	..
	*One or more electives.				

MECHANICAL ENGINEERING

Four-year course leading to the degree of Bachelor of Science in Mechanical Engineering, B.S. (M.E.)

For freshman year, see pages 15 to 17.

In addition to the prescribed courses in each curriculum, sufficient electives must be taken to complete a total of at least 204 credits for graduation. This is an average of 17 credits per quarter.

NOTE.—It is recommended that each student in the Mechanical Engineering Department spend at least one summer vacation in machine shop practice.

Mechanical engineering students who desire to prepare themselves for work in engineering administration should plan their course to include electives which are fundamental to the work of the executive in factory management. Such a group of electives will be found on page 30.

* For list of elective courses, see pages 30 to 32.

† Students specializing in chemistry or physics may substitute electives in such departments for Courses E. E. 132, 134, 136 and M. E. 144, 145, 146.

‡ Students specializing in business may substitute an approved elective in such department for Course E. E. 136.

If the student wishes to pursue this line of work still further the following electives are suggested: Industrial Management, M.E. 223f; Industrial Management Laboratory, M.E. 224w; Industrial Management Problems, M.E. 225s; Contracts and Specifications, G.E. 101w; Safety Engineering, 226s; together with one business course option in the fall quarter.

Students who wish to specialize in power plant engineering or in automotive engineering are advised to look ahead and place their courses in logical sequence which will best develop the particular field desired.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 24	Differential Calculus	5	5	..	..
Phys. 3	Mechanics and Sound	3	1	3	..
Phys. 4	Mechanics Laboratory	1	..	..	2
Rhet. 4	Rhetoric and Composition	3	3	..	..
Draw. 28	Drafting	2	..	..	6
M. E. 14	Machine Shop Practice	4	..	..	12
Mil. 4	Military Drill	0	..	..	3
	Winter Quarter				
M. & M. 25	Integral Calculus	5	5	..	..
Phys. 23	Heat	3	1	3	..
Phys. 24	Heat Laboratory	1	..	..	2
Rhet. 5	Rhetoric and Composition	3	3	..	..
Draw. 29	Drafting	2	..	..	6
M. E. 15	Machine Shop Practice	4	..	..	12
Mil. 5	Military Drill	0	..	..	3
	Spring Quarter				
M. & M. 26	Technical Mechanics (Statics)	5	5	..	..
Phys. 43	Magnetism and Electricity	3	1	3	..
Phys. 44	Electrical Laboratory	1	..	..	2
Rhet. 6	Rhetoric and Composition	3	3	..	..
M. E. 41	Automotives	2	2	..	..
M. E. 21	Mechanical Technology	1	..	1	..
M. E. 31	Machine Design	2	0	..	6
Mil. 6	Military Drill	0	..	..	3

JUNIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 127	Technical Mechanics (Dynamics)	5	5	..	..
M. E. 42	Steam Engines	3	3	..	..
M. E. 81	Mechanical Laboratory	2	..	..	6
M. E. 32	Mechanism	4	4	..	..
	*One or more electives.				
	Winter Quarter				
M. & M. 128	Strength of Materials	5	5	..	..
M. & M. 141	Materials Laboratory	1	..	..	3
M. E. 43	Steam Engines and Boilers	3	3	..	..
M. E. 82	Steam Laboratory	2	..	..	6
M. E. 34	Kinematics and Machine Design	4	2	1	6
	*One or more electives.				

* For list of elective courses, see pages 30 to 32.

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Spring Quarter				
M. & M. 129	Hydraulics	4	4	..	..
M. & M. 143	Hydraulics Laboratory	1	..	..	3
M. E. 61	Measurement of Power	2	2	..	2
M. E. 83	Power Laboratory	2	..	..	6
M. E. 35	Machine Design	3	..	2	6
E. E. 43	Electric Power	3	2	..	3
	*One or more electives.				

SENIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. E. 151	Thermodynamics	3	2	..	..
E. E. 44	Electric Power	3	..	..	8
M. E. 182	Advanced Steam Laboratory	2	..	..	6
M. E. 190	Seminar†	1	..	1	1
	Engineering Design‡	3	..	..	8
	*One or more electives.				
	Winter Quarter				
E. E. 45	Electric Power	3	2	..	3
M. E. 150	Gas Engines and Producers	3	2	..	..
M. E. 183	Power and Gas Engine Laboratory	2	..	..	6
M. E. 191	Seminar†	1	..	1	1
	Engineering Design‡	3	..	..	8
	*One or more electives.				
	Spring Quarter				
M. E. 184	Advanced Engineering Laboratory	2	..	..	6
G. E. 193	Engineering Practice	2	..	2	..
M. E. 192	Seminar†	1	..	1	1
	Engineering Design‡	3	..	..	8
	* One or more electives.				

ARCHITECTURE AND ARCHITECTURAL ENGINEERING

The course in Architecture affords training for the general practice of architecture, and, while giving adequate attention to structural studies, lays particular stress on the study of architectural design. It leads to the degree of Bachelor of Science in Architecture and requires normally four years for its completion.

The course in Architectural Engineering is formulated for those who wish to specialize in the engineering aspects of architecture, with a view to practicing in association with one specializing more particularly in design. It leads to the degree of Bachelor of Science in Architectural Engineering and requires normally four years for its completion.

* For list of elective courses, see pages 30 to 32.

† Three quarters required. May be taken in junior year.

‡ The following courses are accepted for this requirement: M. E. 131f-132w-133s Advanced Engineering Design; M. E. 135f Steam Engine Design; M. E. 136f,w Gas Engine Design; M. E. 137w Advanced Gas Engine Design; M. E. 237s Gas Tractor Design; M. E. 164s Elements of Power Plant Design; M. E. 265f, 266w Power Plant Design; C. E. 37s Structural Engineering.

Students who wish to extend and broaden their architectural training can arrange a five-year course in Arts and Architecture, leading to the degree of Bachelor of Science in the College of Science, Literature, and the Arts, and Bachelor of Science in Architecture in the College of Engineering and Architecture.

In the bulletin of the College of Science, Literature, and the Arts may be found the description of a course in Architecture and Decoration, the technical studies of which are given by the Department of Architecture.

FRESHMAN YEAR

(Architecture and Architectural Engineering)

Students entering with deficiencies in entrance mathematics must take these subjects in their first quarter, postponing certain required subjects to the second and third quarter and the Summer Session. Otherwise they may not enter the sophomore year.

Students who enter without high school chemistry will take Chemistry 1, 2, and 3, in place of Economics 8, 9, and 28 in the junior year.

(For students who enter with credit in both higher algebra and solid geometry.)

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 11	College Algebra	5	5	..	..
Draw. 31	Graphics	2	..	2	..
Rhet. 4	Rhetoric and Composition	3	3	..	..
Arch. 31	Elements of Architecture	5	..	2	9
Arch. 21	Freehand Drawing	2	..	..	6
G. E. 11	Orientation	0	..	1	..
Mil. 1	Military Drill	0	..	..	3
	Winter Quarter				
M. & M. 12	Trigonometry	5	5	..	..
Arch. 62	Shades and Shadows	2	..	1	2
Rhet. 5	Rhetoric and Composition	3	3	..	..
Arch. 32	Elements of Architecture	5	..	2	9
Arch. 22	Freehand Drawing	2	..	..	6
G. E. 12	Orientation	0	..	1	..
Mil. 2	Military Drill	0	..	..	3
	Spring Quarter				
M. & M. 13	Analytical Geometry	5	5	..	..
Arch. 63	Perspective	2	..	1	2
Rhet. 6	Rhetoric and Composition	3	3	..	..
Arch. 33	Elements of Architecture	5	..	2	9
Arch. 23	Freehand Drawing	2	..	..	6
P. H. 2	Hygiene and First Aid	0	..	1	..
Mil. 3	Military Drill	0	..	..	3

FRESHMAN YEAR

(Architecture and Architectural Engineering)

(For students who enter without credit in both higher algebra and solid geometry.)

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 9	Higher Algebra	0	3	..	..
M. & M. 10	Solid Geometry	0	3	..	..
Draw. 31	Graphics	2	..	2	..
Rhet. 4	Rhetoric and Composition	3	3	..	..
Arch. 21	Freehand Drawing	2	..	..	6
G. E. 11	Orientation	0	..	1	..
Mil. 1	Military Drill	0	..	..	3
	Winter Quarter				
M. & M. 11	College Algebra	5	5	..	..
Arch. 62	Shades and Shadows	2	..	1	2
Rhet. 5	Rhetoric and Composition	3	3	..	..
Arch. 22	Freehand Drawing	2	..	..	6
Arch. 31	Elements of Architecture	5	..	2	9
G. E. 12	Orientation	0	..	1	0
Mil. 2	Military Drill	0	..	..	3
	Spring Quarter				
M. & M. 12	Trigonometry	5	5	..	..
Arch. 63	Perspective	2	..	1	2
Rhet. 6	Rhetoric and Composition	3	3	..	..
Arch. 23	Freehand Drawing	2	..	..	6
Arch. 32	Elements of Architecture	5	..	2	9
P. H. 2	Hygiene and First Aid	0	..	1	..
Mil. 3	Military Drill	0	..	..	3
	Summer Session				
M. & M. 13	Analytical Geometry	5	10	..	..
Arch. 33	Elements of Architecture	5	..	4	18

FRESHMAN YEAR

(Architecture and Architectural Engineering)

(For students who enter without credit in higher algebra.)

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 9	Higher Algebra	0	3	..	..
Draw. 31	Graphics	2	..	2	..
Rhet. 4	Rhetoric and Composition	3	3	..	..
Arch. 21	Freehand Drawing	2	..	..	6
Arch. 31	Elements of Architecture	5	..	2	9
G. E. 11	Orientation	0	..	1	..
Mil. 1	Military Drill	0	..	..	3
	Winter Quarter				
M. & M. 11	College Algebra	5	5	..	..
Arch. 62	Shades and Shadows	2	..	1	2
Rhet. 5	Rhetoric and Composition	3	3	..	..
Arch. 22	Freehand Drawing	2	..	..	6
Arch. 32	Elements of Architecture	5	..	2	9
G. E. 12	Orientation	0	..	1	..
Mil. 2	Military Drill	0	..	..	3

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Spring Quarter				
M. & M. 12	Trigonometry	5	5	..	..
Arch. 63	Perspective	2	..	1	2
Rhet. 6	Rhetoric and Composition	3	3	..	..
Arch. 23	Freehand Drawing	2	..	..	6
Arch. 33	Elements of Architecture	5	..	2	9
P. H. 2	Hygiene and First Aid	0	..	1	0
Mil. 3	Military Drill	0	..	..	3
	Summer Session				
M. & M. 13	Analytical Geometry	5	10	..	..

FRESHMAN YEAR

(Architecture and Architectural Engineering)

(For students who enter without credit in solid geometry.)

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 10	Solid Geometry	0	3	..	..
M. & M. 11	College Algebra	5	5	..	..
Draw. 31	Graphics	2	..	2	..
Rhet. 4	Rhetoric and Composition	3	3	..	..
Arch. 21	Freehand Drawing	2	..	..	6
G. E. 11	Orientation	0	..	1	..
Mil. 1	Military Drill	0	..	..	3
	Winter Quarter				
M. & M. 12	Trigonometry	5	5	..	..
Arch. 62	Shades and Shadows	2	..	1	2
Rhet. 5	Rhetoric and Composition	3	3	..	..
Arch. 22	Freehand Drawing	2	..	..	6
Arch. 31	Elements of Architecture	5	..	2	9
G. E. 12	Orientation	0	..	1	..
Mil. 2	Military Drill	0	..	..	3
	Spring Quarter				
M. & M. 13	Analytical Geometry	5	5	..	..
Arch. 63	Perspective	2	..	1	2
Rhet. 6	Rhetoric and Composition	3	3	..	..
Arch. 23	Freehand Drawing	2	..	..	6
Arch. 32	Elements of Architecture	5	..	2	9
P. H. 2	Hygiene and First Aid	0	..	1	..
Mil. 3	Military Drill	0	..	..	3
	Summer Session				
Arch. 33	Elements of Architecture	5	..	4	18

ARCHITECTURE

Four-year course leading to the degree of Bachelor of Science in Architecture, B.S. (Arch.).

For freshman year see pages 24 to 26.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 91	Calculus for Architects	4	4	..	..
Phys. 3	Mechanics and Sound	3	1	3	..
Arch. 24	Freehand Drawing	2	..	..	6
Arch. 34	Architectural Design, Grade I	4	..	..	12
Arch. 14	Architectural History	2	..	2	..
Arch. 44	Building Construction	2	..	2	..
Mil. 4	Military Drill	0	..	..	3
	Winter Quarter				
M. & M. 92	Mechanics for Architects	4	4	..	..
Phys. 23	Heat	3	1	3	..
Arch. 25	Freehand Drawing	2	..	..	6
Arch. 35	Architectural Design, Grade I	4	..	..	12
Arch. 15	Architectural History	2	..	2	..
Arch. 45	Building Construction	2	..	2	..
Mil. 5	Military Drill	0	..	..	3
	Spring Quarter				
M. & M. 93	Strength of Materials for Architects	4	4	..	..
Phys. 43	Magnetism and Electricity	3	1	3	..
Arch. 26	Freehand Drawing	2	..	..	6
Arch. 36	Architectural Design, Grade I	4	..	..	12
Arch. 16	Architectural History	2	..	2	..
Arch. 46	Building Construction	2	..	2	..
Mil. 6	Military Drill	0	..	..	3

JUNIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
Arch. 17	Architectural History	2	..	2	..
Arch. 27	Freehand Drawing	2	..	..	6
Arch. 37	Architectural Design, Grade II	7	..	..	21
C. E. 38	Stresses	3	..	..	6
Econ. 8*	General Economics	3	..	3	..
	Winter Quarter				
Arch. 18	Architectural History	2	..	2	..
Arch. 28	Freehand Drawing	2	..	..	6
Arch. 38	Architectural Design, Grade II	7	..	..	21
C. E. 39	Structural Design	3	..	..	6
Econ. 9*	General Economics	3	..	3	..
	Spring Quarter				
Arch. 19	Architectural History	2	..	2	..
Arch. 29	Freehand Drawing	2	..	..	6
Arch. 39	Architectural Design, Grade II	7	..	..	21
C. E. 41	Reinforced Concrete	3	..	..	6
Econ. 28*	Business Law	3	..	3	..

* Students who entered without high school chemistry will substitute Chemistry 1, 2, and 3 for Economics 8, 9, and 28.

SENIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
Arch. 131	Architectural Design, Grade III	10	..	..	30
Arch. 151	Architectural Seminar	1	..	1	..
Arch. 141	Building Construction	2	..	2	..
Arch. 161	Decoration and Applied Arts	2	..	2	..
E. E. 40	Electric Wiring and Equipment	2	..	2	..
	Winter Quarter				
Arch. 132	Architectural Design, Grade III	10	..	..	30
Arch. 152	Estimating	1	..	1	..
Arch. 142	Building Construction	2	..	2	..
Arch. 162	Landscape Design	2	..	2	..
C. E. 171	Building Sanitation	2	..	2	..
	Spring Quarter				
Arch. 133	Architectural Design, Grade III	10	..	..	30
Arch. 153	Business Relations	2	..	2	..
Arch. 163	History of Painting and Sculpture	2	..	2	..
Arch. 143	Building Construction	2	..	2	..
M. E. 154	Heating and Ventilating	2	..	2	..

ARCHITECTURAL ENGINEERING

Four-year course leading to the degree of Bachelor of Science in Architectural Engineering, B.S. (Arch.E.).

The freshman year of this course is identical with the freshman year of the course in Architecture, pages 24 to 26.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect	Lab.
	Fall Quarter				
M. & M. 24	Differential Calculus	5	5	..	..
Phys. 3	Mechanics and Sound	3	1	3	..
Phys. 4	Mechanics Laboratory	1	..	..	2
Arch. 34	Architectural Design, Grade I	4	..	..	12
Chem. 4*	Chemistry	4	3	..	3
Mil. 4	Military Drill	0	..	..	3
	Winter Quarter				
M. & M. 25	Integral Calculus	5	5	..	..
Phys. 23	Heat	3	1	3	..
Phys. 24	Heat Laboratory	1	..	..	2
Arch. 35	Architectural Design, Grade I	4	..	..	12
Chem. 5*	Chemistry	4	3	..	3
Mil. 5	Military Drill	0	..	..	3
	Spring Quarter				
M. & M. 26	Technical Mechanics (Statics)	5	5	..	..
Phys. 43	Magnetism and Electricity	3	1	3	..
Phys. 44	Electrical Laboratory	1	..	..	2
Arch. 36	Architectural Design, Grade I	4	..	..	12
Chem. 16	Chemistry	5	3	..	6
Mil. 6	Military Drill	0	..	..	3

* Students who enter without high school chemistry must register for Chemistry 14, 15, instead of Chemistry 4, 5.

JUNIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 128	Strength of Materials	5	5	..	..
M. & M. 141	Materials Laboratory	1	..	..	3
C. E. 31	Stresses and Structural Design	3	..	1	6
Arch. 14	Architectural History	2	..	2	..
Arch. 47	Building Construction	4	..	3	3
Econ. 8	Economics	3	..	3	..
	Winter Quarter				
M. & M. 129	Hydraulics	4	4	..	..
M. & M. 143	Hydraulics Laboratory	1	..	..	3
C. E. 32	Stresses and Structural Design	3	..	1	6
Arch. 15	Architectural History	2	..	2	..
Arch. 48	Building Construction	4	..	3	3
Econ. 9	Economics	3	..	3	..
	Spring Quarter				
M. & M. 127	Technical Mechanics (Dynamics)	5	5	..	..
C. E. 33	Stresses and Structural Design	3	..	1	6
Arch. 16	Architectural History	2	..	2	..
Arch. 49	Building Construction	4	..	3	3
Econ. 28	Business Law	3	..	3	..

SENIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. E. 149	Heat Engines	4	2	..	..
C. E. 141a	Reinforced Concrete	3	..	..	7
Arch. 141	Building Construction	2	..	2	..
E. E. 40	Electrical Equipment	2	..	2	..
Arch. 17	Architectural History	2	..	2	..
	*Elective	3	..	..	..
	Winter Quarter				
C. E. 142a	Reinforced Concrete	3	..	..	7
Arch. 142	Building Construction	2	..	..	..
C. E. 171	Building Sanitation	2	..	2	..
Arch. 18	Architectural History	2	..	2	..
Arch. 152	Estimating	1	..	1	..
E. E. 47	Electric Motors	2	3	..	..
	*Elective	3	..	..	..
	Spring Quarter				
C. E. 131	Structural Design	4	..	2	8
Arch. 153	Business Relations	2	..	2	..
M. E. 153	Heating and Ventilating	4	2	1	2
Arch. 19	Architectural History	2	..	2	..
C. E. 18	Surveying	3	..	..	6
	*Elective	3	..	..	..

* For list of elective courses, see pages 30 to 32.

ENGINEERING ADMINISTRATION

The following group of elective courses has been prepared for those advanced students in this college who desire a broad training for service in executive and administrative positions. There is an increasing demand for engineers who have such training, and students whose scholastic records are of high grade are encouraged to include this entire series of electives in their junior and senior years. The more advanced courses may be taken in a postgraduate year, also.

JUNIOR YEAR

Course No.	Title	Credits
	Fall Quarter	
Econ. 8f	General Economics	3
	Winter Quarter	
Econ. 9w	General Economics	3
	Spring Quarter	
Econ. 29s	Principles of Accounting	4

SENIOR YEAR

Course No.	Title	Credits
	Fall Quarter	
Econ. 28f	Business Law	3
Econ. 91f	Principles of Organization and Management	3
	Winter Quarter	
Econ. 92w	Business Finance	3
Econ. 167w	Industrial Relations	3
	Spring Quarter	
Econ. 93s	Cost Accounting	3
Econ. 154s	Public Utilities	3

ELECTIVE COURSES OPEN TO SOPHOMORES

Course No.	Title	Credits	Prerequisites
A. B. 1f,w,s-2w,s,su	General Zoology	10	None
Ast. 4f,w-5w,s	Introduction to Astronomy	10	Trigonometry
Ast. 7f	Navigation	3	Trigonometry
Ast. 11f,w,s	Descriptive Astronomy	5	None
Ast. 30s	Field Astron. for Engineers	3	1 qtr. surveying
Bact. 1f,w,s	General Bacteriology	5	Chemistry 10 credits and biol. 10 credits
Chem. 28f,w	Quantitative Analysis	3	Chem. 16
Chem. 60s	Power Plant Chemistry	3	Chem. 28
Econ. 3f,w,s-4f,w,s	Principles of Economics	10	None
Econ. 8f-9w	General Economics	6	None
Econ. 25f,w,s-26f,w,s	Principles of Accounting	8	Economics 3-4
Econ. 27s	Principles of Accounting	4	None
Eng. 1-2-3	English Survey	9	9 credits in English
Eng. 44f-45w	American Literature	6	English A-B-C
Rhet. 4f,w,s-5f,w,s-6f,w,s	Composition for Technical Students	9	None

Course No.	Title	Credits	Prerequisites
Rhet. 31w,s	Technical Writing	3	Rhetoric 4-5-6
Pub. Sp. 41f-42w-43s	Public Speaking	9	Rhetoric 4-5-6
Pub. Sp. 45f,w,s-46f,w,s	Public Speaking	10	Rhetoric 4-5-6
Geol. 1f,w,s-2f,w,s	General Geology	10	Chemistry
Geol. 5f	Engineering Geology	3	None
Geol. 6w-7s	Applied Geology for Civil Engineers	6	Geol. 5
Geol. 11f-12w	Introduction to Geology	8	None
Geol. 21w-22s	Mineralogy	6	Chemistry
German 1f,w,s-2f,w,s,-3f,w,s	Beginning German	15	None
German 24f-25w-26s	Beginning German	9	None
German 10f,w,s	Rapid Reading	5	German 3 or 2 yrs. prep. German
Hist. 1f,w-2w,s	Modern World	10	None
Hist. 5f,s-6f,w	American History	10	None
Hist. 25f,w,s	World Politics	5	10 cred. in hist. and Pol. Sci. 1
Hist. 40s	Recent American History	5	None
Library 1f,w,s	Use of Books and Libraries	2	None
M. E. 41f,w	Automotives (not open as an elective in spring quarter)	2	M. E. 11, 12, 13
Phil. 2f,w,s	Logic	5	None
Pol. Sci. 1f,w,s	American Government	5	None
Psy. 1f,w-2w,s	General Psychology	6	None
French 1f,w,s-2f,w,s	Beginning French	10	None
French 3f,w,s-4f,w,s	Introduction to French	10	French 1-2 or 2 yrs. high school Fr.
Spanish 1f,w,s-2f,w,s	Beginning Spanish	10	None
Spanish 3f,w,s-4f,w,s	Introduction to Spanish	10	Spanish 1-2
Sociology 1f,w,s	Introduction to Sociology	5	None

For detailed schedules of classes see the programs of respective departments.

ELECTIVE COURSES OPEN TO JUNIORS AND SENIORS

(In addition to all courses open to sophomores.)
See Engineering Administration, page 30.

Course No.	Title	Credits	Prerequisites
Ast. 62f	Practical Astronomy	3	Ast. 4 or 11 or trigonometry
Ast. 140w	Least Squares	3	Calculus
C. E. 53s	Municipal Engineering	3	None
Chem. 186s	Gas Manufacture and Distribution	3	None
Econ. 28f,w,s	Business Law	3	6 cred. in econ.
Econ. 51f-52w-53s	Business Law	9	Juniors with Econ. 8-9 or 10 cred. in economics or political science
Econ. 73w	Railway Traffic and Rates	3	Economics 8-9
Econ. 74s	Transportation Problems	3	Economics 92
Econ. 85f	Principles of Marketing	3	Economics 8-9
Econ. 91f	Principles of Organization and Management	3	Seniors without prerequisites or juniors with 8-9 or equivalent

Course No.	Title	Credits	Prerequisites
Econ. 92w	Business Finance	3	Econ. 8-9 or equiv.
Econ. 93s	Cost Accounting	3	Econ. 29
Econ. 131f-132w-133s	Cost Accounting	9	Economics 29
Econ. 154s	Public Utilities	3	Economics 92
Econ. 167w-168s	Industrial Relations	6	Economics 8-9
G. E. 81f,w,s	Estimating	3	Jr. and sr. only
G. E. 101w	Contracts and Specifications	3	Sr. only
G. E. 111s	Valuation of Public Utilities	1	Sr. only
G. E. 124w	Engineering Relations	1	Sr. only
G. E. 193s	Engineering Practice	2	Sr. only
Geol. 15s	Minerals and Rocks	1	Geology 1 or 29
Geol. 105f	Rock Study	3	Geology 22 or 25
Greek 42s	Greek Sculpture	2	None
Jour. 13f-14w-15s	Reporting	9	One year rhetoric
M. E. 61s	Measurement of Power	2	M. & M. 127
Met. 22f-23w	Metallurgy	3	Chemistry 16
Met. 150f	Metallography (For E. E.)	3	None
Met. 151w	Adv. Metallography (For E. E.)	3	Metallography 150
Met. 156f	Metallography (For sr. M. E.)	3	None
Met. 157w	Adv. Metallography (For sr. M. E.)	3	Metallography 156
Met. 163f-164w-165s	Adv. Metallography	Ar	151, 157 or equiv.
Physics 31f-s	Optics	3	Physics 3
Physics 32f-s	Optics Laboratory	3	Physics 3
Physics 122s	Pyrometry and Heat	3	Physics 23-24
Physics 146w	Elect. Measurements of Precision	3	Physics 142
Pol. Sci. 11f-w-s	Municipal Government	5	Pol. Sci. 1
Psy. 60f	Employment Psychology	3	Psy. 1-2, Econ. 8-9
Pub. Sp. 55f-56w-57s	Argument and Debate	9	Public Speaking 41-42-43 or 45-46
French 50f-51w-52s	Conversation	3	French 3-4
Spanish 50f-51w-52s	Conversation	3	Spanish 3-4

For detailed schedule of classes see the programs of respective departments.

COURSES AND PROGRAMS

ARCHITECTURE

Professors FREDERICK M. MANN, LEON ARNAL; Associate Professor JAMES H. FORSYTHE; Assistant Professors SAMUEL C. BURTON, ROBERT T. JONES, ROY C. JONES; Instructors CARL E. JOHNSON; Lecturers PAUL C. GAUGER, ARTHUR R. NICHOLS.

COURSES

History

14f. ARCHITECTURAL HISTORY. Technical study of the architecture of ancient Egypt, Assyria, Persia, and Greece, with emphasis on the latter. Study of political, social, and economic conditions affecting the architecture of this period. Illustrated lectures and library research. Two credits. Prerequisite: 33. MR. FORSYTHE.

15w. ARCHITECTURAL HISTORY. Technical study of the architecture of ancient Rome and of the Renaissance in Italy to the end of the fifteenth century. Study of political, social, and economic conditions. Illustrated lectures and library research. Two credits. Prerequisite: 14. MR. FORSYTHE.

16s. ARCHITECTURAL HISTORY. Technical study of the architecture of the Renaissance of the sixteenth and seventeenth centuries in Italy. Illustrated lectures and library research. Two credits. Prerequisite: 15. MR. FORSYTHE.

17f. ARCHITECTURAL HISTORY. Technical study of the architecture of the Middle Ages; in Italy, France, and England; sources and influences in the development of the Romanesque and Gothic styles, particularly in France. Lectures and library research. Two credits. Prerequisite: 16. MR. MANN.

18w. ARCHITECTURAL HISTORY. Technical study of developed Gothic architecture in France and England. Early Renaissance architecture in France and England, its courses and affecting influences. Lectures and library research. Two credits. Prerequisite: 17. MR. MANN.

19s. ARCHITECTURAL HISTORY. Technical study of the development of architecture from the seventeenth century to and including the present time, particularly in France, England, and America. Lectures and library research. Two credits. Prerequisite: 18. MR. MANN.

163s. HISTORY OF SCULPTURE AND PAINTING. Historical study of ancient, Renaissance, and modern sculpture and of the Renaissance and modern schools of painting. Two credits. Prerequisite: senior standing. MR. BURTON.

182w-183s. DECORATION AND APPLIED ARTS. Detailed historical and technical study, for students in architecture and decoration, of ornament, decoration, furniture, etc., together with discussion of the use of color in decoration. Three credits. Prerequisites: 16, 26. MR. MANN.

Drawing

21f,w,s,su-22w,s,su-23s,su. FREEHAND DRAWING. Freehand perspective; drawing in pencil, charcoal, and wash from geometric solids and architectural details. Two credits per quarter. Prerequisite: none. MR. JOHNSON.

24f,w,s-25f,w,s-26f,w,s. FREEHAND DRAWING. Drawing in charcoal and water color from still-life, figure details, and the antique. Two credits per quarter. Prerequisite: 23. MR. BURTON.

27f,w,s-28f,w,s-29f,w,s. FREEHAND DRAWING. Drawing, painting, and modelling from architectural detail, from the antique, and from life. Two credits per quarter. Prerequisite: 26. MR. BURTON.

62w. SHADES AND SHADOWS. The geometrical determination of shades and shadows on architectural forms. Two credits. Prerequisite: Drawing 31. MR. FORSYTHE.

63s. PERSPECTIVE. The principles and methods of perspective as applied to architectural drawing. Two credits. Prerequisite: Drawing 31. MR. FORSYTHE.

Design

31f,w-32w,s-33s,su. ELEMENTS OF ARCHITECTURE. Exercises in architectural drawing, lettering, and wash rendering. Study of the elements of architectural design, such as walls, doors, windows, colonnades, arcades, mouldings, vaults, etc., both as to form and construction. Five credits per quarter. Prerequisite: none. MR. FORSYTHE, MR. R. T. JONES.

*34f,w,s-35f,w,s-36f,w,s. ARCHITECTURAL DESIGN, GRADE I. Long and short problems done under individual criticism dealing in general with the elements of plan and elevation. Sketch problems dealing with the simple kinds of composition. Four credits per quarter. Prerequisite: 33. MR. R. C. JONES.

*37f,w,s—38f,w,s-39f,w,s. ARCHITECTURAL DESIGN, GRADE II. Long and short problems done under individual criticism dealing in general with the simpler kinds of architectural composition. Sketch problems dealing with large composition or decorative detail. Seven credits per quarter. Prerequisite: 36. MR. ARNAL.

*131f,w,s-132f,w,s-133f,w,s. ARCHITECTURAL DESIGN, GRADE III. Long, short, and sketch problems done under individual criticism dealing in

* Work in all the design courses is carried on simultaneously and students pass from one to the next in sequence in varying lengths of time, according to their accomplishment and irrespective of University time units. The normal time required to complete the design course is three years. Some students find that they require a longer period and some are able to complete the design work in less time. Those who fall into the former group extend their time for graduation and to those able to complete the work in shorter time special advanced work is open.

general with the more complex kinds of architectural composition, especially with subjects involving special character and a decorative and imaginative interest. Ten credits per quarter. Prerequisite: 39. MR. ARNAL.

*134f,w,s-135f,w,s-136f,w,s. INTERIOR DECORATION DESIGN. Problems done under individual criticism dealing with the decorative treatment, furniture, and accessories of interiors, for students in the course in Architecture and Decoration. Seven credits per quarter. Prerequisite: 36. MR. ARNAL.

Construction

44f-45w-46s. BUILDING CONSTRUCTION. General study, for architectural students, of the principles, methods, and materials involved in the design of ordinary masonry and frame construction. Two credits per quarter. Prerequisite: 33. MR. R. T. JONES.

47s-48w-49s. BUILDING CONSTRUCTION. Detailed study, for architectural engineering students, of the principles, methods, and materials involved in the design of all systems of light and heavy construction. Four credits per quarter. Prerequisite: 33. MR. R. T. JONES.

51f-52w-53s. BUILDING CONSTRUCTION. General non-technical study, for students in architecture and decoration, of the principles, methods, and materials of ordinary construction, particularly as related to domestic architecture and interior finish. Two credits per quarter. Prerequisite: 38. MR. R. T. JONES.

141f-142w-143s. BUILDING CONSTRUCTION. An advanced study of the technology of building materials, and of soils, foundations, systems of framing, and fireproof and mill construction. Two credits per quarter. Prerequisite: C.E. 41 or M.&M. 26. MR. R. T. JONES.

Related Subjects

81f. COLOR AND DESIGN. A general course in the elements of decorative design and the theory of color. Two credits. Prerequisite: none. MR. BURTON.

151f. ARCHITECTURAL SEMINAR. The literature of architecture, special topics and topics of current interest, papers and discussions. One credit. Prerequisite: senior standing. MR. MANN.

152w. ESTIMATING. Principles of the quantity survey; cost analysis. One credit. Prerequisite: senior standing. MR. GAUGER.

153s. BUSINESS RELATIONS. Relations of the architect, owner, and builder; professional ethics and practice; office administration. Two credits. Prerequisite: senior standing. MR. MANN.

* Work in all the design courses is carried on simultaneously and students pass from one to the next in sequence in varying lengths of time, according to their accomplishment and irrespective of University time units. The normal time required to complete the design course is three years. Some students find that they require a longer period and some are able to complete the design work in less time. Those who fall into the former group extend their time for graduation and to those able to complete the work in shorter time special advanced work is open.

161f. DECORATION AND APPLIED ARTS. General historical and technical study, for architectural students, of decoration, furniture, etc., together with discussion of the use of color. Two credits. Prerequisites: 16, 26. MR. MANN.

162w. LANDSCAPE DESIGN. Theory and practice of landscape design. Lectures and design problems. Two credits. Prerequisite: 39. MR. NICHOLS.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
14f	Architectural History.....	IV	MW	320ME	
15w	Architectural History.....	IV	M		
		III	Th	305ME	
16s	Architectural History.....	III	M	320ME	
			Th	305ME	Mr. Forsythe
17f-18w-19s	Architectural History.....	III	TTh	320ME	Mr. Mann
21f,w,s-22w,s-23s	Freehand Drawing.....				
	Sec. 1	VI-VII	MWF	401ME	Mr. Johnson
	2	II-III	MWF	401ME	Mr. Johnson
24f,w,s-25f,w,s-26f,w,s	Freehand Drawing.....	II-IV	TS	401ME	Mr. Burton
27f,w,s-28f,w,s-29f,w,s	Freehand Drawing.....	I-III	WF	401ME	Mr. Burton
31f,32w-33s	Elements of Architecture.....				
	Lect.	IV	T		Mr. R. T. Jones
		II	S	320ME	Mr. Forsythe
		II	ThS(spring)	320ME	
	Lab. Sec. 1	II-IV	MWF	309ME	
	2	VI-VIII	MWF	309ME	
31w,32s	Elements of Architecture.....				
	Lect.	III	W		Mr. Forsythe
		II	F	135ME	Mr. R. T. Jones
	Lab.	II-III	Th		
		VI-VII	Th(winter)		
		VI-VIII	Th(spring)		
		I-IV	S	309ME	
34f,w-35f,w-36f,w	Architectural Design, Grade I	VI-VIII	MTThF	402ME	Mr. R. C. Jones
34s,35s,36s	Architectural Design, Grade I	VI-VIII	MWThF	402ME	Mr. R. C. Jones
37f,w,s-38f,w,s-39f,w,s	Architectural Design, Grade II	VI-VIII	MWF		
		VI-IX	TTh		
		I-IV	S	317ME	Mr. Arnal
44f	Building Construction.....	III	Th	135ME	
		IV	F	320ME	Mr. R. T. Jones
45w-46s	Building Construction.....	IV	WF	320ME	Mr. R. T. Jones
47f	Building Construction.....				
	Lect.	I	TThS	320ME	Mr. R. T. Jones
	Lab.	II-IV	S	317ME	
48w	Building Construction.....				
	Lect.	I	ThS	320ME	
		III	T	135ME	Mr. R. T. Jones
	Lab.	II-IV	S	317ME	

No.	Title	Hour	Day	Room	Instructor
49s	Building Construction.....				
	Lect.	I	TTh		
		III	S	320ME	Mr. R. T. Jones
	Lab.	VI-VIII	M	317ME	
51f-52w-53s	Building Construction.....	III	MW	320ME	Mr. R. T. Jones
		IV	M }	305ME	
		III	W } spring	320ME	
62w	Shades and Shadows.....				
	Lect.	II	T	320ME	Mr. Forsythe
	Lab. Sec. 1	VI-VII	Th	309ME	
	"	VII-VIII	T	309ME	
63s	Perspective				
	Lect.	II	T	320ME	Mr. Forsythe
	Lab. Sec. 1	III-IV	T	309ME	
	"	VII-VIII	Th	309ME	
81f	Color and Design.....	VI-VIII	TTh	402ME	Mr. Burton
131f,w,s-132f,w,s-133f,w,s	Architectural Design, Grade III	III-IV			
		VI-IX	MTWThF	317ME	Mr. Arnal
134f,w,s-135f,w,s-136f,w,s	Interior Decoration Design...	VI-IX	MTWThF		
		I-IV	S	317ME	Mr. Arnal
141f-142w-143s	Building Construction.....	I	MW	320ME	Mr. R. T. Jones
151f	Architectural Seminar.....	II	F	320ME	Mr. Mann
152w	Estimating	II	F	320ME	Mr. Gauger
153s	Business Relations.....	II	TS	135ME	Mr. Mann
161f	Decoration and Applied Arts..	II	MW	320ME	Mr. Mann
162w	Landscape Design.....	II	MW	320ME	Mr. Nichols
163s	History of Sculpture and Painting	II	MTh	135ME	Mr. Burton
182w	Decoration and Applied Arts.	IV	MWF	135ME	Mr. Mann
183s	Decoration and Applied Arts..	IV	M	320ME	
			WF	305ME	Mr. Mann

ASTRONOMY

Professor F. P. Leavenworth; Assistant Astronomer William O. Beal.

COURSE

30s. Field Astronomy for Engineers. Elements of general and practical astronomy. Field work with the surveyor's transit and with the sextant for determining latitude, longitude, clock error, and azimuth. Three credits. Prerequisites: M.&M. 12, one quarter surveying. Mr. Beal.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
30s	Field Astronomy for Engineers	IV	MWF	135ME	Mr. Beal

CHEMISTRY

Professors PAUL H. M.-P. BRINTON, CHARLES A. MANN, CHARLES F. SIDENER; Associate Professors EVERHART P. HARDING, M. CANNON SNEED; Assistant Professor ISAAC W. GEIGER, RAYMOND E. KIRK, GEORGE H. MONTILLON; Instructor NORVILLE C. PERVIER.

COURSES

1-2-3. GENERAL INORGANIC CHEMISTRY. (Pre-med., pre-dent.) Study of the general laws of chemistry and of the non-metals and their compounds. 2. Continuation of Course 1. 3. Study of the metals and their compounds. Continuation of Course 2.

4f-5w. GENERAL INORGANIC CHEMISTRY. A study of the general laws of chemistry and of the non-metals, the metals, and their compounds. Four credits per quarter. Prerequisite: high school chemistry. MR. KIRK.

9w-10s. GENERAL INORGANIC CHEMISTRY. For those who have had one year of high school chemistry. Course 9. General laws of chemistry; non-metals and their compounds. More intensive than Courses 4 or 5. Course 10. Metals and their compounds and ionic equilibrium, considered quantitatively. Five credits. Prerequisite: high school chemistry. MR. SNEED.

14f-15w. GENERAL INORGANIC CHEMISTRY. (Engineers and mines.) Includes a study of the general laws of chemistry and of the non-metals, the metals, and their compounds. Five credits per quarter. Prerequisite: none. MR. PERVIER.

16s. QUALITATIVE ANALYSIS. (Engineers and mines.) Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. Five credits. Prerequisite: 5 or 15. MR. KIRK, MR. PERVIER.

28f,w. QUANTITATIVE ANALYSIS. (Engineers, dentists, and mines.) A short introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems are assigned and attention given to proper laboratory practice. Three credits. Prerequisite: 16. MR. BRINTON, MR. SIDENER, MR. GEIGER.

60s. POWER PLANT CHEMISTRY. (Engineers.) Proximate analysis of coal; determination of calorific power; technical analysis of fuel gases and furnace gases; examination of boiler water; lubricating oils. Three credits. Prerequisite: 28. MR. HARDING.

176f-177w. Applied Electrochemistry. Application of the electric current to chemical processes. Laws and phenomena of electrochemistry, primary and secondary batteries, electroplating, electric furnace construction and operation, and the products of electrolysis of the electric furnace. Four credits per quarter. Prerequisites: 142, 171. Mr. Mann, Mr. Montillon.

186s. Gas Manufacture and Distribution. Fundamental principles of manufacture of coal gas, carbureted water gas, and other industrial fuel gases and the apparatus for manufacture and distribution. Three credits. Prerequisite: none. Mr. Montillon.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
1f-2w-3s	General Inorganic Chemistry.. (Junior architects only)				
	Lect.	VI	MWF	225C	
	Lab. Sec. 1	VI-VII	TTh	210C	
	2	VIII-IX	TTh	210C	
4f-5w	General Inorganic Chemistry.				
	Lect. Sec. 1	I	MWF	100C	Mr. Kirk
	2	IV	TS		
		VI	Th	100C	
	Lab. Sec. A	I-III	S	110C	
	B	VII-IX	M	110C	
	C	VII-IX	F	110C	
	D	VI-VIII	W	110C	
9w-10s	General Inorganic Chemistry.				
	Lect.	VI	MWF	225C	
	Lab.	VIII-IX	MWF	290C	
14f-15w	General Inorganic Chemistry..				
	Lect.	II	TThS	225C	Mr. Pervier
	Lab.	II-IV	WF	110C	
16s	Qualitative Analysis.....				
	Lect. Sec. 1	I	MWF	100C	Mr. Kirk
	2	IV	TS		
		VI	Th	100C	Mr. Kirk
	3	II	TThS	225C	Mr. Pervier
	Lab. Sec. A	I-III	Th	110C	Mr. Kirk
		II-IV	F		Mr. Pervier
	B	VI-VIII	M		
		VII-IX	Th	110C	
	C	VII-IX	W		
		VI-VIII	F	110C	
	D	II-IV	WF	110C	
28f,w	Quantitative Analysis.....				
	Lect.	VI	T	325C	Mr. Brinton
	Lab.	VII-IX	T	310C	Mr. Sidener
					Mr. Geiger
		VI-IX	Th		Mr. Sarver
60s	Power Plant Chemistry.....				
	Lect. Sec. 1	VI	T	215C	Mr. Harding
	2	VI	M	215C	
	Lab. Sec. 1	VII-IX	TTh	ArC	
	2	VII-IX	MW	ArC	
176f-177w	Applied Electrochemistry.....				
	Lect.	III	MWF	111C	Mr. Mann
					Mr. Montillon
	Lab.	VI-VIII	Th	ArC	
186s	Gas Manufacture and Distribution	Ar	Ar	Ar	Mr. Montillon

EXPERIMENTAL ENGINEERING LABORATORIES

Professor FRANK B. ROWLEY, Director; Assistant Professor BURTON J. ROBERTSON, Assistant Director.

Experimental work relating to various branches of engineering is carried on in the experimental engineering laboratories. Work of a special character, such as advanced research, may be arranged through consultation with the heads of the departments and Professor Rowley. The following courses are offered by the departments indicated.

COURSES

No.	Title	Credits per qu.	Required of
C. E. 51f	Highways and Pavements	3	Jr. C. E.
C. E. 52w	Highways and Pavements	3	Jr. C. E.
C. E. 237w,C. E. 238s	Structural Laboratory	3-5	Elective
C. E. 146f,w,s	Cement and Concrete Laboratory	3-5	Elective
C. E. 251	Highway Laboratory	3-5	Elective
C. E. 261	Water and Sewage Purification	3-5	Elective
C. E. 263s	Hydraulic Laboratory	3-5	Elective
M. & M. 85f	Strength of Materials with Laboratory	4	Jr. Ch. E.
M. & M. 86w	Hydraulics with Laboratory	3	Jr. Ch. E.
M. & M. 141f,w,s	Materials-Testing Laboratory	1	Jr. eng.
M. & M. 143f,w,s	Hydraulics Laboratory	1	Jr. eng.
M. & M. 144w	Materials-Testing Laboratory	4 actual hours	Jr. E. M. & Met. E.
M. E. 41f,w,s	Automotives	2	Elective and soph.
M. E. 81f	Elementary M. E. Laboratory	2	Jr. M. E.
M. E. 82w	Steam Laboratory	2	Jr. M. E.
M. E. 83s	Elementary Power Laboratory	2	Jr. M. E.
M. E. 84f	Elementary Laboratory (General)	4 actual hours	Jr. E. M. & Met. E.
M. E. 144f-145w-146s	Heat Engines	3	Sr. E. E.
M. E. 147w	Heat Engines	4	Jr. Ch. E.
M. E. 148s	Heat Engines	3	Jr. Ch. E.
M. E. 149f,w,s	Heat Engines	4	Sr. C. E. & arch.
M. E. 181w	Advanced Laboratory (General)	4 actual hours	Sr. E. M. & Met. E.
M. E. 182f	Advanced Steam Laboratory	2	Sr. M. E.
M.E. 183w	Power and Gas Engine Laboratory	2	Sr. M. E.
M. E. 184s	Advanced Engineering Laboratory	2	Sr. M. E.
M. E. 287f-288w-289s	Mechanical Engineering Research	3-9	Elective

CIVIL ENGINEERING

Professors FREDERIC BASS, ALVIN S. CUTLER, JOHN I. PARCEL; Assistant Professors MAURICE B. LAGAARD, FRED C. LANG, GEORGE A. MANEY, OTTO S. ZELNER; Instructors LEONARD F. BOON, EDMUND B. FELDMAN, MAURICE W. HEWETT.

COURSES

Surveying

11f. SURVEYING. Field problems; use of chain, compass, transit, and level. Computation and platting of surveys made in the field. Determination

of area by D.M.D. method and planimeter. Three credits. Prerequisites: M.&M. 13, Draw. 3. MR. BOON, MR. HEWETT.

12w. SURVEYING. Lectures and drawing room. Platting of maps, profiles, and cross sections. Computation of earthwork quantities. United States public land surveys. Conventional signs. Three credits. Prerequisite: 11. MR. CUTLER, MR. ZELNER, MR. BOON, MR. HEWETT.

13s. SURVEYING. Adjustments of instruments, profile and differential leveling, transit surveys, circular curves. Three credits. Prerequisite: 12. MR. BOON, MR. HEWETT.

14f. SURVEYING. A complete topographical survey, stadia method, is made and platted. Three credits. Prerequisite: 13. MR. ZELNER.

15w. SURVEYING. Classroom. Lectures, assigned reading, etc. Study of purpose and theory of triangulation, meridian determination, methods of angular measurement, base line measurements. Precise, trigonometric, and barometric leveling. Theory and use of sextant. Two credits. Prerequisite: 14. MR. ZELNER.

16s. SURVEYING. Classroom and field. Hydrographic surveying. Soundings, purpose, methods, location. Velocity and volume determination of stream flow. Field problems with sextant. Field problems in triangulation. Plane table surveys—three point problem. Preparation for summer camp. Two credits. Prerequisite: 15. MR. ZELNER.

18s. SURVEYING. A short course in the use, care, and adjustment of surveying instruments. Methods of leveling and transit surveys. Offered to students other than civil engineers. Three credits. Prerequisite: open only to senior, M.E., E.E., and architectural engineers. MR. ZELNER.

23su. SUMMER CAMP. Six weeks immediately preceding the beginning of the senior year. Continuation of Course 22, including extended railroad, topographic, hydrographic, and triangulation surveys. Nine credits. Prerequisites: 16, 22. MR. CUTLER, MR. ZELNER.

Railway Engineering

21w. RAILWAY ENGINEERING. A general survey of the problems of railway location, including grades, curvature, rise and fall, etc. Two credits. Prerequisite: 14. MR. BOON.

22s. RAILWAY ENGINEERING. A study of the construction and maintenance of railway track and structures. Simple, compound, and spiral curves, and turnouts. Two credits. Prerequisite: 21. MR. BOON.

121f. 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. Three credits. Prerequisite: 23. MR. CUTLER.

122w. 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. Three credits. Prerequisite: 23. MR. CUTLER.

123s. RAILWAY ENGINEERING. Design and construction of railroad buildings and structures; culverts, wooden trestles, switches, cross-overs, crossing frogs, etc. Method of computing earthwork, and estimates and reports. Distribution of material by means of mass diagram. Three credits. Prerequisite: 23. MR. CUTLER.

124s. TRANSPORTATION. Railway, highway, ocean, and inland waterway transport, motive power and car equipment, operating problems, railway, water, and joint terminal problems, typical design and equipment. Cost and value of service, valuation, regulation, present systems, and organizations. Three credits. Prerequisite: 121. MR. CUTLER.

125s. TRANSPORTATION. Specific illustrative problems: Twin City and Mississippi Valley traffic situation, Mississippi River experiment, New York Barge Canal, Great Lakes traffic, St. Lawrence River project, Panama Canal status. Rapid transit, motor transport. Three credits. Prerequisite: 121. MR. CUTLER.

221f-222w-223s. RAILWAY ADMINISTRATION. An analysis of railway organization and methods of management and operation. Principles of valuation and rate-making. Three credits per quarter. Prerequisite: 122. MR. CUTLER.

224f. RAILWAY TERMINALS AND YARDS. A continuation of Course 123. Three credits. Prerequisite: 122. MR. CUTLER.

Structural Engineering

31f. STRESSES IN STRUCTURES. Algebraic and graphic analysis of various types of roof and bridge trusses for fixed loading. Three credits. Prerequisites: M.&M. 26, Draw. 23. MR. PARCEL, MR. LAGAARD, MR. FELDMAN.

32w. STRESSES IN STRUCTURES. Moving loads and influence lines. Standard engine loadings and equivalent uniform loads. Three credits. Prerequisite: 31. MR. PARCEL, MR. LAGAARD, MR. FELDMAN.

33s. ELEMENTARY STRUCTURAL DESIGN. Designing principles and methods. Complete design and detail drawing of framed mill building bent. Three credits. Prerequisite: 32. MR. FELDMAN.

37s. STRUCTURAL ENGINEERING. (For electrical and mechanical engineers.) Analysis of stresses in simple structural frames. Roof trusses, crane trusses, mill building bent. Three credits. Prerequisite: M.&M. 26. MR. FELDMAN.

38f. STRESSES IN STRUCTURES. (For architects.) Application of laws of equilibrium to simple structures. Special emphasis is placed on graphic methods. Three credits. Prerequisite: M.&M. 93. MR. LAGAARD.

39w. STRUCTURAL DESIGN. (For architects.) General principles of structural design. Girders, columns, and roof trusses. Three credits. Prerequisite: 38. MR. LAGAARD.

41s. REINFORCED CONCRETE. (For architects.) Brief course in theory and designing methods with special reference to building. Three credits. Prerequisite: M.&M. 93. MR. LAGAARD.

131f. BRIDGE ANALYSIS. Stresses in simple span railway bridge trusses of the larger type. Baltimore, Petit, Whipple, and "K" trusses. Three credits. Prerequisite: 33. MR. PARCEL.

132w. BRIDGE DESIGN. Design and detail drawing of railway plate girder viaduct. Three credits. Prerequisite: 131. MR. PARCEL.

133s. BRIDGE DESIGN. Complete design and detail drawing of railway pin truss span. Three credits. Prerequisite: 132. MR. PARCEL.

134w,s. STATICALLY INDETERMINATE STRUCTURES. General theory deflections and statically indeterminate stresses and their application to continuous girder, frames, swing bridges, and redundant members. Three credits. Prerequisites: 132, 142. MR. PARCEL.

135s. REINFORCED CONCRETE DESIGN. Studies and problems in the structural layout of various types of buildings. Various types of floor systems, columns, and footings calculated and studied to determine their desirability in specific cases. Four credits. Prerequisite: 33. MR. MANEY.

141f. REINFORCED CONCRETE. Principles of reinforced concrete. Theory of beams, slabs, and columns and the application to ordinary structures. Three credits. Prerequisite: M.&M. 141. MR. MANEY.

141(a)f. REINFORCED CONCRETE. Similar to C.E. 141 with problems of special interest to students in architectural engineering. Three credits. Prerequisite M.&M. 141. MR. MANEY.

142f,w. REINFORCED CONCRETE DESIGN. Continuation of 141 with especial emphasis on the practical features of the design of buildings, bridges, retaining walls, etc. Three credits. Prerequisite: 141. MR. MANEY.

142(a)w. REINFORCED CONCRETE DESIGN. Similar to C.E. 142 with problems of special interest to students in architectural engineering. Three credits. Prerequisite: M.&M. 141. MR. MANEY.

143w,s. REINFORCED CONCRETE ANALYSIS. Study of advanced problems in design including reinforced concrete arch. Three credits. Prerequisite: 142. MR. MANEY.

144s. REINFORCED CONCRETE. A short course for mechanical and electrical engineers embracing the principal features of 141. Two credits. Prerequisites: M.&M. 127, 128. MR. LAGAARD.

146f,w,s. CEMENT AND CONCRETE LABORATORY. Laboratory technique and experimental investigation of special problems in cement, concrete, and reinforced concrete. Three credits. Prerequisite: M.&M. 141. MR. LAGAARD.

234f-235w-236s. ADVANCED STRUCTURAL DESIGN. Fundamental theory of stresses applied to special problems. Stress distribution in girders, riveted joints. Bending of straight bar. Built-up compression members. Impact and fatigue. Relative economy in design. Comparative study of specifications. Three credits per quarter. Prerequisites: 133, 142. MR. MANEY.

237w-238s. STRUCTURAL LABORATORY. Similar to 243, but dealing mainly with experimental problems in structural steel. Strain gauge study of actual stress distribution in beams, columns, and riveted joints. Three to five credits per quarter. Prerequisite: 133. MR. LAGAARD, MR. MANEY.

245f-246w-247s. ADVANCED REINFORCED CONCRETE ANALYSIS. Critical review of the literature of reinforced concrete and study of the advanced theory. Study of test data and analysis of stresses in reinforced concrete structures. Three credits per quarter. Prerequisite: 142. MR. LAGAARD, MR. MANEY.

Highway Engineering

51f. HIGHWAYS AND PAVEMENTS. Elementary course with field inspection, relating to the economics, location, construction, and maintenance of highways and pavements. Three credits. Prerequisite: 12. MR. LANG.

52w. HIGHWAYS AND PAVEMENTS. Continuation of Course 51, with laboratory practice. Three credits. Prerequisite: 51. MR. LANG.

251w. HIGHWAY LABORATORY. Investigations in coöperation with State Highway Department. Three to five credits. Prerequisites: 51, 52. MR. LANG.

252. HIGHWAY ADMINISTRATION. Problems of highway administration and finance. Three credits. Prerequisite: 51. MR. LANG.

Hydraulic Engineering

164f,w-165s. WATER POWER. Types of low, medium, and high-head developments. Details of developments. Dams. Turbine settings and characteristics. Three credits. Prerequisite: M.&M. 129. MR. BASS, MR. HEWETT.

263s. HYDRAULIC LABORATORY. Study of special hydraulic problems in laboratory, drafting room, and field. Three to five credits. Prerequisite: 164.

Municipal and Sanitary Engineering

53s. 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. Three credits. Prerequisite: none. MR. BASS.

161f. HYDROLOGY. Rainfall, evaporation, transpiration, percolation, run-off. Flood and low-water flows of streams. Storage for use in water supply, water power, irrigation, and navigation. Mass curves and frequency curves. Open only to seniors. Three credits. Prerequisite: none. MR. BASS, MR. HEWETT.

162f,w. 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. Three credits. Prerequisite: M.&M. 129. MR. BASS, MR. HEWETT.

163w,s. 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. Three credits. Prerequisite: M.&M. 129. MR. BASS.

171w. BUILDING SANITATION. The location and orientation of buildings; lighting, ventilation, water supply, plumbing, sewage, and refuse disposal. Two credits. Prerequisites: open only to senior architects. MR. BASS, MR. LEWIS.

261f-262w. WATER AND SEWAGE PURIFICATION. Continuation of Course 163. Design of water purification and sewage disposal. Three to five credits per quarter. Prerequisite: 162. MR. BASS.

272f. CITY-PLANNING. The physical elements of the city; topography, drainage, geology. Public works and structures. Street arrangements; rapid transit; railroad terminals. City-districting. Subsurface structures. Esthetic features of the city; the civic center; parks; boulevards; public buildings. Three to five credits. Prerequisites: 51, 52. MR. BASS, MR. MANN.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
11f	Surveying				
	Lect. Sec. 1, 2	III	F	21ME	Mr. Boon
	3, 4	VII	W	21ME	Mr. Boon
	Lab. Sec. 1	I-IV	T		
		I-III	Th	302ME	Mr. Boon
	2	II-IV	M		
		VI-IX	T	1ME	Mr. Hewett
	3	II-IV	W		
		VI-IX	Th	302ME	Mr. Boon
	4	VI-IX	M		
		II-IV	S	302ME	Mr. Boon
12w	Surveying				
	Lect. Sec. 1, 2	IV	F	21ME	Mr. Cutler
	3	VII	M	21ME	Mr. Cutler
	Lab. Sec. 1	I-IV	T		Mr. Zelner
		I-III	Th	302ME	Mr. Boon
	2	II-IV	M		Mr. Hewett
		VI-IX	T	1ME	Mr. Zelner
	3	II-IV	W		Mr. Boon
		VI-IX	Th	302ME	Mr. Zelner
13s	Surveying				
	Lect. Sec. 1 and 2	IV	F	21ME	Mr. Hewett
	3	VII	F	22ME	Mr. Boon
	Lab. Sec. 1	I-IV	T		Mr. Boon
		I-III	Th	302ME	Mr. Hewett
	2	II-IV	M		Mr. Boon
		VI-IX	Th	302ME	Mr. Hewett
	3	VII-IX	M		Mr. Boon
		I-IV	W	302ME	Mr. Boon
14f	Surveying				
	Sec. 1	VI-IX	M	225B-ME	
			W	225A-ME	Mr. Zelner
	2	VI-IX	F		
		I-IV	S	225B-ME	Mr. Zelner
	3	VI-IX	T	302B-ME	
			Th	225B-ME	Mr. Zelner
15w	Surveying				
	Sec. 1	VI-VII	MF	229ME	Mr. Zelner
	2 and 3	II-III	F	206ME	
		I-II	S	203ME	Mr. Zelner
16s	Surveying				
	Sec. 1	III-IV	W		
		VI-IX	Th	225A-ME	Mr. Zelner
	2	III-IV	M		
		VI-IX	W	225B-ME	Mr. Zelner
	3	VI-IX	T	302ME	
		II-III	F	225B-ME	Mr. Zelner
18s	Surveying	VI-IX	MF	21ME	Mr. Zelner
21w	Railway Engineering.....				
	Lect. Sec. 1	II	F	215ME	Mr. Boon
	2 and 3	III	T	107ME	Mr. Boon
	Lab. Sec. 1	VI-IX	W	225B-ME	Mr. Boon
	2	VI-IX	F	225B-ME	Mr. Boon
	3	VI-IX	T	225B-ME	Mr. Boon

No.	Title	Hour	Day	Room	Instructor
22s	Railway Engineering.....				
	Lect. Sec.	IV	T	135ME	Mr. Boon
	Lab. Sec. 1	VI-IX	W	225A-ME	Mr. Boon
	2	VI-IX	T	225B-ME	
	3	VI-IX	F	225B-ME	
23su	Summer Camp.....	About August 10			Mr. Cutler Mr. Zelner
31f	Stresses in Structures.....				
	Lect. Sec. 1	II	Th	135ME	Mr. Parcel
	2 and 3	III	Th	201ExE	Mr. Parcel
	Lab. Sec. 1	VI-IX	T	225B-ME	Mr. Feldman
		I-II	S	ExE	Mr. Lagaard
	2	III-IV	T	ExE	Mr. Parcel
		VI-IX	W	225B-ME	Mr. Parcel
	3	II-III	F	ExE	Mr. Lagaard
		VI-IX	F	225A-ME	Mr. Feldman
32w	Stresses in Structures.....				
	Lect. Sec. 1	II	T	229ME	Mr. Parcel
	2 and 3	I	T	229ME	Mr. Parcel
	Lab. Sec. 1	VI-IX	Th	225B-ME	Mr. Feldman
		I-II	S	ExE	Mr. Lagaard
	2	III-IV	W	ExE	Mr. Lagaard
		VI-IX	M	225B-ME	Mr. Feldman
	3	III-IV	S	ExE	Mr. Lagaard
		VI-IX	F	225A-ME	Mr. Feldman
33s	Elementary Structural Design				
	Lect. Sec.	IV	S	135ME	Mr. Parcel
	Lab. Sec. 1	III-IV	M	ExE	Mr. Lagaard
		VI-IX	T	225A-ME	Mr. Feldman
	2	III-IV	W	ExE	Mr. Lagaard
		VI-IX	F	225A-ME	Mr. Parcel
	3	VI-IX	M	225B-ME	Mr. Feldman
		I-II	S	ExE	Mr. Lagaard
37s	Structural Engineering.....	VI-IX	WTh	205MechE	Mr. Feldman
38f	Stresses in Structures (Arch.)	I-II	MTTh	402ME	Mr. Lagaard
39w	Structural Design (Arch.)...	I-II	MTTh	402ME	Mr. Feldman
41s	Reinforced Concrete (Arch.)..	I-II	MTTh	402ME	Mr. Feldman
51f	Highways and Pavements....				
	Lect. Sec. 1 and 2	I	Th	201ExE	Mr. Lang
	3	II	Th	201ExE	Mr. Lang
	Lab. Sec. 1	VI-IX	ThF	201ExE	Mr. Lang
	2	VI-IX	MT	201ExE	
	3	I-IV	T		
		II-V	S	201ExE	
52w	Highways and Pavements....				
	Lect.	IV	T	201ExE	Mr. Lang
	Lab. Sec. 1	VI-IX	T		
		III-IV	S	201ExE	Mr. Lang
	2	III-IV	M		
		VI-IX	W	201ExE	Mr. Lang
	3	II-III	W		
		VI-IX	Th	201ExE	Mr. Lang
53s	Municipal Engineering.....	III	TThS	135ME	Mr. Bass
121f	Railway Engineering.....				
	Lect.	III	F	206ME	Mr. Cutler
	Lab. Sec. 1	II-IV	TW	227ME	Mr. Cutler
	2	VI-VIII	TTh	225A-ME	Mr. Cutler

No.	Title	Hour	Day	Room	Instructor
122w	Railway Engineering.....				
	Lect.	II	T	206ME	Mr. Cutler
	Lab.	VI-IX	W		
		II-III	F	225A-ME	Mr. Cutler
123s	Railway Engineering.....				
	Lect.	II	W	206ME	Mr. Cutler
	Lab.	VI-IX	W	302ME	
		II-III	F	225A-ME	
124w	Transportation	IV	T		
		VI	Th		
		II	S	215ME	Mr. Cutler
125s	Transportation	IV	T		
		VI	Th		
		II	S	206ME	Mr. Cutler
131f	Bridge Analysis.....	VI-VIII	Th		
		I-IV	S	227ME	Mr. Parcel
132w	Bridge Design.....	I-III	Th		
		II-III	W		
		III-IV	S	225A-ME	Mr. Parcel
133s	Bridge Design.....	II-IV	T	225A-ME	
		II-III	Th	225B-ME	
		III-IV	S	225A-ME	Mr. Parcel
134w,s	Statically Indeterminate Structures	VI-IX	M		
		VII-IX	Th	227ME	Mr. Parcel
135s	Reinforced Concrete Design..	VI-IX	TW	227ME	Mr. Maney
		VI-VII	Th	225B-ME	
141f	Reinforced Concrete.....	VI-IX	T		
		I-III	Th	227ME	Mr. Maney
141(a)f	Reinforced Concrete.....	VI-IX	T		
		I-III	F	227ME	Mr. Maney
142f	Reinforced Concrete.....	VI-IX	M		
		I-IV	S	225A-ME	Mr. Maney
142w	Reinforced Concrete.....	VI-IX	M		
		VII-IX	Th	225A-ME	Mr. Maney
142(a)w	Reinforced Concrete.....	VI-IX	M		
		VI-VIII	Th	225A-ME	Mr. Maney
143w	Reinforced Concrete Analysis	II-IV	M		
		II-III	Th		
		III-IV	S	227ME	Mr. Maney
143s	Reinforced Concrete Analysis	II-IV	T		
		II-III	Th		
		III-IV	S	227ME	Mr. Maney
144s	Reinforced Concrete.....	Ar	Ar	Ar	Mr. Maney
146f	Cement and Concrete Laboratory	VI-IX	WF	ExE	Mr. Lagaard
146w	Cement and Concrete Laboratory	VI-IX	TF	ExE	Mr. Lagaard
146s	Cement and Concrete Laboratory	VI-IX	WF	ExE	Mr. Lagaard
161f	Hydrology				
	Lect.	II	MF	229ME	Mr. Bass
	Lab. Sec. 1	VI-VIII	M	227ME	Mr. Hewett
	2	I-III	Th	225A-ME	Mr. Bass
162f	Water Supply Engineering...				
	Lect.	III	M	206ME	Mr. Bass
	Lab.	I-IV	T		Mr. Hewett
		II-III	W	225A-ME	Mr. Bass

No.	Title	Hour	Day	Room	Instructor
162w	Water Supply Engineering...				
	Lect.	II	MF	229ME	Mr. Bass
	Lab.	VI-IX	T	225A-ME	Mr. Bass
163w	Sanitary Engineering.....				
	Lect.	III	T	206ME	Mr. Bass
	Lab.	III-IV	W	227ME	
		II-III	Th	225B-ME	
		III-IV	S	225B-ME	Mr. Hewett
163s	Sanitary Engineering.....				
	Lect.	II	S	215ME	Mr. Bass
	Lab.	III-IV	W	227ME	
		II-III	Th	225A-ME	Mr. Hewett
164f	Water Power.....				
	Lect.	I	T	217ME	Mr. Bass
	Lab.	VI-IX	WF	227ME	Mr. Hewett
164w	Water Power.....				
	Lect.	II	T	135ME	Mr. Bass
	Lab.	VI-IX	W		
		II-IV	F	227ME	Mr. Hewett
165s	Water Power.....				
	Lect.	II	W	205ME	Mr. Bass
	Lab.	VI-IX	W		
		II-IV	F	227ME	
171w	Building Sanitation.....	I	TTh	107ME	Mr. Bass Mr. Lewis
221f-222w-223s	Railway Administration.....	Ar	Ar	Ar	Mr. Cutler
224f	Railway Terminals and Yards	Ar	Ar	Ar	Mr. Cutler
234f-235w-236s	Advanced Structural Design..	Ar	Ar	Ar	Mr. Parcel
237w-238s	Structural Laboratory.....	Ar	Ar	Ar	Mr. Lagaard Mr. Maney
245f-246w-247s	Advanced Reinforced Concrete Analysis	Ar	Ar	Ar	Mr. Lagaard Mr. Maney
251w	Highway Laboratory.....	Ar	Ar	Ar	Mr. Lang
252s	Highway Administration.....	Ar	Ar	Ar	Mr. Lang
261f-262w	Water and Sewage Purification	Ar	Ar	Ar	Mr. Boon
263s	Hydraulic Laboratory.....	Ar	Ar	Ar	
272f	City Planning.....	Ar	Ar	Ar	Mr. Bass Mr. Mann

DRAWING AND DESCRIPTIVE GEOMETRY

Professor WILLIAM H. KIRCHNER; Assistant Professors ROBERT W. FRENCH, HOWARD D. MYERS; Instructors LEON ARCHIBALD, JOHN O. CEDERBERG, HENRY C. T. EGGERS, JOSEPH E. FINLEY, SIDNEY A. FRELLSEN, EDGERTON W. KIBBEY, CARROLL F. LEWIS, ARTHUR P. PETERSON, ORRIN W. POTTER, ROBERT F. SCHUCK, WILLIAM S. WILLIAMS.

COURSES

1f,w,su. ENGINEERING DRAWING. The elements of drafting including an introductory course in the methods of representation and constructive geometry. Graphs and formulas. Sketching, lettering, working drawings, conventions, standards, tracing, and blue printing. Three credits.

Prerequisite: Solid geometry. MR. KIRCHNER, MR. MYERS, MR. ARCHIBALD, MR. EGGERS, MR. FINLEY, MR. FRELLSEN, MR. KIBBEY, MR. LEWIS, MR. PETERSON, MR. POTTER, MR. SCHUCK, MR. WILLIAMS.

2w,s,su. ENGINEERING DRAWING. A continuation of Course 1. Three credits. Prerequisite: 1. MR. KIRCHNER, MR. MYERS, MR. ARCHIBALD, MR. EGGERS, MR. FINLEY, MR. FRELLSEN, MR. KIBBEY, MR. LEWIS, MR. PETERSON, MR. POTTER, MR. SCHUCK, MR. WILLIAMS.

3s,f,su. DESCRIPTIVE GEOMETRY. An elementary course in the methods of representation, correlated in part with analytical geometry. Graphical and algebraic solutions. Lectures, demonstrations, and drawing room exercises. Three credits. Prerequisites, 2. M.&M. 12, MR. KIRCHNER, MR. MYERS, MR. ARCHIBALD, MR. EGGERS, MR. KIBBEY, MR. LEWIS, MR. PETERSON, MR. POTTER, MR. SCHUCK, MR. WILLIAMS.

4f,su-5w,su-6s,su. ENGINEERING DRAWING AND DESCRIPTIVE GEOMETRY. The elements of drafting, including the study of polyhedra and other problems of solid and constructive geometry. An elementary course in descriptive geometry including graphical methods of representation, correlated in part with analytical geometry. Required of freshmen in the course in chemistry and chemical engineering who satisfy the entrance requirements in mathematics. Two credits per quarter. Prerequisite: solid geometry. MR. SCHUCK.

7w,su-8s,su. ENGINEERING DRAWING AND DESCRIPTIVE GEOMETRY. This course covers the same subject-matter as Course 4-5-6. It is required of freshmen in the course in chemistry and chemical engineering who take solid geometry during the first quarter. Three credits per quarter. Prerequisite: solid geometry. MR. POTTER, MR. SCHUCK.

9f,w,s. DRAFTING. Developments and intersections. Assembly drawings, outline drawings, diagrammatic layout, and detail drawings of experimental and industrial installations. Open to chemical engineering students who have completed Course 6 or 8. Two to six credits as elected. MR. SCHUCK.

M.&M.10f,su. SOLID GEOMETRY. Lines and planes in space, dihedral and polyhedral angles; polyhedrons, cylinders, cones, similarity, prismoid formula, sphere area, volumes, numerical exercises in area, volumes, weights. Three hours per week but without credit. MR. ARCHIBALD, MR. LEWIS, MR. PETERSON, MR. SCHUCK, MR. WILLIAMS.

11f. ENGINEERING DRAWING. (Mines.) Sketching, lettering, representation, elements of drafting, details of machines and structures, interpretation of working drawings. Four credits. Prerequisite: none. MR. FRELLSEN, MR. POTTER.

12w. ENGINEERING DRAWING. (Mines.) Continuation of Course 11. The elements of general drafting, mechanical drawing as a language. Lines, views, dimensions, standards, signs, abbreviations, and explanatory notes. Three credits. Prerequisite: 11. MR. FRELLSEN, MR. POTTER.

13s. ENGINEERING DRAWING. (Mines.) Continuation of Course 12. The elements of general drafting. Maps and sketches. Brush and pen conventions. Three credits. Prerequisite: 12. MR. FRELLSEN, MR. POTTER.

14f. DESCRIPTIVE GEOMETRY. (Mines.) Projection; central and special cases, principles and application, representation of lines, planes, and solids, and of their relations; tangencies, intersections, and developments. Recitations, lectures, and solution of problems. Three credits. Prerequisites: 13, Math. 5. MR. MYERS.

15w. DRAFTING. (Mines.) Graphics, machine-drafting, and structural drafting. Instruction in drafting room methods. Two credits. Prerequisite: 14. MR. MYERS.

21f,w,su. DRAFTING. (C.E.) Drawing of structures and machines. Detail, assembly, and construction drawings. The solution of problems of simple structures. The application of descriptive geometry to drafting room problems. Two credits. Prerequisite: 3. MR. FRENCH, MR. MYERS.

22w,s,su. DRAFTING. (C.E.) Continuation of Course 21. Drafting problems in concrete, highway, and topographical work as met by the civil engineering draftsman in practice. Intersections, developments, and other practical geometric problems. Two credits. Prerequisite: 21. MR. FRENCH, MR. MYERS.

23s,su. DRAFTING. (C.E.) A continuation of Course 22. Two credits. Prerequisite: 22. MR. FRENCH, MR. MYERS.

26f,w,su. DRAFTING. (E.E.) The application of descriptive geometry to drafting room problems. Sheet metal work, belting, conveyors, and connections. Working drawings and tracing. Two credits. Prerequisite: 3. MR. EGGERS, MR. LEWIS, MR. PETERSON.

27w,s,su. DRAFTING. (E.E.) The application of elementary formulas in the proportioning of simple machine parts. Outline and assembly drawings, electrical conventions, circuit diagrams, the development of simple formulas, and graphical methods. Two credits. Prerequisite: 26. MR. EGGERS, MR. LEWIS, MR. PETERSON.

28f,w,su. DRAFTING. (M.E.) The application of descriptive geometry to drafting room problems. Sheet metal work, belting, conveyors, and connections. Working drawings and tracing. Two credits. Prerequisite: 3. MR. LEWIS, MR. POTTER, MR. WILLIAMS.

29w,s,su. DRAFTING. (M.E.) The application of elementary formulas in the proportioning of simple machine parts. Outline and assembly drawings, structural drafting, the development of simple formulas, and graphical methods. Two credits. Prerequisite: 28. MR. LEWIS, MR. POTTER, MR. WILLIAMS.

30f. PROJECTION AND SHADOWS. Methods of representation, arrangement of views, sections, tangencies and penetrations, and architectural shades and shadows. (Required of sophomores taking the course in architecture and decoration). Three credits. MR. KIRCHNER.

31f. GRAPHICS. Architectural shades and shadows. Pure and applied perspective. Exercises in constructive geometry and applications. Theorems, methods, and the solution of problems. Two credits. Prerequisite: none. MR. KIRCHNER, MR. MYERS.

37f,w,s. LETTERING FOR ENGINEERS. The analysis of the alphabets. Exercises in Roman and Gothic lettering. Design and composition of the paragraph and the title. Two credits. Prerequisite: none. MR. KIRCHNER.

38f-39w-40s. GRAPHS AND CHARTS. The theory and construction of graphic charts and diagrams. This course can be entered at any quarter, also can be continued from one quarter through the following quarter. Two credits per quarter. Prerequisites: sophomore drawing. M.&M. 26. MR. KIRCHNER.

41-42-43f,w,s,su. TECHNICAL DRAWING. (a) A general course in the theory and practice of drawing. Sketching, lettering, tracing, conventions, renderings, and mechanical drawing. (b) Modification of the above course of particular interest to dental and medical students. Two credits per quarter. Prerequisite: none. MR. CEDERBERG, MR. SCHUCK.

44f,w,s. LETTERING. A practical course in plain lettering and the making of graphs and charts. One credit per quarter. Prerequisite: none. MR. KIRCHNER.

45f,w,s-46f,w,s. ALPHABETS. Construction and analysis of various types of letterings. Demonstrations and exercises. Open to juniors and seniors. Two credits per quarter. Prerequisite: none. MR. KIRCHNER.

47f-48w-49s. DRAWING, ENGRAVING, AND DECORATION. A study of the graphic arts and processes with special emphasis on their application to the art of printing. Open to juniors and seniors. Three credits per quarter. Prerequisite: none. MR. KIRCHNER.

71f,w,s. GRAPHICAL REPRESENTATION—CIRCUITS. Schematic, connection, wiring, and pictorial diagrams of electrical circuits. Two one-hour lectures and one three-hour laboratory period. Three credits. Prerequisites: 27, E.E. 111. MR. EGGERS.

COURSES

111-112f,w,s. ADVANCED DESCRIPTIVE GEOMETRY. Methods of representation; parallel and central projection. Curves and surfaces, geometrography, axonometry, and photogrammetry. Two credits per quarter. Prerequisites: 3, Calculus. MR. KIRCHNER.

113f,w,s. PERSPECTIVE. The principles and practice of perspective, including shadows, reflections, distortions, corrections, systems, methods, the practical problem, and inverse construction. Three credits. Prerequisite: 33. MR. KIRCHNER.

115f-116w-117s. GEOMETRY. Pure and applied. Transformations, perspective, kinematics, stereomtomy, graphic statics, graphic calculus, nomography. Three credits per quarter. Prerequisite: calculus. MR. KIRCHNER.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
M & M. 1of	Solid Geometry.....				
	Sec. 6	III	MW		
		VII	F	21ME	
	7	III	TThS	206ME	
	12	IV	MWF	203ME	
	18	I	MWF	106ME	
11	Engineering Drawing.....				
	Sec. 1	III-IV	MTW		
		IV-V	S	445C	
	2	III-IV	MTW		
		IV-V	S	443C	
	3	III-IV	MTW		
		IV-V	S	411C	
	4	III-IV	MTW		
		IV-V	S	415C	
	5	III-IV	MTW		
		IV-V	S	417C	
	8	I-II	MTFS	411C	
	9	I-II	MTFS	443C	
	10	I-II	MTFS	445C	
	11	I-II	MTFS	415C	
	13	VI-VII	MT		
		II-III	Th		
		III-IV	F	445C	
	14	VI-VII	MT		
		II-III	Th		
		III-IV	F	443C	
	15	VI-VII	Th		
		VII-VIII	MTW	411C	
	16	VI-VII	Th		
		VII-VIII	MTW	415C	
	17	VI-VII	MTWTh	417C	
1w	Engineering Drawing.....				
	Sec. 7	I-II	MTFS	417C	
	8	I-II	MTFS	411C	
	13	VI-VII	MT		
		II-III	Th		
		III-IV	F	445C	
	18	VI-VII	MTWTh	417C	

No.	Title	Hour	Day	Room	Instructor
2w	Engineering Drawing.....				
	Sec. 1	III-IV	MTW		
		IV-V	S	445C	
	2	III-IV	MTW		
		IV-V	S	443C	
	3	III-IV	MTW		
		IV-V	S	411C	
	5	III-IV	MTW		
		IV-V	S	417C	
	9	I-II	MTFS	443C	
	10	I-II	MTFS	445C	
	11	I-II	MTFS	415C	
	14	VI-VII	MT		
		II-III	Th		
		III-IV	F	443C	
	15	VII-VIII	MTW		
		VI-VII	Th	411C	
	16	VII-VIII	MTW		
		VI-VII	Th	415C	
2s	Engineering Drawing.....				
	Sec. 7	I-II	MTFS	417C	
	8	I-II	MTFS	411C	
	11	I-II	MTFS	415C	
	18	III-IV	T		
		VI-VII	MWF	445C	
3f	Descriptive Geometry.....	III	M	110ExE	
			W	206ME	
			F	320ME	
3s	Descriptive Geometry.....				
	Sec. 1	III-IV	MW		
		IV-V	S		
		VII-VIII	Th	445C	
	2	III-IV	MW		
		IV-V	S		
		VIII-IX	Th	443C	
	3	III-IV	MW		
		IV-V	S		
		VII-VIII	Th	411C	
	9	I-II	MTFS	443C	
	10	I-II	MTFS	445C	
	15	VII-VIII	MW		
		III-IV	T		
		VI-VII	F	411C	
	16	VII-VIII	MW		
		III-IV	T		
		VI-VII	F	415C	
4f-5s	Engineering Drawing (Chem.)	VIII-IX	T		
		VI-VII	Th		
		VII-VIII	F	445C	Mr. Schuck
6s	Descriptive Geometry (Chem.)	III-IV	T		
		VI-VII	WTh	417C	Mr. Schuck
7w	Engineering Drawing (Chem.)	VIII-IX	T		
		VI-VIII	Th		
		VII-IX	F	445C	Mr. Schuck

No.	Title	Hour	Day	Room	Instructor
8s	Engineering Drawing and Descriptive Geometry (Chem.)	III-IV	T		
		VI-VIII	WTh	417C	Mr. Schuck
9f,w,s	Drafting (Chem.)	Ar	Ar	Ar	
11f	Engineering Drawing (Mines)	III-IV	MTWFS	101ME	
12w-13s	Engineering Drawing (Mines)	III-IV	TWFS	101ME	Mr. Potter
14f	Descriptive Geometry (Mines)	III	MWF	203ME	Mr. Myers
15w	Drafting (Mines)	III-IV	WF	1ME	Mr. Myers
21f	Drafting (C.E.)				
	Sec. 1	I-II	MWF	201ME	
	2	I-II	ThS		
		III-IV	W	201ME	
	3	III-IV	TFS	201ME	
	4	VIII-IX	TWTh	201ME	
21w	Drafting (C.E.)	III-IV	MWF	415C	
22w	Drafting (C.E.)				
	Sec. 1	I-II	MWF	201ME	
	2	III-IV	W		
		I-II	ThS	201ME	
	3	III-IV	TFS	201ME	
22s	Drafting (C.E.)	III-IV	MWF	415C	
23s	Drafting (C.E.)				
	Sec. 1	I-II	MWF	201ME	
	2	III-IV	W		
		I-II	ThS	201ME	
	3	III-IV	TFS	201ME	
26f	Drafting (E.E.)				
	Sec. 1	VI-VII	TThF	201ME	
	2	VI-VII	TTh		
		III-IV	S	455C	
	3	I-II	TThS	417C	
	4	I-II	MWF	101ME	
26w	Drafting (E.E.)	III-IV	MWF	415C	
27w	Drafting (E.E.)				
	Sec. 1	VI-VII	TThF	201ME	
	2	VI-VII	TTh		
		III-IV	S	455C	
	3	I-II	TThS	455C	
	4	I-II	MWF	101ME	
27s	Drafting (E.E.)	III-IV	MWF	415C	
28f	Drafting (M.E.)				
	Sec. 1	VI-VII	MT		
		I-II	Th	101ME	
	2	VII-VIII	Th		
		VI-VII	WF	101ME	
28w	Drafting (M.E.)	III-IV	MWF	415C	
29w	Drafting (M.E.)				
	Sec. 1	VI-VII	MT		
		I-II	Th	101ME	
	2	I-II	T		
		VI-VII	WF	101ME	
29s	Drafting (M.E.)	III-IV	MWF	415C	
30f	Projection and Shadows (Arch.)	III	TThS	203ME	Mr. Kirchner
31f	Graphics (Arch.)	II	TTh	205ME	Mr. Kirchner
37f-w-s	Lettering for Engineers	IV	WF	206ME	

No.	Title	Hour	Day	Room	Instructor
38f-39w-40s	Graphs and Charts.....	I	WF	206ME	Mr. Kirchner
41f-w,42f-w, 43f-w	Technical Drawing.....				
	Sec. 1	I-II	MWF	455C	
	2	III-IV	MWF	455C	
	3	VII-VIII	MWF	455C	
41s-42s-43s	Technical Drawing.....				
	Sec. 1	I-II	MWF	455C	Mr. Cederberg
	2	III-IV	MWF	455C	Mr. Schuck
	3	VII-VIII	MF		
		VIII-IX	T	455C	
44f,w,s	Lettering				
	Sec. 1	IV	T	217ME	
	2	II	Th	107ME	
				203ME(spring)	
45f,w,s-46f-w-s	Alphabets	II	TTh	217ME	Mr. Schuck
47f-48w-49s	Drawing, Engraving, and Decoration (S.L.A.).....	II	MWF	217ME	Mr. Kirchner
71f,w,s	Graphical Representation.....				
	Lect.	I	WF	201ExE	Mr. Eggers
	Lab.	Ar	Ar	Ar	
111-112f,w,s	Advanced Descriptive Geometry	Ar	Ar	Ar	Mr. Kirchner
113f-w-s	Perspective	Ar	Ar	Ar	Mr. Kirchner
115f-116w-117s	Geometry	Ar	Ar	Ar	Mr. Kirchner

ECONOMICS

Professor George W. Dowrie, Roy G. Blakey[1], Jeremiah S. Young; Assistant Professors Z. Clark Dickinson, Howard S. Noble, John J. Reighard, J. Warren Stehman; Lecturers Charles L. Jamison, Ben W. Palmer; Instructors Joseph E. Cummings, Ralph Farmer, Milton N. Nelson, Harry J. Ostlund.

COURSES

8f-9w. General Economics. (For engineers.) Principles of economics with special emphasis upon their application to current problems such as money, banking, conservation, insurance, international commerce, monopolies, transportation, labor socialism, public ownership, and finance. Three credits. Prerequisite: none. Mr. Blakey and others.

28f,w,s. Business Law. A course in business law arranged for engineers, including the law of contracts, suretyship, agency, partnership, corporations, negotiable instruments, conveyance patents, and riparian rights. Offered to juniors, seniors, and sophomores with six credits in economics. Three credits. Mr. Palmer.

[1] Absent on leave, 1922-23.

29s. PRINCIPLES OF ACCOUNTING. (For engineers.) The purpose and principles of account classification; capital and revenue; accruals; valuation; depreciation; preparation and interpretation of balance sheets, income accounts, and other statements. Three hours of lecture and one laboratory period a week. Four credits. Prerequisite: none. MR. OSTLUND.

51f-52w-53s. BUSINESS LAW. Principles governing ordinary business transactions. Contracts—formation, operation, interpretation, breach, and discharge. Agency and service. Negotiable instruments. Business associations—partnerships and private corporations. Property—personal and real. Three credits per quarter. Prerequisite: nine credits in economics or political science. MR. YOUNG.

73w. RAILWAY TRAFFIC AND RATES. Railway transportation from standpoint of the business man and shipper. Freight-shipping documents. Classification and tariffs, time and preference freight, private car lines, industrial trackage and terminal service, express rates and service, special passenger rates. Three credits. Prerequisite: 8-9. MR. CUMMINGS.

74s. TRANSPORTATION PROBLEMS. An intensive study of certain important problems such as valuation, public ownership, operation, and regulation. Three credits. Prerequisite: 92. MR. CUMMINGS.

85f,s. PRINCIPLES OF MARKETING. A general course dealing with the mechanics and operation of markets: classification, organization, market agencies as factors in production. The price-making process: control of supply, assumption of risk, incidence of marketing costs. Wastes of competition. Three credits. Prerequisite: 8-9. MR. NELSON.

91f. PRINCIPLES OF ORGANIZATION AND MANAGEMENT. (For engineers.) Types of operating organization; specialization; coördination of men and departments, planning; delegation of authority; means of control; establishment and maintenance of standards for materials, operation, machinery; scientific management; personnel problems. Three credits. Prerequisite: seniors without prerequisite or juniors with 8-9 or equivalent. MR. JAMISON.

92w. BUSINESS FINANCE. (For engineers.) A study of the principles of financing business concerns. Banking facilities from the viewpoint of the business man. The organization and financial management of corporations with special reference to the various types of corporate securities. Three credits. Prerequisite: 8-9 or equivalent. MR. STEHMAN.

93s. COST ACCOUNTING. (For engineers.) Principles of manufacturing cost accounting. Use of accounting records and reports to control materials, labor, and indirect factory expenses. Special factory cost problems. Three credits. Prerequisite: 29. MR. OSTLUND.

131f-132w-133s.* COST ACCOUNTING. General principles of cost accounting; elements of costs; methods of arriving at costs, and of distribution overhead; application of cost accounting principles to selling, banking, mining, farming, etc. Three credits per quarter. Prerequisite: 29. MR. NOBLE.

154s. 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. Summary of the theories of valuation. Three credits. Prerequisite: 92. MR. REIGHARD.

167w-168s. INDUSTRIAL RELATIONS. (For engineers.) Labor (personnel) policy in business management. Problems and methods as to employment, promotion, training, health, and safety, employees' service, employers' representation, wages, hours, stability of work, and working conditions. Studies of actual business practice, written report. Three credits per quarter. Prerequisites: 8, 9. MR. DICKINSON.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
8f-9w	General Economics.....				
	Sec. 1	I	MWF	135ME	Mr. Blakey
	2	I	MWF	225C	
	3	III	MWF	225C	
	4	IV	MWF	107ME	
	5	IV	MWF	135ME(fall) 136ME(winter)	
28f,w,s	Business Law.....	IV	MWF	102MechE(fall) 106ME(winter)	Mr. Palmer
	(Section limited to 50 students)		M WF	21ME 229ME(spring)	
29s	Principles of Accounting.....				
	Lect. Sec. 1	I	MWF	107ME	Mr. Ostlund
	2	I	MWF	135ME	
	3	I	TThS	104ME	
	4	III	MWF	206ME	
	5	IV	MWF	205ME	
	Lab. Sec. 1	VI-VII	Th	201ME	
	2	VIII-IX	Th	201ME	
	3	VI-VII	M	201ME	
	4	VI-VII	F	1ME	
	5	VI-VII	W	201ME	
51f-52w-53s	Business Law.....				
	Lect.	II	WF	301F LitTh(spring)	Mr. Young
	Sec. 1	I	M	102F	
	2, 3, 4	II	M	3F,2F,321F	
	5	VII	M	205F	
	6, 7	Ar	Ar	Ar	
73w	Railway Traffic and Rates....	VI	MWF	213MA	Mr. Cummings
74s	Transportation Problems.....	VI	MWF	213MA	Mr. Cummings

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

No.	Title	Hour	Day	Room	Instructor
85f	Principles of Marketing.....				
	Lect.	I	S	202MA	Mr. Nelson
	Sec. 1	I	TThS	202MA	
	2	I	WF	209MA	
85s	Principles of Marketing.....	I	TTh	102MA	Mr. Nelson
91f	Principles of Organization and Management	I	MWF	107ME	Mr. Jamison
92w	Business Finance.....	I	MWF	107ME	Mr. Stehman
93s	Cost Accounting.....	IV	MWF	107ME	Mr. Ostlund
131f-132w-133s	Cost Accounting.....				
	Sec. 1	II	TThS	109MA 303(spring)	Mr. Noble
	2	III	TThS	109MA 303(spring)	
154s	Public Utilities.....	I	MWF	102MA	Mr. Reighard
167w	Industrial Relations.....	IV	MWF	104MechE	Mr. Dickinson
168s	Personnel Management.....	II	TThS	209MA	Mr. Dickinson

ELECTRICAL ENGINEERING

Professors George D. Shepardson, Frank W. Springer; Associate Professor William T. Ryan; Assistant Professors Cyril M. Jansky, Jr., Edwin R. Martin; Instructors John H. Kuhlman, George W. Swenson, Milo E. Todd; Assistant Henry C. Forbes; Teaching Fellows Ludvig C. Larson, Emanuel C. Manderfeld.

COURSES

Direct Current

11f-13w-15s. Elements of Electrical Engineering. Introduction to the development, principles, materials, safety, and general application of electrical engineering. Class and laboratory. Open to students registered for physics. Three credits per quarter. Mr. Shepardson, Mr. Kuhlman, Mr. Swenson, Mr. Todd, Mr. Larson, Mr. Manderfeld.

111f-113w-115s. Direct Current Machinery. Electrical engineering measuring instruments and their use, units, theory of dynamo electric machinery, methods of regulation, construction and operation of generators and motors, methods of testing. Three credits per quarter. Prerequisites: 11, 13, 15. Mr. Springer.

112f-114w-116s. Direct Current Machinery Laboratory. To be taken with Course 111-113-115. Electrical engineering measurements, calibration of instruments, operation and characteristic curves of generator and motor. Lectures and practice. Two credits per quarter. Prerequisite: registration in 111, 113, or 115. Mr. Martin, Mr. Swenson, Mr. Todd.

Alternating and Transient Currents

121f-123w-125s. Alternating Currents. Phenomena, measurement, and use of alternating currents, theory of the transformer, generator, and motor, types of apparatus. Three credits per quarter. Prerequisite: 115. Mr. Ryan.

122f 124w-126s. ALTERNATING CURRENT LABORATORY. To be taken with Course 121-123-125. Experimental study of alternating currents, regulation and efficiency tests of alternators, transformers, motors, and rotaries. Two credits per quarter. Prerequisite: registration in 121, 123, or 125. MR. SPRINGER.

221f. TRANSIENT ELECTRICAL PHENOMENA. Mathematical study of the electric circuit containing resistance, inductance, and capacity. Abnormal currents and voltages upon switching circuits containing iron core inductances. Two credits. Prerequisite: registration in 121. MR. JANSKY.

223w. TRANSIENT ELECTRICAL PHENOMENA. Current and voltage distribution in circuits containing distributed resistance, inductance, and capacity. Distortion in telephone lines and its correction. Two credits. Prerequisite: 221. MR. JANSKY.

225s. TRANSIENT AND HIGH FREQUENCY PHENOMENA. Transient phenomena in coupled circuits. Distribution of current and flux in conductors at high and low frequencies. Change of resistance with frequency. Theoretical study of special problems. Two credits. Prerequisite: 223. MR. JANSKY.

Design

132f-134w-136s. ELECTRICAL DESIGN. The design of direct current generators and motors, alternating current transformers, generators and synchronous motors. Complete calculations and predetermination of operating characteristics. Two credits per quarter. Prerequisite: for 132, 115; for 134 and 136, 121. MR. KUHLMAN.

232f-234w-236s. ELECTRICAL DESIGN. Special problems. Two credits per quarter. Prerequisite: 136. MR. KUHLMAN.

237s. POWER TRANSMISSION LINE DESIGN. Preparation of detailed plans and specifications for the construction of high voltage transmission lines and distributing systems. Economic electrical and mechanical principles and calculations. Overhead and underground lines. Transmission line supports. Three credits. Prerequisites: 134, 142. MR. RYAN.

Electric Power

40f. ELECTRIC WIRING AND EQUIPMENT. Elementary principles of direct and alternating current circuits. Interior wiring and electrical equipment of buildings. Elements of calculation of illumination. Some detailed study of plans and specifications. For senior architects and architectural engineers. Two credits. Prerequisite: Physics 43. MR. TODD.

41f. ELECTRIC POWER. Elementary principles of continuous currents, generators, and motors. Elementary principles of alternating currents, generators, transformers, and motors. Measurement of power. Elementary principles of transmission and distribution. Lectures, recitations, and laboratory work. For senior students in the School of

Mines. Open to seniors in architecture. Three credits. Prerequisite: Physics 43. MR. RYAN, MR. SWENSON.

42w,s. ELECTRIC POWER. Similar to Course 41f. For seniors in civil engineering. Four credits. Prerequisite: Physics 43. MR. SWENSON.

43s-44f-45w. ELECTRIC POWER. An elementary study of the problems involved in the generation, distribution, measurement, and utilization of electric power. Lectures, recitations, and laboratory work, supplemented by numerous problems. For seniors in mechanical engineering and chemistry. Three credits per quarter. Prerequisite: Physics 43. MR. MARTIN, MR. TODD.

47w. ELECTRIC MOTORS. Elementary principles of direct and alternating current motors. Applications of motors to elevators and ventilation equipment. Recitations and laboratory. For seniors in architectural engineering. Two credits. Prerequisite: 40. MR. TODD.

141f. 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. Two credits. Prerequisite: registration in 121. MR. RYAN.

142w. 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. Two credits. Prerequisite: 141. MR. RYAN.

143f,w,s. POWER PLANT OPERATION. Practice in operation and care of gas producer, gas engine, boilers, engines, turbines, dynamos, battery, switchboards and auxiliary apparatus of the University lighting plant. One credit. Prerequisite: 116 or 45. MR. RYAN, MR. DIXON.

144w. RAILWAY ELECTRICAL ENGINEERING. History, development, economics, principles of mechanics applied to electric train movements, motor characteristics, control systems, substations, railway problems, speed-time curves, and time schedules. Lectures and recitations. Two credits. Prerequisite: 42 or 45 or 115. MR. MARTIN.

145s. RAILROAD ELECTRIFICATION. Reasons for electrification, study of European and American systems, trolley and third-rail construction, variation in locomotive design, performance as compared to steam locomotives, electrical features, results of electrification as to service and economy. Lectures, assignments. Two credits. Prerequisite: 144. MR. MARTIN.

146f,w,s. BATTERIES AND VEHICLES. Operation and performance of alkaline and acid storage batteries for automobiles, trucks, and locomotives, and for car lighting. Charging and regulating equipment. One credit. Prerequisite: 45 or 113. MR. RYAN, MR. MARTIN.

147w. ELECTRIC EQUIPMENT OF BUILDINGS. Lectures on electrical equipment of modern office and factory buildings. Detailed study of plans and specifications. Inspection and reports on jobs under construction and after completion. Special lectures. Two credits. Prerequisite: 41 or 45 or 115.

Electric Lighting

151f. ELECTRIC LIGHTING. Principles of vision, photometers, and measurement of light, methods and calculations of illumination, various sources of light, development of electric illuminants, distribution systems. Lectures and problems. One credit. Prerequisite: 40 or 43 or 111. MR. MARTIN.

152f. PHOTOMETRIC LABORATORY. Photometric studies of incandescent and arc electric lamps, gas, and oil lamps. Bench and radial photometers and illuminometers. One credit. Prerequisite: registration in 151. MR. MARTIN.

251w-253s. ILLUMINATING ENGINEERING. Performance of electric and gas lamps, reflectors and diffusers, luminous efficiency, distribution, color characteristics, physiological phenomena, methods of determining location, kind, and quantity of light for obtaining desired illumination. Two credits per quarter. Prerequisite: 151. MR. SHEPARDSON.

252w-254s. ILLUMINATION LABORATORY. Laboratory tests of shades and fixtures. Tests of lighting installations. Two credits per quarter. Prerequisite: registration in 251. MR. SHEPARDSON, MR. MARTIN.

Communication

*61f. ELEMENTS OF COMMUNICATION. Telegraph. Importance of communication. Comparison of methods. General theory of telegraph apparatus. Simplex, duplex, and induction telegraphs. Ground telegraphy. Locating grounds. Batteries and battery charging. Lectures with laboratory practice. Three credits. Prerequisite: registration in 111. MR. SHEPARDSON, MR. SWENSON.

*63w. ELEMENTS OF COMMUNICATION. Telephone. Nature of speech sounds. Essential parts of telephone system. General theory of telephone apparatus. Elements of switchboards and circuits. Lectures and laboratory. Three credits. Prerequisite: 61. MR. SHEPARDSON, MR. SWENSON.

65s. ELEMENTS OF COMMUNICATION. Telegraph and telephone lines. Capacity and inductance of circuits. Interference. Transposition, phantoms, and other multiple uses of lines. Elements of transmission phenomena. One or two credits. (Laboratory may be omitted.) Prerequisite: 63. MR. SHEPARDSON, MR. SWENSON.

66su. ELEMENTS OF RADIO COMMUNICATION. Fundamental phenomena underlying radio telegraphy and telephony. Principal types of transmitting and receiving apparatus. Wavemeters and their use. Daily lecture and laboratory work. Open to those who have had trigonometry and one year of college physics. Three credits. No credit toward curriculum in electrical engineering. MR. JANSKY, MR. FORBES.

67su. TELEGRAPHIC CODE PRACTICE. Practice in sending and receiving messages by international telegraphic code. Intended primarily for high school teachers, and accompanying Course 66. One hour daily. MR. FORBES.

*161f. RADIO COMMUNICATION. Phase relations in high frequency circuits. Mathematical theory of damped wave transmitting and receiving circuits. Inductance and capacity measurements, using damped waves. The electron tube as a detector and amplifier. Signal Corps apparatus. Three credits. Prerequisite: registration in 121. MR. JANSKY, MR. FORBES.

*162w. RADIO COMMUNICATION. Theory and measurement of logarithmic decrement. Undamped wave transmitting and receiving circuits. Heterodyne reception. The arc, high frequency generator, and electron tube as sources of high frequency power. High frequency measurements, using undamped waves. Three credits. Prerequisite: 161. MR. JANSKY, MR. FORBES.

163s. RADIO COMMUNICATION. Mathematical theory of the electron tube and its use in the radio circuit. Design of electron tube oscillator and amplifier circuits. Radio telephone, modulation, carrier frequencies. Direction-finding apparatus and selective circuits for interference elimination. Three credits. Prerequisite: 162. MR. JANSKY, MR. FORBES.

164f. TELEGRAPH AND TELEPHONE APPARATUS. Theoretical and experimental study of apparatus used for signaling, telegraphy, and telephony. Lecture and laboratory. Two or three credits as elected. Prerequisite: 63. MR. SHEPARDSON, MR. SWENSON.

165w-166s. TELEGRAPH AND TELEPHONE CIRCUITS. Theoretical and experimental study of telegraph and telephone circuits and the phenomena of long-line transmission. Applications of hyperbolic functions. Phantoms, loading, repeaters. Inductive disturbances, transpositions. Multiplex telephony. Two or three credits per quarter as elected. Prerequisite: registration in 123. MR. SHEPARDSON, MR. SWENSON.

* NOTE. Courses 61, 63, 161, and 162 are required as part of military science Courses 51 to 54 for R.O.T.C. Signal Corps, and are open as electives for civilian students.

167f-168w-169s. RADIO STATION OPERATION. For men already proficient, licensed radio operators. Includes maintaining schedule in the radio station and the interpretation of the data obtained on radio communication methods and apparatus. Open only to a limited number by permission. One or two credits per quarter as arranged. Prerequisite: registration in 161. MR. JANSKY, MR. FORBES.

Research

171w-172s. UNDERGRADUATE THESIS. An investigation of some approved problem in electrical engineering. Three to six credits per quarter as elected. Prerequisite: 121. MR. SHEPARDSON, MR. SPRINGER, MR. RYAN, MR. JANSKY, MR. MARTIN, MR. SWENSON.

183w-184s-185f. SPECIAL ELECTRICAL LABORATORY. Efficiency tests and special problems. Two credits per quarter. Prerequisite: 116. MR. SPRINGER.

186w,s. HIGH TENSION TESTING. Low frequency pressure to 320,000 volts, high frequency to several million volts, applied to study of dielectric phenomena, such as testing high tension transmission cables, transformer oil, transmission line insulators. Laboratory and library reference course given only by special arrangement. Two credits. Prerequisites: 123, 124 or registration in 123 or 124. MR. SPRINGER.

281w-282s. ADVANCED ALTERNATING CURRENT MEASUREMENTS. Vector treatment of circuit networks. Bridge circuits for the measurement of resistance, inductance, and capacity at audio and radio frequencies. Two credits per quarter. Prerequisite: 126. MR. JANSKY.

284w-285s-286f. PRECISE ELECTRICAL ENGINEERING MEASUREMENTS. Lectures and laboratory work. Precise measurements of resistance, voltage, current, self-induction, and capacity; standardization of measuring instruments. Two credits per quarter. Prerequisite: 122. MR. SPRINGER.

275f-276w-277s. ENGINEERING RESEARCH. Investigation of special problems in laboratory or library. Two to six credits per quarter. Open to graduate students. MR. SHEPARDSON, MR. SPRINGER, MR. RYAN, MR. MARTIN, MR. JANSKY.

91s. ENGINEERING INSPECTION TRIP. Personally conducted inspection of factories, power plants, and other places of engineering interest, usually including Milwaukee, Chicago, and Gary. Occupies the Easter recess, costing about $50 for each person. Open to seniors, juniors, and sophomores. One credit. Prerequisite: 11.

191f-192w-193s. SEMINAR. Weekly discussion of current electrical periodicals. One credit per quarter. Prerequisite: 111. MR. SHEPARDSON.

291f-292w-293s. GRADUATE SEMINAR. Continuation of Course 191-192-193. One credit per quarter. Prerequisite: 126.

294f-295w-296s. 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. Two credits per quarter. Prerequisite: 124. MR. SPRINGER.

297s. ELECTROCHEMICAL ENGINEERING. Theoretical and experimental study of the engineering problems of electrolytic and electrothermal processes. Two credits. Prerequisite: 45 or 116. MR. SHEPARDSON.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
11f	Elements of Elec. Eng.....				
	Lect. Sec. 1	II	ThS	201EE	Mr. Shepardson
	2	II	ThS	136ME	Mr. Todd
	3	III	ThS	201EE	Mr. Swenson
	4	III	Th	107ME	Mr. Todd
			S	205ME	
	Lab. Sec. A	VI-VII	W	100EE	
	B	III-IV	S	100EE	
	C	VII-VIII	M	100EE	
	D	VIII-IX	Th	100EE	
	E	III-IV	M	100EE	
	F	VIII-IX	T	100EE	
	G	I-II	T	100EE	
	H	VI-VII	Th	100EE	
13w	Elements of Elec. Eng.....				
	Lect. Sec. 1	II	ThS	201EE	Mr. Shepardson
	2	II	ThS	136ME	Mr. Todd
	3	III	ThS	201EE	Mr. Swenson
	4	III	ThS	135ME	Mr. Todd
	Lab. Sec. A	VI-VII	W	100EE	
	B	III-IV	S	100EE	
	C	VII-VIII	M	100EE	
	D	VIII-IX	Th	100EE	
	E	III-IV	M	100EE	
	F	VII-VIII	T	100EE	
	G	I-II	T	100EE	
	H	VI-VII	Th	100EE	
15s	Elements of Elec. Eng.....				
	Lect. Sec. 1	II	ThS	201EE	Mr. Shepardson
	2	III	ThS	107ME	Mr. Todd
	3	III	ThS	201EE	Mr. Swenson
	4	II	ThS	136ME	Mr. Todd
	Lab. Sec. A	VI-VII	W	100EE	
	B	III-IV	S	100EE	
	C	VII-VIII	M	100EE	
	D	VII-VIII	F	100EE	
	E	III-IV	T	100EE	
	F	VII-VIII	T	100EE	
	G	I-II	M	100EE	
	H	I-II	T	100EE	
40f	Electric Wiring and Equip....	I	TTh	206ME	Mr. Todd
41f	Electric Power (Miners).....	II	TTh	202Mines	Mr. Ryan

No.	Title	Hour	Day	Room	Instructor
42w	Electric Power (C.E.).....	I	TThS	206ME	Mr. Swenson
	Lab. Sec. 1	II-IV	M	100EE	
	2	II-IV	W	100EE	
42s	Electric Power (C.E.).....	I	TThS	107ME	Mr. Swenson
	Lab. Sec. 1	I-III	M	100EE	
	2	I-III	W	100EE	
43s	Electric Power (Chem.).....				
	Lect.	II	MW	111C	Mr. Martin
	Lab.	I-III	S	100EE	
44f	Electric Power.....				
	Lect. Sec. M.E.	I	ThS	104MechE	Mr. Martin
	Chem.	II	TTh	115C	Mr. Martin
	Lab. Sec. M.E. 1	II-III	W	100EE	Mr. Todd
	M.E. 2	II-III	F	100EE	Mr. Todd
	Chem.	I-III	S	100EE	Mr. Martin
45w	Electric Power.....				
	Lect. Sec. M.E.	I	ThS	104MechE	Mr. Martin
	Chem.	II	TTh	115C	Mr. Martin
	Lab. Sec. M.E. 1	II-III	W	100EE	
	M.E. 2	II-III	F	100EE	
	Chem.	I-III	S	100EE	Mr. Martin
47w	Electric Motors.....	II	MW	201EE	Mr. Todd
61f	Elements of Communication..				
	Lect.	II	T		
		IV	S	201EE	Mr. Shepardson
	Lab. Sec. 1	VI-VIII	M	204EE	Mr. Swenson
	2	VI-VIII	T	204EE	
	3	VI-VIII	W	204EE	
	4	VI-VIII	Th	204EE	
63w	Elements of Communication..				
	Lect.	II	T		
		IV	S	201EE	Mr. Shepardson
	Lab. Sec. 1	VI-VIII	M	204EE	Mr. Swenson
	2	VI-VIII	T	204EE	
	3	VI-VIII	W	204EE	
	4	VI-VIII	Th	204EE	
65s	Elements of Communication..				
	Lect.	II	T		
		IV	S	201EE	Mr. Shepardson
	Lab. Sec. 1	VI-VIII	M	204EE	Mr. Swenson
	2	VI-VIII	T	204EE	
	3	VI-VIII	W	204EE	
	4	VI-VIII	Th	204EE	
91s	Engineering Inspection Trip..	Easter Recess			
111f	Direct Current Machinery....	II	MWF	136ME	Mr. Springer
112f	Direct Current Mach. Lab...				
	Sec. 1	VI-VIII	M	100EE	Mr. Martin
	2	VI-VIII	T	100EE	Mr. Martin
	3	I-III	T	100EE	Mr. Swenson
	4	I-III	Th	100EE	Mr. Kuhlman
113w	Direct Current Machinery....	II	MWF	136ME	Mr. Springer
114w	Direct Current Mach. Lab...				
	Sec. 1	VI-VIII	M	100EE	Mr. Martin
	2	VI-VIII	T	100EE	Mr. Martin
	3	I-III	T	100EE	Mr. Swenson
	4	I-III	Th	100EE	Mr. Kuhlman

No.	Title	Hour	Day	Room	Instructor
115s	Direct Current Machinery....	II	MWF	136ME	Mr. Springer
116s	Direct Current Mach. Lab....				
	Sec. 1	VI-VIII	M	100EE	Mr. Martin
	2	VI-VIII	T	100EE	Mr. Martin
	3	I-III	T	100EE	Mr. Swenson
	4	I-III	Th	100EE	Mr. Kuhlman
121f	Alternating Currents.....				
	Sec. 1	III	MWF	201EE	Mr. Ryan
	2	IV	MWF	201EE	Mr. Ryan
122f	Alternating Currents Lab.....				
	Sec. 1	VI-IX	F	100EE	Mr. Springer
	2	VI-IX	W	100EE	
	3	VI-IX	Th	100EE	
123w	Alternating Currents.....				
	Sec. 1	III	MWF	201EE	Mr. Ryan
	2	IV	MWF	201EE	Mr. Ryan
124w	Alternating Currents Lab....				
	Sec. 1	VI-IX	F	100EE	Mr. Springer
	2	VI-IX	W	100EE	
	3	VI-IX	Th	100EE	
125s	Alternating Currents.....				
	Sec. 1	III	MWF	201EE	Mr. Ryan
	2	IV	MWF	201EE	Mr. Ryan
126s	Alternating Currents Lab.....				
	Sec. 1	VI-IX	F	100EE	Mr. Springer
	2	VI-IX	W	100EE	
	3	VI-IX	Th	100EE	
132f-134w-136s	Electrical Design.....				
	Sec. 1	II-IV	T	1ME	
		VI-VIII	Th	1ME	Mr. Kuhlman
	2	VI-VIII	MF	1ME	Mr. Kuhlman
141f	Central Stations.....	III	ThS	229ME	Mr. Ryan
142w	Electrical Transmission.....	III	ThS	229ME	Mr. Ryan
143f,w,s	Power Plant Operation.....	Any three consecutive hours			Mr. Ryan
				Power Plant	Mr. Dixon
144w	Railway Electrical Engineering	IV	M	206ME	Mr. Martin
			W	209ExE	
145s	Railway Electrification.....	IV	M	206ME	Mr. Martin
			W	104MechE	
146f,w,s	Batteries and Vehicles.....	Ar	Ar	Ar	Mr. Ryan
147f,w,s	Electrical Equipment of Buildings	Not offered in 1922-23			
151f	Electric Lighting.....	IV	MW	209ExE	Mr. Martin
152f	Photometric Lab.....	VI-VII	W	209EE	Mr. Martin
161f-162w-163s	Radio Communication.....				
	Lect.	I	ThS	201EE	Mr. Jansky
	Lab. Sec. 1	VI-VIII	M	207EE	Mr. Jansky
	2	VI-VIII	T	207EE	
	3	VI-VIII	W	207EE	
	4	VI-VIII	F	207EE	
164f	Telegraph and Telephone Apparatus	Ar	Ar	Ar	Mr. Shepardson
165w-166s	Telegraph and Telephone Circuits	Ar	Ar	Ar	Mr. Shepardson

No.	Title	Hour	Day	Room	Instructor
167f-168w-169s	Radio Station Operation.....	Ar	Ar	207EE	Mr. Jansky
171w-172s	Undergraduate Thesis.....	Ar	Ar	Ar	Ar
183f-184w-185s	Special Electrical Lab.....	Ar	Ar	100EE	Mr. Springer
186w,s	High Tension Testing.....	Ar	Ar	Ar	Mr. Springer
191f-192w-193s	Seminar	VII-VIII	T	201EE	Mr. Shepardson
221f-223w-225s	Transients	Ar	Ar	Ar	Mr. Jansky
232f-234w 236s	Electrical Design.....	Ar	Ar	Ar	Mr. Kuhlman
237s	Power Transmission Line Design	Ar	Ar	Ar	Mr. Ryan
251w-253s	Illuminating Engineering.....	Ar	Ar	Ar	Mr. Shepardson
252w-254s	Illuminating Laboratory.....	Ar	Ar	Ar	Mr. Shepardson
275f-276w-277s	Electrical Engineering Research	Ar	Ar	Ar	Mr. Martin Ar
281w-282s	Advanced A. C. Measurements	Ar	Ar	Ar	Mr. Jansky
284w-285s-286f	Precise Electrical Engineering Measurements	Ar	Ar	Ar	Mr. Springer
291f-292w-293s	Graduate Seminar.....	Ar	Ar	Ar	Ar
294f-295w-296s	Electrical Ignition.....	Ar	Ar	Ar	Mr. Springer
297s	Electrochemical Engineering...	Not offered in 1922-23.			

ENGLISH

Professor ELMER E. STOLL; Associate Professor FRANK M. RARIG; Instructors HAROLD L. COOK, ARIEL MACNAUGHTON, HARLOW C. RICHARDSON, ALPHEUS W. SMITH.

COURSES

4f,w-5w,s-6s,su. RHETORIC AND COMPOSITION. Training in writing; study of the work of writers who have handled scientific subjects with clearness and power; outside reading. Three credits per quarter. Prerequisites: none. MR. COOK, MR. RICHARDSON, MR. SMITH.

31w,s. TECHNICAL WRITING. A quarter course in business letters, reports, etc., planned to meet the professional needs of engineering students. Three credits. Prerequisites: 4-5-6.

41f-42w-43s. PUBLIC SPEAKING. A general course in public speaking. Three credits per quarter. Prerequisites: 4-5-6. MR. RARIG, MISS MACNAUGHTON.

45f,w,s-46w,s,f. PUBLIC SPEAKING. A five-credit course identical in subject-matter with 41-42-43. Five credits per quarter. Prerequisites: 4-5-6. MR. RARIG.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
4f	Rhetoric and Composition....				
	Sec. 1	III	MWF	135ME	
	2	III	MWF	107ME	
	3	IV	MWF	215ME	
	4	IV	MWF	217ME	
	5	III	S		
		VI	TTh	107ME	
	6	III	S		
		VI	TTh	135ME	
	7	VII	MWF	215ME	
	8	VII	MWF	217ME	
	9	I	TThS	135ME	
4w	Rhetoric and Composition....	III	MWF	107ME	
5w	Rhetoric and Composition....				
	Sec. 1	III	MF	135ME	
			W	106ME	
	2	IV	MWF	215ME	
	3	IV	MWF	217ME	
	4	III	S		
		VI	TTh	107ME	
	5	VII	MWF	215ME	
	6	VII	MWF	217ME	
	7	I	TThS	135ME	
5s	Rhetoric and Composition....	III	MWF	107ME	
6s	Rhetoric and Composition....				
	Sec. 1	III	MWF	203ME	
	2	IV	MWF	215ME	
	3	IV	MWF	217ME	
	4	I	TThS	135ME	
	5	IV	S		
		VI	TTh	217ME	
	6	VII	MWF	215ME	
	7	VII	MWF	217ME	
31w	Technical Writing.....	I	MWF	21ME	
31s	Technical Writing.....	IV	MWF	104ME	
41f-42w-43s	Public Speaking.....				
	Sec. 1	I	MWF	308F	
	2	II	MWF	308F	
	3	III	TThS	308F	
	4	VI	MWF	308F	Miss Macnaughton
	5	I	TThS	308F	
	6	II	TThS	308F	
45f,w,s-46w,s,f	Public Speaking.....				
	Sec. 1	IV	MTWFS	3F	
	2	VII	MTWThF	109F	Mr. Rarig
	3	VIII	MTWThF	308F	

GENERAL ENGINEERING

COURSES

11f-12w. ORIENTATION. A series of general lectures covering all phases of engineering and allied courses. Illustrated by lantern slides and moving pictures. Given by various members of the staff. No credits. Prerequisite: none. Required of freshmen in Engineering and Architecture.

81f,w,s. ESTIMATING. Cost estimates of engineering structures including buildings, bridges, culverts, sewage, and water-works systems, roads, and pavements. Itemized tabulation of construction units and general methods of arriving at costs of contemplated construction. Open to junior and senior engineers only. Three credits. MR. FRENCH.

101w. 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. Open to seniors only. Three credits. MR. FLATHER.

111s. VALUATION OF PUBLIC UTILITY PROPERTIES. Factors affecting value, depreciation, taxation, and regulation of public utility properties. Elements of engineering economics; cost analysis, economic investigations, rate-making. Open to seniors only. One credit. MR. RYAN and non-resident lecturers.

124w. ENGINEERING RELATIONS. Lectures, assigned reading, and discussions on the human side of engineering. Relations of the engineer to employer, employees, customers, and public. Engineering code of ethics. Bridging between college and business. Practical training of engineering graduates. Open to seniors only. One credit. MR. SHEPARDSON and non-resident lecturers.

193s. ENGINEERING PRACTICE. Engineering relations, legal and ethical, collaboration and consultation; technical reports, investigation and estimates. Professional employment, ownership of plans; patents and rights of invention. Day labor and contract systems of construction; public and private works, arbitration. Open to seniors only. Two credits. MR. FLATHER.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
11f-12w	Orientation	VIII	F	100C	Mr. Ryan
81f,w,s	Estimating	I	MWF	225aME	Mr. French
101w	Contracts and Specifications	II	MWF	106ME	Mr. Flather
111s	Valuation of Public Utility Properties	Ar	Ar	Ar	Mr. Ryan
124w	Engineering Relations.....	III	M	110ExE	Mr. Shepardson
		VI	F		
193s	Engineering Practice.....	III	MS	104MechE	Mr. Flather

GEOLOGY AND MINERALOGY

Professor WILLIAM H. EMMONS; Instructor GEORGE M. SCHWARTZ.

COURSES

5f. ENGINEERING GEOLOGY. Materials of the earth and geologic processes. Application of geology to engineering problems. Lectures, rock study, and field excursions. Three credits. Prerequisite: none. MR. SCHWARTZ.

6w. APPLIED GEOLOGY FOR CIVIL ENGINEERS. Occurrence, properties, production, and uses of building stones, cements, clay, fuels, and road metals. Lectures and reference work. Three credits. Prerequisite: 5. MR. SCHWARTZ.

7s. APPLIED GEOLOGY FOR CIVIL ENGINEERS. Continuation of 6w. Includes an introduction to ore deposits and a brief review of historical geology and the use of geologic maps. Lectures and reference work. Three credits. Prerequisite: 6. MR. SCHWARTZ.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
5f	Engineering Geology.....	I	MWF	210P	Mr. Schwartz
6w,7s	Applied Geology for Civil Engineers	I	MWF	210P	Mr. Schwartz

MATHEMATICS AND MECHANICS

Professors WILLIAM E. BROOKE, WILLIAM F. HOLMAN; Associate Professors HANS H. DALAKER, JACOB O. JONES; Assistant Professors CARL A. HERRICK, RAYMOND R. HERRMANN, WILLIAM M. MCCLINTOCK, GEORGE C. PRIESTER, RODERICK W. SILER, HUGH B. WILCOX; Instructors LEWIS M. BECKER, CHARLES BOEHNLEIN, HENRY E. HARTIG, ELMER W. JOHNSON, OSCAR C. LEE.

COURSES

Mathematics

9f,1su. HIGHER ALGEBRA. (High school.) Fundamental rules, fractions, linear simultaneous equations, graphs, theory of exponents, surds, complex quantities, quadratic equations, numerical exercises, slide rule. Without credit. Prerequisite: none. MR. MCCLINTOCK, MR. SILER, MR. HARTIG.

10f,su. SOLID GEOMETRY. See M.&M. 10f under Department of Drawing and Descriptive Geometry.

11f,w. COLLEGE ALGEBRA. Theory of quadratic equations, interpretation of complex results, graphical representation, indeterminate equation, ratio, proportion, variation, progressions, series, undetermined coefficients, binomial theorem, logarithms, theory of equations, derivatives,

Horner's method. Five credits. Prerequisite: higher algebra and solid geometry. MR. MCCLINTOCK, MR. BECKER, MR. HARTIG, MR. JOHNSON, MR. LEE.

12w,s. TRIGONOMETRY. Rectangular coördinates, angles, trigonometric functions, solution of plane right triangles, reduction formulas, fundamental relations, addition formulas, double angles, half angles, identities and equations, inverse functions, oblique triangles, De Moivre's theorem, spherical right triangles. Five credits. Prerequisite: 11. MR. MCCLINTOCK, MR. BECKER, MR. HARTIG, MR. JOHNSON, MR. LEE.

13s,su. ANALYTICAL GEOMETRY. Coördinate systems, equation, locus, straight line, second degree equations, polar coördinates, parametric equations, derivatives, tangents, normals, conic sections, rotation of axes, empirical equations. Space coördinates, plane, line, quadric surfaces, cylinders, space curves, tangent lines, planes. Five credits. Prerequisite: 12. MR. MCCLINTOCK, MR. BECKER, MR. HARTIG, MR. JOHNSON, MR. LEE.

24f,w. DIFFERENTIAL CALCULUS. Rules for differentiating, simple applications of derivative, maxima and minima, differentials, rates, change of variables, radius of curvature, mean value, indeterminate forms, partial differentiation, series, Taylor's theorem, asymtotes, singular points, applications to geometry of space. Five credits. Prerequisite: 13. MR. DALAKER, MR. MCCLINTOCK, MR. SILER, MR. BECKER, MR. BOEHNLEIN, MR. JOHNSON.

25w,s. INTEGRAL CALCULUS. Standard elementary forms, definite integral, rational fractions, integration by substitution, integration by parts, reduction formulas, integration a process of summation, successive and partial integration, elementary ordinary differential equations. Five credits. Prerequisite: 24. MR. DALAKER, MR. MCCLINTOCK, MR. SILER, MR. BECKER, MR. BOEHNLEIN, MR. JOHNSON.

91f. CALCULUS FOR ARCHITECTS. A short course, derivatives, maxima and minima, integration of simple forms, definite integrals, areas. Four credits. Prerequisite: 13. MR. HOLMAN.

151f. DIFFERENTIAL EQUATION. Differential equations and their solutions. First order and first degree, first order and higher degree, singular solutions; total differential equation, linear differential equation, miscellaneous methods, system of simultaneous equations, integration in series. Partial differential equations. Three credits. Prerequisite: 25 MR. HARTIG.

152w-153s. ADVANCED CALCULUS AND APPLICATIONS. Text, Wilson's *Advanced Calculus*. Three credits per quarter. Prerequisite: 151. MR. DALAKER.

261f-262w-263s. ELLIPTIC FUNCTIONS WITH APPLICATION. Three credits per quarter. Prerequisite: 153. MR. DALAKER.

254f-255w-256s. MODERN ANALYSIS. Based on Whittaker and Watson's text. Three credits. Prerequisite: 153. MR. DALAKER.

Mechanics

26s,su. TECHNICAL MECHANICS. *Statics and Kinematics.* Characteristics of a force, parallelogram law, moments, couples, resultant of a force system, equilibrium of a force system, frictions, centroids, moment of inertia. Motion of a particle, motion of a rigid body. Five credits. Prerequisite: 25. MR. BROOKE, MR. HERRICK, MR. HERRMANN, MR. SILER, MR. WILCOX, MR. LEE.

127f,w,s. TECHNICAL MECHANICS. *Dynamics.* Force, mass, acceleration, translation and rotation, gyroscope, governors, work, energy, power, conservation of energy, impulse, momentum, loss of kinetic energy, conservation of momentum. Five credits. Prerequisite: 26. MR. BROOKE, MR. HERRICK, MR. HERRMANN, MR. WILCOX, MR. LEE.

92w. MECHANICS FOR ARCHITECTS. Statics, resolution of forces, conditions of equilibrium, center of gravity, moment of inertia of plane sections, stresses in framed structures. Four credits. Prerequisite: 91. MR. HOLMAN.

84s. TECHNICAL MECHANICS. (Course in Chemical Engineering.) Statics, resolution of forces, conditions of equilibrium, center of gravity, moment of inertia, stresses in framed structures, and machines, kinematics, dynamics of a particle, Newton's laws of motion, work, energy, power impulse, and momentum. Five credits. Prerequisite: 25. MR. HERRICK.

161f-162w-163s. ADVANCED TECHNICAL MECHANICS. Special problems in the dynamics of machinery; vibration, balancing, whirling shafts, rapidly rotating disks, dynamical stability, gyroscope. Three credits per quarter. Prerequisite: 127. MR. BROOKE, MR. WILCOX.

267f-268w-269s. ADVANCED DYNAMICS. Text, Routh's *Rigid Dynamics.* Three credits per quarter. Prerequisite: 153. MR. BROOKE.

Materials

128f,w,s. STRENGTH OF MATERIALS. Mechanical and elastic properties of materials of construction, beams, shafts, columns, combined stresses, hollow cylinder, rollers, plates, curved bars, springs, dynamic stresses, true stresses. Five credits. Prerequisite: 26. MR. HOLMAN, MR. HERRMANN, MR. PRIESTER, MR. WILCOX.

141f,w,s. MATERIALS-TESTING LABORATORY. Investigation of the physical properties of various metals and engineering materials (wood, cement, ropes, etc.). Standard methods of testing. One credit. Prerequisite: 128 or registration in 128. MR. HOLMAN, MR. HERRMANN, MR. PRIESTER, MR. WILCOX, MR. BOEHNLEIN.

93s. STRENGTH OF MATERIALS. (Course in Architecture.) Mechanical and elastic properties of materials of construction, design of riveted joints, beam theory, columns, arches. Four credits. Prerequisite: 92. MR. HOLMAN.

85f. STRENGTH OF MATERIALS WITH LABORATORY. (Course in Chemical Engineering.) Mechanical and elastic properties of materials of construction, beams, shafts, columns, combined stresses, dynamic stresses. Four credits. Prerequisite: 84. MR. HERRICK.

144w. MATERIALS-TESTING LABORATORY. (Course in Mining and Metallurgical Engineering.) Investigation of the physical properties of metals and engineering materials; wood, cement, ropes, etc., supplemented by lectures. Materials of construction and methods of testing. Four laboratory hours. Open to junior mining and metallurgical engineers. MR. BOEHNLEIN.

146f. MATERIALS OF ENGINEERING. Appliances for testing materials of construction. Mechanical tests, their use and significance. Definition, classification, manufacture and application of plasters, limes, cements, concrete, building stones, bricks, tile, terra cotta, rubber, and leather. Three credits. Prerequisite: 26. MR. PRIESTER.

147w. MATERIALS OF ENGINEERING. Origin, manufacture, properties, treatment, and use of iron and steel and their special alloys. Uses and limitations of special alloy steels in engineering practice—special tests of steel. Three credits. Prerequisite: 26. MR. PRIESTER.

148s. MATERIALS OF ENGINEERING. Origin, manufacture, properties, treatment, and use of copper, zinc, lead, tin, aluminum, nickel, brasses, bronzes, and bearing metals. Growth and structural characteristics of trees. Physical and mechanical properties of wood. Seasoning and preservation of timber. Three credits. Prerequisite: 26. MR. PRIESTER.

271f-272w-273s. MATHEMATICAL THEORY OF ELASTICITY. Three credits per quarter. Prerequisites: 128, 153.

Hydraulics

129f,w,s. 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. Four credits. Prerequisite: 26. MR. BROOKE, MR. HOLMAN, MR. HERRICK, MR. JONES, MR. PRIESTER, MR. BOEHNLEIN.

143f,w,s. HYDRAULICS LABORATORY. Experimental and demonstrational work. Pressure head, Piezometer tubes, gages, stability of flotation, Bernoulli's theorem. Venturi meter, flow through orifices, over weirs, and through pipes. Open channels, gaging, impact on vanes, pumps, and hydraulic machines. One credit. Prerequisite: 129 or registration in 129. MR. BROOKE, MR. HOLMAN, MR. HERRICK, MR. JONES, MR. PRIESTER, MR. BOEHNLEIN.

86w. HYDRAULICS WITH LABORATORY. (Course in Chemical Engineering.) Hydrostatics, Bernoulli's theorem, flow through orifices, pipes, and over weirs, dynamic action of jets and streams, flow of gases through pipes. Three credits. Prerequisite: 84. MR. HERRICK.

281f-282w-283s. HYDRODYNAMICS. Three credits per quarter. Prerequisite: 129, 153. MR. BROOKE.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
9f,1su	H. S. Higher Algebra.....				
	Sec. 5	II	MWS	104ME	
	7	IV	MWF	104ME	
	18	I	TThS	106ME	
10f,su	Solid Geometry.....				
	(See Dept. of Draw. and Des. Geom.)				
11f,w	College Algebra.....				
	Sec. 1	VI	MTWThF	136ME	
	2	VI	MTWThF	215ME	
	3	VII	MTWThF	203ME	
	4	VII	MTWThF	205ME	
	6	VI	Th		
		II	W		
		IV	MTS	106ME	
	8	III	MTThFS	209ExE	
	9	III	MTThFS	22ME	
	10	III	MTThFS	104ME	
	11	III	MTThFS	106ME	
	12	II	MTThFS	106ME	
	13	I	Th		
		II	TWFS	21ME	
	14	I	Th		
		II	TWFS	22ME	
	15	IV	S	21ME	
		I	F	21ME	
		VI	MTW	106ME	
	16	IV	S	22ME	
		I	F	22ME	
		VI	MTW	205ME	
	17	I	MTWFS	104ME	
	Arch. 1	I	MTWThF	205ME	
	2	I	MTWThF	203ME	
	Chem.	I	MTWFS	215C	
11w	College Algebra.....				
	Sec. 5	II	MTWS		
		VI	Th	104ME	
	8	III	TTh	110ExE	
			MFS	203ME	
	13	I	Th		
		II	TWFS	21ME	
	14	I	Th		
		II	TWFS	22ME	
	18	I	S	104ME	
			MTWTh	106ME	
	19	III	MTThFS	215ME	
	Arch. 2	I	MTWThF	203ME	

No.	Title	Hour	Day	Room	Instructor
12w	Trigonometry				
	Sec. 1	VI	MTWThF	136ME	
	2	VII	MTWThF	136ME	
	3	VII	MTWThF	205ME	
	7	III	Th	107ME	
			MTFS	104ME	
	9	III	MTThFS	22ME	
	10	III	MTThFS	21ME	
	11	III	MTThFS	106ME	
	15	I	F		
		IV	S		
		VI	MTW	104ME	
	16	I	F		
		IV	S		
		VI	MTW	22ME	
	Arch. 1	I	MTWThF	205ME	
	Chem.	I	MTWFS	215C	
12s	Trigonometry				
	Sec. 5	IV	T		
		II	MWThF	22ME	
	8	VI	W		
		III	MTFS	22ME	
	11	IV	W		
		III	MTFS	136ME	
	13	II	TWThFS	21ME	
	14	II	TWThFS	104ME	
	18	I	MTWFS	21ME	
	Arch. 2	I	MTWThF	203ME	
13s	Analytical Geometry.....				
	Sec. 1	VI	MTWThF	203ME	
	2	IV	T		
		VII	MWThF	205ME	
	3	VII	W		
		VI	MTThF	136ME	
	7	IV	W		
		III	MTFS	21ME	
	9	VI	W		
		III	MTFS	104ME	
	10	VI	W		
		III	MTFS	106ME	
	15	IV	S		
		VI	MTTh	22ME	
			W	21ME	
	16	IV	S		
		VI	MTTh	104ME	
			W	107ME	
	Arch. 1	I	MTWThF	205ME	
	Chem.	I	MTWFS	215C	

No.	Title	Hour	Day	Room	Instructor
24f	Differential Calculus.....				
	Sec. C.E. 1	VII	MTWThF	22ME	
	C.E. 2	IV	S		
		VI	MWThF	104ME	
	C.E. 3	II	MTThFS	203ME	
	C.E. 4	III	MTWThF	205ME	
	E.E. 1	III	MTWThF	215ME	
	E.E. 2	I	S		
		IV	MTWF	136ME	
	E.E. 3	IV	S		
		VI	MWThF	203ME	
	E.E. 4	II	S		
		III	MTWF	229ME	
	M.E. 1	III	Th		
		IV	MTWF	21ME	
	M.E. 2	I	S		
		IV	MWF	229ME	
		VI	Th		
	Chem.	III	MTWFS	115C	
24w	Differential Calculus.....				
	Sec. C.E. 2	IV	S	136ME	
		VI	MWThF	205ME	
	E.E. 2	I	S		
		IV	MTWF	22ME	
25w	Integral Calculus.....				
	Sec. C.E. 1	VII	MTWThF	22ME	
	C.E. 3	II	MTThFS	203ME	
	E.E. 1	III	MTWThF	205ME	
	E.E. 3	VI	MTWThF	203ME	
	E.E. 4	II	S		
		III	MTWF	229ME	
	M.E. 1	III	Th		
		IV	MTWF	104ME	
	M.E. 2	I	S		
		IV	MTWF	229ME	
	Chem.	III	MTWFS	115C	
25s	Integral Calculus.....				
	Sec. C.E. 2	IV	S		
		VI	MTWF	205ME	
	E.E. 2	I	S		
		IV	MTWF	106ME	
	E.E. 4	III	MTWThS	205ME	
26s	Technical Mechanics (Statics)				
	Sec. C.E. 1	III	S		
		VII	MWThF	203ME	
	C.E. 3	II	MTThFS	106ME	
	E.E. 1	I	S		
		II	MTWF	203ME	
	E.E. 3	VI	MTWThF	215ME	
	M.E. 1	III	Th		
		IV	MTFS	136ME	
	M.E. 2	I	S		
		IV	MT	229ME	
		VI	WF		
84s	Technical Mechanics (Chem.)	III	MTWFS	215C	Mr. Herrick
85f	Strength of Materials (Chem.)	I	MWF	315C	Mr. Herrick
	Lab.	VI-VIII	W	ExE	

No.	Title	Hour	Day	Room	Instructor
86w	Hydraulics (Chem.).....	I	MF	315C	Mr. Herrick
	Lab.	VII-IX	W	ExE	
91f	Calculus for Architects.....	I	MTWF	209ExE	Mr. Holman
92w	Mechanics for Architects.....	I	MTWS	209ExE	Mr. Holman
93s	Strength of Materials (Arch.)	I	MTWF	209ExE	Mr. Holman
127f	Technical Mechanics (Dynamics)				
	Sec. M.E. 1	III	MTWThF	136ME	
	M.E. 2	I	S	203ME	
			MTWTh	136ME	
127w	Technical Mechanics (Dynamics)				
	Sec. E.E. 1	I	MWThFS	217ME	
	E.E. 2	III	MTWThF	217ME	
	E.E. 3	IV	MTWFS	205ME	
127s	Technical Mechanics (Dynamics)				
	Sec. C.E. 1	II	MTWThF	215ME	
	C.E. 2	II	MTWThS	107ME	
	C.E. 3	I	MTWThF	136ME	
128f	Strength of Materials.....				
	Sec. C.E. 1	III	TWThFS		
			TThS	110ExE	
			WF	201ExE	
	C.E. 2	II	MTWThF	215ME	
	C.E. 3	I	MWThFS	215ME	
128w	Strength of Materials.....				
	Sec. M.E. 1	III	MTWThF	209ExE	
	M.E. 2	I	MWThFS	136ME	
128s	Strength of Materials.....				
	Sec. E.E. 1	I	MTWThF	215ME	
	E.E. 2	III	MTWThF	215ME	
	E.E. 3	IV	MTWFS	203ME	
129f	Hydraulics				
	Sec. E.E. 1	I	MWThF	229ME	
	E.E. 2	III	MTThF	217ME	
	E.E. 3	IV	MWFS	205ME	
129w	Hydraulics				
	Sec. C.E. 1	III	TWThF	136ME	
	C.E. 2	II	MTWTh	215ME	
	C.E. 3	I	MWThF	215ME	
129s	Hydraulics				
	Sec. M.E. 1	III	F		
		II	TWTh	229ME	
	M.E. 2	I	MWThF	106ME	
141f	Materials-Testing Laboratory..				
	Sec. C.E. 1	II-IV	M	ExE	
	C.E. 2	VI-VIII	Th	ExE	
	C.E. 3	VI-VIII	M	ExE	
141w	Materials-Testing Laboratory..				
	Sec. M.E. 1	VI-VIII	M	ExE	
	M.E. 2	VI-VIII	F	ExE	
141s	Materials-Testing Laboratory..				
	Sec. E.E. 1	VII-IX	W	ExE	
	E.E. 2	VI-VIII	Th	ExE	
	E.E. 3	VI-VIII	F	ExE	

No.	Title	Hour	Day	Room	Instructor
143f	Hydraulics Laboratory.....				
	Sec. E.E. 1	VI-VIII	Th	ExE	
	E.E. 2	I-III	S	ExE	
	E.E. 3	VI-VIII	W	ExE	
143w	Hydraulics Laboratory.....				
	Sec. C.E. 1	II-IV	M	ExE	
	C.E. 2	VI-VIII	T	ExE	
	C.E. 3	VI-VIII	M	ExE	
143s	Hydraulics Laboratory.....				
	Sec. C.E. 1	VI-VIII	M	ExE	
	M.E. 2	VII-IX	F	ExE	
144w	Materials-Testing Laboratory (Miners)	VI-IX	Th	ExE	
146f-147w-148s	Materials of Engineering.....	I	MWF	217ME 229ME(winter)	Mr. Priester
151f	Differential Equations.....	IV	MWF	22ME	Mr. Hartig
152w-153s	Advanced Calculus.....	I	F	106ME	Mr. Dalaker
			MW	104ME(winter)	
			MWF	229ME(spring)	
161f-162w-163s	Advanced Technical Mechanics	I	MWF	102MechE(fall)	Mr. Wilcox
			MW	22ME	
			F	320ME(winter)	
			MWF	104ME(spring)	
254f-255w-256s	Modern Analysis.....	Not offered in 1922-23			
261f-262w-263s	Elliptic Functions with Applications	IV	MWF		
			M	206ME	Mr. Dalaker
			WF	106ME(fall) 203ME(winter) 22ME(spring)	
267f-268w-269s	Advanced Dynamics.....	Ar	Ar	Ar	Mr. Brooke
271f-272w-273s	Mathematical Theory of Elasticity	Not offered in 1922-23			
281f-282w-283s	Hydrodynamics	Not offered in 1922-23			

MECHANICAL ENGINEERING

Professors JOHN J. FLATHER, FRANK B. ROWLEY, S. CARL SHIPLEY; Associate Professors JOHN V. MARTENIS, JOHN H. ROWEN, CHARLES F. SHOOP; Assistant Professor BURTON J. ROBERTSON; Instructors VICTOR GAUVREAU, JOHN H. MOFFETT, JOSEPH W. NILSON, EDWARD P. QUIGLEY, PAUL W. RHAME, WILLIAM H. RICHARDS, GEORGE L. TUVE; Assistants HARRY MARTINSON, CARL PETERSON, FRED TEAL, JOHN A. WIDING.

COURSES

Shop Practice and Industrial Engineering

Course 11f,w,s. ELEMENTARY SHOP PRACTICE. Wood-working and pattern-making. Two credits. Prerequisite: none. MR. SHIPLEY, MR. RICHARDS.

Course 12f,w,s. ELEMENTARY SHOP PRACTICE. Floor and machine molding. Iron and brass casting. Two credits. Prerequisite: none. MR. SHIPLEY, MR. MOFFETT.

Course 13f,w,s. ELEMENTARY SHOP PRACTICE. Forging and tempering. Two credits. Prerequisite: none. MR. SHIPLEY, MR. QUIGLEY.

14f,su. MACHINE SHOP PRACTICE. Machine operations. Manufacturing methods. Also heat treatment of steel, autogenous welding, welding and brazing. Shop practice, lectures, and recitations. Four credits. Prerequisite: none. MR. SHIPLEY, MR. NILSON, MR. QUIGLEY.

15w. MACHINE SHOP PRACTICE. Continuation of Course 14. Also heat treatment of steel, autogenous welding, welding and brazing. Four credits. Prerequisite: 14. MR. SHIPLEY, MR. NILSON, MR. QUIGLEY.

16s. MACHINE SHOP PRACTICE. Course 14 condensed for students in electrical engineering. Two credits. Prerequisite: none. MR. SHIPLEY, MR. NILSON, MR. QUIGLEY.

17f. MACHINE SHOP PRACTICE. Arranged for students in chemical engineering. Two credits. Prerequisite: none. MR. SHIPLEY, MR. NILSON.

110f,w,s. TOOL DESIGN. Design of tools for manufacturing interchangeable parts; jigs and milling fixtures. Three credits. Prerequisite: 31. MR. RHAME.

111f,w,s. TOOL CONSTRUCTION. Construction of tools, jigs, and fixtures for manufacturing interchangeable parts. Three credits. Prerequisite: 15. MR. SHIPLEY, MR. NILSON.

21s. MECHANICAL TECHNOLOGY. Study of mechanical processes involved in various manufacturing industries and in the development and utilization of power. Lectures by various specialists. One credit. Prerequisite: M.&M. 13. MR. SHOOP.

18f,w,s. INDUSTRIAL EDUCATION. Special course in shop work including sloyd. For teachers in College of Education. Three credits. Prerequisite: none. MR. RICHARDS.

223f. INDUSTRIAL MANAGEMENT. Shop and factory organization and management; cost and wage systems. Depreciation of equipment. Machine burden. Time studies. Seniors only. Three credits. Prerequisite: 15. MR. FLATHER.

224w. 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. Three credits. Prerequisite: 223. MR. FLATHER.

225s. INDUSTRIAL MANAGEMENT PROBLEMS. Special investigations of practical problems and suggested methods of procedure. Lectures, assigned reading, and reports. Three credits. Prerequisite: 224. MR. FLATHER.

226w,s. 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. Two credits. Prerequisite: 223. MR. FLATHER, MR. SHIPLEY.

Machine Design

31s. ELEMENTARY MACHINE DESIGN. Empirical proportion and design of machine parts; tracings; working drawings from sketches; drawing-room systems and conventional methods. Taken in conjunction with the work in engineering design. Two credits. Prerequisite: Drawing 29. MR. SHIPLEY.

32f. MECHANISM. Transmission of motion. Levers, gearing, linkwork, belts, screws, epicyclic trains, parallel motions, quick return movements. Graphical determination of paths, speeds, accelerations of important mechanisms; centroids, analysis of mechanisms; cams; kinematic pairs, machine parts. Four credits. Prerequisite: 31. MR. MARTENIS, MR. GAUVREAU.

33w. MECHANISM AND KINEMATICS. The transmission of motion without consideration of the strength of parts. Levers, gearing linkwork, kinematic pairs; machine parts; construction of tooth profiles. Paths and velocities of mechanisms. A short course arranged for electrical engineers. Three credits. Prerequisite: Drawing 27. MR. MARTENIS, MR. GAUVREAU.

34w. KINEMATICS AND MACHINE DESIGN. Construction of tooth profiles, roulettes; study of gearing. Calculation and design of machine parts; riveted and screwed joints; rotating pieces, bearings. Gearing; spur, bevel, and spiral. Four credits. Prerequisite: 32. MR. MARTENIS, MR. GAUVREAU.

35s. MACHINE DESIGN. Calculation and design of pulleys, flywheels, belt- and rope-driving; study and design of valves, D-slide, piston, double ported, riding cut-off, Corliss; Stephenson link, Walschaert gear. Three credits. Prerequisite: 34. MR. MARTENIS, MR. GAUVREAU, MR. RHAME.

37s. MACHINE DESIGN. Calculation and design of such machine parts as fastenings, bearings, rotating pieces, pulleys and belting, spur-gearing, bevel gears, spiral gears, and rope-driving. Recitations, lectures, drawing room practice. Arranged for students in electrical engineering. Three or four credits. Prerequisite: 33. MR. MARTENIS, MR. GAUVREAU, MR. RHAME.

38f. MACHINE DESIGN. Calculation and design of such machine parts as fastenings, rotating pieces, pulleys and belting; spur gears and bevel gears; lectures and drawing room practice. Arranged for students in chemical engineering. Three credits. Prerequisite: M.&M. 26. MR. MARTENIS, MR. GAUVREAU.

Engineering Design

131f-132w-133s. ADVANCED ENGINEERING DESIGN. Original design, including machinery for changing size and form, cranes, pumping, transmission machinery, and engineering appliances. Lectures, problems, and drawing room practice. Three credits per quarter. Prerequisite: 35. MR. FLATHER, MR. ROWEN, MR. GAUVREAU.

135f. STEAM ENGINE DESIGN. Calculations and working drawings for a high speed automatic or Corliss steam engine. Theoretical diagrams, inertia forces; determination of details. Senior option. Three credits. Prerequisite: 42 or equivalent. MR. FLATHER, MR. ROWEN.

136f,w. GAS ENGINE DESIGN. Calculations and working drawings of a gas motor for heavy duty tractor, truck, marine, or other service. Theoretical diagrams and details of parts. Senior option. Three credits. Prerequisite: registration in 150. MR. ROWLEY, MR. GAUVREAU.

137w. ADVANCED GAS ENGINE DESIGN. Continuation of Course 136. Three credits. Prerequisite: 136. MR. GAUVREAU.

237s. GAS TRACTOR DESIGN. Selection of wheel sizes; horsepower weight and drawbar pull. Bearing pressures; ratios and strength of gearing. Details of principal parts. Senior option. Three credits. Prerequisite: 136. MR. ROWLEY, MR. GAUVREAU.

294f,w,s. AEROPLANE DESIGN. Calculations and drawings for a given aeroplane; stability, strength, propulsion, and motive power required. Three credits. Prerequisite: 136. MR. GAUVREAU.

Automotive Engineering

41f,w,s. AUTOMOTIVES. A study of mechanical problems involved in automobiles, trucks, and tractors, starting and ignition devices, carburetors, lubrication, cooling, and transmissions. Two credits. Prerequisites: 11, 12, 13. MR. RHAME.

141f,w,s. ADVANCED STUDY OF AUTOMOTIVES. Detailed study of American and foreign car improvements, developments, and tendencies. An analysis of the various units of automotive equipment with especial regard to friction losses. Advanced study of electrical units. The cost and effectiveness of accessories. Three credits. Prerequisites: M.E. 41, Phys. 43. MR. RHAME.

293f,w,s. AERONAUTICAL ENGINEERING. Design of aerial propellers, aeroplane engines. Application of theory of propellers and gasoline engines to aeroplanes. Includes calculations and drawings for high-speed, multi-cylinder, light-weight engine; balancing reciprocating parts; uniform torque; theoretical diagrams. Three credits. Prerequisite: 150. MR. GAUVREAU.

Heat Engineering

42f. STEAM ENGINES. The steam engine, including elementary thermodynamics. Types and details, mechanics of the steam engine, steam distribution, reciprocating parts, indicator cards. Valve gears, Zeuner diagram; governors. Compound engines. Elementary study of steam turbines. Taken in connection with Course 81. Three credits. Prerequisite: M.&M. 26. MR. ROWEN, MR. SHOOP.

43w. STEAM ENGINES AND BOILERS. Continuation of the preceding course, together with an elementary study of condensers and air pumps, also steam boilers and stokers. Smoke prevention. To be taken in connection with 82. Three credits. Prerequisite: 42. MR. ROWEN, MR. SHOOP.

144f. HEAT ENGINES. Elementary thermodynamics. Properties of steam; types and details of steam engines; valve gears; governors; compound engines. Condensers and air pumps. Courses 144, 145, 146 are arranged for students in electrical engineering, and are accompanied by three hours' work in laboratory each week. Three credits. Prerequisite: M.&M. 26. MR. ROWLEY, MR. RHAME, MR. ROBERTSON.

145w. HEAT ENGINES. Continuation of Course 144. Combustion and fuels; boilers, smoke prevention. Selection of engines and boilers. Courses 144, 145, 146 are arranged for students in electrical engineering and are accompanied by three hours' work in the laboratory each week. Three credits. Prerequisite: 144. MR. ROWLEY, MR. ROBERTSON, MR. RHAME.

146s. HEAT ENGINES. Elementary study of steam turbines and gas engines. Courses 144, 145, 146 are arranged for students in electrical engineering and are accompanied by three hours' work in laboratory each week. Three credits. Prerequisite: 145. MR. ROWLEY, MR. ROBERTSON, MR. RHAME.

147w. HEAT ENGINES. Elementary thermodynamics. Properties of steam; calorimeters; pyrometry; types and details of steam engines; valve gears; governors; compound engines. Condensers and pumps. Combustion, and fuels; evaporation; steam boilers, smoke prevention. Includes four hours' work in laboratory per week. Four credits. Prerequisite: M.&M. 26. MR. SHOOP, MR. TUVE.

148s. HEAT ENGINES. Elementary study of steam turbines and gas engnies; gas producers. Refrigeration. Air compressors. Includes four hours' work in laboratory per week. Three credits. Prerequisite: 147. MR. SHOOP.

149f,w,s. HEAT ENGINES. A brief course for students in civil engineering and the course in architectural engineering includes four hours' laboratory per week. Four credits. Prerequisite: M.&M. 26. MR. TUVE.

150w. GAS ENGINES AND PRODUCERS. Laws of gases; gas cycles. Otto, semi-Diesel, and Diesel engines. Mechanism of various types. Carburetion, governing, cooling, lubrication. Principles of design. Gas producers; types, suction, pressure, blast furnace. By-products recovery. Three credits. Prerequisites: 41, 43. MR. ROWLEY.

151f,s. THERMODYNAMICS. The mechanical theory of heat as applied to steam oil, gas, and hot air engines and allied power plant machinery and accessory equipment, including compressors, injectors, reheaters, and refrigerating apparatus. Three credits. Prerequisites: M.&M. 127, 128, 129. MR. SHOOP, MR. ROWEN.

152w. STEAM TURBINES. Theory and practice applied to various types. Thermodynamics and mechanical analysis of problems involved in the design of nozzles, blades, rotors, bearings, and governors. Condition of operation; systems of transmission; lubrication; economy; field of service. Laboratory investigation. Senior option. Three credits. Prerequisite: 151. MR. SHOOP, MR. ROWEN.

153s. HEATING AND VENTILATING. Principles of heating and ventilation. Construction and operation of heating apparatus. Furnaces, steam, hot water, vapor, vacuum, and fan systems of heating; ventilation. Lectures, recitations, and designs. Senior option. Four credits. Prerequisites: M.&M. 127, 128, 129. MR. MARTENIS.

154s. HEATING AND VENTILATING. Same as Course 153 with the omission of design problems. Arranged for students in the course in architecture. Two credits. Prerequisite: M.&M. 92. MR. MARTENIS.

255f,w,s. ADVANCED HEATING AND VENTILATING. An advanced course for graduates. To be taken in connection with research work in the laboratory, Course 287. Three credits. Prerequisite: 153. MR. ROWLEY.

156s. COMPRESSED AIR AND REFRIGERATOR MACHINERY. (a) Air compressors and motors; power transmission by compressed air. (b) Principles of refrigeration. Various types of refrigerating machines, refrigerants applications to ice-making, cold storage, cooling of air, liquids, and solids. Lectures and recitations. Three credits. Prerequisite: 151. MR. ROWEN.

166s. WATER TURBINES. The theory of operation, design, construction, and regulation of water turbines. Turbine-testing; characteristics, selection of type. Cost of turbines and water power. Senior option. Three credits. Prerequisite: M.&M. 129. MR. ROWEN.

257w. 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 lay-outs. Equipment designs for various types of buildings. Three credits. Prerequisite: Phys. 43. MR. ROWLEY, MR. MARTENIS.

Power Plant Engineering

61s. MEASUREMENT OF POWER. Methods employed in measuring power. Dynamometers, friction brakes, railway dynamometer cars, ship dynamometers, power required to drive machine tools and shafting, selection of motors, calculation of circuits. Lectures, recitations, and drawing room work. To be taken in conjunction with 83. Two credits. Prerequisite: M.&M. 127. MR. FLATHER.

162f. POWER PLANT MACHINERY. Advanced study and application of engines, stokers, boilers; coal-handling equipment and accessories. Lectures, recitations. Three credits. Prerequisite: M.E. 43. MR. ROWEN.

163w. POWER ENGINEERING. Principles of thermodynamics applied to power plant equipment. Three credits. Prerequisite: M.E. 162. MR. ROWEN.

164s. ELEMENTS OF POWER PLANT DESIGN. Problems in design of power plant elements such as condensers, air pumps, boilers, turbines, piping, and separators. Three credits. Prerequisite: M.E. 163. MR. ROWEN.

265f-266w. 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. Three credits per quarter. Prerequisite: M.E. 164. MR. ROWEN.

267s. POWER PLANT MANAGEMENT. Operation and maintenance of boilers, engines, gas producers, gas engines, steam turbines, and accessory apparatus. Smoke prevention. Flue gas analysis. Power plant finance. Daily logs and power cost. Three credits. Prerequisite: M.E. 164. MR. ROWEN.

Railway Mechanical Engineering

271f. 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. One credit. Prerequisites: M.&M. 127, 128, 129. MR. MARTENIS.

272f-273w-274s. RAILWAY DESIGN AND LOCOMOTIVE CONSTRUCTION. Locomotive and car details; the locomotive boiler, linkages, and assembled parts. Construction of locomotives: frames, springs, equalizing arrangements, running gear, brakes, trucks, lubrication. Engine details; heat insulation, cylinder proportions. Lectures and assigned reading. Four credits per quarter. Prerequisite: 271, or registration in 271.

278s. LOCOMOTIVE ROAD TESTS. Tests on locomotives and trains. Dynamometer car and drawbar pull. Three credits. Prerequisite: 271, 272. MR. FLATHER and assistants.

Mechanical Engineering Laboratory

81f. ELEMENTARY MECHANICAL LABORATORY. Calibration of gages, Pitot tubes, indicator springs. Study of steam calorimeters, indicator cards, valve-setting. Tests of hoists and gears; power pumps and mechanical appliances, viscosity and specific gravity of oils. Two credits. Prerequisite: registration in 42 or equivalent. MR. SHOOP, MR. TUVE.

82w. STEAM LABORATORY. Tests of steam engines, injectors, ejectors, steam separators, steam and power pumps, boilers. Two credits. Prerequisite: 81. MR. SHOOP, MR. TUVE.

83s. ELEMENTARY POWER LABORATORY. Calibration of dynamometers, measurement of power required to drive machinery; calibration of water meters, Venturi and Pitot tubes. Two credits. Prerequisite: registration in 61. MR. ROBERTSON, MR. TUVE.

84f. ELEMENTARY GENERAL LABORATORY. Calibration of thermometers, gages, weirs, nozzle orifices, and meters. Efficiency of machines, friction of belting, friction tests; burning point, chill point, viscosity and specific gravity of oils. Tests of water motor, rams, and pulsometers. Four actual hours. Prerequisite: M.&M. 26 or equivalent. MR. SHOOP, MR. RHAME.

181w. ADVANCED GENERAL LABORATORY. Indicator practice, valve-setting, separating and throttling calorimeters, tests of steam engines, gas engines, pumps, air compressors, blowers, turbines, boilers, and power plant. Four actual hours. Prerequisite: 84. MR. ROWLEY, MR. SHOOP, MR. ROBERTSON.

182f,w. ADVANCED STEAM LABORATORY. Tests of steam turbines, flow of steam through nozzles and pipes. Tests of compound and triple expansion engines, condensers, superheaters, and boilers. Two credits. Prerequisite: 151. MR. ROWLEY, MR. SHOOP, MR. ROBERTSON.

183f,w. POWER AND GAS ENGINE LABORATORY. Tests of gas, gasoline, and hot air engines, gas producers. Power and lighting plants. Two credits. Prerequisite: registration in 150. MR. ROWLEY, MR. SHOOP.

184s. ADVANCED ENGINEERING LABORATORY. Opportunity will be offered for carrying on investigations in connection with tests of power plants, refrigerators, air compressors, blowers, and fans. Also automobile-testing and gas engine investigations. Two credits. Prerequisites: 182, 183. MR. ROWLEY, MR. SHOOP.

287f-288w-289s. MECHANICAL ENGINEERING RESEARCH. Courses may be elected which involve investigations in connection with fuels, lubricating oils, steam and gas engines, heating and ventilating, and other problems as selected. Reports, special problems, and related tests. Three credits per quarter. Prerequisite: 181 or registration in 181. MR. FLATHER, MR. ROWLEY, MR. ROWEN, MR. SHOOP.

General Courses

90f-91w-92s. SEMINAR.† Reding of assigned articles in current technical press. Preparation of synopsis and presentation of principal features. Arranged for juniors. One credit. MR. MARTENIS, MR. GAUVREAU.

190f-191w-192s. SEMINAR. Same as Course 93. Arranged for seniors. One credit per quarter. MR. FLATHER, MR. ROWLEY, MR. ROWEN.

290f-291w-292s. SEMINAR. Same as Course 93. Arranged for graduate students. One credit per quarter. MR. FLATHER, MR. ROWLEY, MR. ROWEN.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
11f,w-12f,w-13f,w	Elementary Shop Practice*...				
	Sec. A	I-III	Th	MechE	Mr. Shipley,
		II-IV	F		Mr. Moffett,
					Mr. Quigley,
					Mr. Richard
	B	VI-VIII	T		
		I-III	W	MechE	
	C	II-IV	M		
		VI-VIII	F	MechE	
11f,12f,13f	Elementary Shop Practice*...				
	Sec. Pre-dent	VII-IX	MW	MechE	
11w,13w	Elementary Shop Practice*...				
	Sec. Pre-dent	VII-IX	MW	MechE	
12w	Elementary Shop Practice*...				
	Sec. Chem.	VII-IX	MW	MechE	

† Credit in 90-91-92 will be accepted as an equivalent for 190-191-192.
* Students can not register in broken sections.

No.	Title	Hour	Day	Room	Instructor
11s,12s,13s	Elementary Shop Practice*....				
	Sec. A	I-III	TS	MechE	
	B	I-III	WTh	MechE	
	C	II-IV	M		
		VII-IX	Th	MechE	
11s,12s	Elementary Shop Practice*...				
	Sec. Pre-dent	VII-IX	MF	MechE	
13s	Elementary Shop Practice*...				
	Sec. Chem.	VII-IX	MF	MechE	
14f	Machine Shop Practice*.....				
	Sec. 1	VI-IX	Th	MechE	Mr. Shipley,
		VI-VIII	F		Mr. Nilson
		I-IV	S		
	2	I-IV	T		
		VI-IX	T		
		I-III	Th	MechE	
15w	Machine Shop Practice*.....				
	Sec. 1	VI-IX	Th		
		VI-VIII	F		
		I-IV	S	MechE	
	2	VI-IX	MT		
		I-III	Th	MechE	
16s	Machine Shop Practice* (E.E.)				
	Sec. 1	VI-VIII	TF	MechE	
	2	I-III	T		
		VII-IX	W	MechE	
	3	II-IV	MW	MechE	
	4	VII-IX	M		
		I-III	F	MechE	
17f	Machine Shop Practice*				
	(Chem.)	VII-IX	MW	MechE	
18f,w,s	Industrial Education.....	(See College of Education Bulletin)			
21s	Mechanical Technology.....	III	TS	102MechE	Mr. Shipley
31s	Elementary Machine Design..				
	Sec. 1	VI-VIII	MF	101ME	Mr. Shipley
	2	VII-IX	W	101ME	Mr. Shipley
		VI-VIII	Th		
32f	Mechanism				
	Sec. 1	II	MTThS	102MechE	Mr. Martenis
	2	III	MTThS	102MechE	Mr. Gauvreau
33w	Mechanism and Kinematics...				
	Sec. 1	III	TThS	102MechE	Mr. Gauvreau
	2	I	MWF	102MechE	Mr. Martenis
	3	III	MWF	104MechE	Mr. Martenis
34w	Kinematics and Machine Design				
	Lect. Sec. 1	IV	MWF	102MechE	Mr. Martenis
	2	III	M	102MechE	
		II	WF	104MechE	Mr. Gauvreau
	Lab. Sec. 1	VI-IX	W		
		I-II	Th	204MechE	Mr. Martenis
	2	II-IV	T		
		VI-IX	Th	204MechE	Mr. Gauvreau

* Students can not register in broken sections.

No.	Title	Hour	Day	Room	Instructor
35s	Machine Design.....				
	Lect. Sec. 1	IV	F		
		III	Th	104MechE	Mr. Gauvreau
	2	III	M	102MechE	
		I	T	104MechE	Mr. Martenis
	Lab. Sec. 1	II-IV	M		
		VI-VIII	W	204MechE	Mr. Gauvreau
	2	II-IV	T		
		VI-VIII	Th	204MechE	Mr. Martenis
37s	Machine Design (E.E.).....				
	Lect. Sec. 1	II	Th	102MechE	Mr. Martenis
	2	II	Th	104MechE	Mr. Gauvreau
	3	III	W	104MechE	Mr. Gauvreau
	Lab. Sec. 1	VI-VIII	F		
		I-III	S	204MechE	Mr. Martenis
	2	VI-VIII	F		
		I-III	S	204MechE	Mr. Gauvreau
	3	VI-VIII	MT	204MechE	Mr. Gauvreau
38f	Machine Design (Chem.).....				
	Lect.	IV	W	104MechE	Mr. Martenis
	Lab.	VI-IX	MF	204MechE	Mr. Gauvreau
41f,w	Automotives	I	MWF	110ExE	Mr. Rhame
41s	Automotives				
	Lect. Sec. 1	I	WF	110ExE	Mr. Rhame
	2	I	TTh	110ExE	
	Lab. Sec. A	VI-VII	W		
	B	VI-VII	Th		
	C	VI-VII	M		
	D	II-III	Th	ExE	
42f	Steam Engines.....				
	Sec. 1	IV	MF	104MechE	
		II	W	102MechE	Mr. Rowen
	2	II	MF	104MechE	
			W	102MechE	Mr. Rowen
43w	Steam Engines and Boilers...				
	Sec. 1	II	MWF	102MechE	Mr. Rowen
	2	II	M		
		III	WF	102MechE	Mr. Rowen
61s	Measurement of Power.....				
	Lect. Sec. 1	III	W		
		II	F	102MechE	Mr. Flather
	2	III	WF	102MechE	
	Lab. Sec. 1	III-IV	T	205MechE	
	2	II-III	Th	204MechE	
81f	Elementary Mechanical Laboratory				
	Sec. 1a-1b	VI-IX	WF	ExE	Mr. Shoop
	2a-2b	VI-IX	MT	ExE	Mr. Tuve
82w	Steam Laboratory.....				
	Sec. 1a-1b	VI-IX	F		Mr. Shoop
		I-IV	S	ExE	Mr. Tuve
	2a-2b	VI-IX	MT	ExE	
83s	Elementary Power Laboratory.				
	Sec. 1a-1b	VI-IX	F		Mr. Robertson
		II-V	S	ExE	Mr. Tuve
	2a-2b	VI-IX	MT	ExE	

No.	Title	Hour	Day	Room	Instructor
84f	Elementary General Laboratory (Miners)				
	Sec. 1	VI-IX	Th	ExE	Mr. Shoop
	2	VI-IX	Th	ExE	Mr. Rhame
90f	Seminar				
	Sec. 1	IV	S	102MechE	Mr. Martenis
	2	IV	S	104MechE	Mr. Gauvreau
91w	Seminar				
	Sec. 1	IV	S	104MechE	Mr. Martenis
	2	IV	S	102MechE	Mr. Gauvreau
92s	Seminar				
	Sec. 1	IV	S	104MechE	Mr. Martenis
	2	IV	S	102MechE	Mr. Gauvreau
110f,w,s	Tool Design	Ar	Ar	Ar	Mr. Rhame
111f,w,s	Tool Construction	Ar	Ar	MechE	Mr. Shipley, Mr. Nilson
131f-132w-133s	Advanced Engineering Design	VI-IX	MTh WTh(spring)	205MechE	Mr. Flather, Mr. Rowen, Mr. Gauvreau
135f	Steam Engine Design	VI-IX	MTh	205MechE	Mr. Flather, Mr. Rowen
136f,w	Gas Engine Design	VI-IX	MTh	205MechE	Mr. Rowley, Mr. Gauvreau
137w	Advanced Gas Engine Design	VI-IX	MTh	205MechE	Mr. Gauvreau
141f,w,s	Advanced Study of Automotives	IV	MWF	201ExE	Mr. Rhame
			MW	21ME } (winter)	
			F	209ExE } (winter)	
144f	Heat Engines (Elect.)				
	Rec. Sec. 1 and 2a	II	WF	110ExE	Mr. Rowley
	2b and 3	III	WF	110ExE	Mr. Robertson
	Lab. Sec. 1	VI-VIII	M	ExE	Mr. Rhame
	2	II-IV	S	ExE	Mr. Robertson
	3	II-IV	T	ExE	Mr. Rhame
145w	Heat Engines (Elect.)				
	Rec. Sec. 1 and 2a	II	WF	110ExE	Mr. Rowley
	2b and 3	III	WF	110ExE	Mr. Robertson
	Lab. Sec. 1	VI-VIII	M	ExE	Mr. Robertson
	2	II-IV	S	ExE	Mr. Rhame
	3	II-IV	T	ExE	Mr. Rhame
146s	Heat Engines (Elect.)				
	Rec. Sec. 1	II	WF	110ExE	Mr. Rowley
	2	III	WF	110ExE	Mr. Robertson
	Lab. Sec. 1	VI-VIII	M	ExE	Mr. Robertson
	2	II-IV	S	ExE	Mr. Robertson
	3	VI-VIII	W	ExE	Mr. Rhame
147w	Heat Engines (Chem.)				
	Rec.	IV	M	209ExE	
			WF	201ExE	Mr. Shoop
	Lab.	VI-IX	W	ExE	
148s	Heat Engines (Chem.)				
	Rec.	IV	MWF	110ExE	Mr. Shoop
	Lab.	VI-IX	F	ExE	
149f	Heat Engines (C.E. & Arch.)				
	Rec. Sec. 1 and 2	IV	MWF	110ExE	Mr. Tuve
	Lab. Sec. 1	VI-IX	W	ExE	
	2	VI-IX	F	ExE	

No.	Title	Hour	Day	Room	Instructor
149w	Heat Engines (C.E.).....				
	Rec.	IV	MWF	110ExE	Mr. Tuve
	Lab.	VI-IX	W	ExE	
149s	Heat Engines (C.E.).....				
	Rec.	IV	MWF	209ExE	Mr. Tuve
	Lab.	VI-IX	W	ExE	
150w	Gas Engines and Producers..	II	MThS	110ExE	Mr. Rowley
151f	Thermodynamics	II	MThS	110ExE	Mr. Shoop
151s	Thermodynamics				
	Sec. 1	I	TThS	102MechE	Mr. Rowen
	2	II	MWF	209ExE	Mr. Shoop
152w	Steam Turbines.....	I	MWF	104MechE	Mr. Rowen
153s	Heating and Ventilating.....				
	Rec.	II	MWF	205MechE	Mr. Martenis
	Lab.	VI-IX	Ar	Ar	
154s	Heating and Ventilating (Arch.)	I	ThF	205MechE	Mr. Martenis
156s	Compressed Air and Refrigerator Machinery.....	I	MWF	102MechE	Mr. Rowen
162f	Power Plant Machinery.....	I	MWF	104MechE	Mr. Rowen
163w	Power Engineering.....	III	MThS	205MechE	Mr. Rowen
164s	Elements of Power Plant Design	III	F		
		VI-VIII	WTh	205MechE	Mr. Rowen
166s	Water Turbines.....	II	MWF	104MechE	Mr. Rowen
181w	Advanced General Laboratory Sec. 1 and 2	VI-IX	Th	ExE	Mr. Rowley, Mr. Shoop, Mr. Robertson
182f	Advanced Steam Laboratory..				
	Sec. 1	I-IV	T		Mr. Shoop
		VI-VII	T	ExE	Mr. Rowley, Mr. Robertson
	2	III-IV			
		VI-IX	T	ExE	
183w	Power and Gas Engine Laboratory				
	Sec. 1	I-IV			
		VI-VII	T	ExE	Mr. Shoop
	2	III-IV			
		VI-IX	T	ExE	Mr. Rowley
184s	Advanced Engineering Laboratory				
	Sec. 1	I-IV			
		VI-VII	T	ExE	Mr. Rowley
	2	III-IV			
		VI-IX	T	ExE	Mr. Shoop
190f-191w-192s	Seminar				
	Sec. 1	IV	S	105MechE	Mr. Flather
	2	IV	S	110ExE	Mr. Rowley
	3	IV	S	205MechE	Mr. Rowen
223f	Industrial Management.....	IV	MWF	205MechE	Mr. Flather
224w	Industrial Management Laboratory	IV	MWF	205MechE	Mr. Flather
225s	Industrial Management Problems	IV	MWF	205MechE	Mr. Flather

No.	Title	Hour	Day	Room	Instructor
226w,s	Safety Engineering	Ar	Ar	Ar	Mr. Flather, Mr. Shipley
237s	Gas Tractor Design	Ar	Ar	MechE	Mr. Rowley, Mr. Gauvreau
255f,w,s	Advanced Heating and Ventilating	Ar	Ar	Ar	Mr. Rowley
257w	Mechanical Equipment of Buildings	Ar	Ar	MechE	Mr. Rowley, Mr. Martenis
265f-266w	Power Plant Design	VI-IX	MTh	205MechE	Mr. Rowen
267s	Power Plant Management	IV	MWF	102MechE	Mr. Rowen
271f	Railway Technology	Ar	Ar	Ar	Mr. Martenis
272f-273w-274s	Railway Design and Locomotive Construction	Ar	Ar	Ar	
278s	Locomotive Road Tests	Ar	Ar	Ar	Mr. Flather
287f-288w-289s	Mechanical Engineering Research	Ar	Ar	ExE	Mr. Flather Mr. Rowley, Mr. Rowen, Mr. Shoop
290f-291w-292s	Seminar	Ar	Ar	Ar	Mr. Flather, Mr. Rowley, Mr. Rowen
293f,w,s	Aeronautical Engineering	Ar	Ar	MechE	Mr. Gauvreau
294f,w,s	Aeroplane Design	Ar	Ar	MechE	Mr. Gauvreau

METALLURGY

Professors WILLIAM R. APPLEBY, PETER CHRISTIANSON, LEVI B. PEASE; Associate Professor OSCAR E. HARDER; Instructors RALPH L. DOWDELL, CLAYTON M. REASONER.

COURSES

22f. METALLURGY. A short course in metallurgy of base metals, special consideration being given to mechanical features. Three credits. Prerequisite: Chem. 16. MR. CHRISTIANSON, MR. PEASE.

23w. METALLURGY. A short course in metallurgy of base metals, special consideration being given to electrical features. Three credits. Prerequisite: 22. MR. CHRISTIANSON, MR. PEASE.

150f. METALLOGRAPHY FOR ELECTRICAL ENGINEERS. Principles of metallography, including pyrometry, thermal analysis, constitution diagrams, microscopic and photomicrographic technique; study of typical alloys with special reference to electrical resistance, conductivity, magnets, etc. Laboratory work and demonstrations. Open to junior and senior electrical engineers. Three credits. Prerequisite: none. MR. HARDER, MR. DOWDELL, MR. REASONER.

151w. ADVANCED METALLOGRAPHY FOR ELECTRICAL ENGINEERS. Continuation of 150. Study of iron and steel, alloy steels, metals and alloys used in electrical engineering practice. Special problems for outside reading and for research. Laboratory work. Three credits. Prerequisite: 150. MR. HARDER, MR. DOWDELL, MR. REASONER.

156f. METALLOGRAPHY FOR MECHANICAL ENGINEERS. Principles of metallography, including pyrometry, thermal analysis, constitution diagrams, microscopic and photomicrographic technique; metallography and heat treatment of iron and steel. Laboratory work. Open to senior mechanical engineers. Three credits. Prerequisite: none. MR. HARDER, MR. DOWDELL, MR. REASONER.

157w. ADVANCED METALLOGRAPHY FOR MECHANICAL ENGINEERS. Continuation of 156. Metallography of alloy steels, tool steels, high speed tool steels, and important non-ferrous alloys; metallography applied to engineering practice and specifications. Outside reading and special reports. Laboratory work. Three credits. Prerequisite: 156. MR. HARDER, MR. DOWDELL, MR. REASONER.

163f-164w-165s. ADVANCED METALLOGRAPHY. Technical and scientific research. The study of steel rails, automobile and locomotive parts, tool steels, etc. Special problems in metallography with outside reading. Seminar work on the recent advance in metallography. Credits to be arranged. Prerequisites: 151, 157 or equivalent. MR. HARDER.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
22f-23w	Metallurgy	IV	MWF	111M	Mr. Christianson
150f	Metallography (Elect.).....				
	Lect.	I	MW	112M	Mr. Dowdell
	Lab.	VI-IX	M	307M	
151w	Adv. Metallography (Elect.)..				
	Lect.	I	MW	112M	Mr. Dowdell
	Lab.	VI-IX	M	307M	
156f	Metallography (Mech.).....				
	Lect.	III	MTh	108M	Mr. Harder
	Lab. Sec. 1	VI-IX	W	307M	
	2	VI-IX	F	307M	
157w	Adv. Metallography (Mech.)..				
	Lect.	III	MTh	108M	Mr. Harder
	Lab. Sec. 1	VI-IX	W	307M	
	2	VI-IX	F	307M	
163f-164w-165s	Advanced Metallography.....	Ar	Ar	Ar	Mr. Harder

MILITARY SCIENCE AND TACTICS

Professor GIRARD STURTEVANT, Colonel, Infantry; Assistant Professors JAMES E. WARE, Lieutenant Colonel, Retired; HENRY H. RUTHERFORD, Lieutenant Colonel, Medical Corps; LAURENCE T. WALKER, Major, Coast Artillery Corps; LEE R. WATROUS, JR., Major, Coast Artillery Corps; FREDERICK R. WUNDERLICH, Major, Dental Corps; EDWARD G. SHERBURNE, Major, Infantry; JAMES E. WATSON, Captain, Signal Corps; NEWTON W. SPEECE, Captain, Infantry; ANDREW C. TYCHSEN, Captain, Infantry; RUSSELL C. THROCKMORTON, Captain, Infantry; LEO J. FARRELL, Captain, Infantry; HAL M. ROSE, Captain, Cavalry; Instructors JOSEPH HAVLICEK, Regimental Commissary Sergeant, Retired; CARL JENSEN, Regimental Supply Sergeant, Retired; JOHN

McWILLIAMS, 1st Sergeant, Retired; HENRY DAHL, 1st Sergeant, Retired; HARRY E. STRIDER, Technical Sergeant, Signal Corps; ALFRED BRANDT, Technical Sergeant, Infantry; AUBREY DUNKUM, Staff Sergeant, Coast Artillery Corps; CLARENCE E. LANGE, Sergeant, Field Artillery; JOE WEIR, Sergeant, Infantry; EDMUND T. McCANN, Sergeant, Infantry; HENRY W. BROWN, Sergeant, Coast Artillery Corps; EARL J. BLONSCHINE, Private, 1st Class, Coast Artillery Corps.

REQUIRED WORK

All physically fit male students are required to take instruction in military science for three hours each week during the first two undergraduate years of their course. Previous instruction in this subject at other institutions under an officer of the regular army detailed as professor of military science and tactics exempts the student from so much of this work as the length of his prior training justifies in each case. All students taking this course are given the instruction prescribed for the Basic Course, Senior Division, R.O.T.C. No credits are allowed for this work.

ELECTIVE WORK

Any student legally eligible for enrolment who has completed the Basic Course, Senior Division, R.O.T.C., or other military work announced as equivalent thereto, may register for, and be enrolled in, the Advanced Course, Senior Division, R.O.T.C., provided the professor of military science and tactics and the president of the University, respectively, recommend and approve such enrolment in each case.

Students enrolled in the Advance Course receive from the government a fixed sum per day as commutation of rations while pursuing this course; they are required to sign an agreement to continue in the course during their time at the University (not to exceed two years), and to attend such summer training camps as are prescribed by the Secretary of War; all expense incident to training camp attendance being borne by the government.

Students who successfully pass the Advanced Course are, upon the recommendation of the president of the University and the professor of military science and tactics, eligible for appointment as reserve officers of the army.

The Advanced Course embraces three departments: Infantry, Coast (Heavy) Artillery, and Signal Corps, in any of which the student may be enrolled.

COURSES

1f-2w-3s. FIRST-YEAR BASIC COURSE R.O.T.C.

INFANTRY. Practical and theoretical instruction in school of soldier, squad, and company; elementary subjects of military training; infantry equipment. No credits. Prerequisite: none.

COAST ARTILLERY. Duties of heavy artillery soldier; military customs and methods; elementary topography; practical study of one gun and one carriage. No credits. Prerequisite: none.

SIGNAL CORPS. Infantry drill and physical training; military hygiene and first aid; military courtesy; guard duty; army organization and organization of signal troops; military telegraph apparatus; military telephone apparatus; radio telegraphy. No credits. Prerequisite: none.

4f-5w-6s. SECOND-YEAR BASIC COURSE R.O.T.C.

INFANTRY. Practical instruction in school of platoon and company; military sketching and map-reading; infantry weapons; minor tactics. No credits. Prerequisite: 1-2-3.

COAST ARTILLERY. Duties of non-commissioned officer of heavy artillery; guns, carriages, ammunition and accessories (elementary); topography (preparation of precise maps); construction and operation of motor vehicles. No credits. Prerequisite: 1-2-3.

SIGNAL CORPS. Infantry drill and physical training; military sketching and map-reading; army organization; organization of signal troops; military telegraph and telephone apparatus; radio telegraphy. No credits. Prerequisite: 1-2-3.

51f-52w-53s. FIRST-YEAR ADVANCED COURSE R.O.T.C.

INFANTRY. Field engineering; infantry weapons including trench mortars, 37mm. gun, grenades, and pistol; minor tactics. Three credits per quarter. Prerequisite: 4-5-6.

COAST ARTILLERY. Duties of a heavy artillery officer; guns, carriages, and determination of geodetic data; motor transport (advanced). Three credits per quarter. Prerequisite: 4-5-6.

SIGNAL CORPS. Minor tactics; field engineering; organization and tactics of all arms; staff organizations and duties; message centers; codes and ciphers; telephone construction; communication engineering (Electrical Communication, E.E. 61-63). Three credits per quarter. Prerequisite: 4-5-6.

54f-55w-56s. SECOND-YEAR ADVANCED COURSE R.O.T.C.

INFANTRY. Minor tactics; administration; military law; military history and policy of the United States; rules of land warfare. Three credits per quarter. Prerequisite: 51-52-53.

COAST ARTILLERY. Duties of heavy artillery officer; administrative methods; military law; military policy of the United States; tactics of infantry; field engineering; problems in employment of heavy artillery and in the use of heavy artillery against armored ships. Three credits per quarter. Prerequisite: 51-52-53.

SIGNAL CORPS. Minor tactics; field engineering; organization and tactics of signal troops; military history and policy of the United States; administration; military laws; signal corps duties; message centers; codes and ciphers; semi-permanent and temporary telephone construction; communication engineering (Electrical Communication, given by Department of Electrical Engineering). Three credits per quarter. Prerequisite: 51-52-53.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
1f-2w	First-Year Basic Course				
	R.O.T.C.				
	Sec. 1	VI	MWF	A	Mr. Sturtevant, Mr. Walker, Mr. Watson
	2	IX	MWF	A	
3s	First-Year Basic Course				
	R.O.T.C.	VII-IX	T	A	
4f-5w	Second-Year Basic Course				
	R.O.T.C.				
	Sec. 1	I	MWF	A	Mr. Sturtevant, Mr. Walker, Mr. Watson
	2	VIII	MWF	A	
	Arch. (Infantry)	III	MWF	A	
6s	Second-Year Basic Course				
	R.O.T.C.				
	Artillery and Infantry	VII-IX	T	A	Mr. Sturtevant, Mr. Walker, Mr. Watson
	Signal Corps	VII-IX	Th	A	
51f-52w	First-Year Advanced Course				
	R.O.T.C.				
	Artillery and Signal Corps	IV	MF	A	Mr. Walker
		VI-VIII	W	A	Mr. Watson
	Infantry	III	TS	A	
		VII-IX	Th	A	
53s	First-Year Advanced Course				
	R.O.T.C.				
	Artillery and Signal Corps	IV	MF	A	Mr. Walker
		VI-VIII	W	A	Mr. Watson
	Infantry	III	TS	A	
		VII-IX	T or W	A	
54f-55w	Second-Year Advanced Course				
	R.O.T.C.				
	Artillery and Signal Corps	I	MW	A	Mr. Walker
		VI-VIII	F	A	Mr. Watson
	Infantry	IV	TS	A	
		VII-IX	Th	A	
56s	Second-Year Advanced Course				
	R.O.T.C.				
	Artillery and Signal Corps	I	MW	A	Mr. Walker
		VI-VIII	F	A	Mr. Watson
	Infantry	IV	TS	A	
		VII-IX	T or W	A	

PHYSICS

Professors HENRY A. ERIKSON, Chairman, W. FRANCIS G. SWANN, JOHN T. TATE, ANTHONY ZELENY; Assistant Professor LOUALLEN F. MILLER; Instructors, ARCHIE D. POWER, JOSEPH VALASEK.

COURSES

3f,w,s,su. ELEMENTS OF MECHANICS AND SOUND. Mechanics of solids, fluids, wave motion, and sound. A study of the simpler fundamental principles. First part of a general course 3, 23, 43. Course 4 should be taken in conjunction with this course. Three lectures, one quiz hour a week. Three credits. Prerequisite: trigonometry equivalent to M.&M. 12. MR. ERIKSON.

4f,w,s,su. ELEMENTS OF MECHANICS AND SOUND LABORATORY. Measurements in the mechanics of solids, fluids, wave motion, and sound; the laboratory part supplementing Course 3. One two-hour session in the laboratory a week. One credit. Prerequisite: 3 or registered in 3. MR. ERIKSON.

23w. HEAT. A study of the principles underlying heat phenomena. Course 24 should be taken in conjunction with this course. Three lectures, one quiz hour a week. Three credits. Prerequisite: 3. MR. MILLER.

24w. HEAT LABORATORY. The laboratory part supplementing Course 23. One two-hour session in the laboratory a week. One credit. Prerequisites: 4, 23 or registered in 23. MR. MILLER.

43s. MAGNETISM AND ELECTRICITY. A study of the principles underlying magnetic and electric phenomena. Course 44 should be taken in conjunction with this course. Three lectures, one quiz hour a week. Three credits. Prerequisite: 3. MR. ZELENY.

44s. ELECTRICAL LABORATORY. The laboratory part supplementing Course 43. One two-hour session in the laboratory a week. One credit. Prerequisites: 4, 43 or registered in 43. MR. ZELENY.

122s. PYROMETRY AND HEAT. An experimental study of pyrometry, heat transfer, hygrometry, and gas liquefaction. One lecture, two three-hour sessions in the laboratory a week. Three credits. Prerequisites: 23 and 24. MR. MILLER.

144f. ELECTRICAL MEASUREMENTS. Devoted mainly to the study of potentiometer methods, capacity, inductance, magnetic flux. Two-hour lecture and two two-hour laboratory periods a week. Three credits. Prerequisites: 43 and 44.

For other electives in the Department of Physics see the bulletin of the College of Science, Literature, and the Arts.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
3f	Elements of Mechanics and Sound				
	Lect. Sec. 1	I	MWF	30Ph	Mr. Erikson
	2	II	MWF	30Ph	
	3	VI	MWF	30Ph	
	Quiz—All sections	IX	F	305ME	
3w	Elements of Mechanics and Sound				
	Lect.	VIII	MWF	30Ph	Mr. Erikson
	Quiz	IX	F	100C	
3s	Elements of Mechanics and Sound				
	Lect.	III	TThS	30Ph	Mr. Erikson
	Quiz	IX	F	100C	
4f	Elements of Mechanics and Sound Lab.....				
	Sec. C.E. 1	I-II	S	16Ph	Mr. Erikson
	C.E. 2	III-IV	T	16Ph	
	C.E. 3	III-IV	M	16Ph	
	C.E. 4	VII-VIII	F	16Ph	
	E.E. 1	VI-VII	M	16Ph	
	EE. 2	I-II	T	16Ph	
	E.E. 3	III-IV	F	16Ph	
	E.E. 4	I-II	Th	16Ph	
	M.E. 1	VI-VII	W	16Ph	
	M.E. 2	III-IV	S	16Ph	
4w-s	Elements of Mechanics Lab...				
	Sec. 1	VI-VII	T	16Ph	Mr. Erikson
	2	VIII-IX	T	16Ph	
	3	VIII-IX	Th	16Ph	
23w	Heat				
	Lect. Sec. 1	I	MWF	30Ph	Mr. Miller
	2	II	MWF	30Ph	
	3	VI	MWF	30Ph	
	Quiz—All engineering sections	IX	F	305ME	
	Arch. section	II	Th	100C	
24w	Heat Laboratory.....				
	Sec. C.E. 1	I-II	S	23Ph	Mr. Miller
	C.E. 2	III-IV	T	23Ph	
	C.E. 3	III-IV	M	23Ph	
	E.E. 1	VI-VII	M	23Ph	
	E.E. 2	I-II	T	23Ph	
	E.E. 3	III-IV	F	23Ph	
	E.E. 4	I-II	Th	23Ph	
	M.E. 1	VI-VII	W	23Ph	
	M.E. 2	III-IV	S	23Ph	
43s	Magnetism and Electricity....				
	Lect. Sec. 1	I	MWF	30Ph	Mr. Zeleny
	2	II	MWF	30Ph	
	3	VI	MWF	30Ph	
	Quiz—All engineering sections	IX	F	305ME	
	Arch. section	II	Th	100C	

No.	Title	Hour	Day	Room	Instructor
44s	Electrical Laboratory.....				
	Sec. C.E. 1	I-II	S	31Ph	Mr. Zeleny
	C.E. 2	III-IV	T	31Ph	
	C.E. 3	III-IV	M	31Ph	
	E.E. 1	VI-VII	M	31Ph	
	E.E. 2	I-II	M	31Ph	
	E.E. 3	III-IV	F	31Ph	
	E.E. 4	I-II	W	31Ph	
	M.E. 1	I-II	T	31Ph	
	M.E. 2	VII-VIII	F	31Ph	
122s	Pyrometry and Heat.....	VI-VIII	MWF	9Ph	Mr. Miller
144f	Electrical Measurements.....				
	Lect.	VI-VII	F	30Ph	Mr. Zeleny
	Lab. Sec. 1	VI-VII	T		
		II-III	Th	31Ph	Mr. Zeleny
	2	VII-IX	M		
		VI-VII	Th	31Ph	
	3	VI-VII	M		
		I-II	S	31Ph	

PREVENTIVE MEDICINE AND PUBLIC HEALTH

Assistant Professor HAROLD S. DIEHL, Director; Associate Professor LOUIS J. COOKE; Instructor EDWIN S. BROWN.

COURSE

2s. HYGIENE AND FIRST AID TO THE SICK AND INJURED. Lectures, demonstrations, and recitations. Promotion of health. Sources, routes, and prevention of communicable diseases. One hour per week during the spring quarter. No credit. DR. DIEHL, DR. COOKE, DR. BROWN,

PROGRAM

No.	Title	Hour	Day	Room	Instructor
2s	Hygiene and First Aid to the Sick and Injured....				
	Sec. 1	VI	T	305ME	Dr. Diehl, Dr. Cooke, Dr. Brown
	2	VIII	F	305ME	

SUMMER READING

All engineering students are advised to take general courses in reading of non-professional character during their summer vacations. The purpose of this general reading is to increase the acquaintance of the student with literature, history, and general science; to develop in him a taste for good reading; and to impress him with the importance of such knowledge not only as a source of individual enjoyment but as a practical aid to engineers in their social and business relations.

A circular on general reading has been prepared and may be secured at the dean's office. This contains a list of books from which the student may make his own selection. The books have been chosen for their value

in providing general training, but an attempt has been made to include only readable and attractive works. Most of the books in the list are available in standard low-priced editions, and each student is urged to purchase his own copy and thus add to the value and pleasure of the reading. A statement of the books read during the summer vacation is required at the beginning of the next college year, and applications for credit must be submitted to the dean before October 14. The student will be examined on the books read. One credit will be allowed for each course satisfactorily completed, but not more than one credit will be granted in one year. The total credits for this reading shall not exceed three.

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The College of Agriculture, Forestry, and Home Economics

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CONTENTS

1921

JULY

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	..	..	..	..	..	..

AUGUST

Su	Mo	Tu	W	Th	Fr	Sa
..	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	..	..	..
..	..	..	..	..	..	..

SEPTEMBER

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	**28**	29	30	..
..	..	..	..	..	..	..

OCTOBER

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	..	1
2	3	4	5	6	7	8
9	10	11	12	13	14	**15**
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	..	..	..	..	..

NOVEMBER

Su	Mo	Tu	W	Th	Fr	Sa
..	..	1	2	3	4	**5**
6	7	8	9	10	**11**	12
13	14	15	16	17	18	19
20	21	22	23	**24**	25	26
27	28	29	30	..	..	..
..	..	..	..	..	..	..

DECEMBER

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	**21**	**22**	**23**	**24**
25	**26**	**27**	**28**	**29**	**30**	**31**
..	..	..	..	..	..	..

1922

JANUARY

Su	Mo	Tu	W	Th	Fr	Sa
1	**2**	**3**	**4**	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	..	..	..	..
..	..	..	..	..	..	..

FEBRUARY

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	**22**	23	24	25
26	27	28	..	..	..	..
..	..	..	..	..	..	..

MARCH

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	**23**	**24**	**25**
26	**27**	**28**	**29**	30	31	..
..	..	..	..	..	..	..

APRIL

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	..	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	..	..	..	..	..	..

MAY

Su	Mo	Tu	W	Th	Fr	Sa
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14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	**30**	31	..	..	..
..	..	..	..	..	..	..

JUNE

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	1	2	3
4	5	6	7	8	9	10
11	12	**13**	14	15	16	17
18	19	**20**	21	22	23	24
25	26	27	28	29	30	..
..	..	..	..	..	..	..

JULY

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	..	1
2	3	**4**	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	**28**	29
30	31	..	..	..	..	..

AUGUST

Su	Mo	Tu	W	Th	Fr	Sa
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6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	..	..
..	..	..	..	..	..	..

SEPTEMBER

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
..	..	..	..	..	..	..

OCTOBER

Su	Mo	Tu	W	Th	Fr	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	..	..	..	..
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NOVEMBER

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	..	..
..	..	..	..	..	..	..

DECEMBER

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	..	..	..	..	..	..

UNIVERSITY CALENDAR

1922-23

1922			
September	16	Saturday	Payment of fees closes, except for new students
September	19-26		Examinations for removal of conditions and entrance examinations
			Physical examinations for all new students
September	19-23		Registration period, new students
September	26	Tuesday	Payment of fees for new students closes
September	27	Wednesday	Fall quarter begins, 8:15* a.m.
October	2	Monday	School of Agriculture, first term begins
October	14	Saturday	Class Scrap Day; classes dismissed the third and fourth hours
October	26	Thursday	Senate meeting, 4:30 p.m.
October	27	Friday	Last day for removal of spring quarter incompletes
November	4	Saturday	Home Coming Day; classes dismissed the third and fourth hours
November	7	Tuesday	General Election Day; a holiday
November	11	Saturday	Armistice Day; a holiday
November	13	Monday	Advanced Creamery Operators' Short Course begins
November	25	Saturday	Advanced Creamery Operators' Short Course closes
November	27	Monday	Ice Cream Operators' Short Course begins
November	30	Thursday	Thanksgiving Day; a holiday
December	2	Saturday	Ice Cream Operators' Short Course closes
December	4	Monday	Milk Plant Operators' Short Course begins
December	9	Saturday	Milk Plant Operators' Short Course closes
December	14	Thursday	Senate meeting, 4:30 p.m.
December	20	Wednesday	Last day for registration except for new students
			Fall quarter ends, Christmas vacation begins, 5:20 p.m.
			School of Agriculture, first term closes
1923			
December / January	26 / 2		Registration for new students
January	2	Tuesday	Creamery Operators' Short Course begins

January	2-6		Farmers' and Home-Makers' Week Short Course
			Power Farming Short Course
January	4	Thursday	Christmas vacation ends, winter quarter begins, 8:15* a.m.
January	8	Monday	School of Agriculture, second term begins
February	5	Monday	Last day for removal of fall quarter incompletes and conditions
			Horticultural Short Course begins
February	10	Saturday	Creamery Operators' Short Course closes
February	12	Monday	Lincoln's Birthday; a holiday
February	13	Tuesday	Cheese Plant Operators' Short Course begins
February	15	Thursday	Senate meeting, 4:30 p.m.
February	22	Thursday	Washington's Birthday; a holiday
February	24	Saturday	Horticultural Short Course closes
March	10	Saturday	Cheese Plant Operators' Short Course closes
March	23	Friday	Last day for spring quarter registration except for new students
			Winter quarter ends, spring vacation begins, 5:20 p.m.
March	28	Wednesday	School of Agriculture, second term closes
April	2-6		Boys' and Girls' Week Short Course
April	4	Wednesday	Spring vacation ends, spring quarter begins, 8:15* a.m.
April	18	Wednesday	Home Nursing Short Course begins
May	3-5		Editors' Short Course
May	4	Friday	Last day for removal of winter quarter incompletes and conditions
May	15-18		Beekeepers' Short Course
May	17	Thursday	Senate meeting, 4:30 p.m.
May	23	Wednesday	Home Nursing Short Course closes
May	30	Wednesday	Memorial Day; a holiday
June	17	Sunday	Baccalaureate service
June	20	Wednesday	Fifty-first annual commencement
June	20	Wednesday	Spring quarter closes, 5:20 p.m.
June	23-25		Registration days for Summer Session
June	26	Tuesday	Summer Session and summer quarter begin
July	4	Wednesday	Independence Day; a holiday
August	3	Friday	Summer Session closes
September	7	Friday	Summer quarter closes

* First hour classes begin at 8:30 on the Minneapolis campus.

THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

FACULTY

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CLIFFORD P. FITCH, M.S., D.V.M., Professor of Animal Pathology and Bacteriology

[1] Died April 3, 1922.

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[1] Leave of absence, 1922-23.

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J. GRANT DENT, Instructor in Farm Engineering
SHERMAN DICKINSON, M.A., Instructor in Agricultural Education
LOUISE DOSDALL, M.A., Instructor in Plant Pathology
AUBREY R. DUNKUM, Staff Sergeant, D.E.M.L., Instructor in Military Science and Tactics
AMANDA EBERSOLE, B.S., Instructor in Home Economics
HALLY J. FISHER, R.N., Instructor in Home Nursing
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SAMUEL A. GRAHAM, Ph.D., Instructor in Entomology
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CLARENCE H. WELCH, Assistant to the Director
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FRANK J. BROWN, B.S. in Agr., Assistant State Leader County Agents
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KENNETH F. WARNER, M.S., Livestock Specialist
LESLIE V. WILSON, B.S., Dairy Specialist
HENRY G. ZAVORAL, B.S.A., Livestock Specialist

MEMBERS OF OTHER FACULTIES GIVING INSTRUCTION IN THE COLLEGE OF AGRICULTURE, FORESTRY AND HOME ECONOMICS

CEPHAS D. ALLIN, LL.B., M.A., Professor of Political Science
[1]FRANCIS B. BARTON, Docteur de l'Université de Paris, Assistant Professor of Romance Languages
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WILLIAM S. FOSTER, Ph.D., Associate Professor of Psychology

[1] Absent on leave, 1922-23.
[2] Absent on leave, fall and winter quarters.

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GUSTAV A. LUNDQUIST, M.A., Assistant Professor of Rural Sociology
ELIAS P. LYON, Ph.D., M.D., Professor of Physiology
JESSE F. MCCLENDON, Ph.D., Professor of Physiology
FRANK H. MACDOUGALL, Ph.D., Associate Professor of Chemistry
LOUALLEN F. MILLER, M.A., Assistant Professor of Physics
WILFORD S. MILLER, Ph.D., Professor of Educational Psychology
CECIL A. MOORE, Ph.D., Associate Professor of English
BRUCE D. MUDGETT, B.A., Associate Professor of Economics
HENRY F. NACHTRIEB, B.S., Professor of Animal Biology
MARVIN G. NEALE, Ph.D., Professor of Educational Administration and Supervision
HOWARD S. NOBLE, M.B.A., Assistant Professor of Accounting
OSCAR W OESTLUND, Ph.D., Assistant Professor of Animal Biology
EVERETT W. OLMSTED, Ph.D., Litt.D., Professor of Romance Languages
DONALD G. PATERSON, M.A., Associate Professor of Psychology
CHAUNCEY J. V. PETTIBONE, Ph.D., Associate Professor of Physiologic Chemistry
RUTH S. PHELPS, M.A., Associate Professor of Romance Languages
RUTH RAYMOND, Assistant Professor of Art Education
LLOYD H. REYERSON, Ph.D., Assistant Professor of Chemistry
THOMAS S. ROBERTS, M.D., Professor of Ornithology
C. OTTO ROSENDAHL, Ph.D., Professor of Botany
CARL SCHLENKER, B.A., Professor of German
CARLYLE M. SCOTT, Professor of Music
FREDERICK H. SCOTT, Ph.D., M.B., B.Sc., Professor of Physiology
COLBERT SEARLES, Ph.D., Professor of Romance Languages
CHARLES F. SIDENER, B.S., Professor of Chemistry
CHARLES P. SIGERFOOS, Ph.D., Professor of Zoology

M. Cannon Sneed, Ph.D., Associate Professor of Chemistry
J. Warren Stehman, M.A., Assistant Professor of Economics
Elmer E. Stoll, Ph.D., Professor of English
Fletcher H. Swift, Ph.D., Professor of Education
Josephine E. Tilden, M.S., Professor of Botany
Gustave van Roosbroeck, Ph.D., Assistant Professor of Romance Languages
Marvin J. Van Wagenen, Ph.D., Assistant Professor of Educational Psychology
Herbert Woodrow, Ph.D., Associate Professor of Psychology
Jeremiah S. Young, Ph.D., Professor of Political Science
Anthony Zeleny, Ph.D., Professor of Physics
Otto W. Davis, B.A., Lecturer in Sociology
J. Franklin Ebersole, M.A., Ph.B., Professorial Lecturer in Economics
Antonio Heras, Bachiller, Licenciado en Derecho, Professorial Lecturer in Romance Languages
William W. Hodson, B.A., LL.D., Lecturer in Sociology
Harry M. Johnson, Ph.D., Lecturer in Psychology
Jean H. Alexander, M.A., Instructor in History and Philosophy of Education
Ira S. Allison, B.A., Instructor in Geology and Mineralogy
Anne G. Benton, B.A., Instructor in Bacteriology
Louis A. Boettiger, M.A., Instructor in Sociology and Social Work
Harry S. Cannon, Ph.D., Instructor in German
Hugh S. Carter, B.A., Instructor in Sociology and Social Work
Nelson F. Coburn, M.A., Instructor in Romance Languages
Joseph E. Cummings, M.A., Instructor in Economics
Lynwood Downs, M.A., Instructor in German
George Fairclough, F.A.G.O., M.Mus., Instructor in Organ
Charles L. Farabaugh, B.S., Diplôme d'Etudes Supérieures, Instructor in Botany
Robert G. Green, M.A., Instructor in Bacteriology
John W. Gruner, M.S., Instructor in Geology and Mineralogy
Leah M. Hanley, B.S., Instructor in Art Education
Charles R. Hoffer, M.S., Instructor in Sociology
Gertrude Hull, Instructor in Voice
Richard Jente, Ph.D., Instructor in German
Arthur M. Johnson, Ph.D., Instructor in Botany
Carl E. Johnson, Instructor in Architecture
Lee O. Lantis, M.A., Instructor in Sociology
Walter M. Lauer, M.S., Instructor in Chemistry
Hazel S. Martin, Instructor in Art Education
Abe Pepinsky, Instructor in Music
Gertrude Reeves, Instructor in Music
George S. H. Rossouw, M.A., Instructor in Sociology and Social Work
Karl Scheurer, Instructor in Music
George M. Schwartz, M.A., Instructor in Geology and Mineralogy

GLADYS SPEAKER, M.A., Instructor in Anthropology and Americanization Training

DAVID O. SPRIESTERSBACH, M.S., Instructor in Bacteriology and Immunology

GEORGE A. THIEL, M.A., Instructor in Geology and Mineralogy

JOSEPH VALASEK, M.A., Instructor in Physics

W. COURTNEY WERNER, B.A., Instructor in Geology and Mineralogy

FACULTY COMMITTEES

1922-1923

Executive.—The Executive Committee of the Department of Agriculture.

Curriculum.—Mr. Freeman, Miss Biester, Mr. A. Boss, Mr. Cheyney, Mr. Eckles, Mr. Riley, Mr. Storm, Miss Weigley, Miss Weller, Mr. West.

Enrolment.—Mr. Field, Miss Clara Brown, Mr. Wentling, Mr. Morrow, Mr. West.

Students' Work.—Mr. Freeman, Miss Weigley, Mr. Alderman, Mr. Working, Mr. Cheyney, Mr. Nicholson, Mrs. Ladd, Mr. Storm, Mr. Carnes.

Student Organizations.—Mr. Lansing, Mr. Palmer, Miss Patchin, Miss Weller, Mr. Freeman.

Faculty Business.—Mr. Willaman, Mr. Rost, Miss Phelps, Mr. Keithley.

Farm Experience.—Mr. A. Boss, Mr. Alderman, Mr. Eckles.

Program.—Mr. Fitch, Mr. Allison, Mr. Ruggles, Mr. Hayes, Miss Child.

Scholarships.—Mr. Eckles, Miss Weigley, Mr. Gortner, Mr. Hayes, Mr. Black, Mr. Freeman.

1922-23 bulletin. See Dept Agr Catalog for 1921-22

GENERAL INFORMATION

ADMISSION

New students are admitted at the opening of any quarter provided a suitable program can be arranged. Prospective students, however, are advised to enter at the opening of the fall quarter if possible.

All students entering for the first time must submit their credentials to the Enrolment Committee.

Admission is either by certificate (in the case of graduates of accredited schools) or by examination. Candidates must have completed the equivalent of a four-year high school course and must present:

1. Four units of English; or three units of English and four units of a foreign language; or three units of English and two units in each of two foreign languages.
2. One unit of elementary algebra and one unit of plane geometry.
3. Enough additional work to make in all fifteen units, of which not more than four may be in subjects not listed in the admission groups in the general information bulletin.

Graduates of the School of Agriculture of the University of Minnesota who have completed the two summers of supervised work offered in the school course, one additional school year, and one additional summer's work, or the equivalent thereof, will be admitted to the College of Agriculture, Forestry, and Home Economics.

For details of admission requirements and definition of "unit," see the bulletin of general information.

Applicants for admission are urged to present physics (1 unit) and chemistry (1 unit), for entrance credits. If these subjects are not completed in the high school, they will have to be taken in the University, thus postponing some of the vocational courses.

Every prospective student in agriculture 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 who major in dairy husbandry at least three of the six months of approved farm experience must be on an accredited dairy farm.

FEES

Tuition fee (per quarter)	
Residents of Minnesota	$20.00
Non-residents	30.00
Deposit (first quarter only)	5.00
Military deposit (for all students registered for military drill)	10.00
Health fee (per quarter)	2.00
Minnesota Union or Shevlin Hall (per quarter)	1.00
Post-office box (per quarter)	.20

Special fees	
Itasca Park tuition (freshmen and juniors in forestry) prorated on basis of regular quarter tuition per quarter of 12 weeks	20.00
Physical Training for Women	
First year courses, per quarter	2.50
Other courses, per quarter	2.00
Maximum fee per quarter, $3.50	
Vocal or instrumental music	
One hour per week, per quarter	25.00
Two hours per week, per quarter	45.00
Examination for removal of conditions	1.00
Examinations for credit (after the first quarter in residence)	5.00
Special examinations	5.00
Change of registration	2.00

Late registration.—Old students must indicate their registration and pay their fees not later than two weeks before the day set for classes to begin. New students must complete their registration (including payment of fees) before the day set for classes to begin. The penalty for delay in either indicating or completing registration is two dollars. An additional dollar is charged for each day of delay after the last day set for the completion of registration and a similar charge is made for each day of delay after the last day set for payment of fees.

Important.—The regulations require that no student be allowed to register after the quarter opens except by special committee action.

FACULTY REGULATIONS

Students are held responsible for compliance with all faculty regulations. These regulations are published in a booklet issued to students at the time of registration.

REQUIREMENTS FOR GRADUATION AND DEGREES

After the completion of the prescribed course of study, including all of the required work and the requisite amount of elective work equivalent to a total of 204 credit hours, with 204 honor points in agriculture and forestry; and 189 credit hours with 189 honor points in home economics, candidates will be recommended for graduation with the degree of bachelor of science.

GRADING SYSTEM AND HONOR POINTS

There are four passing grades, A, B, C, and D, of which A is the highest and D the lowest. In addition there are the following non-passing grades: E (condition), F (failure) and I (incomplete). For rules governing the non-passing grades, see the booklet of Faculty Regulations.

Honor points are awarded on the following basis: each credit hour with a grade of A counts three honor points; each credit hour with a grade of B counts two honor points; and each credit hour with a grade of C counts one honor point. A grade of D counts no honor points.

CANDIDATES FOR THE TEACHER'S CERTIFICATE IN AGRICULTURE AND HOME ECONOMICS

The University teacher's certificate will be granted only to graduates of the College of Education. Students expecting to receive this certificate upon graduation shall be registrants in the College of Education from the beginning of the junior year. Students in the College of Agriculture, Forestry, and Home Economics desiring the University teacher's certificate shall in addition to their registration in this college register also in the College of Education. No formal application is necessary for transfer from the College of Agriculture, Forestry, and Home Economics to the College of Education if such transfer is made at the beginning of the junior year. However, no student may transfer who has not earned 90 credits and 90 honor points.

BOARD AND ROOM

Sanford Hall.—The one dormitory for University women, is located near the Minneapolis campus. It accommodates ninety women, about one half of whom may be freshmen. The charge for room and board is $300 for the University year. Applications should be sent to the director of Sanford Hall, University of Minnesota.

Home management houses.—Two residences for women, located near the University Farm campus, are maintained by the Division of Home Economics, furnishing accommodations for a small number of students. The charge is $90 each quarter, payable in advance. This covers the cost of living in the houses, with the exception of luncheon for the first five days of the week. Applications should be sent to the chief of the Division of Home Economics, University Farm, St. Paul. A deposit of $10 is required when a room is reserved.

Private houses.—After June 1 the Housing Bureau will supply a list of approved boarding and rooming places.

COURSES OF STUDY

AGRICULTURE

(See pages 21 to 39.)

The course of study in agriculture provides an opportunity in the junior and senior years to major in one of the following groups:

1. Agricultural Economics and Farm Management
2. Agricultural Education and Agricultural Extension
3. Animal Industry
4. Agricultural Sciences and Plant Industry
5. Farm Engineering

Students are advised to follow one of the following suggested curricula:

General courses in:

1. General Agriculture
2. Agricultural Economics
3. Agricultural Education (offered jointly with the College of Education)
4. Agricultural Engineering
5. Agricultural Extension
6. Animal Husbandry
7. Dairy Husbandry
8. Dairy Products
9. Farm Management
10. Fur-Farming
11. Horticulture
12. Landscape Gardening

Students desiring to specialize in one of the agricultural sciences with a view to further study in the Graduate School may arrange courses in the following fields:

1. Agricultural Biochemistry
2. Agricultural Economics
3. Agricultural Education
4. Agronomy and Farm Management
5. Animal Husbandry
6. Dairy Husbandry
7. Entomology and Economic Zoology
8. Horticulture
9. Plant Pathology and Botany
10. Soils
11. Veterinary Medicine

AGRICULTURE–PRE-BUSINESS

Students desiring to prepare for admission to the School of Business may complete the Agriculture–Pre-Business course and in their junior and senior years, after entering the School of Business, major in:

1. General course in Agricultural Business
2. Marketing of Farm Products

FORESTRY

(See pages 40 to 45.)

The course of study in forestry provides an opportunity in the junior and senior years to major in one of the following fields:

1. Sylviculture
2. Forest Organization and Management
3. Forest Products

Students are advised to follow one of the following suggested curricula:

1. Technical Forestry
2. Commercial Lumbering
3. Forest By-Products
4. Landscape Gardening

HOME ECONOMICS

(See pages 46 to 51.)

The course of study in home economics provides an opportunity in the junior and senior years to follow one of the following outlined curricula:

1. General Home Economics, as a type of general arts education for women
2. Foods and Nutrition
3. Textiles and Clothing
4. Dietitians
5. Institution Management
6. Home Economics Extension

The following teachers' courses are also offered jointly with the College of Education:

7. General Home Economics
8. Foods and Home Management
9. Textiles and Clothing
10. Related Art

EXPLANATION OF TERMS AND COURSE NUMBERS

The quarters in which courses are offered are indicated by the letters f (fall), w (winter), s (spring), and su (summer) following the course number. For example: 5f,w,s indicates that Course 5 is given in the fall quarter and is repeated in the winter and again in the spring quarter; 5f-6w indicates a two-quarter course extending through the fall and winter quarters; and 5f,w-6w,s, indicates that Course 5-6 is given in the fall and winter quarters and repeated through the winter and spring quarters.

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

Numbers following the descriptive name of a course indicate the number of credit hours.

Course numbers in parentheses, following the number of credit hours, indicate prerequisite courses.

Descriptions of the courses listed in the following outline of the curricula, together with those of additional courses offered as electives, will be found on pages 52 to 104. The program of classes is printed on pages 107 and following. The divisional statements are arranged alphabetically according to the names of the divisions.

One *credit hour* is equivalent to (1) one lecture or recitation period requiring two hours of preparation, (2) two periods of laboratory work requiring one hour of preparation, or (3) three periods of laboratory work with no preparation, each week for one quarter.

Honor point.—See page 16 for definition.

A *major* is a series of courses equivalent to from 24 to 36 credit hours chosen from one of the elective groups.

A *minor* is a series of courses equivalent to 18 credit hours chosen from one of the elective groups.

A *required* course is a course required of all students for graduation, irrespective of their major sequence.

A *limited elective* course is an elective which may not be chosen from the same group as the major or minor.

A *free elective* course may be chosen from any courses offered in the University for which the student has completed the prerequisites.

In planning registration note particularly (a) prerequisites, (b) classes of students (fr., soph., jr., or sr.) to which courses are offered, (c) number of credits, (d) quarter or quarters offered, and be sure that provision is made in registration for the proper sequence of continuation courses.

Registration for courses as electives in other colleges of the University must be in conformity with regulations of the college offering the course.

Elective courses in the College of Science, Literature, and the Arts are separated into Junior College courses, open to freshmen and sophomores, and Senior College courses, open to juniors and seniors. In addition to satisfying other prerequisites an average grade of one honor point per credit must be maintained for the first two years in order to register for a Senior College elective.

COURSES OF STUDY IN AGRICULTURE

The course of study is made up of 204 credit hours of work, including:

1. Required subject courses, 101 to 108 credit hours, *which every student must complete before graduation* (see below).

2. Elective subject courses, 96 to 103 credit hours, distributed according to several methods described below (page 22).

(For explanation of terms and course numbers, see page 19.)

REQUIRED SUBJECT COURSES

Required subject courses, 101 to 108 credit hours, *are required of every student before graduation.* These constitute approximately half of the curriculum and are considered fundamental and necessary to any course of study in agriculture. Every student must complete these subject courses, if possible, before the end of the sophomore year.

For some students the outline for the first two years, given below, represents more than the regular amount of work of 17 credit hours per quarter. In such cases those subjects which can not be taken in the freshman and sophomore years must take precedence the following year. Registration for from 15 to 18 credit hours of work each quarter will be allowed without special permission. Care should be taken in registration to give precedence to courses offered only one quarter.

FRESHMAN YEAR

1. *Non-credit courses* required for graduation in addition to the 204 credit hours.

Freshman lectures. A course of six lectures intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter.

Mil. Sci. 1f-2w-3s, Basic Course. Three hours per week throughout the year. Students found to be physically unfit may be required to substitute special corrective exercises in gymnasium.

Phys. Educ. 1f,w,s, Personal Hygiene. Two hours per week for six weeks. Must be taken the first quarter in residence.

2. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and the prerequisites must be observed.

Agron. 1f,w,s, Farm Crops, 3

An. Husb. 10f,w, Market Classes of Livestock, 5

Bot. 4f-5w-6s, General Botany, 9

Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high school chemistry may omit this course and register for Chem. 9-10. Those required to take this course because of inability to carry successfully Chem. 9-10 will be allowed not more than 10 credits.

Chem. 9f-10w, Advanced General Inorganic Chemistry, 10. (1 yr. h. s. chem.). Those required to take Chem. 1-2-3 may omit this course.

Dy. Husb. 1f,w,s, Elements of Dairying, 5

Farm Eng. 8f,w, Farm Engineering, 5

Farm Eng. 11f,w,s, Applied Mathematics, 5

For. 26f,w, Tree Crops, 1

Hort. 6f, Fruit-Growing, 3; or Hort. 32s, Vegetable-Growing, 3

[1]Rhet. 1f,w,s, Rhetoric I, 3
Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1)
Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2)
[1]Rhet. 4f,w,s, Elementary Rhetoric, 3. Required only of those who are found to be unable to carry Rhet. 1.

SOPHOMORE YEAR

1. *Non-credit courses* required for graduation in addition to the 204 credit hours.

Mil. Sci. 4f-5w-6s, Basic Course. Three hours per week throughout the year. Students found to be physically unfit may be required to substitute special corrective exercises in gymnasium.

2. *Freshman courses* which were not completed during the freshman year.

3. *General courses.*—The following courses may be registered for any quarter that they are offered, except that the proper sequence of continuation courses and the prerequisites must be observed.

Agr. Biochem. 7f,w-8w,s, General Agricultural Biochemistry, 10 (Chem. 10 cred.)
An. Biol. 14f-15w-16s, General Zoology, 9
Bact. 1f,w,s, General Bacteriology, 5 (Chem. 10 cred.)
Econ. 5f,w,s, Principles of Economics, 5
Econ. 6f,w,s, Agricultural Economics, 3 (Econ. 5)
Farm Eng. 3f,s, Mechanical Drawing, 2
Farm Eng. 23f,s, General Physics, 5. Those presenting a year of high school physics may omit this course and substitute 5 credits elective later in their course of study.
Rhet. 11f,w,s, Argumentation, 3 (Rhet. 3, Rhet. 22 advised) or Rhet. 31f,w,s, English Literature I, 5 (Rhet. 3)
Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)
Soils 4f, Soils, 3 (Chem., 10 credits)
Soils, 5s, Soil Fertility, 3 (Soils 4)

ELECTIVE SUBJECT COURSES

JUNIOR AND SENIOR YEARS

Elective subject courses, 96 to 103 credits, may be distributed according to one of the following methods: A (see below) or B (page 23). Every student is required to file in the registrar's office by the end of his sophomore year a statement of the course of study which he plans to pursue during his junior and senior years. Such statements from each student will make it possible to provide a workable program of subject courses. The student may make, and is strongly advised to make, this statement at the end of his freshman year. In this case he would have ample opportunity to change his course at the end of the sophomore year. A change from one method or course of study to another after the close of the sophomore year is permitted only on approval and does not exempt the student from any of the requirements of the course of study which he finally selects. Such changes usually involve inconvenience and sometimes loss of credit to the student. All students are invited to consult with the dean of the college concerning the selection of courses of study.

Method A—*Open Elective Course of Study*

Recommended for those students who are preparing themselves for some special line of work and who have definitely in mind the relations of subjects offered to this work.

[1] Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 99.

Under this method the student, with the approval of his adviser, may select any course of study which complies with the following requirements:

a. A major of from 24 to 36 credit hours.
b. A minor of 18 credit hours.
c. Limited electives amounting to 50 per cent of the remaining number of credit hours, which must be selected outside of the groups from which the major and minor have been chosen, and
d. Free electives, sufficient to meet the number of credit hours required for graduation chosen from any of the courses offered in the University.

The major and minor must be selected from different elective groups, except that students whose major is chosen from Group 4 (see below), Agricultural Sciences and Plant Industry, may select their minor from a different field of work in the same group.

ELECTIVE GROUPS

A. Groups from which major, minor, or electives may be chosen

1. Agricultural Economics and Farm Management, including
   - Agricultural Economics
   - Farm Management
2. Agricultural Education[1] and Agricultural Extension, including
   - Agricultural Education
   - Agricultural Extension
3. Animal Industry, including
   - Animal Husbandry
   - Dairy Husbandry
   - Poultry Husbandry
   - Veterinary Medicine
4. Agricultural Sciences and Plant Industry, including
   - Agricultural Biochemistry
   - Agronomy
   - Entomology and Economic Zoology
   - Horticulture
   - Plant Pathology and Botany
   - Soils
5. Farm Engineering, including
   - Farm Engineering

B. Groups from which electives only may be chosen

1. Bee Culture
2. Forestry
3. Home Economics
4. Military Science and Tactics
5. Physical Education
6. Rural Publications and Journalism
7. Courses in departments of other schools and colleges of the University

Method B—*Suggested Elective Courses of Study*

The following courses of study have been arranged and are recommended by the several departments as useful and suggestive. Changes may be made with the approval of the Students' Work Committee. The subject course programs and the offerings of subjects in different quarters are based primarily on these courses of study so that students will have an

[1] All students intending to teach agriculture are referred to the required curriculum in Agricultural Education, page 25.

opportunity of getting the subject courses in their proper sequence and without conflict. These specified courses are offered in the hope that they will also be of value to the student in vocational guidance. Students who desire to select any of these courses with modifications should study the changes involved to see whether or not the desired modifications admit of a possible program.

1. General Agriculture

Recommended for those students who desire a general course in agriculture. It is designed especially for those who aim to obtain a broad general training and for those who expect to engage in general farming. It aims to emphasize two features, viz.: to include in its subject-matter the principal fields of study in agriculture and to select the essential courses necessary to an understanding of these fields. A sufficient number of electives is provided to permit the student to emphasize any special line in which he may become interested.

This course is completely included in the courses in agricultural education and agricultural extension, and in the general courses in farm management and agricultural economics. It is included, with only a few substitutions, in the courses in animal husbandry, dairy husbandry, and in horticulture.

JUNIOR YEAR	SENIOR YEAR
Fall Quarter	
Agr. Biochem. 15f,s, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)	Agron. 102f,w, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 5)
Agron. 121f, Cereal Crops, 3 (Agron. 1)	Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)
Agron. 131f, Principles of Genetics, 3 (Bot. 9 cred., An. Biol. 9 cred.)	Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
An. Husb. 11f, Types and Breeds of Livestock, 3 (An. Husb. 10)	Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
Hort. 6f, Fruit-Growing, 3 (May be omitted if completed as a part of the general requirements)	Electives, 3
Electives, 2 or 5	
Winter Quarter	
Agron. 122w, Corn and Potato Crops, 3 (Agron. 1)	Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)
An. Husb. 12w, Types and Breeds of Livestock, 3 (An. Husb. 11)	An. Husb. 5w, Livestock-Breeding, 3 (Agron. 131)
Ent. 3f,w, Economic Entomology, 3 (An. Biol. 9 cred.)	Econ. 117w,[1] Prices of Farm Products, 3 (sr. class. or 13 cred. in econ. and farm mgt. and 5 cred. in soc. sciences)
Electives, 8	Farm Eng. 7w, Farm Structures, 3 (Farm Eng. 3)
	Sociol. 14f,w,s, Rural Sociology, 3 (sr. class. or Sociol. 1)
	Electives, 2

[1] Econ. 50s, Farm Finance, 3 (Econ. 3-4 or 5, 6) or Econ. 116f,w, Economics of Agricultural Production, 3 (see tabular statement) may be substituted for this course.

Spring Quarter

Agron. 11s, Farm Machinery, 3
Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1)
An. Husb. 8s, Fundamentals of Feeding, 3 (Agr. Biochem. 15)
Econ. 85f,s, Principles of Marketing, 3 (Econ. 6)
Hort. 32s, Vegetable-Growing, 3 (May be omitted if completed as a part of the general requirements)
Electives, 2 or 5
Vet. 8s, Veterinary Studies, 5
Electives, 12

2. General Course in Agricultural Economics

Suggested for those who desire to take a general course with emphasis upon agricultural economics. In addition to the subjects listed under the General Course in Agriculture, above, the student is advised to take the following:

Econ. 28f,s, Principles of Accounting, 5 (Econ. 5)
Econ. 50s, Farm Finance, 3 (Econ. 6)
Econ. 108w, Marketing of Farm Products, 3 (Econ. 85)
Econ. 116f,w, Economics of Agricultural Production, 3. (See tabular statement.)

For additional electives consult the Division of Agricultural Economics. A limited number of substitutions may be made in the subjects of the general course with the consent of the Students' Work Committee.

3. Agricultural Education

(Required for University teacher's certificate)

Students who desire to teach agriculture in the high schools or other secondary schools may obtain the University teacher's certificate in addition to the regular college degree, upon graduation, by registering in both the College of Education and the College of Agriculture, Forestry, and Home Economics in the junior and senior years. The following course has been approved by both colleges and is required of all students who are candidates for the University teacher's certificate.

The University teacher's certificate entitles the holder to teach agriculture in any Minnesota high school for two years. Upon satisfactory completion of the teaching of these two years, the holder may have the certificate renewed as a life certificate by approval of the president of the University and of the State Department of Education. Every student who expects to teach agriculture and who expects to obtain the University endorsement for a certificate must complete the subjects listed in this course.

JUNIOR YEAR

Fall Quarter

Agr. Biochem. 15f,s, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
Agr. Educ. 21f, Vocational Education, 3
Agron. 121f, Cereal Crops, 3 (Agron. 1)
Agron. 131f, Principles of Genetics, 3 (Bot. 9 cred., An. Biol. 9 cred.)
An. Husb. 11f, Types and Breeds of Livestock, 3 (An. Husb. 10)
Hort. 6f, Fruit-Growing, 3 (May be omitted if completed as a part of the general requirements)

Winter Quarter

Agr. Educ. 11f,w,s, Principles of Vocational Education, 3
Agron. 122w, Corn and Potato Crops, 3 (Agron. 1)
An. Husb. 5w, Livestock-Breeding, 3 (Agron. 131)
An. Husb. 12w, Types and Breeds of Livestock, 3 (An. Husb. 11)
Ent. 3f,w, Economic Entomology, 3 (An. Biol. 9 cred.)
Electives, 2

Spring Quarter

Agr. Educ. 131f,w,s, Methods in Teaching High School Agriculture, 5 (See tabular statement)
Agron. 11s, Farm Machinery, 3
Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1)
An. Husb. 8s, Fundamentals of Feeding, 3 (Agr. Biochem. 15)
Econ. 85f,s, Principles of Marketing, 3 (Econ. 6)
Hort. 32s, Vegetable-Growing, 3 (May be omitted if completed as a part of the general requirements)

SENIOR YEAR

Fall Quarter

Agr. Educ. 41f,w,s, Apprentice Teaching, 2 (See tabular statement)
Agron. 102f,w, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils, 5)
Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)
Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
Electives, 1

Winter Quarter

Agr. Educ. 42f,w, Teaching, 3 (See tabular statement)
Agr. Educ. 75w,s, Visual Presentation, 3 (Agr. Educ. 11)
Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)
Econ. 117w,[1] Prices of Farm Products, 3 (sr. class. or 13 cred. in econ. and 5 cred. in soc. sciences)
Sociol. 14f,w,s, Rural Sociology, 3 (sr. class or Sociol. 1)
Electives, 2

Spring Quarter

Agr. Educ. 151w,s, Organization and Management, 5 (Agr. Educ. 11, 21)
Farm Eng. 40f,s, Mechanical Training, 3
Vet. 8s, Veterinary Studies, 5
Electives, 3

4. General Course in Agricultural Engineering

Suggested for those who intend to prepare for general farming, county agent work, etc. A general course with emphasis on engineering.

[1] Econ. 50s, Farm Finance, 3 (Econ. 3-4 or 5, 6) or Econ. 116f,w, Economics of Agricultural Production, 3 (see tabular statement) may be substituted for this course.

JUNIOR YEAR

Fall Quarter

Agr. Biochem. 15f,s, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
Agron. 121f, Cereal Crops, 3 (Agron. 1)
An. Husb. 11f, Types and Breeding of Livestock, 3 (An. Husb. 10)
Farm Eng. 5f, Framing and Building Construction, 3
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)

Winter Quarter

Agron. 122w, Corn and Potato Crops, 3 (Agron. 1)
An. Husb. 12w, Types and Breeds of Livestock, 3 (An. Husb. 11)
Ent. 3f,w, Economic Entomology, 3 (An. Biol. 9 cred.)
Farm Eng. 7w, Farm Structures, 3 (Farm Eng. 3)
Farm Eng. 13w, Farm Motors I, 3
Electives, 2

Spring Quarter

Agron. 11f, Farm Machinery, 3
Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1)
An. Husb. 8s, Fundamentals of Feeding, 3 (Agr. Biochem. 15)
Econ. 85f,s, Principles of Marketing, 3 (Econ. 6)
Farm Eng. 14s, Farm Motors II, 3 (Farm Eng. 13)
Electives, 2

SENIOR YEAR

Fall Quarter

Agron. 131f, Principles of Genetics, 3 (Bot. 9 cred.; An. Biol. 9 cred.)
Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)
Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
Farm Eng. 18f, Surveying, 5 (Farm Eng. 8, 11 or equiv.)
Sociol. 14f,w,s, Rural Sociology, 3 (sr. class.)

Winter Quarter

Agron. 102f,w, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 5)
An. Husb. 5w, Livestock-Breeding, 3 (Agron. 131)
Econ. 117w,[1] Prices of Farm Products, 3 (sr. class. or 13 cred. in econ. and farm management and 5 cred. in social sciences)
Farm Eng. 24w, Agricultural Physics I, 4 (Farm Eng. 8, 11, 23, or equiv.)
Electives, 4

Spring Quarter

Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)
Farm Eng. 25s, Agricultural Physics II, 4 (Farm Eng. 24)
Farm Eng. 31s, Principles of Drainage, 5 (Farm Eng. 18)
Farm Eng. 37s, Rural Sanitation, 3 (Farm Eng. 8)
Electives, 3

5. General Course in Agricultural Extension

Suggested for those who are preparing for county agent work or for some other phase of agricultural extension. For special modifications consult the Division of Agricultural Education.

JUNIOR YEAR

Fall Quarter

Agr. Biochem. 15f,s, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
Agron. 121f, Cereal Crops, 3 (Agron. 1)
Agron. 131f, Principles of Genetics, 3 (Bot. 9 cred., An. Biol. 9 cred.)
An. Husb. 11f, Types and Breeds of Livestock, 3 (An. Husb. 10)
Hort. 6f, Fruit-Growing, 3 (May be omitted if completed as a part of the general requirements)
Electives, 2 or 5

SENIOR YEAR

Fall Quarter

Agron. 102f,w, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 5)
Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)
Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
Sociol. 14f,w,s, Rural Sociology, 3 (sr. class. or Sociol. 1)

[1] Econ. 50s, Farm Finance, 3 (Econ. 3-4 or 5, 6) or Econ. 116f,w, Economics of Agricultural Production, 3 (see tabular statement) may be substituted for this course.

Winter Quarter

Agron. 122w, Corn and Potato Crops, 3 (Agron. 1)
Agr. Educ. 11f,w,s, Principles of Vocational Education, 3
An. Husb. 5w, Livestock-Breeding, 3 (Agron. 131)
An. Husb. 12w, Types and Breeds of Livestock, 3 (An. Husb. 11)
Ent. 3f,w, Economic Entomology, 3 (An. Biol. 9 cred.)
Electives, 2

Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)
Agr. Educ. 75w,s, Visual Presentation, 3 (Agr. Educ. 11)
Agr. Educ. 131f,s, Methods of Teaching High School Agriculture, 5 (See tabular statement)
Econ. 117w,[1] Prices of Farm Products, 3 (sr. class. or 13 cred. in econ. and farm mgt. and 5 cred. in soc. sciences)
Electives,[2] 3

Spring Quarter

Agron. 11s, Farm Machinery, 3
Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1)
An. Husb. 8s, Fundamentals of Feeding, 3 (Agr. Biochem. 15)
Econ. 85f,s, Principles of Marketing, 3 (Econ. 6)
Hort. 32s, Vegetable-Growing, 3 (May be omitted if completed as a part of the general requirements)
Electives, 2 or 5

Vet. 8s, Veterinary Studies, 5
Agr. Educ. 81s, Extension Work, 3 (6 cred. in farm mgt., 6 cred. in farm crops, 15 cred. in an. ind., 6 cred. in agr. educ.)
Farm Eng. 40f,s, Mechanical Training, 3
Electives,[2] 6

General Course in Animal Husbandry

For those who aim to make a special study of livestock as a preparation for (a) various phases of livestock-farming and management, for (b) the technical positions relating to livestock, and for (c) further study in graduate work when the student desires to prepare for college, experiment station, and government research and similar positions requiring a still greater degree of specialization.

Fall Quarter

JUNIOR YEAR

Agr. Biochem. 15f,s, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
Agron. 131f, Principles of Genetics, 3 (Bot. 9 cred., An. Biol. 9 cred.)
An. Husb. 11f, Types and Breeds of Livestock, 3 (An Husb. 10).
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
Vet. 2f, Anatomy of Domestic Animals, 5

SENIOR YEAR

Agron. 102f,w, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils, 5)
An. Husb. 101f, Advanced Stock-Judging, 3 (An. Husb. 2)
An. Husb. 7f, Meats, 3 (An. Husb. 2, Agr. Biochem. 15)
Econ. 85f,s, Principles of Marketing, 3 (Econ. 6)
Vet. 6f, Physiology and Hygiene of Breeding, 3 (Vet. 3-4)
Electives, 1

[1] Econ. 50s, Farm Finance, 3 (Econ. 3-4 or 5, 6) or Econ. 116f,w, Economics of Agricultural Production, 3 (see tabular statement) may be substituted for this course.

[2] Agr. Educ. 82f,w,s, Agricultural Extension Field Course may be taken provided the student has pursued a broad curriculum approved by the Department of Agricultural Education and has obtained a position as assistant county agent approved by the Division of Agricultural Extension. The course carries from 3 to 10 credits based upon studies and reports to be made from time to time and evidences of proficiency obtained from other sources.

Winter Quarter

Agron. 122w, Corn and Potato Crops, 3 (Agron. 1)
An. Husb. 5w, Livestock-Breeding, 3 (Agron. 131)
An. Husb. 12w, Types and Breeds of Livestock, 3 (An. Husb. 11)
Ent. 3f,w, Economic Entomology, 3 (An. Biol. 9 cred.)
Vet. 3w, Comparative Physiology, 3 (Vet. 2)
Electives, 2

Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)
An. Husb. 6w, Livestock-Feeding, 5 (Agr. Biochem. 15)
Econ. 117w,[1] Prices of Farm Products, 3 (sr. class. or 13 cred. in econ. and 5 cred. in soc. sciences)
Farm Eng. 7w, Farm Structures, 3 (Farm Eng. 3)
Vet. 12w, Infectious Diseases, 3 (Vet. 3-4, Bact. 1)

Spring Quarter

Agron. 11s, Farm Machinery, 3
Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1)
An. Husb. 2s, Livestock-Judging, 3 (An. Husb. 11-12)
An. Husb. 9s, Pedigrees and Herd Books, 3 (An. Husb. 5)
Vet. 4s, Comparative Physiology, 3 (Vet. 3)
Electives, 2

An. Husb. 102s, Horse Husbandry, 3 (An. Husb. 2)
An. Husb. 103s, Beef Cattle Husbandry, 3 (An. Husb. 2)
An. Husb. 104s, Sheep Husbandry, 3 (An. Husb. 2)
An. Husb. 105s, Swine Husbandry, 3 (An. Husb. 2)
An. Husb. 108s, Seminar, 3 (An. Husb. 5, 6)
Electives, 11

7. General Course in Dairy Husbandry

Recommended for those students who plan definitely to engage in dairy farming or in some practical branch of dairy production.

JUNIOR YEAR

Fall Quarter

Agr. Biochem. 15f,s, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
An. Husb. 11f, Types and Breeds of Livestock, 3 (An. Husb. 10)
Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)
Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
Vet. 2f, Anatomy of Domestic Animals, 5

Winter Quarter

Agron. 122w, Corn and Potato Crops, 3 (Agron. 1)
An. Husb. 6w, Livestock-Feeding, 5 (Agr. Biochem. 15)
An. Husb. 12w, Types and Breeds of Livestock, 3 (An. Husb. 11)
Dy. Husb. 2w,s, Dairy Bacteriology, 5 (1, Bact. 1)
Vet. 3w, Comparative Physiology, 3 (Vet. 2)

SENIOR YEAR

Fall Quarter

Agron. 102f,w, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 5)
Agron. 121f, Cereal Crops, 3 (Agron. 1)
Agron. 131f, Principles of Genetics, 3 (Bot. 9 cred., An. Biol. 9 cred.)
Dy. Husb. 105f, Seminar I, 1 (3 courses in dy. husb.)
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
Vet. 6f, Physiology and Hygiene of Breeding, 3 (Vet. 3-4)

Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)
An. Husb. 5w, Livestock-Breeding, 3 (Agron. 131)
Dy. Husb. 103w, Dairy Stock-Feeding, 3 (Dy. Husb. 101, Agr. Biochem. 15)
Econ. 117w,[1] Prices of Farm Products, 3 (sr. class. or 13 cred. in econ. and 5 cred. in soc. sciences)
Ent. 3f,w, Economic Entomology, 3 (An. Biol. 9 cred.)
Farm Eng. 7w, Farm Structures, 3 (Farm Eng. 3)

[1] Econ. 50s, Farm Finance, 3 (Econ. 3-4 or 5, 6) or Econ. 116f,w, Economics of Agricultural Production, 3 (see tabular statement) may be substituted for this course.

Spring Quarter

Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1)
Dy. Husb. 104s, Advanced Study of Dairy Breeds, 3 (Dy. Husb. 6, 101)
Econ. 85f,s, Principles of Marketing, 3 (Econ. 6)
Vet. 4s, Comparative Physiology, 3 (Vet. 3)
Electives, 3

Agron. 11s, Farm Machinery, 3
Dy. Husb. 107s, Seminar III, 1 (3 courses in dy. husb.)
Electives, 12

8. General Course in Dairy Products

Those desiring to specialize in dairy products are advised to follow the group plan of electives. The major and minor groups will be arranged to include most of the courses in the General Course in Dairy Husbandry, and in addition the following of special importance to one interested in this field of work.

Agr. Biochem. 103s, Dairy Chemistry, 5 (Agr. Biochem. 7-8)
Dy. Husb. 111f, Dairy Products I, 3 (Dy. Husb. 1, 2)
Dy. Husb. 112s, Dairy Products II, 3 (Dy. Husb. 1, 2)
Dy. Husb. 102s, Market Milk, 3 (Dy. Husb. 1, 2)
Econ. 28s, Principles of Accounting, 5 (Econ. 5)

9. General Course in Farm Management

Suggested for those who desire a broad training in agriculture in preparation for general farm management. This includes the subjects of the general course and suggested electives which add an emphasis upon those subjects which bear on technical farm management.

JUNIOR YEAR

Fall Quarter

Agr. Biochem. 15f,s, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
Agron. 121f, Cereal Crops, 3 (Agron. 1)
Agron. 131f, Principles of Genetics, 3 (Bot. 9 cred., An. Biol. 9 cred.)
An. Husb. 11f, Types and Breeds of Livestock, 3 (An. Husb. 10)
Econ. 85f,s, Principles of Marketing, 3 (Econ. 6)
Hort. 6f, Fruit-Growing, 3 (May be omitted if completed as a part of the general requirements)
Electives, 0 or 2

SENIOR YEAR

Agron. 102f,w, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 5)
Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)
Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
Elective, 3

Winter Quarter

Agron. 122w, Corn and Potato Crops, 3 (Agron. 1)
An. Husb. 5w, Livestock-Breeding, 3 (Agron. 131)
An. Husb. 12w, Types and Breeds of Livestock, 3 (An. Husb. 11)
Ent. 3f,w, Economic Entomology, 3 (An. Biol. 9 cred.)
Electives, 5

Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)
Econ. 108w, Marketing of Farm Products, 3 (Econ. 85)
Econ. 117w,[1] Prices of Farm Products, 3 (sr. class. or 13 cred. in econ. and 5 cred. in soc. sciences)
Farm Eng. 7w, Farm Structures, 3 (Farm Eng. 3)
Sociol. 14f,w, Rural Sociology, 3 (sr. class. or Sociol. 1)
Electives, 2

Spring Quarter

Agron. 11s, Farm Machinery, 3
Agron. 101s, Farm Management I, 3 (Agron. 1, Econ. 6)
Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1)
An. Husb. 8s, Fundamentals of Feeding, 3 (Agr. Biochem. 15)
Hort. 32s, Vegetable-Growing, 3 (May be omitted if completed as a part of the general requirements)
Electives, 2 or 4

Agron. 104s, Farm Management III, 3 (Agron. 101, 102)
Vet. 8s, Veterinary Studies, 5
Electives, 9

10. Fur-Farming

The prices for furs during the past few years have stimulated greatly the interest in fur-bearing animals. Some fox farms and skunk farms have been established and other fur-bearing animals are being raised with a view to supplying furs for the trade. This has aroused frequent inquiry for a course that would fit students for such work either as a business or in connection with other farm enterprises. The college does not offer a special curriculum for students desiring to engage in fur-farming but the important studies underlying such a course are already provided by the required work of the curriculum of the College of Agriculture, Forestry, and Home Economics. Certain elective courses are also available which under faculty regulations may be so chosen as to meet the needs of students wishing to specialize in fur-farming.

11. General Course in Horticulture

A foundation course suggested for those who purpose to engage in the production or horticultural crops or to enter into some horticultural business.

[1] Econ. 50s, Farm Finance, 3 (Econ. 3-4 or 5, 6) or Econ. 116f,w, Economics of Agricultural Production, 3 (see tabular statement) may be substituted for this course.

JUNIOR YEAR	SENIOR YEAR
Fall Quarter	
Agr. Biochem. 15f,s, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)	Agron. 121f, Cereal Crops, 3 (Agron. 1)
An. Husb. 11f, Types and Breeds of Livestock, 3 (An. Husb. 10)	Hort. 93f, Judging Horticultural Crops, 2 (Hort. 6 or 32)
Hort. 6f, Fruit-Growing, 3 (May be omitted if completed as a part of the general requirements)	Hort. 107f, Orchard Management, 3 (Hort. 6, Bot. 9 cred.)
Hort. 56f, Propagation and Nursery Practice, 3	or
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)	Hort. 131f, Advanced Vegetable Production, 3 (Hort. 32, Bot. 9 cred.)
Electives, 0 or 3	Hort. 109f, Principles of Genetics, 3 (Bot. 9 cred., An. Biol. 9 cred.)
	Hort. 193f, Horticultural Seminar, 1 (Hort. 9 cred.)
	Sociol. 14f,w,s, Rural Sociology, 3 (sr. class. or Sociol. 1)
	Electives, 2
Winter Quarter	
An. Husb. 12w, Types and Breeds of Livestock, 3 (An. Husb. 11)	Agron. 102f,w, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 5)
Ent. 3f,w, Economic Entomology, 3 (An. Biol. 9 cred.)	An. Husb. 5w, Livestock-Breeding, 3 (Hort. 109)
Hort. 21w, Small Fruit Culture, 3 (Hort. 6 or 32, Bot. 9 cred.)	or
Hort. 135w, Potato Production, 3 (Hort. 6 or 32, Bot. 9 cred.)	Hort. 110w, Horticultural Crop-Breeding, 3 (Hort. 109)
Electives, 5	Econ. 117w,[1] Prices of Farm Products, 3 (sr. class. or 13 cred. in econ. and 5 cred. in soc. sciences)
	Farm Eng. 7w, Farm Structures, 3 (Farm Eng. 3)
	Hort. 194w, Horticultural Seminar, 1 (Hort. 193)
	Electives, 4
Spring Quarter	
Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1)	Agron. 11s, Farm Machinery, 3
An. Husb. 8s, Fundamentals of Feeding, 3 (Agr. Biochem. 15)	Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)
Bot. 22f,s, Elementary Plant Physiology, 5 (Bot. 2 or 5, Org. Chem. advised)	Econ. 85f,s, Principles of Marketing, 3 (Econ. 6)
or	Electives, 8
Vet. 8s, Veterinary Studies, 5	
Hort. 32s, Vegetable-Growing, 3 (May be omitted if completed as a part of the general requirements)	
Electives, 3 or 6	

[1] Econ. 50s, Farm Finance, 3 (Econ. 3-4 or 5, 6) or Econ. 116f,w, Economics of Agricultural Production, 3 (see tabular statement) may be substituted for this course.

12. Landscape Gardening

A suggested course for students majoring in landscape gardening.

JUNIOR YEAR	SENIOR YEAR
Fall Quarter	
Arch. 21f,w, Free-Hand Drawing, 2	Farm Eng. 18f, Surveying, 5 (Farm Eng. 3, 11, or equiv.)
Hort. 56f, Propagation and Nursery Practice, 3	Hort. 75f, Landscape Design I, 3 (Hort. 74, Draw. 10 cred.)
Hort. 72f, Plant Materials, 3	Pol. Sci. 51f, Business Law, 3
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.) or Pl. Path. 10f, Forest Pathology, 5 (Bot. 9 cred.) Not required of students who have completed Pl. Path. 10 as a part of the general requirements in forestry.	Electives, 6
Soils 4, Soils, 3 (Chem. 10 cred.) Not required of students who have completed this course as a part of the general requirements in agriculture.	
Electives, 4 or 6	
Winter Quarter	
Arch. 22w,s, Free-Hand Drawing, 2	Ent. 3f,w, Economic Entomology, 3 (An. Biol. 9 cred.)
For. 27w, Groves and Windbreaks, 3 For students who have completed the freshman and sophomore years in agriculture, or	Hort. 76w, Landscape Design II, 3 (Hort 75)
For. 35w, Seeding and Planting, 3 (For. 3-4) For students who have completed the freshman and sophomore years in forestry.	Hort. 191w, Special Problems, 3 (Instructor's permission)
Hort. 74w, Principles of Landscape Design, 3 (Hort. 72)	Pol. Sci. 52w, Business Law, 3
Electives, 9	Electives, 5
Spring Quarter	
Arch. 23s, Free-Hand Drawing, 2	C. E. 53s, Municipal Engineering, 3
Farm Eng. 38s, Advanced Mechanical Drawing, 2	Farm Engineering 31s, Principles of Drainage, 5 (Farm Eng. 3, 11, or equiv.)
Hort. 50s, Floriculture, 3	Hort. 192s, Special Problems, 2 (Hort. 191)
Hort. 73s, History of Landscape Design, 3	Electives, 6
Soils 5, Soil Fertility, 3 (Soils 4). Not required of those who have completed this course as a part of the general requirements in agriculture.	
Electives, 4 or 7	

SPECIAL COURSES IN AGRICULTURAL SCIENCES

Opportunity is offered to students who desire to specialize in the various branches of agriculture and agricultural sciences. In all cases it is assumed that such students will spend one or more years in graduate study. Only those students who have had high scholarship records in their undergraduate course and who have a clear understanding of the study to be pursued and who have a lasting and abiding enthusiasm for the chosen field of specialization should enter upon these courses. Since a comparatively small num-

ber of students will enter these special courses and since the specialization may vary considerably even in one field with the individual student, complete curricula are not suggested in all lines. The student is referred to the various divisions concerned and is advised to construct a curriculum in accordance with the open elective system, (Method A, page 22). The student, however, would do well to include in his course as many of the subjects listed under the General Course in Agriculture as are consistent with his special course. The attention of the student is also called to the modern language requirements for graduate students. In many divisions French or German is required for the Master's degree and in all cases both French and German are required for a degree of doctor of philosophy. At least one modern language should be obtained during the undergraduate work.

Students in these courses may prepare themselves for teaching in colleges and universities, for research and experimental work in experiment stations, for regulatory, experimental, and extension service in the state and Federal departments of agriculture and for various technical and industrial positions in agricultural industries and in the industries related to agriculture. For the opportunities offered, the student is advised to consult with the various divisions and with the dean of the college.

Special courses are offered in the following fields:

I. Agricultural Biochemistry

Positions open to graduates from an agricultural biochemistry course are:

Control chemists in flour mills or the grain trade
Control chemists in state department control laboratories
Junior chemist, U. S. Department of Agriculture, Bureau of Chemistry
Assistants or instructors in other colleges or universities
Assistant chemist in agricultural experiment station
Chemists or assistants in hospitals or medical laboratories
Chemical positions with industrial corporations, especially those dealing with biological or agricultural products, etc.

Students specializing in agricultural biochemistry are expected to complete the following courses:

Agr. Biochem. 15f,s, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8). Optional with Agr. Biochem. 108, 110

Agr. Biochem. 101f-102w, Agricultural Quantitative Analysis, 6 (Agr. Biochem. 7-8)

Agr. Biochem. 103s, Dairy Chemistry, 5 (Agr. Biochem. 7-8). Optional with Agr. Biochem. 108, 110; and 15, 116

Agr. Biochem. 108s, Chemistry of Wheat and Wheat Products, 3 (Agr. Biochem. 7-8). Optional with Agr. Biochem. 15, 103; and 15, 116

Agr. Biochem. 110s, Flour Laboratory Methods, 5 (Agr. Biochem. 101-102, or Chem. 131-132). Optional with Agr. Biochem. 15, 103; and 15, 116

Agr. Biochem. 111f-112w, Phytochemistry, 6 (Biol. 9 cred., organ. chem.)

Agr. Biochem. 113f-114w, Biochemical Laboratory Methods, 4 (quant. anal., Agr. Biochem. 111-112 parallel)

Agr. Biochem. 116w, Advanced Animal Nutrition, 2 (Agr. Biochem. 111-112, 113, 114; or Physiol. 101-102; or Agr. Biochem. 7-8, 15). Optional with Agr. Biochem. 108, 110; and 15, 103

Agr. Biochem. 118f,w,s, Laboratory Problems in Biochemistry, 3 or 5 (Agr. Biochem. 111-112, 113-114, or 103 or 110)
Chem. 35f-36w, Organic Chemistry, 10 (Chem. 15 cred.)
Ger. 1f,w,s, Beginning German A, 5
Ger. 2f,w,s, Beginning German B, 5 (Ger. 1 or 1 yr. prep. Ger.)
Phys. 1f,w,s, Elements of Mechanics and Sound, 3 (trigonometry)
Phys. 2f,w,s, Elements of Mechanics Laboratory, 1 (Phys. 1 or parallel)
Phys. 21f,w, Heat, 3 (Phys. 1)
Phys. 22f,w, Heat Laboratory, 1 (Phys. 2, 21, or parallel)
Phys. 41w,s, Magnetism and Electricity, 3 (Phys. 1)
Phys. 42w,s, Magnetism and Electricity Laboratory, 1 (Phys. 2, 41, or parallel)

At least 10 credits should be selected from the following courses, all of which are highly desirable:

An. Biol. 17f-18w, General Physiology, 10 (14 cred. in an. biol., or 9 cred. in an. biol. and 10 cred. in chem. or phys.)
Bot. 22f,s, Elementary Plant Physiology, 5 (Bot. 2 or 5, org. chem. advised)
Chem. 140f-141w-142s, Physical Chemistry, 9, 12, or 15 (2 yrs. chem., 1 yr. phys.)
Math. 30f,w,s, Analytical Geometry, 5 (Math. 6, 7)
Math. 50f,w,s, Calculus I, 5 (Math. 30)
Math. 51w,s, Calculus II, 5 (Math. 50)
Physiol. 100f-101w, Physiologic Chemistry, 12 (org. chem., phys., an. biol.)
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
Soils 101f, Chemical Analysis of Soils, 3-5 (quant. anal., Soils 5)

2. Agricultural Economics

Those students who plan to specialize in agricultural economics are advised to include the following subjects in their course of study, and to consult with the Department of Agricultural Economics in regard to the remaining subjects. Substitution will be made to suit the needs of each student.

Agron. 102f,w, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 5)
Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)
Econ. 13f, Agricultural Statistics, 5 (Econ. 5)
Econ. 28s, Principles of Accounting, 5 (Econ. 5)
Econ. 50s, Farm Finance, 3 (Econ. 6)
Econ. 85f,s, Principles of Marketing, 3 (Econ. 6)
Econ. 106w,s, Land Economics, 3 (sr. class. or 13 cred. in econ. and farm mgt., and 5 cred. in other soc. sciences)
Econ. 108w, Marketing of Farm Products, 3 (Econ. 85)
Econ. 116f,w, Economics of Agricultural Production, 3 (same prereq. as Econ. 106)
Econ. 117w, Prices of Farm Products, 3 (same prereq. as Econ. 106)
Econ. 126f, Principles of Coöperation, 3 (Econ. 85 or same prereq. as Econ. 106)

3. Agricultural Education

Consult Department of Agricultural Education for outline of course of study.

4. Agronomy and Farm Management

Consult Division of Agronomy and Farm Management for outline of course of study.

5. Animal Husbandry

The General Course listed on page 24 is also designed as a preparation for special advanced study.

6. Dairy Husbandry

Those who desire to specialize in dairy husbandry should consult with the Division of Dairy Husbandry regarding the arrangement of their course. Special care will be given to arrange a well-rounded course of study in the fundamental sciences and applied subjects closely related to dairy husbandry. Those preparing for college, experiment station, or government positions are advised to elect one foreign language.

7. Entomology and Economic Zoology

Consult the Division of Entomology and Economic Zoology for outline of course of study.

8. Horticulture

Consult the Division of Horticulture for outline of course of study.

9. Plant Pathology and Botany

Consult the Division of Plant Pathology and Botany for outline of course of study.

10. Soils

Students are expected to complete the courses listed below and for the remaining courses should consult with the division.

Chem. 20w-21s, Quantitative Analysis, 10 (Chem. 12-13)
Chem. 35f-36w, Organic Chemistry, 10 (15 cred. in chem.)
Geol. 1f,w,s-2w,s, General Geology, 10 (Chem. 10 cred.)
Geol. 21w-22s, Essentials of Mineralogy, 6 (Chem. 10 cred.)
Math. 30f,w,s, Analytical Geometry, 5 (Math. 6, 7)
Math. 50f,w,s, Calculus I, 5 (Math. 30)
Math. 51w,s, Calculus II, 5 (Math. 50)
Phys. 1f,w,s, Elements of Mechanics and Sound, 3 (trigonometry)
Phys. 2f,w,s, Elements of Mechanics Laboratory, 1 (Phys. 1 or parallel)
Phys. 21f,w, Heat, 3 (Phys. 1)
Phys. 22f,w, Heat Laboratory, 1 (Phys. 2, 21, or parallel)
Phys. 41w,s, Magnetism and Electricity, 3 (Phys. 1)
Phys. 42w,s, Magnetism and Electricity Laboratory, 1 (Phys. 2, 41, or parallel)

11. Veterinary Medicine

Consult the Division of Veterinary Medicine for outline of course of study.

AGRICULTURE—BUSINESS COURSE

This course offers an opportunity for those who wish to prepare specifically for some branch of agricultural business, such as the marketing of farm products, farm finance, farm implements, farm real estate, country merchandising, and the like. The first two years are practically prescribed

and include introductory courses in agriculture, economics, and the fundamental sciences necessary for further work in agriculture. During the freshman and sophomore years, students will register in the College of Agriculture, Forestry, and Home Economics. The junior and senior years are offered in the School of Business. The transfer to the School of Business may be made without petition when the required work of the freshman and sophomore years outlined below has been completed with a minimum of 102 credits and 102 honor points. For definition of "honor point" see page 16. Approximately half of the last two years is elective and may include advanced courses in agriculture and economics.

FRESHMAN AND SOPHOMORE YEARS

The outline for these years is the same as the Course in Agriculture (see pages 21 to 22) except that the following courses are omitted:

Agr. Biochemistry 7-8, General Agricultural Biochemistry, 10
Bact. 1, Elementary Bacteriology, 5
Farm Eng. 3, Mechanical Drawing, 2
Farm Eng. 11, Applied Mathematics, 5
Farm Eng. 23, General Physics, 5
Rhet. 11, Argumentation, 3; or Rhet. 31, English Literature I, 5
Rhet. 22, Public Speaking, 3
Soils 4, Soils, 3
Soils 5, Soil Fertility, 3

The following courses are added:

Econ. 20s, Economic Geography of Agriculture, 5 (must be taken in the freshman year)
Econ. 21w, Economic History of Agriculture, 5 (must be taken in the freshman year)
Econ. 25f,w-26w,s, Principles of Accounting, 8 (3-4 or 5, or parallel; not open to freshmen)
Econ. 13f, Agricultural Statistics, 5 (Econ. 3-4, or 5. Not open to freshmen)
Electives sufficient to make a total of 102 credit hours, to be selected from the courses omitted from the first two years of the Agriculture Course

JUNIOR AND SENIOR YEARS

The courses dealing with agricultural business which are offered by the School of Business and the College of Agriculture, Forestry, and Home Economics during the last two years are arranged by School of Business into two lines of specialization: (1) General Course in Agricultural Business, and (2) Course in Marketing of Farm Products. Outlines of these courses of study appear below.

1. General Course in Agricultural Business

JUNIOR YEAR	SENIOR YEAR
Fall Quarter	
Econ. 51f, Business Law, 3 (10 cred. in econ.)	Econ. 103f, Value and Distribution, 3 (Econ. 3-4 or 5, 6)
Econ. 85f,s, Principles of Marketing, 3 (Econ. 3-4 or 5, 6)	Econ. 116f,w, Economics of Agricultural Production, 3 (See tabular statement)
Econ. 143f, The Financial System, 4, (Econ. 3-4 or 5, 6)	Econ. 126f, Principles of Coöperation, 3 (Econ. 85, or see tabular statement)

Winter Quarter

Agron. 102f,w, Farm Management II: Organization, 3 (Agron. 1, Econ. 6, An. Husb. 6 or 8, Soils 5)
Econ. 52w, Business Law, 3 (Econ. 51)
Econ. 73w, Railway Traffic and Rates, 3 (Econ. 3-4 or 5, 6)
Econ. 144w, The Financial System, 4 (Econ. 143)
Econ. 104w, Value and Distribution, 3 (Econ. 103)
Econ. 106w,s, Land Economics, 3 (See tabular statement)
Econ. 117w, Prices of Farm Products, 3 (See tabular statement)

Spring Quarter

Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)
Econ. 50s, Farm Finance, 3 (Econ. 3-4 or 5, 6)
Econ. 53s, Business Law, 3 (Econ. 52)
Econ. 107s, Land Tenure, 3 (Econ. 106)
Econ. 149s, Business Cycles, 3 (Econ. 143-144)

RECOMMENDED ELECTIVES

Advanced courses in technical agriculture dealing with special products.
Econ. 72f, Economics of Transportation, 3 (Econ. 3-4, 5, 6)
Econ. 88w, Advertising and Selling, 3 (Econ. 85)
Econ. 90s, Economics of Consumption, 3 (Econ. 3-4 or 5, 6)
Econ. 112f, Business Statistics, 3 (Econ. 13 or 14)
Econ. 155s, Corporation Finance, 3 (Econ. 143-144)
Econ. 176f, Commercial Policies, 3 (Econ. 3-4 or 5, 6)
Econ. 177w, Foreign Trade, 3 (Econ. 176)
Econ. 191f-192w, Public Finance, 6 (Econ. 3-4 or 5, 6)

2. Marketing of Farm Products

JUNIOR YEAR — SENIOR YEAR

Fall Quarter

Econ. 51f, Business Law, 3 (10 cred. in econ.)
Econ. 85f,s, Principles of Marketing, 3 (Econ. 3-4 or 5, 6)
Econ. 143f, The Financial System, 4, (Econ. 3-4 or 5, 6)
Econ. 103f, Value and Distribution, 3 (Econ. 3-4 or 5, 6)
Econ. 111f, Practice Course in Marketing, 2 (Econ. 110)
Econ. 126f, Principles of Coöperation, 3 (Econ. 85, or see tabular statement)

Winter Quarter

Econ. 52w, Business Law, 3 (Econ. 51)
Econ. 73w, Railway Traffic and Rates, 3 (Econ. 3-4 or 5, 6)
Econ. 144w, The Financial System, 4 (Econ. 143)
Econ. 104w, Value and Distribution, 3 (Econ. 103)
Econ. 108w, Marketing of Farm Products, 3 (Econ. 85)
Econ. 117w, Prices of Farm Products, 3 (See tabular statement)
Econ. 127w, Marketing Organization and Management, 3 (Econ. 85, 25-26 or 28)

Spring Quarter

Econ. 53s, Business Law, 3 (Econ. 52)
Econ. 90s, Economics of Consumption, 3 (Econ. 3-4 or 5, 6)
Econ. 110s, Practice Course in Marketing, 1 (Econ. 25-26 or 28, 85, 108)
Econ. 128s, Marketing Organization and Management, 3 (Econ. 127)
Econ. 149s, Business Cycles, 3 (Econ. 143-144)

RECOMMENDED ELECTIVES

Advanced courses in technical agriculture dealing with special products.
Econ. 50s, Farm Finance, 3 (Econ. 3-4 or 5, 6)
Econ. 72f, Economics of Transportation, 3 (Econ. 3-4 or 5, 6)
Econ. 88w, Advertising and Selling, 3 (Econ. 85)
Econ. 106w,s, Land Economics, 3 (See tabular statement)
Econ. 107s, Land Tenure, 3 (Econ. 106)
Econ. 116f,w, Economics of Agricultural Production, 3 (See tabular statement)
Econ. 145s, Foreign Exchange, 3 (Econ. 143-144)
Econ. 155s, Corporation Finance, 3 (Econ. 143-144)
Econ. 176f, Commercial Policies, 3 (Econ. 3-4 or 5, 6)
Econ. 177w, Foreign Trade, 3 (Econ. 176)

COURSES OF STUDY IN FORESTRY

The course of study is made up of 204 credit hours of work including:

1. Required subject courses, 103 to 110 credit hours, which every student must complete. These constitute approximately one half of the curriculum and are considered as fundamental to any course in forestry. In most cases these will be completed in the freshman and sophomore years.

2. Elective subject courses, 94 to 101 credit hours, distributed according to several methods described below (page 41).

(For explanation of terms and course numbers, see page 19.)

REQUIRED SUBJECT COURSES

Required subject courses, 103 to 110 credit hours are required of every student before graduation. These constitute approximately half of the curriculum and are considered fundamental and necessary to any course of study in forestry. For some students the outline for the first two years, given below represents more than the regular amount of work of 17 credit hours per quarter. In such cases those subjects which can not be taken in the freshman and sophomore years must take precedence the following year. Registration for from 15 to 18 credit hours of work each quarter (summer quarter at Itasca Park, 6 credit hours), will be allowed without special permission. Care should be taken in registration to give precedence to courses offered only one quarter.

FRESHMAN YEAR

1. *Non-credit courses* required for graduation in addition to the 204 credit hours.

Freshman lectures. A course of six lectures intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter.

Mil. Sci. 1f-2w-3s, Basic Course. Three hours per week throughout the freshman year. Students found to be physically unfit may be required to substitute corrective exercises in gymnasium.

Phys. Educ. 1f,w,s, Personal Hygiene

2. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and the prerequisites must be observed.

Bot. 4f-5w-6s, General Botany, 9

Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high school chemistry may omit this course and register for Chem. 9-10. Those required to take this course because of inability to carry successfully Chem. 9-10 will be allowed not more than 10 credits.

Chem. 9f-10w, Advanced General Inorganic Chemistry, 10. (1 yr. h. s. chem.) Those required to take Chem. 1-2-3 are exempt.

Farm Eng. 3f,s, Mechanical Drawing, 2

Farm Eng. 11f,w,s, Applied Mathematics, 5

For. 1f,s, General Forestry, 4

For. 3w-4s, Dendrology, 8 (Bot. 4)

[1]Rhet. 1f,w,s, Rhetoric I, 3

Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1)

Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2)

[1]Rhet. 4f,w,s, Elementary Rhetoric, 3. Required only of those who are found to be unable to carry Rhet. 1.

[1] Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 99.

Itasca Park (Summer Session)

For. 2su, Elementary Dendrology, 2
For. 5su, Elementary Sylviculture, 2
For. 9su, Elementary Mensuration, 2

SOPHOMORE YEAR

1. *Non-credit courses* required for graduation in addition to the 204 credit hours.
Mil. Sci. 4f-5w-6s, Basic Course. Three hours per week throughout the year. Students found to be physically unfit may be required to substitute special corrective exercises in gymnasium.
2. *Freshman courses* which were not completed during the freshman year.
3. *General courses.*—The following courses may be registered for any quarter that they are offered, except that the proper sequence of continuation courses and the prerequisites must be observed.
An. Biol. 14f-15w-16s, General Zoology, 9
Bot. 7s, Taxonomy of Flowering Plants, 5 (Bot. 2, 5, or 8)
Econ. 5f,w,s, Principles of Economics, 5
Farm Eng. 23f,s, General Physics, 5. Those presenting a unit of high school physics for entrance may omit this course and substitute 5 credits elective later in their course of study.
For. 47f-48w, Forest Products, 6
Geol. 29f, General Physiography, 5
Pl. Path. 10f, Forest Pathology, 5 (Bot. 4-5-6)
Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)

JUNIOR YEAR

1. *Sophomore courses* which were not completed during the sophomore year.
2. *General courses.*—The following courses may be registered for any quarter that they are offered, except that the proper sequence of continuation courses and the prerequisites must be observed.
Ent. 6w, Insects of Forest Products, 3 (An. Biol. 9 cred.)
For. 33f-34w, Wood Structure and Identification, 6 (For. 3-4, Bot. 4-5-6)
For. 41f, Sylvics, 3 (For. 3-4, Bot. 4-5-6)
3. *Special courses and electives* as prescribed in one of the suggested courses of study pages 43 to 45 or enough electives selected on the major-minor group system (see below) to make from 15 to 18 credit hours per quarter. Full work for the year consists of 51 **credit hours.**

ELECTIVE SUBJECT COURSES

2. Elective subject courses 94 to 101 credits, may be distributed according to one of the following methods: A (page 42) or B (page 43). Every student is required to file in the registrar's office by the end of his sophomore year a statement of the course of study which he plans to pursue during his junior and senior years. Such statements from each student will make it possible to provide a workable program of subject courses. The student may make, and is strongly advised to make, this statement at the end of his freshman year. In this case he would have ample opportunity to change his course at the end of the sophomore year. A change from one method or course of study to another after the close of the sophomore year is permitted only on approval and does not exempt the student from any of the requirements of the course which he finally selects. Such changes

usually involve inconvenience and sometimes loss of credit to the student. All students are invited to consult with the dean of the college concerning the selection of courses of study.

Method A—*Open Elective Course of Study*

Recommended for those students who are preparing themselves for some special line of work and who have definitely in mind the relations of subjects offered to this work.

Under this method the student with the approval of his adviser may select any course of study which complies with the following requirements:

a. A major of from 24 to 36 credit hours.
b. A minor of 18 credit hours.
c. Limited electives amounting to 50 per cent of the remaining number of credit hours, which must be selected outside of the groups from which the major and minor have been chosen, and
d. Free electives, sufficient to meet the number of credit hours required for graduation chosen from any of the courses offered in the University.

The major and minor must be selected from different elective groups.

ELECTIVE GROUPS

A. Groups from which major, minor, or electives may be chosen.

1. Sylviculture
   Bot. 20f, Forest Ecology, 3
   Bot. 22f,s, Elementary Plant Physiology, 5
   Bot. 113f-114w-115s, Advanced Taxonomy, 9
   Bot. 131f, Field Ecology, 5
   Bot. 132s, Ecological Anatomy, 5
   Bot. 133s, Forest Geography of North America, 5
   Bot. 141f-142w-143s, Advanced Plant Physiology, 15
   For. 27w, Groves and Windbreaks, 3
   For. 35w, Seeding and Planting, 3
   For. 43s, Sylviculture Laboratory, 5 (Itasca Park)
   For. 101w, Advanced Dendrology, 3
   For. 106w, Investigative Methods in Forestry, 3
2. Forest Organization and Management
   Econ. 28f,s, Principles of Accounting, 5
   Econ. 85f,s, Principles of Marketing, 3
   Econ. 91w,s, Principles of Organization and Management, 3
   Econ. 143f-144w, The Financial System, 8
   Econ. 155s, Corporation Finance, 3
   Econ. 167w, Industrial Relations, 3
   Ent. 7s, General Forest Entomology, 1 (Itasca Park)
   Farm Eng. 18f, Surveying, 5
   For. 10w, Mensuration, 5
   For. 11f, Forest Valuation, 5
   For. 20w, Grazing, 3
   For. 28w, Logging, 3
   For. 32w, Lumber Distribution, 5
   For. 36w, Forest Policy and Administration, 5
   For. 46s, Forest Regulation Laboratory, 5 (Itasca Park)
   For. 112w, Advanced Forest Mensuration, 3.
3. Forest Products
   Agr. Biochemistry 2f, Quantitative Methods, 5
   Agr. Biochem. 3f,w,s, Types of Carbon Compounds, 6

Agr. Biochem. 101f-102w, Agricultural Quantitative Analysis, 6
Agr. Biochem. 111f-112w, Phytochemistry, 6
Agr. Biochem. 113f-114w, Biochemistry Laboratory, 4
or
Chem. 11f,s, Qualitative Chemical Analysis, 4
Chem. 27f, Quantitative Chemistry, 4
Chem. 35f-36w, Organic Chemistry, 10
For. 23su, Factory Experience, 3 to 5
For. 29f, Sawmills and Wood-Working Machinery, 3
For. 30s, Wood-Seasoning, 3
For. 39f, Wood-Preservation, 3
For. 44s, Wood Pulp and Paper, 3
For. 47f-48w, Forest Products, 6
For. 107f-108w 109s, Uses of Wood, 9
For. 110w, Mechanical and Physical Properties of Wood, 2
For. 119f-120w, Advanced Wood Structure, 6
For. 113w, Advanced Forest By-Products, 3

4. Forest Sciences
Includes any courses offered in the fields of
Chemistry
Ecology
Entomology and Zoology
Plant Pathology

B. Groups from which electives only may be chosen

1. Courses in other divisions of the College of Agriculture, Forestry, and Home Economics, not listed in major groups
2. Military Science and Tactics
3. Physical Education
4. Courses in departments of other schools and colleges of the University, not included in major groups

Method B—*Suggested Elective Courses of Study*

The following courses of study have been arranged and are recommended by the several departments as useful and suggestive. Changes may be made with the approval of the Students' Work Committee. The subject course programs and the offerings of subjects in different quarters are based primarily on these courses of study so that students will have an opportunity of getting the subject courses in their proper sequence and without conflict. These specified courses are offered in the hope that they will also be of value to the student in vocational guidance. Students who desire to select any of these courses with modifications should study the changes involved to see whether or not the desired modifications admit of a possible program.

1. Course in Technical Forestry

Suggested for those who are preparing themselves for technical forest work, such as positions in the federal or state services, or foresters for paper companies, lumber companies, or other large timber owners, involving the growth, management, and harvesting of forest crops.

JUNIOR YEAR

Fall Quarter

Bot. 20f, Forest Ecology, 3 (Bot. 2 or 5, For. 1)
Farm Eng. 18f, Surveying, 5 (Farm Eng. 3, 11, or equiv.)
For. 33 and 41, see general requirements, page 41.
Electives, 3

Winter Quarter

Ent. 6, see general requirements, page 41
For. 10w, Forest Mensuration, 5 (For. 3-4)
For. 20w, Grazing, 3
For. 34, see general requirements, page 41.
For. 35w, Seeding and Planting, 3 (For. 3-4)

Spring Quarter

(Itasca Park)
Ent. 7s, General Forest Entomology, 1 (Ent. 6)
For. 43s, Sylviculture Laboratory, 5 (For. 35)
For. 46s, Forest Regulation Laboratory, 5 (For. 11)

SENIOR YEAR

Fall Quarter

Bot. 22f,s, Elementary Plant Physiology, 5 (Bot. 2 or 5, Org. Chem. advised)
Bot. 131f, Field Ecology, 5 (Bot. 20 or 21)
For. 11f, Forest Valuation, 5 (For. 10, 41)
Electives, 2

Winter Quarter

For. 27w, Groves and Windbreaks, 3
For. 28w, Logging, 3 (For. 3-4)
For. 36w, Forest Policy and Administration, 5 (For. 11, 43, 28 parallel)
For. 106w, Investigative Methods, 3 (For. 43)
Electives, 3

Spring Quarter

Electives, 17

2. Course in Commercial Lumbering

Suggested for those who wish to enter any branch of lumber business. Includes fundamental business courses and a thoro training in the structure, handling, and uses of wood.

JUNIOR YEAR

Fall Quarter

Econ. 85f,s, Principles of Marketing, 3 (Econ. 3-4 or 5)
For. 29f, Sawmills and Wood-Working Machinery, 3 (For. 3-4)
For. 33 and 41, see general requirements, page 41
For. 39f, Wood Preservation, 3 (For. 33 parallel)
Electives, 2

Winter Quarter

Econ. 91w,s, Principles of Organization and Management, 3 (Econ. 3-4 or 5)
Ent. 6, see general requirements, page 41
For. 10w, Forest Mensuration, 5 (For. 3-4)
For. 34, see general requirements, page 41
Electives, 3

SENIOR YEAR

Fall Quarter

Econ. 143f, The Financial System, 4 (Econ. 3-4 or 5)
For. 107f, Uses of Wood I, 3 (For. 33-34)
Pol. Sci. 51f, Business Law, 3 (Econ. 10 cred.)
Electives, 7

Winter Quarter

Econ. 144w, The Financial System, 4 (Econ. 143)
For. 28w, Logging, 3 (For. 3-4)
For. 32w, Lumber Distribution, 5 (For. 33 parallel)
For. 108w, Uses of Wood II, 3 (For. 33-34)
Pol. Sci. 52w, Business Law, 3 (Pol. Sci. 51)

Spring Quarter

Econ. 28f,s, Principles of Accounting, 5 (Econ. 3-4 or 5)
For. 30s, Wood-Seasoning, 3 (For. 33-34)
Electives, 9

Econ. 155s, Corporation Finance, 3 (Econ. 143-144)
For. 109s, Uses of Wood III, 3 (For. 107-108)
Pol. Sci. 53s, Business Law, 3 (Pol. Sci. 52)
Electives, 7

3. Course in Forest By-Products

Suggested for those who wish to enter the field of pulp and paper manufacture, wood distillation, wood preservation, etc. Includes a series of courses in chemistry and a thoro training in the structure, handling, and uses of wood.

JUNIOR YEAR

Fall Quarter

Agr. Biochem. 2f, Quantitative Methods, 5 (Chem. 10 cred.)
Econ. 85f,s, Principles of Marketing, 3 (Econ. 3-4 or 5)
For. 33 and 41, see general requirements, page 41
For. 39f, Wood Preservation, 3 (For. 33 parallel)

Winter Quarter

For. 10w, Forest Mensuration, 5 (For. 3-4)
Ent. 6, see general requirements, page 41
For. 34, see general requirements, page 41
Electives, 6

Spring Quarter

Agr. Biochem. 3f,w,s, Types of Carbon Compounds, 6 (Chem. 10 cred.)
Econ. 28f,s, Principles of Accounting, 5 (Econ. 3-4 or 5)
For. 30s, Wood-Seasoning, 3 (For. 33-34)
Electives, 3

SENIOR YEAR

Fall Quarter

Agr. Biochem. 101f, Agricultural Quantitative Analysis, 3 (Agr. Biochem. 2 and 3 or 7-8)
Agr. Biochem. 111f, Phytochemistry, 3 (Biol. 9 cred., organ. chem.)
Agr. Biochem. 113f, Biochemical Laboratory Methods, 2 (Quant. Anal., parallel 111)
For. 107f, Uses of Wood I, 3 (For. 33-34)
Electives, 6

Winter Quarter

Agr. Biochem. 102w, Agricultural Quantitative Analysis, 3 (Agr. Biochem. 101)
Agr. Biochem. 112w, Phytochemistry, 3 (Agr. Biochem. 111)
Agr. Biochem. 114w, Biochem. Laboratory Methods, 2 (Agr. Biochem. 113)
For. 32w, Lumber Distribution, 5 (For. 33 parallel)
For. 108w, Uses of Wood II, 3 (For. 33-34)
Electives, 2

Spring Quarter

For. 109s, Uses of Wood III, 3 (For. 107-108)
Electives, 14

4. Landscape Gardening

See suggested course of study on page 33.

COURSES OF STUDY IN HOME ECONOMICS

The courses of study are designed (a) to prepare women for the responsibilities of citizenship and of home-making; (b) to prepare teachers for the extension of home economics education; (c) to prepare women for vocations which have as their foundation, work of the home economics group.

A number of courses of study are outlined on the following pages. In addition, opportunity is offered through substitutions and selections of electives to prepare for other special fields of work.

The College of Agriculture, Forestry, and Home Economics, and the College of Education coöperate in the preparation of teachers of home economics as outlined in the Teachers' Course in Home Economics, the Teachers' Course in Foods and Home Management, the Teachers' Course in Textiles and Clothing, and the Teachers' Course in Related Art.

The teachers' courses, designed to prepare for the teaching of vocational courses in home economics, are arranged in accordance with the provisions of the Smith-Hughes Act.

The required work of the freshman and the sophomore years is the same in each course of study. Specialization is provided for in the junior and senior years.

(For explanation of terms and course numbers, see page 19.)

HOME PRACTICE

Home practice in garment-making is required of students who have completed H.E. 11, as a prerequisite to H.E. 13. The character and amount of the home practice work will be arranged with a member of the faculty of the textile and clothing section.

GROUP I. GENERAL REQUIREMENTS FOR ALL STUDENTS IN HOME ECONOMICS

FRESHMAN YEAR

All of the following work is required of every student except for the exemptions indicated. For some students this represents more than the regular amount of work of 15 credit hours per quarter. In such cases those subjects listed below which can not be taken in the freshman year must take precedence in the following year. Registration for from 14 to 16 credit hours of work each quarter will be allowed without special permission. Care should be taken in registration to give precedence to courses offered only one quarter.

1. *Non-credit courses* required for graduation in addition to the 189 credit hours.

Freshman lectures. A course of lectures, one hour per week, intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter.

Phys. Educ. 1f-2w-3s, Elementary Physical Training. Three hours per week throughout the year.

Phys. Educ. 4f, Personal Hygiene.

2. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequences of continuation courses and the prerequisites must be observed.

An. Biol. 14f-15w-16s, General Zoology, 9. Bot. 8s, General Botany, 5, may be substituted for An. Biol. 16s.

Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high school chemistry may omit this course and register for Chem. 9-10. Those required to take this course because of inability to carry Chem. 9-10 successfully will be allowed not more than 10 credits.

Chem. 9f-10w, Advanced General Inorganic Chemistry, 10 (1 yr. h. s. chem.). Those required to take Chem. 1-2-3 are exempt from this course.

Farm Eng. 23f,s, General Physics, 5. Those presenting a year of high school physics may omit this course and substitute 5 credits elective later in their course of study.

H. E. 3f,w,s, Textiles, 5

H. E. 11f,w,s, Garment-Making, 3

H. E. 51f,w,s, Drawing and Design, 3

Rhet. 1f,w,s,[1] Rhetoric I, 3

Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1)

Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2)

Rhet. 4f,w,s, Elementary Rhetoric, 3. Required only of those who are found to be unable to carry Rhet. 1.

SOPHOMORE YEAR

1. *Non-credit courses* required for graduation in addition to the 189 credit hours.

Phys. Educ. 23w, Sophomore Elementary Swimming. Not required of those who can pass the swimming test in their freshman year.

2. *Freshman courses* which were not completed during the freshman year.

3. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and prerequisites must be observed. From 15 to 17 credit hours should be selected each quarter.

Agr. Biochem. 3f,w,s, Types of Carbon Compounds, 6 (Chem. 10 cred.)

Bact. 1f,w,s, Elementary Bacteriology, 5 (Chem. 10 cred.)

H. E. 13f,w,s, Dressmaking, 5 (H. E. 3, 11, 51, home practice in garment-making)

H. E. 21f,w,s, Foods and Cookery, 5 (Chem. 10 cred., Physiol. 4 or parallel.)

H. E. 22f,w,s, Food Economics, 5 (H. E. 21)

Physiol. 4f,w,s, Human Physiology, 5 (Chem. 10 cred., Biol. 9 cred.)

Psychol. 1f-2w, General Psychology, 6

Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)

Sociol. 1f,w,s, Introduction to Sociology, 3

4. *Electives.*—Enough elective credits should be selected to make, with the required work of the freshman and sophomore years a total of 93 credit hours. The number selected will vary from 1 to 11 credit hours depending upon the specific high school preparation of each student. Those whose programs permit are advised to register for Rhet. 11, Argumentation, 3, otherwise required in the junior year.

JUNIOR YEAR

1. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and prerequisites must be observed.

Econ. 5, Principles of Economics, 5

H. E. 37f,s, Health Care of the Family, 3 (Chem. 5 cred., Bact. 1)

[1] Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 99.

H. E. 52f,w,s, Art History and Appreciation, 3 (H. E. 51)
H. E. 53f,w,s, Advanced Design, 4 (H. E. 51)
H. E. Educ. 40f, Child-Training, 3 (Psychol. 1-2)
Rhet. 11f,w,s, Argumentation, 3 (Rhet. 3, 22 advised) or Rhet. 31f,w,s, Survey of English Literature I, 5 (Rhet. 3)

2. *Special courses* as prescribed by the curriculum of the line of specialization selected See special requirements on pages 48 to 51.
3. *Electives.*—Enough electives should be selected to make, with those listed in 1 and 2 above, from 15 to 17 credit hours each quarter. Full work for the year consists of 48 credit hours.

SENIOR YEAR

1. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and prerequisites must be observed.

H. E. 34f,w,s, Home Management: Operation and Maintenance, Lectures, 3 (H. E. 22, 35 parallel, Econ. 5 or parallel)
H. E. 35f,w,s, Home Management: Operation and Maintenance, Laboratory, 6 (H. E. 22, 37, H. E. Educ. 40, or parallel; must parallel H. E. 34)
H. E. 45w,s, Home Economics Survey, 2
H. E. 131f,w,s, Home Management: House-Planning and Equipment, 5 (52, 53)

2. *Special courses* as prescribed by the curriculum of the line of specialization selected. See special requirements on pages 48 to 51.
3. *Electives.*—Enough electives should be selected to make, with those listed above, from 15 to 17 credit hours each quarter. Full work for the year consists of 48 credit hours.

GROUP II. SPECIAL REQUIREMENTS IN THE DIFFERENT LINES OF SPECIALIZATION (SUPPLEMENTARY TO GROUP I)

Students should consult with the faculty of the section in which they have chosen to major, with reference to the elective courses which must be chosen to make up the 189 credit hours required for graduation.

In selecting electives, note particularly (a) prerequisites, (b) classes of students (fr., soph., jr., or sr.) to which courses are offered, (c) number of credits, (d) quarter or quarters offered, and be sure that provision is made in registration for the proper sequence of continuation courses.

Registration for courses as electives in other colleges of the University must be in conformity with the regulations of the college offering the course.

Elective courses in the College of Science, Literature, and the Arts, are separated into Junior College courses, open to freshmen and sophomores, and Senior College courses, open to juniors and seniors. In addition to satisfying other prerequisites an average grade of one honor point per credit must be maintained for the first two years in order to register for a Senior College elective.

1. General Course in Home Economics

JUNIOR YEAR

H. E. 23f,w, Nutrition I, 5 (H. E. 22, Bact. 1, Agr. Biochem. 3)
H. E. 108f,w,s, Nutrition II, 5 (H. E. 23)

SENIOR YEAR

Econ. 90s, Economics of Consumption, 3 (Econ. 5)
H. E. 17f,w,s, Advanced Clothing Construction, 3 (H. E. 13, 53)
H. E. 103f,w,s, Dietetics, 5 (H. E. 108)
H. E. 123w,s, Clothing Economics, 2 (H. E. 13, Econ. 5)

2. Course in Foods and Nutrition

Those students planning to specialize in foods and nutrition should add the following courses to those listed in the General Course:

JUNIOR YEAR

Agr. Biochem. 2f, Quantitative Methods, 5 (Chem. 10 cred.)
Agr. Biochem. 108s, Chemistry of Wheat and Wheat Products, 3 (Agr. Biochem. 3) or H. E. 111s, Special Food Problems, 3 (H. E. 105, Agr. Biochem 2)
H. E. 109s, Advanced Nutrition, 5 (H. E. 108, Agr. Biochem. 2)

SENIOR YEAR

H. E. 105f,w, Experimental Cookery, 3 (H. E. 22, 23)
H. E. 110s, Special Problems in Dietetics, 3 (H. E. 103)

3. Course in Textiles and Clothing

Those students planning to specialize in textiles and clothing should register for Advanced Clothing Construction and Clothing Economics in the junior year and add the following courses to those listed in the General Course, omitting Nutrition I, Nutrition II, and Dietetics.

JUNIOR YEAR

Agr. Biochem. 2w, Quantitative Methods, 5 (Chem. 10 cred.)
H. E. 55f,s, Decorative Needlework and Other Crafts, 3 (H. E. 51, 53, or parallel)

SENIOR YEAR

H. E. 18w,s, Commercial Clothing Manufacture, 4 (H. E. 17, or parallel)
H. E. 58w, Costume Design, 3 (H. E. 55)
H. E. 122w,s, Advanced Textiles, 3 (H. E. 3, Agr. Biochem. 2, Econ. 5 or parallel)
H. E. 126s, Textile Analysis and Related Problems, 3 (H. E. 122, Agr. Biochem. 2)

4. Course for Dietitians

Those students planning to become dietitians may omit the following courses from the General Course: Advanced Clothing Construction, Clothing Economics, Economics of Consumption.

They should add the following courses to those listed in the General Course:

JUNIOR YEAR

Agr. Biochem. 2f, Quantitative Methods, 5 (Chem. 10 cred.)
Educ. Psychol. 55f,w,s, Educational Psychology, 3 (Psychol. 1-2) or Agr. Educ. 11f,w,s, Principles of Vocational Education, 3
H. E. 109s, Advanced Nutrition, 5 (H. E. 108, Agr. Biochem. 2)
H. E. Educ. 42f,w,s, Special Methods in Teaching Home Economics, 5 (H. E. 13, 22, Psychol. 1-2, Agr. Educ. 11 or Educ. Psychol. 55)

SENIOR YEAR

H. E. 61f,w,s, Large Quantity Cookery and Marketing, 4 (H. E. 22)
H. E. 63f,w,s, Institution Experience, 3 (H. E. 22)
H. E. 105f,w, Experimental Cookery, 3 (H. E. 22, 23)
H. E. 151s, Institution Management Problems, 4 (H. E. 61, 63)

5. Course in Institution Management

Those students specializing in institution management may omit the following courses from the General Course in Home Economics: Advanced Clothing Construction, Clothing Economics, Economics of Consumption.

They should add the following courses to those listed in the General Course:

JUNIOR YEAR

Farm Eng. 34w, Household Mechanics and Heat, 4 (Farm Eng. 23 or equiv.)
H. E. 61f,w,s, Large Quantity Cookery and Marketing, 4 (H. E. 22)
H. E. 63f,w,s, Institution Experience, 3 (H. E. 22)

SENIOR YEAR

Econ. 85f,s, Principles of Marketing, 3 (Econ. 5)
Econ. 28f,s, Principles of Accounting, 5 (Econ. 5)
H. E. 105f,w, Experimental Cookery, 3 (H. E. 22, 23)
H. E. 151s, Institution Management Problems, 4 (H. E. 61, 63)

6. Course in Extension Work

Students planning to become home economics extension workers should add the following courses to those listed in the General Course:

JUNIOR YEAR

Ent. 20w, Home Economics Entomology, 3 (An. Biol. 6 cred.)
Farm Eng. 34w, Household Mechanics and Heat, 4 (Farm Eng. 23 or equiv.)
Farm Eng. 35s, Household Electricity and Light, 4 (Farm Eng. 34)
H. E. Educ. 42f,w,s, Special Methods of Teaching Home Economics, 5 (H. E. 13, 22, Psychol. 1-2, Agr. Educ. 11 or Educ. Psychol. 55)

SENIOR YEAR

H. E. 44s, Methods in Home Economics Extension Work, 3 (H. E. Educ. 42)
H. E. 110s, Special Problems in Dietetics, 3 (H. E. 103)

COURSES FOR TEACHERS

(College of Education)[1]

7. Teachers' Course in Home Economics

Students specializing in this course must complete the required work of the General Course in Home Economics and in addition the following professional subjects:

JUNIOR YEAR

Educ. Psychol. 55f,w,s, Educational Psychology, 3 (Psychol. 1-2) or Agr. Educ. 11f,w,s, Principles of Vocational Education, 3
Hist. and Philos. of Educ. 5s, Public Education in the U. S., 3 (Psychol. 1-2)
H. E. Educ. 42f,w,s, Special Methods of Teaching Home Economics, 5 (H. E. 13, 22, Psychol. 1-2, Educ. Psychol. 55 or Agr. Educ. 11)

SENIOR YEAR

H. E. Educ. 49f,w, Observation and Teaching, 8 (H. E. Educ. 42)

[1] See scholarship requirements for Admission of the College of Education, page 17.

8. Teachers' Course in Foods and Home Management

Students specializing in this course must complete the required work of the course in foods and nutrition and in addition the following professional subjects:

JUNIOR YEAR

Hist. and Philos. of Educ. 5s, Public Education in the U. S., 3 (Psychol. 1-2)

H. E. Educ. 42f,w,s, Special Methods of Teaching Home Economics, 5 (H. E. 13, 22, Psychol. 1-2, Agr. Educ., 11 or Educ. Psychol. 55)

Educ. Psychol. 55f,w,s, Educational Psychology, 3 (Psychol. 1-2) or Agr. Educ. 11f,w,s, Principles of Vocational Education, 3

SENIOR YEAR

H. E. Educ. 47f,w, Observation and Teaching, 8 (H. E. Educ. 42, H. E. 34, 35)

9. Teachers' Course in Textiles and Clothing

Students specializing in this course must complete the required work of the course in textiles and clothing with the exception of Textile Analysis and Related Problems, and in addition the following professional subjects:

JUNIOR YEAR

Educ. Psychol. 55f,w,s, Educational Psychology, 3 (Psychol. 1-2) or Agr. Educ. 11f,w,s, Principles of Vocational Education, 3

Hist. and Philos. of Educ. 5s, Public Education in the U. S., 3 (Psychol. 1-2)

H. E. Educ. 42f,w,s, Special Methods of Teaching Home Economics, 5 (H. E. 13, 22, Psychol. 1-2, Agr. Educ. 11 or Educ. Psychol. 55)

SENIOR YEAR

H. E. Educ. 48f,w, Observation and Teaching, 8 (H. E. Educ. 42)

10. Teachers' Courses in Related Art

Students specializing in the teaching of related art may omit the following courses from the General Course and the Teachers' Course in Textiles and Clothing: Economics of Consumption, Commercial Clothing Manufacture, Advanced Textiles, Observation and Teaching: Textiles and Clothing.

They should add the following courses:

JUNIOR YEAR

Art Educ. 32C,f-33C,w-34C.s, Sketch; or 32A,f-33A,w-34A,s, Still Life, 6

H. E. 58s, Costume Design, 3 (H. E. 55)

SENIOR YEAR

Art Educ. 43C,f; 44C,w; 45C,s, Sketch, 3 (Art Educ. 32C, 33C, 34C)

H. E. 54s, Interior Design, 3 (H. E. 52, 53, 131)

H. E. 57w, Weaving and Other Crafts, 3 (H. E. 3, 51, 53)

H. E. Educ. 43w, Organization and Methods for Related Art Teaching, 3 (H. E. 52, 53, H. E. Educ. 42)

DESCRIPTION OF COURSES

AGRICULTURAL BIOCHEMISTRY

Professors Ross A. Gortner, Clyde H. Bailey; Associate Professor Leroy S. Palmer; Assistant Professors Cornelia Kennedy, Clarence A. Morrow, John J. Willaman; Instructors Arthur K. Anderson, Paul F. Sharp.

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.

COURSES

2. Quantitative Methods. Principles of quantitative analysis, including stoichiometric problems, practice in the use of the balance and in typical gravimetric and volumetric manipulations. Mr. Willaman.

3. Types of Carbon Compounds. The groups of carbon compounds, with special reference to their relationships and their occurrence in plant and animal materials used as food. Mr. Anderson

7-8. General Agricultural Biochemistry. A qualitative and quantitative study of the types of organic and inorganic compounds found in plants and animals and of the chemical changes involved in metabolism, growth, and maintenance. Lecture and laboratory. Mr. Anderson.

15. Principles of Animal Nutrition. Lectures, recitations, and collateral reading emphasizing the chemical and physiological principles underlying digestion, metabolism, utilization of feeds, maintenance, growth, fattening, milk production, vitamine hypothesis, and deficiency diseases. Mr. Palmer.

101-102. Agricultural Quantitative Analysis. The estimation of inorganic and organic constituents of biological products, the proximate analysis of foods and feeding stuffs, the use of the polariscope, immersion refractometer, colorimeter and nephelometer, viscosimeter, and other special apparatus. Mr. Morrow.

103. Dairy Chemistry. Lectures and laboratory work on the physical, colloidal, and chemical properties of milk and dairy products, the chemistry of the various constituents of milk and of the processes involved in the manufacture of dairy products. Mr. Palmer.

106. Chemical Technology of Agricultural 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. Mr. 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. MR. BAILEY.

109. SELECTED FLOUR LABORATORY METHODS. A laboratory course in which particular attention is given to recently developed methods for testing wheat products. Less extensive than 110. Designed for men with commercial laboratory experience. (Not open to students who have credit in Course 110.) MR. BAILEY.

110. FLOUR LABORATORY METHODS. A laboratory course in methods of analysis of wheat and its products; milling tests of wheat, baking, and special tests of flour. Designed to train students for research and control work in the cereal industry. (Not open to students who have credit in Course 109.) MR. BAILEY.

111-112. PHYTOCHEMISTRY. Advanced course dealing with the colloidal state, and the chemistry of proteins, carbohydrates, glucosides, tannins, fats, plant acids, enzymes, and pigments and their physicochemical relations to the vital processes involved in growth and nutrition. MR. MORROW.

113-114. BIOCHEMICAL LABORATORY METHODS. A laboratory course paralleling the lectures in 111-112, using recent methods for the investigation of biologically important compounds, with especial reference to the detection and estimation of such compounds in cells or tissues. MR. MORROW, MR. SHARP.

116. ADVANCED ANIMAL NUTRITION. Lectures and assigned readings on recent developments in animal nutrition, covering the field of proteins, mineral metabolism, vitamines, and the relation of nutrition to disease. MR. PALMER, MISS KENNEDY.

117. LABORATORY PROBLEMS IN ANIMAL NUTRITION. A laboratory course on methods used in nutrition studies through assisting in investigations under way or carrying out independent studies under the direction of the instructors. MR. PALMER, MISS KENNEDY.

118. LABORATORY PROBLEMS IN BIOCHEMISTRY. Special laboratory work in the preparation and isolation of pure compounds which occur in living cells, the study of biochemical reactions, and special methods of identification or determination of biochemical products. MR. GORTNER, MR. BAILEY, MR. PALMER, MR. MORROW, MR. WILLAMAN.

AGRICULTURAL ECONOMICS

See Economics (page 68).

AGRICULTURAL EDUCATION

COLLEGE OF EDUCATION

Professors ASHLEY V. STORM, DEXTER D. MAYNE; Assistant Professors WILLIAM P. DYER, ALBERT M. FIELD, FRANK W. LATHROP; Instructor SHERMAN DICKINSON; Extension Specialists THEODORE A. ERICKSON, GEORGE F. HOWARD, FRANK W. PECK.

COURSES

11. PRINCIPLES OF VOCATIONAL EDUCATION. The fundamental principles upon which education is based. Emphasis is placed on those phases which are most closely related to vocational education. MR. DYER.

21. VOCATIONAL EDUCATION. A short history of vocational education; present status in Europe and the United States; manual training and home arts in an educational system; place of agriculture in the public schools with special reference to Minnesota. MR. MAYNE.

41. APPRENTICE TEACHING. An introductory course in teaching, including observation of class work, apprentice teaching, and special conference discussions of problems relating to teaching. Intended to initiate the student into the routine of classroom procedure. Professional readings. MR. FIELD, MR. LATHROP, MR. DICKINSON.

42. TEACHING. 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 teaching. Review and discussion of assigned professional readings. MR. FIELD, MR. LATHROP, MR. DICKINSON.

63-64-65. GENERAL AGRICULTURE. For students majoring in such fields of work as agricultural biochemistry, entomology, and economic zoology, plant pathology, and in other colleges. A series of units by division chiefs and other agricultural specialists. MR. STORM, MR. MAYNE.

75. VISUAL PRESENTATION. To prepare persons for presenting materials by means of slides, films, charts, etc. Students assist in assembling materials for their own use and in acquiring skill and technique in preparation and operation of various mediums. MR. DICKINSON.

81. 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 of Minnesota. MR. STORM, MR. PECK.

82. AGRICULTURAL EXTENSION FIELD WORK. Actual field practice in extension work on part salary in addition to credits. Number admitted to course limited by positions available. Usually will cover summer quarter, may extend into fall quarter. MR. STORM, MR. PECK.

121. TEACHERS' COURSE, HOME AND SCHOOL GARDENING. A lecture and laboratory course designed to give teachers the preparation necessary for the proper planning, management, and supervision of home and school gardens. MR. FIELD.

131. METHODS IN TEACHING HIGH SCHOOL AGRICULTURE. Fundamentals 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. MR. FIELD.

151. ORGANIZATION AND MANAGEMENT. Organization and management of work in secondary schools, particularly in Minnesota, with special reference to agricultural work, courses of study, programs, equipment, laboratory and class management, extension work, plots, and coördination of work. MR. STORM, MR. DYER, MR. LATHROP.

153. CONSOLIDATED RURAL SCHOOLS. To prepare principals to meet the problems of organization and management peculiar to consolidated rural schools, such as building arrangements, curriculum adjustments, transportation of pupils, and home project work. MR. DYER.

154. RURAL EDUCATION AND COMMUNITY LIFE. The rural school as a community center, and ways and means of organizing educational and recreational activities, such as clubs, festivals, fairs, and other desirable features of rural community life. MR. DYER.

155. CONSOLIDATED RURAL SCHOOL PROBLEMS. Opportunity for intensive study and research in special problems of administration and supervision and village and consolidated rural schools. MR. DYER.

161-162-163. 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. MR. STORM.

164. FUNDAMENTALS OF AGRICULTURE. Basic principles of agricultural science and elements of practical agriculture. Emphasis on concrete problems in soils, crops, and animal husbandry, as related to classroom instruction and to school and home projects. For consolidated school principals. MR. FIELD.

176. ADVANCED VISUAL PRESENTATION. Continuation of 75. Further work in design and construction of charts and lantern slides. Special study of motion picture machines. Actual practice in effective use of visual aids in lecture and recitation. MR. DICKINSON.

181. AGRICULTURAL STATISTICS AND GRAPHIC REPRESENTATION. Course teaches application of statistical methods to agriculture and different means of representing agricultural statistics graphically. Of value to

all students to enable them to interpret, present, and use agricultural statistics and graphic representations.

191-192-193. SEMINAR IN AGRICULTURAL EDUCATION. Critical studies of important problems in agricultural education; opportunity for individual investigation and research; review and interpretation of current educational literature. MR. STORM, MR. DYER, MR. FIELD, MR. LATHROP.

AGRONOMY AND FARM MANAGEMENT

Professors ANDREW BOSS, HERBERT K. HAYES; Associate Professors ALBERT C. ARNY, LOUIS B. BASSETT; Assistant Professors LOUIS F. GAREY, FORREST W. MCGINNIS, GEORGE A. POND; Instructors FRED W. GRIFFEE, FERDINAND H. STEINMETZ; Extension Specialists WILLIAM L. CAVERT, RALPH F. CRIM.

COURSES

I. FARM CROPS. The important field crops of the United States with emphasis upon those of local importance; distribution, economic importance, agricultural classification, cultural methods, and principles of improvement and seed selection. MR. STEINMETZ.

II. FARM MACHINERY. Lectures and laboratory work covering classification, mechanical construction, adjustment, and operation of the different kinds of farm machinery. MR. BASSETT.

101. FARM MANAGEMENT I. Farm records—simple farm accounting and the forms and methods employed in making cost of production studies and farm management surveys. Practice in record-keeping and accounting. MR. POND.

102. FARM MANAGEMENT II: ORGANIZATION. The business side of farming is emphasized. Special attention is given to farm organization and equipment. MR. BOSS, MR. GAREY.

103. FARM MANAGEMENT II: OPERATION. Continuation of 102. Special attention is given to farm operation. MR. BOSS, MR. GAREY.

104. FARM MANAGEMENT III. An advanced seminar course, including cost of production studies, farm business analyses, and farm practices. MR. BOSS.

121. CEREAL CROPS. An advanced study of the cereal crops. Structure, group classifications, improvement, growing, and utilization. Brief score card practice and a limited amount of placing on intrinsic value included. MR. MCGINNIS.

122. CORN AND POTATO CROPS. Corn and potato crops similar to that outlined for Course 121. MR. MCGINNIS.

123. FORAGE AND FIBER CROPS. A study of forage plants through assigned reading, laboratory and field work. Following the study of each crop

some attention is given to score card practice and comparative placing of representative samples. MR. ARNY, MR. STEINMETZ.

131. PRINCIPLES OF GENETICS. Fundamental principles of breeding, heredity, variation, biometry, and evolution. Same as Hort. 109. MR. GRIFFEE, MR. BEAUMONT.

132. FARM CROPS PLANT-BREEDING. Applied genetics. Methods of breeding each of the important agricultural crops. MR. HAYES, MR. GRIFFEE.

133. JUDGING AND GRADING FARM CROPS. Experimental evidence regarding the factors which determine the market value of the crops as a basis for judging and grading work. MR. ARNY.

ANIMAL BIOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors HENRY F. NACHTRIEB, HAL DOWNEY, WILLIAM A. RILEY, THOMAS S. ROBERTS, CHARLES P. SIGERFOOS; Associate Professor ELMER J. LUND; Assistant Professors ROYAL N. CHAPMAN, OSCAR W. OESTLUND.

General statement.—Courses in this department are closely correlated with those offered by the Division of Entomology and Economic Zoology of the College of Agriculture, Forestry, and Home Economics. For courses of that division, see page 73.

Credit is given for acceptable work done at any approved seaside laboratory.

COURSES

9-10. HISTOLOGY. A comparative microscopic study of the origin and structure of the tissue of vertebrates and invertebrates, and of the organs of mammals. It is advisable to complete the year with Course 11. Textbook, lectures, and laboratory. MR. DOWNEY.

11. CYTOLOGY AND TECHNIQUE. The structure and properties of the animal cell and the elements of microscopical technique. Lectures, reference and laboratory work. MR. NACHTRIEB.

14-15-16. GENERAL ZOOLOGY. Same as Course 1-2 extended throughout three quarters. MR. SIGERFOOS, MR. RILEY.

17. GENERAL PHYSIOLOGY I. Physical and chemical properties of living protoplasm and cells. Rôle of diffusion, osmotic pressure, and ions in cell physiology. Permeability. An introduction to the application of physical chemistry to cell processes. Lectures, laboratory, and assigned reading. MR. LUND.

18. GENERAL PHYSIOLOGY II. Comparative physiology of respiration, nutrition, and growth. The nature of the production of movement, heat, light, and electricity of organisms. Lectures, laboratory, and assigned reading. MR. LUND.

19. PRINCIPLES OF ANIMAL BEHAVIOR. The nature of the process of stimulation. Comparative physiology of the nervous system and sense organs of lower organisms and reactions of lower organisms to stimuli. Lectures, laboratory, and assigned reading. MR. LUND.

37-38-39. GENERAL ENTOMOLOGY. Elements of entomology leading up to discussion of the principles of taxonomy and their application to the classification of insects. MR. OESTLUND.

44. ANIMAL PARASITES AND PARASITISM. Lectures and laboratory work. A consideration of the origin and biological significance of parasitism, and the structure, life history, and economic relations of representative parasites. Methods of control and prevention will be emphasized. MR. RILEY.

45. RELATIONS OF INSECTS TO DISEASE. The causation and transmission of disease by insects and other anthropods. Life history, habits, and methods of control of hominoxious species. MR. RILEY.

46-47. ORNITHOLOGY. Structure, classification, and habits of birds with special reference to the birds of Minnesota. Considerable time devoted to field study. Bird or field glass and handbook required. Laboratory, lectures, and quizzes. Class limited to ten. MR. ROBERTS.

48. GENERAL ECOLOGY. A general course covering the relationships of animals, animal societies, and faunas to the inorganic and organic factors of the environment. The course consists of lectures, assigned reading, recitations, laboratory and field work. MR. CHAPMAN.

107. PROTOZOOLOGY. Lectures, reference and laboratory work on the structures and life histories of Protozoa, with special reference to the relation of the Protozoa to diseases of animals. MR. SIGERFOOS.

109-110-111. GENERAL PHYSIOLOGY. A thoro survey of fundamental physiological processes in organisms. Based on Bayliss's *Principles of General Physiology*. Laboratory, lectures, and reading. MR. LUND.

117-118-119. ECOLOGY OF INSECTS. General principles of ecology with special reference to the insects of Minnesota. Lectures, laboratory, assigned reading, and field work. MR. CHAPMAN.

124. ADVANCED ECOLOGY. Similar to 117-118-119 with special field work. MR. CHAPMAN.

125-126-127. ADVANCED ENTOMOLOGY. Advanced work in the lines of morphology and classification of insects, with lectures on the history of entomology. MR. OESTLUND.

130. BIOLOGY AND TAXONOMY OF THE APHIDIDAE. Intensive study of the natural history, bibliography, and classification of the Aphididae. MR. OESTLUND.

139-140. HISTOLOGY AND DEVELOPMENT OF INSECTS. Lectures and laboratory work on the histology, embryonic and postembryonic development of insects. MR. RILEY.

144-145-146. ANIMAL PARASITES AND PARASITISM. Lectures and laboratory work. Origin and biological significance of parasitism, structure, life history, and economic relations of representative parasites. Second quarter devoted primarily to the relation of insects to diseases of man and animals. MR. RILEY.

181-182. EMBRYOLOGY. A survey of the principles of animal development and a detailed study of the development of the circulatory or urinogenital system of a vertebrate. Lectures, reference and laboratory work. MR. NACHTRIEB.

183. GENETICS AND EUGENICS. Facts and theories of heredity and the application of the laws governing natural inheritances for the improvement of the race. Lectures, references, quizzes, and demonstrations. MR. NACHTRIEB.

ANTHROPOLOGY AND AMERICANIZATION TRAINING

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor ALBERT E. JENKS; Instructor GLADYS SPEAKER.

COURSES

1. INTRODUCTION TO ANTHROPOLOGY. Origin and development of human societies; various agencies which have determined type of social life; social organization, institutions, and progress; bearing of sociology upon other social sciences and arts. MR. JENKS.

4. CULTURAL ANTHROPOLOGY. Origin and early development of the most important activities and institutions which had their beginning among primitive men. MR. JENKS.

5. GENERAL IMMIGRATION. Facts of recent world migration. Chief causes of emigration from the old nests, and of immigration to the United States; federal and state problems of immigrant legislation, control, and distribution.

12. ETHNOLOGY. The different so-called races of men; their historical classifications; determinance of ethnic types; important ethnic problems. MISS SPEAKER.

108. PHILIPPINE PEOPLES. Comparative study of the four large ethnic and cultural groups of people; policy of insular government affecting American home interests in the Orient. MR. JENKS.

112. THE AMERICAN NEGRO. Development of the American negro; his characteristics, conditions, and developing tendencies; negro and immigration adjustments. MR. JENKS.

113. THE AMERICAN PEOPLE. OLDER IMMIGRANTS. Characteristics, contributions, and distribution of the older immigrant peoples in America, their modification and importance to us. MR. JENKS.

114. THE AMERICAN PEOPLE. NEWER IMMIGRANTS. Characteristics, contributions, and distribution of the newer immigrant peoples in America, their modification and importance to us. MR. JENKS.

115. THE AMERICAN PEOPLE. AMERICANISMS AND ASSIMILATIONS. Essential and unique historical Americanisms, and their value and virility for the future in America. Conditions and facts of assimilation. MR. JENKS.

117. THE IMMIGRANT WOMAN. The peculiar problems of the woman immigrant in personal service, in industrial groups, in the home, and out of regular employment. MISS SPEAKER.

118. GOVERNMENT AND THE IMMIGRANT. Legal and administrative aspects of Americanization. Federal and state laws affecting immigration, citizenship, and naturalization; practical administration of these laws through governmental agencies; political experiences of the foreign-born.

120. THE AMERICAN INDIAN. Origin and migrations of the Indian. Basic material for study of origin and spread of indigenous cultures.

123-124. PROBLEMS IN ANTHROPOLOGY. An advanced course of method and independent research. MR. JENKS.

ANIMAL HUSBANDRY

ANIMAL INDUSTRY GROUP

Professors WALTER H. PETERS, EVAN F. FERRIN; Assistant Professors PHILIP A. ANDERSON, NORRIS K. CARNES; Instructor ALFRED L. HARVEY; Extension Specialists KENNETH F. WARNER, HENRY G. ZAVORAL.

COURSES

2. LIVESTOCK-JUDGING. Practice in judging horses, cattle, sheep, and hogs from both the type and the breed standpoint. MR. ANDERSON.

3-4. MARKET CLASSES OF LIVESTOCK. Livestock markets and marketing methods. The market classes of horses, cattle, sheep, and swine. Practice in classifying, judging, and appraising livestock. (Not offered after 1922-23.) MR. FERRIN.

5. LIVESTOCK-BREEDING. The application of the principles of genetics to the breeding of livestock; a review of the master-breeders' methods and consideration of the practical breeders' problems. MR. PETERS.

6. LIVESTOCK-FEEDING. Feeding livestock under farm conditions; efficiency and economy in growing and fattening meat animals; feeding draft

horses and colts. Consideration of experimental work and present practice. Practical feeding problems. Only three credits allowed to those who have completed Course 8. MR. FERRIN.

7. MEATS. Dressing of animals and the cutting of carcasses. Lectures and laboratory work. MR. ANDERSON.

8. ELEMENTS OF FEEDING. Brief survey of livestock and dairy feeding designed for students not majoring in animal industry. Not open to those who have completed Course 6 or Dy. Husb. 103. MR. RAYBURN, MR. HARVEY.

9. PEDIGREES AND HERD BOOKS. Pedigree registration; laboratory practice in the use of the stud, herd, and flock records; tracing and tabulating pedigrees. MR. FERRIN.

10. MARKET CLASSES OF LIVESTOCK. Livestock markets and marketing methods. The market classes of horses, cattle, sheep, and swine. Practice in classifying, judging, and appraising livestock. MR. FERRIN.

11-12. 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. (Not offered in 1922-23.) MR. CARNES.

101. ADVANCED STOCK-JUDGING. Competitive judging of all types, breeds, and classes of livestock supplemented by visits to nearby stock farms. MR. FERRIN.

102. HORSE HUSBANDRY. Stud farm management; the selection of foundation stock and the breeding, feeding, and marketing of horses. Horsepower; factors determining a horse's efficiency for work. MR. PETERS.

103. BEEF CATTLE HUSBANDRY. The management of pure blood and grade herds; selection of foundation stock, sales and shows, building equipment, labor. Practicums in fitting cattle for show and sale, animal photography, preparation of feeds, and the care of cattle. MR. CARNES.

104. SHEEP HUSBANDRY. The care and management of purebred sheep. Stud of pedigrees, registrations, fitting for show purposes, marketing. Practicums in feeding, shearing, blocking, and caring for young lambs. MR. ANDERSON.

105. SWINE HUSBANDRY. Hog farm equipment, purebred vs. market hogs; building a breeding herd, private herd records, herd management, fitting and showing, marketing breeding stock. Barn work and feeding practice. MR. FERRIN.

106. ADVANCED MEATS. Practice work in dressing animals and cutting carcasses giving particular attention to conformation as related to dressing percentage and the carcass; also a study of the physical and chemical composition of meat. MR. ANDERSON.

107. MEAT PROBLEMS. The wholesale cuts and grades of meat; the packing industry and the utilization of by-products. Special problems and trips to packing establishments. MR. ANDERSON.

108. SEMINAR. Special problems and review of investigations pertaining to the livestock industry. MR. PETERS.

ARCHITECTURE

COLLEGE OF ENGINEERING AND ARCHITECTURE

Instructor CARL E. JOHNSON.

21-22-23. ELEMENTARY FREE-HAND DRAWING. Free-hand perspective. Drawing with charcoal, pencil, and color from architectural ornament and details of the figure. MR. JOHNSON.

ART EDUCATION

COLLEGE OF EDUCATION

Assistant Professor RUTH RAYMOND; Instructors LEAH M. HANLEY, HAZEL S. MARTIN.

COURSES

29-30-31. FUNDAMENTAL PRINCIPLES OF DESIGN. MISS RAYMOND.

32-33-34. FREE-HAND DRAWING AND COMPOSITION. MISS RAYMOND, MRS. HANLEY, MRS. MARTIN.

40-41-42. PRINCIPLES OF HARMONY IN FORM AND COLOR. MISS RAYMOND.

BACTERIOLOGY AND IMMUNOLOGY

MEDICAL SCHOOL

Professor WINFORD P. LARSON; Associate Professor ARTHUR T. HENRICI; Instructors ANNE G. BENTON, ROBERT G. GREEN, DAVID O. SPRIESTERSBACH.

COURSES

1. GENERAL 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. DR. LARSON, MISS BENTON, MR. GREEN, MR. SPRIESTERSBACH.

103. SPECIAL BACTERIOLOGY FOR STUDENTS OF AGRICULTURE. Bacteriology of the soil in relation to fertility; the nitrogen-fixing bacteria of legumes; bacteria that cause plant diseases; bacterial diseases of domestic animals; the bacteriology of milk and dairying. DR. HENRICI.

105. HOUSEHOLD BACTERIOLOGY. The decay, fermentation, and putrefaction of foodstuffs; molds; canning; bacterial food-poisoning; bacteriology of the cleansing processes. MISS BENTON.

BEE CULTURE

Professor FRANCIS JAGER.

General statement.—Scientific and practical instruction on bees, bee practice, and bee industry.

Students registering for beekeeping should have a working knowledge of botany, zoology, and entomology. If not, they should take courses in those fields parallel with beekeeping.

COURSES

1. ELEMENTARY BEE SCIENCE. Classification, structure of *Apis Mellifica.* Life history of the queen, worker, and drone. Organization of the colony. Colony instincts and activities. Nutrition of the bee. Food sources. Diseases and enemies. MR. JAGER.

2. INDUSTRIAL BEEKEEPING. Bees as honey producers and pollinators. Beehives, tools, and appliances. Bee shop. Location. Handling bees; commercial management of bees. Production of comb and extracted honey. Increase. Accounting and marketing. MR. JAGER.

3. ADVANCED BEEKEEPING. Outfit for a professional apiary. Location and management of outapiaries. Migratory beekeeping. Transportation. Bee workshop. Central extracting plant. Power and machinery. Economical feeding. Wax-rendering. Professional disease treatment. Organization. MR. JAGER.

4. QUEEN-RAISING. Principles of reproduction. Queen- and drone-judging. Production of virgin queens and drones. Building of nuclei. Mating. Mailing, introducing, and requeening. In connection with the University Farm queen-raising project. Theory of queen-breeding. MR. JAGER.

5. BEE DISEASES. Fungi and parasites. Brood and mature bee diseases. Their diagnosis, causes, and practical treatment. Bee inspection. MR. JAGER.

6. STUDY OF HONEY. Analysis, purity of honey, specific gravity, granulation. Influence of weather, soil, etc., on quality and color of honey. Honey-judging, by taste and color. Wax, vinegar, and other by-products. MR. JAGER.

BOTANY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors C. OTTO ROSENDAHL, ELIAS J. DURAND, LEE I. KNIGHT, JOSEPHINE E. TILDEN; Associate Professors FREDERIC K. BUTTERS, RODNEY B. HARVEY; Assistant Professors WILLIAM S. COOPER, NED L. HUFF; Instructors CHARLES L. FARABAUGH, ARTHUR M. JOHNSON.

COURSES

1-2. General Botany. Mr. Durand, Mr. Butters, Mr. Huff, Mr. Johnson, and assistants.

4-5-6. General Botany. Same as Course 1-2, extended throughout three quarters. For students in agriculture and forestry only. Mr. Durand.

7. Taxonomy of Flowering Plants. A general study of the classification and relationships of flowering plants. Mr. Rosendahl, Mr. Johnson.

8. General Botany. A course adapted to the needs of students in home economics. Mr. Durand.

12. General Morphology of Algae. Miss Tilden.

13. General Morphology of Fungi. Mr. Johnson.

20. Forest Ecology. Relation between forest trees and their environment; soil and atmospheric factors, their influence upon function, structure, and distribution; forest communities and successions. Mr. Cooper.

21. Elementary Ecology. The study of plants in relation to their environment. Mr. Cooper.

22. Elementary Plant Physiology. General survey of plant functions. Mr. Knight, Mr. Harvey, Mr. Farabaugh.

48. Plant Industry. Lecture demonstration course on relation of plants to modern important industries and conservation policies. Especially for students in arts and the professions. Given with the coöperation of special lectures from the departments of the Plant Science Group. Mr. Rosendahl, Mr. Freeman, and special lecturers.

51. Histological Methods. Training in technique of preparing plant material for microscopic study. Mr. Rosendahl.

62. General Morphology of Bryophytes and Pteridophytes. Structure, evolution, and classification of the liverworts, mosses, and ferns. Mr. Huff.

63. General Morphology of Angiosperms and Gymnosperms. Structure, evolution, and classification of seed plants. Mr. Butters.

107. Morphology and Taxonomy of the Bryophytes. Structure and classification of the liverworts, and mosses. Mr. Durand.

108. Morphology and Taxonomy of Pteridophytes. An intensive study of lycopods, ferns, and their allies; their structure, history, and classification. Mr. Butters.

110. Morphology and Taxonomy of Gymnosperms. An intensive study of cycads, conifers, and their allies; their structure, history, and classification. Mr. Butters.

113-114-115. ADVANCED TAXONOMY. Special attention is given to the taxonomy of difficult natural groups of angiosperms, involving systematic principles and practice, rules of nomenclature, and systems of classification. MR. ROSENDAHL.

118. CYTOLOGY. Origin, development, structure, and functions of the plant cell and its various constituents. MR. ROSENDAHL.

127. ANATOMY OF VASCULAR PLANTS. Microscopic structure of vascular plants with particular attention to the development and evolution of the vascular system in the root, stem, and leaf. MR. BUTTERS.

131. FIELD ECOLOGY. A survey of the local plant communities and successions followed by a written report, and by a study of the general principles of plant association and succession. MR. COOPER.

132. ECOLOGICAL ANATOMY. The individual plant and its parts as related to environment; special plant forms and structures, their causes and significance. MR. COOPER.

133. FOREST GEOGRAPHY OF NORTH AMERICA. Preliminary discussion of the principles of plant distribution followed by a detailed study of the forest regions of North America. MR. COOPER.

141. PHYSICAL PHASES OF PLANT PHYSIOLOGY. The intake and translocation of materials, and the energy relations of the plant. MR. KNIGHT, MR. HARVEY, MR. FARABAUGH.

142. PLANT METABOLISM. The synthesis of plant food, its transformation and utilization by the plant. MR. KNIGHT, MR. HARVEY, MR. FARABAUGH.

143. PLANT METABOLISM AND GROWTH. A continuation of Course 142, dealing with respiration, growth, and movement. MR. HARVEY, MR. KNIGHT, MR. FARABAUGH.

144. PLANT MICROCHEMISTRY. Localization of materials of physiological importance in the plant and their relation to physiological processes. MR. HARVEY.

CHEMISTRY

THE SCHOOL OF CHEMISTRY

Professors WILLIAM H. HUNTER, CHARLES F. SIDENER; Associate Professors FRANK H. MACDOUGALL, M. CANNON SNEED; Assistant Professors ISAAC W. GEIGER, LLOYD H. REYERSON; Instructor WALTER M. LAUER.

COURSES

1-2-3. GENERAL INORGANIC CHEMISTRY. 1-2—General laws of chemistry and of the non-metals and their compounds. 3—Metals and their compounds. MR. SNEED.

9-10. GENERAL INORGANIC CHEMISTRY. 9—General laws of chemistry, the non-metals and their compounds. 10—Metals and their compounds and ionic equilibrium, considered quantitatively. MR. REYERSON.

11. QUALITATIVE CHEMICAL ANALYSIS. Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. MR. SNEED.

12-13. QUALITATIVE CHEMICAL ANALYSIS. Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. MR. SNEED.

20-21. QUANTITATIVE ANALYSIS. General principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems will be assigned and attention given to proper laboratory practice. MR. SIDENER, MR. GEIGER.

35-36. ORGANIC CHEMISTRY. An introduction to the chemistry of carbon compounds. The laboratory work will include the preparation of characteristic substances. MR. HUNTER, MR. LAUER.

140-141-142. PHYSICAL CHEMISTRY. A general survey of the subject. Laboratory work three or six hours per week. Nine, twelve, or fifteen credits, depending on amount of laboratory work. MR. MACDOUGALL.

CIVIL ENGINEERING

COLLEGE OF ENGINEERING AND ARCHITECTURE

Professor FREDERIC H. BASS.

COURSE

53. 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. MR. BASS.

DAIRY HUSBANDRY

ANIMAL INDUSTRY GROUP

Professors CLARENCE H. ECKLES, JOSEPH R. KEITHLEY; Professor Emeritus THEOPHILUS L. HAECKER; Assistant Professors HAROLD MACY, ALLAN B. RAYBURN; Instructors CHESTER D. DAHLE, THOR W. GULLICKSON; Assistants ELMER O. ANDERSON, CARL F. HUFFMAN; Extension Specialists EDWIN A. HANSON, ARTHUR J. MCGUIRE, LESLIE V. WILSON.

COURSES

1. ELEMENTS OF DAIRYING. Composition of milk. Causes of variation in composition; milk constituents and their uses in dairy manufactures and as food; Babcock test; sanitary handling of milk and cream on the farm; cream-separating and farm butter-making. MR. KEITHLEY, MR. DAHLE, MR. GULLICKSON, MR. ANDERSON, MR. HUFFMAN.

2. DAIRY BACTERIOLOGY. Lectures and laboratory exercises. Types of milk organisms; the contamination of milk and how prevented; relation of milk to the public health; the bacteriology of dairy products. MR. MACY.

4. CHEESE FACTORY PRACTICE. A minimum of one month's experience in an approved practical cheese factory. Records are kept and reports made. MR. KEITHLEY.

5. CREAMERY PRACTICE. A minimum of one month's experience in an approved practical creamery. Records are kept and a report made. MR. KEITHLEY.

6. JUDGING DAIRY CATTLE. Comparative judging of dairy cattle and study of breed types. Recommended to be taken parallel to 101. MR. RAYBURN.

101. MILK PRODUCTION. Problems of the dairy farmer, such as characteristics and adaptations of dairy breeds; selection and management of dairy herd and sire; calf-raising; dairy barns. MR. ECKLES.

102. MARKET MILK. Lectures and laboratory work. Classes of market milk; transportation and marketing; sanitary inspection; equipment of plants; problems of public control. Standardization. Pasteurization. Reconstitution. Accounting. MR. KEITHLEY, MR. MACY.

103. DAIRY STOCK-FEEDING. Application of principles of nutrition to feeding the dairy cow and growing young animals. Feeding standards; characteristics of various feeding stuffs; formation of rations. MR. ECKLES.

104. ADVANCED STUDY OF DAIRY BREEDS. Practice in comparative judging of dairy cattle representing different breeds and ages; selection and valuation of cattle according to type and pedigree; a study of important strains and families; visits to purebred herds. MR. RAYBURN.

105. SEMINAR I. Special investigation and study of selected topics. Each student presents papers and reports on assigned subjects and reviews recent scientific investigations along dairy husbandry lines. MR. ECKLES.

106. SEMINAR II. Continuation of 105, but 105 not a prerequisite. MR. ECKLES.

107. SEMINAR III. Continuation of 106, but 106 not a prerequisite. MR. ECKLES.

111. DAIRY PRODUCTS I. The manufacture of butter and ice cream with special reference to the chemical and bacteriological processes involved. Organization, construction, equipment, operation, and accounting in such factories. Laboratory exercises to illustrate these processes. MR. KEITHLEY, MR. DAHLE.

112. DAIRY PRODUCTS II. The manufacture of cheese, condensed milk, and milk powder with special reference to the chemical, bacteriological, and physical processes involved. Organization, construction, equipment, operation, and accounting in such factories. Laboratory exercises and lectures to illustrate principles of these processes. MR. KEITHLEY, MR. DAHLE.

ECONOMICS

SCHOOL OF BUSINESS

Professors GEORGE W. DOWRIE, JOHN D. BLACK, ROY G. BLAKEY; Associate Professors FREDERIC B. GARVER, BRUCE D. MUDGETT; Assistant Professors ERNEST A. HEILMAN, HOWARD S. NOBLE, H. BRUCE PRICE, J. WARREN STEHMAN, HOLBROOK WORKING; Professorial Lecturer J. FRANKLIN EBERSOLE; Instructors HILDING E. ANDERSON,[1] CLAUD F. CLAYTON, JOSEPH E. CUMMINGS, BUDD A. HOLT, PAUL L. MILLER, WARREN C. WAITE, VIRGIL R. WERTZ.

5. PRINCIPLES OF ECONOMICS. (For agriculture, forestry, and home economics students.) MR. WORKING, MR. CLAYTON, MR. HOLT, MR. WERTZ.

6. AGRICULTURAL ECONOMICS. MR. WORKING, MR. WAITE.

13. AGRICULTURAL STATISTICS. Statistical method applied to agricultural data. MR. WORKING.

20. ECONOMIC GEOGRAPHY OF AGRICULTURE. The localization of agricultural products, markets and systems of farming; economic and other forces determining this localization; considered in relation to industries in general. MR. BLACK, MR. CLAYTON.

21. ECONOMIC HISTORY OF AGRICULTURE. The evolution of the economic organization with special reference to agriculture. The development of methods of agricultural production and marketing, types of farming, and tenure systems. MR. PRICE.

25-26. PRINCIPLES OF ACCOUNTING. MR. NOBLE.

28. PRINCIPLES OF ACCOUNTING. (For agriculture, forestry, and home economics students.) MR. HEILMAN, MR. MILLER.

[1] Leave of absence, 1922-23.

50. FARM FINANCE. The financial needs of typical farmers. Present facilities for supplying them; institutions, their organization and operation, interest rates, defects, and proposed remedies. The financing of the various farm organizations. The farmer as an investor. MR. DOWRIE.

72. ECONOMICS OF TRANSPORTATION. MR. CUMMINGS.

73. RAILWAY TRAFFIC AND RATES. MR. CUMMINGS.

85. PRINCIPLES OF MARKETING. Analysis of market functions, marketing channels, and marketing agencies. Market price and market costs. MR. PRICE, MR. ANDERSON.

90. ECONOMICS OF CONSUMPTION. Nature of human wants; standards of living; cost of living; income, administration of income; nature of demand; demand and price; relation of consumption to the population problem. MR. GARVER.

91. PRINCIPLES OF ORGANIZATION AND MANAGEMENT. Administration of business enterprises; coördination of men and departments; delegation of authority; planning; production control; scientific management.

103-104. VALUE AND DISTRIBUTION. An advanced course in economic theory devoted chiefly to the study of recent theories of wages, interest, rent, and profits. Assigned readings and reports on current problems in distribution. MR. GARVER.

106. LAND ECONOMICS. Land as a factor of production; rural and urban utilization; rents and land values; land classification; land exchange. MR. BLACK.

107. LAND TENURE. Property in land; tenancy; farm labor; evolution of the tenure classes. MR. BLACK.

108. MARKETING OF FARM PRODUCTS. Studies of the problems and methods of marketing selected farm products with special reference to the Twin City markets. MR. PRICE, MR. ANDERSON.

110-111. PRACTICE COURSE IN MARKETING. Eight to twelve weeks of experience as an employee in central or local markets. Careful study and observation of methods. Written plans and reports. MR. PRICE, MR. ANDERSON.

112. BUSINESS STATISTICS. The use of statistics in the analysis of the internal operations of a business and of external business conditions. MR. MUDGETT.

113. THEORY OF STATISTICS. The calculation and use of various constants of importance in the analysis of statistical data; averages, measures of dispersion and of correlation, partial correlation; and the theory of errors. MR. MUDGETT.

116. ECONOMICS OF AGRICULTURAL PRODUCTION. Detailed analysis of the economic principles underlying agricultural production; the relation of value and price to combinations of factors of production and selection of enterprises. MR. BLACK.

117. PRICES OF FARM PRODUCTS. Description, analysis, and criticism of the way in which prices of farm products are determined in the various markets. MR. WORKING.

126. PRINCIPLES OF COÖPERATION. The coöperative mode of economic functioning as compared with the competitive and governmental, as to motivation, organization, and public control; applied to agricultural marketing, finance, production, and consumption. MR. BLACK, MR. MILLER.

127-128. MARKETING ORGANIZATION AND MANAGEMENT. Principles of accounting and business organization applied to the organization and management of proprietory and coöperative marketing business units. MR. BLACK, MR. MILLER.

131. COST ACCOUNTING. MR. NOBLE.

143-144. THE FINANCIAL SYSTEM. MR. DOWRIE, MR. STEHMAN, MR. EBERSOLE.

145. FOREIGN EXCHANGE. MR. DOWRIE.

149. BUSINESS CYCLES. American business conditions since 1890 with regard to the great cycles of alternate prosperity and depression, and financial panics. Critical examination of all the available business barometers designed to forecast similar conditions. MR. EBERSOLE.

150. ADVANCED FARM FINANCE. Not open to those who have credit in Course 50. MR. DOWRIE.

155. CORPORATION FINANCE. The organizing, financing, and managing of corporations. A study of corporate securities for purposes of promotion and reorganization and of facilities for marketing them. MR. STEHMAN.

167. INDUSTRIAL RELATIONS. Principles of labor administration for various types of organizations and workers. Job analysis, wages, stability of work, joint relations.

168. PERSONNEL MANAGEMENT. Problems and methods as to employment, promotion, training, health, safety, hours, working conditions, and employees' service.

176. COMMERCIAL POLICIES. Theory of international commerce; free trade, reciprocity, protection, subsidies, preferential treatment, the open door, international finance, commercial treaties, foreign policies, and other governmental and organized efforts to affect trade. American problems emphasized. MR. BLAKEY.

177. FOREIGN TRADE. MR. BLAKEY.

180-181-182. SENIOR SEMINAR IN ECONOMICS. Advanced course work in marketing, production, consumption, prices, land economics, finance, statistics, accounting, transportation, etc., to suit the needs of advanced groups of students in these fields. MR. DOWRIE, MR. BLACK, MR. BLAKEY, MR. GARVER, MR. HEILMAN, MR. MUDGETT, MR. PRICE, MR. WORKING.

191-192. PUBLIC FINANCE. MR. BLAKEY.

193. STATE AND LOCAL TAXATION. MR. BLAKEY.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

COLLEGE OF EDUCATION

Professor MERVIN G. NEALE.

COURSE

119. THE ELEMENTARY SCHOOL CURRICULUM. Principles underlying organization of subject-matter for courses in elementary school, including a critical examination of curricula, syllabi, and school texts in the light of their function in the teaching and administration of the curriculum. MR. NEALE.

EDUCATIONAL PSYCHOLOGY

COLLEGE OF EDUCATION

Professor WILFORD S. MILLER; Assistant Professor MARVIN J. VAN WAGENEN.

COURSES

55. EDUCATIONAL PSYCHOLOGY. A survey of fundamental facts of human behavior involved in educational activities. Open to seniors, juniors, and qualified students in third quarter of sophomore year upon advice of Dean Haggerty. MR. MILLER.

106-107-108. ADVANCED EDUCATIONAL PSYCHOLOGY. Advanced work in genetic psychology, origin and nature of human organism, development and control of instincts. Methods of measuring rate of learning; typical learning experiments. Group and individual differences, their relations to educational practice. MR. VAN WAGENEN.

111. EDUCATIONAL DIAGNOSIS. Typical educational problems involving educational scales and standard tests. Nature of tests, methods of use, analysis of results obtained, and programs of remedial educational procedure, based on the results of the tests. MR. VAN WAGENEN.

ENGLISH

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors ELMER E. STOLL, RICHARD BURTON;[1] Associate Professors JOSEPH W. BEACH, CECIL A. MOORE.

General statement.—The following courses are recommended for election by the students of the College of Agriculture, Forestry, and Home Economics.

COURSES

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

6. CHAUCER. Reading of tales from the Canterbury collection, with introduction dealing with the grammar and literary forms of fourteenth-century English.

8. SHAKESPEARE. Shakespeare's development as a poet and dramatist up to *King Lear*. MR. STOLL.

40. THE BIBLE AS LITERATURE. A literary study of the Old Testament with special attention to forms and the critical study of selected readings. (Not offered in 1922-23.) MR. BURTON.

41. BROWNING AND TENNYSON. MR. BURTON.

44-45. AMERICAN LITERATURE. MR. MOORE.

51. SPENSER. The forms and literary influences in the Elizabethan period illustrated in the poetry of Edmund Spenser, with brief readings from the minor poems and extended study of *The Faerie Queene*. (Not offered in 1922-23.) MR. STOLL.

53. SEVENTEENTH-CENTURY LYRISTS. The tradition of the Elizabethan lyric traced in the work of the metaphysical and cavalier schools of poetry. MR. MOORE.

58-59. NINETEENTH-CENTURY PROSE. The more important prose writers of the nineteenth century; their styles, personalities, opinions, and relations to their period. MR. BEACH.

62. MILTON. Milton, with some consideration of his contemporaries. MR. STOLL.

64. BACON. Bacon as an essayist and as a promoter of learning. (Not offered in 1922-23.) MR. STOLL.

66. THE ENGLISH NOVEL. Principles and personalities in the evolution of the English novel. Written reports on selected novels. MR. BURTON.

[1] Absent on leave, fall and winter quarter.

70. MASTERPIECES OF ELIZABETHAN DRAMA. Elizabethan dramatic art aside from Shakespeare's. Special attention to the art of the chief writers—Marlowe, Jonson, Beaumont and Fletcher, Webster, and Massinger. MR. STOLL.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Professors WILLIAM A. RILEY, ARTHUR G. RUGGLES, FREDERIC L. WASHBURN; Assistant Professors ROYAL N. CHAPMAN, HARRY H. KNIGHT, OSCAR W. OESTLUND; Instructor SAMUEL A. GRAHAM.

General statement.—Courses in this department are closely correlated with those offered by the Department of Animal Biology of the College of Science, Literature, and the Arts. Courses 37-38-39, 44, 117-118-119, 125-126-127, 130, 139-140, 144-145-146, and 197 of this division are also offered under these numbers by the Department of Animal Biology.

For introductory courses in general entomology see 37-38-39 and An. Biol. 16.

COURSES

3. ECONOMIC ENTOMOLOGY. The life histories, habits, and methods of control of the insect pests of orchard, field, and garden. Laboratory work in the determination of the more important forms. MR. RUGGLES.

4. ECONOMIC VERTEBRATE ZOOLOGY. Relations of birds and wild animals to agriculture. Lectures, laboratory, and field work. Identification and studies of Minnesota birds and wild animals affecting the horticulturist and agriculturist, methods of combating injurious and conserving useful forms. MR. WASHBURN.

6. INSECTS OF FOREST PRODUCTS. Treating life history, habits, and control of insects attacking dead or freshly felled wood, and forest products. MR. GRAHAM.

7. GENERAL FOREST ENTOMOLOGY. A field course treating of insects affecting trees under actual forest conditions. MR. GRAHAM.

8. VARIETIES AND HABITS OF FUR-BEARING ANIMALS. Deals with North American fur bearers with special reference to their adaptability to domestication and commercial fur-farming. MR. WASHBURN.

12. FOREST ZOOLOGY. Forest animals. Relation of birds and of various four-footed animals to forest protection. Habits, range, usefulness; the manner of protecting the important large and small game, fish, and birds; fish culture. Lectures and laboratory work. MR. WASHBURN.

20. HOME ECONOMIC ENTOMOLOGY. Designed for home economics students. Insects as related to public health problems, insects of the household and those attacking foods will be discussed. The principles of control of insect pests of plants will be considered. MR. RILEY, MR. RUGGLES.

37-38-39. General Entomology. Leads up to discussion of the principles of taxonomy and their application to the classification of insects. Textbook, lectures, quizzes, and laboratory. Mr. Oestlund.

44. Introductory Course in Animal Parasites and Parasitism. Lectures and laboratory work. A consideration of the origin and biological significance of parasitism, and of the structure, life history, and economic relations of representative animal parasites. Methods of control and prevention will be emphasized. Mr. Riley.

117-118-119. General Ecology of Insects. General ecology with special reference to the insects of Minnesota. Frequent field trips. Lectures, laboratory, and field work. Mr. Chapman.

125-126-127. Advanced General Entomology. Advanced work in the lines of morphology and classification of insects with lectures on the history of entomology. Lectures and laboratory. Mr. Oestlund.

130. Biology and Taxonomy of the Aphididae. Intensive study of the natural history, bibliography, and classification of the Aphididae. Additional work is offered in Course 197. Mr. Oestlund.

139-140. Histology and Development of Insects. Lectures and laboratory work on the histology, embryonic, and postembryonic development of insects. Individual work along these lines is available to properly qualified students in Course 197. Mr. Riley.

144-145-146. Animal Parasites and Parasitism. Lectures and laboratory work. Origin and biological significance of parasitism; structure, life history, and economic relations of representative parasites. Second term devoted primarily to the relation of insects to diseases of man and animal. Mr. Riley.

150. Insecticides and Their Action. A study of the chemical composition, the physical properties, and the physiological action of standard, of little-known, and of new insecticides.

197. Introduction to Research. Preparation for investigational work in lines of entomology, parasitology, or economic zoology. Advanced laboratory, field, and library work; training in preparation of bibliographies and manuscripts; special problems. Summer work should be planned when possible. Mr. Knight, Mr. Oestlund, Systematic Entomology; Mr. Ruggles, General Economic Entomology; Mr. Chapman, Insect Ecology; Mr. Riley, Parasitology, Insect Morphology; Mr. Washburn, Economic Vertebrate Zoology.

FARM ENGINEERING

Professor William Boss; Associate Professors Harry B. Roe, Earl A. Stewart, Mark J. Thompson; Assistant Professors Guy R. B. Elliott, Arthur J. Schwantes, James B. Torrance, Arthur G. Tyler,

HALL B. WHITE; Instructors J. GRANT DENT, MAURICE G. JACOBSON, ALLEN D. JOHNSTON.

COURSES

3. MECHANICAL DRAWING. Materials, instruments, and their uses. The conventions, lettering, scale-reading, kinds of drawings, practice in pictorial drawing and drawing building plans. MR. JACOBSON.

4. BLACKSMITHING. The management of forge and fire in bending, shaping, and welding iron. MR. JOHNSTON.

5. FRAMING AND BUILDING CONSTRUCTION. Instruction and practice in framing, construction, and painting of farm buildings. MR. WHITE.

7. FARM STRUCTURES. The planning, designing, and location of farm buildings including specifications and estimates of cost. MR. WHITE.

8. FARM ENGINEERING. A general course of farm engineering. Lectures on farm mechanics, drainage, water supply, heating, sanitation, buildings, roads, power machinery, and land-clearing. MR. BOSS.

11. APPLIED MATHEMATICS. Rules of practical mathematics with special attention to formulas and problems directly related to agricultural and forestry work; e.g., areas, volumes, percentages, proportions, variations, investments, cost problems, etc.

13. FARM MOTORS I. Theory, operation, care, and repair of gasoline engines. MR. TORRANCE.

14. FARM MOTORS II. Instruction and practice in the care, adjustment, and operation of the farm tractor. MR. TORRANCE.

17. ADVANCED BLACKSMITHING. Bending, shaping, welding, and tempering of steel. MR. JOHNSTON.

18. SURVEYING. Plain surveying as applied to agriculture and forestry. Land surveying, mensuration, leveling, elements of topography, and mapping. MR. ROE.

23. GENERAL PHYSICS. The elements of physics for those who have not had physics in high school. Mechanics, heat, light, and electricity with laboratory work. MR. STEWART, MR. TYLER.

24. AGRICULTURAL PHYSICS I. An applied course involving lecture and laboratory work in mechanics and heat. Special emphasis given to farm power, hydraulics, heating, ventilation, and meteorology. MR. STEWART.

25. AGRICULTURAL PHYSICS II. A practical lecture, recitation, and laboratory course on electricity and light, including electric generating plants, batteries, motors, lighting systems, and light and radiant energy as applied to farm problems. MR. STEWART.

28. LAND-CLEARING. Land-clearing methods, explosives, and machinery. Farm development in cut-over timber districts. MR. THOMPSON, MR. SCHWANTES.

31. PRINCIPLES OF DRAINAGE. Elementary principles and practice of drainage, simple leveling, and grade determination, field technique of tile drainage survey and construction and lecture on drainage in relation to plant growth, crop and land values, and farm development. MR. ROE, MR. ELLIOTT.

34. HOUSEHOLD MEHANICS AND HEAT. Lectures, recitations, and laboratory work on household appliances and methods of operation, such as water supply, plumbing, sewage disposal, washing, cooking, refrigeration, heating, and ventilation. (Open only to students in H. E..) MR. STEWART.

35. HOUSEHOLD ELECTRICITY AND LIGHT. A course with laboratory work on the fundamental principles of electricity and the use of electrical appliances in the home, with a special study of light, color, and lighting. (Open only to students in H. E.) MR. STEWART.

37. RURAL SANITATION. Wells, pumps, and water supply, with methods of securing sanitary water systems for farmsteads and rural institutions. Sanitary sewage disposal methods for homes, creameries, etc. MR. STEWART.

38. ADVANCED MECHANICAL DRAWING. Applied to landscape gardening problems. MR. JACOBSON.

40. MECHANICAL TRAINING. Instruction and laboratory practice in mechanical trades, embracing rope work; belt-lacing and pulleys; cement work; soldering; sharpening tools; pipe-fitting; cold metal work; electric wiring; babbitting; glazing; painting; wood-finishing; harness repair; etc. MR. DENT.

101. ADVANCED DRAINAGE. Special drainage problems including surface run-off, soil permeability, relation of soil type to drainage, studies in peat land drainage, shape and regulation of water table in relation to root growth, etc. MR. ROE.

136. EXPERIMENTAL PHYSICAL ANALYSES. A laboratory course in physical measurements for specialists in the agricultural sciences. The work includes the use of bridges, potentiometers, galvanometers, refractometers, spectrometers, polarimeters, thermocouples, etc.

FORESTRY

Professors EDWARD G. CHEYNEY, JOHN H. ALLISON; Associate Professor JOHN P. WENTLING; Instructors LELAND L. DE FLON, THORWALD S. HANSEN, GILBERT H. WIGGIN.

COURSES

1. General Forestry. A brief history of the development of forestry in Europe and America; its bearing on the forestry problems of the United States; description of the United States forests. Lectures and collateral reading. Mr. Cheyney.

2. Elementary Dendrology. Trees and shrubs found in Itasca Park, with special reference to identification by means of gross characters. Mr. Wentling.

3-4. Dendrology. The forest trees of the United States; their classification, characteristics, and range, with special attention to prominent and constant characteristics. Lectures, assigned reading, laboratory. Mr. Wentling, Mr. de Flon.

5. Elementary Sylviculture. Largely field work designed to give the student a working knowledge of the forest. Includes sylvicultural study of the species found in the north woods and the general principles underlying sylvicultural reconnaissance. Mr Wentling.

9. Elementary Mensuration. Largely field work. Includes elementary work in timber-cruising, valuation surveys, stem analysis, and the study of the measurements of stand, volume, and yield. Mr. Allison.

10. Forest Mensuration. The basic principles underlying the measurement of forest products. Measurement of standing and felled timber. Special attention is given to log rules, preparation and use of volume tables, growth of trees, and yield table. Mr. Hansen.

11. Forest Valuation. The business of forest management. A study of the different factors entering into the valuation of forest property. Mr. Allison.

20. Grazing. History of grazing in the West. Kinds of stock used. Forage plants. Regulations and methods of handling stock. Range management and protection. Lectures, recitations, and reading. Mr. Allison.

23. Factory Experience. Two or more months in a factory utilizing wood by-products such as pulp or paper mill, wood distillation or wood preservation plant.

26. Tree Crops. The part trees play in the successful development of the farm. The relation of the forest to agriculture and animal husbandry. The farm and the timber supply. Mr. Cheyney.

27. Groves and Windbreaks. Trees and their relation to the farm. Planning and planting farm windbreaks and shelterbelts. Utilization and marketing of farm, grove, or woodlot products. Mr. Wiggin.

28. Logging. The practice, cost, and development of the different logging methods in use in the different forest regions of the United States,

and the modifications required by forest management. Report based on personal investigations required. MR. CHEYNEY.

29. SAWMILL AND WOOD-WORKING MACHINERY. Sawmills, wood-working machinery, and other processes in the primary manufacture of lumber products. MR. CHEYNEY.

30. SEASONING OF WOOD. The theory and practice of air seasoning and kiln drying the different species of wood and the different forms of wood products; the results obtained and the defects to be avoided. MR. CHEYNEY.

32. LUMBER DISTRIBUTION. The standing timber of the United States in its relation to the lumber market. The organization of the industry and the distributing agencies. MR. CHEYNEY.

33-34. WOOD STRUCTURE AND IDENTIFICATION. Structure, classification, and identification of the most important commercial, domestic, and foreign woods. Lectures, papers, laboratory. Record's *Economic Woods* used as a text. MR. WENTLING.

35. SEEDING AND PLANTING. The cultural principles, operations, methods, and equipment in nursery work and artificial regeneration. Includes seed-collecting, storing, sowing, raising seedlings, packing, transplanting, field-planting, packing for shipment, etc. MR. WIGGIN.

36. POLICY AND ADMINISTRATION. Policy of the United States and the states toward the utilization of the public forest resources. Policy of other owners toward forest resources controlled by them. Administration of the national and state forests. MR. ALLISON.

39. WOOD PRESERVATION. Lectures and collateral reading upon the history, development, and methods of wood preservation. Different systems now in use and preservatives used. MR. ALLISON.

41. SYLVICS. The fundamentals forming the basis of sylviculture with special attention to the sylvics of the important tree species. Lectures, readings, and required papers. MR. WENTLING.

43. SYLVICULTURAL LABORATORY. Nursery practice and field-planting. Field investigations and planting plans. Seed-collecting, extracting, and storing. Daily nursery and field work. MR. WENTLING.

44. WOOD PULP AND PAPER. The manufacture of wood pulp and wood pulp papers. MR. ALLISON.

46. FOREST REGULATION LABORATORY. Field work. The collection of the data necessary to working up a forest working plan. Includes the making of the timber estimates, growth studies, and maps necessary to a forest working plan. MR. ALLISON.

47-48. FOREST PRODUCTS. An introductory survey of the whole field of products of the forest—wood in all its forms, and products other than wood, as pulp, paper, naval stores, wood distillates, tannins, etc. Lectures, reading, papers. MR. WENTLING, MR. ALLISON.

101. ADVANCED DENDROLOGY. A continuation of Course 3-4 with special studies in classification and distribution of the timber species of the world. MR. WENTLING.

106. INVESTIGATIVE METHODS IN FORESTRY. The fundamental principles upon which sylviculture is based. Methods used at experiment stations in solving problems in forestation, protection, and management. MR. HANSEN.

107. USES OF WOOD I. The economic hard and soft woods, both foreign and domestic from standpoint of regions of production, distribution centers, qualities, amounts, and prices in relation to the wood-using industries. Lectures, reading, reports. MR. WENTLING.

108. USES OF WOOD II. A continuation of Course 107 dealing with the industries and the woods they use. Kinds, grades, qualities, properties, requirements for each product. Use, re-use, distribution of product. Regions of production and relation to other industries. Lectures, reading, reports. MR. WENTLING.

109. USES OF WOOD III. The actual use of wood in the industries. At least six hours per week must be spent in actual study in a factory. Complete reports and collateral reading. MR. WENTLING.

110. MECHANICAL AND PHYSICAL PROPERTIES OF WOOD. Study of strength as related to density, quality, etc. Wood stresses, failures, and methods of testing timber. MR. WENTLING.

112. ADVANCED FOREST MENSURATION. Continuation of Course 10 with special emphasis on tree forms. The development of the formula used in study of volume and growth of trees. MR. HANSEN.

113. ADVANCED FOREST BY-PRODUCTS Methods of production of wood pulp and paper products, naval stores, tannins, oils, wood distillation products, etc. Lectures, reading, reports. MR. ALLISON.

119. ADVANCED WOOD STRUCTURE I. A detailed study of the elements and structure of native and foreign economic woods. Preparation, sectioning, and mounting of typical sections. Reference reading and reports. MR. WENTLING.

120. ADVANCED WOOD STRUCTURE II. Study of wood structure in relation to seasoning, mechanical failures, penetration of preservatives, variation in strength, etc. MR. WENTLING.

GEOLOGY AND MINERALOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor WILLIAM H. EMMONS; Instructors IRA S. ALLISON, JOHN W. GRUNER, GEORGE M. SCHWARTZ, GEORGE A. THIEL, W. COURTNEY WERNER.

COURSES

1-2. GENERAL GEOLOGY. A synoptical treatment of materials of the earth and of geologic processes. Physiographic, dynamic, structural, and historical geology. Lectures, laboratory work, field excursions, and conferences outside of class hours. MR. EMMONS, MR. ALLISON, MR. THIEL.

7-8. LABORATORY WORK. Open only to students taking Course 1-2. Supplements Course 1-2 with study of rocks and ores, topographic and geologic maps, and reference reading. MR. ALLISON.

11-12. GENERAL GEOLOGY. A synoptical treatment of materials of the earth and of geologic processes. Physiographic, dynamic, structural, and historical geology. Lectures, laboratory work, field excursions, and conferences outside of class hours. MR. WERNER.

21-22. ESSENTIALS 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. MR. GRUNER.

29. GENERAL PHYSIOGRAPHY. Principles of earth sculpture; physiographic changes in progress, and agencies causing them; hydrography and oceanography; planetary relations; climatology; field excursions.

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.

37. ECONOMIC AND COMMERCIAL GEOGRAPHY. Geographic factors influencing production and trade. Natural resources in their relation to commerce and industry and the major trade routes will be emphasized.

51-52. ECONOMIC GEOLOGY. The mineral resources of the United States. The origin, occurrence, distribution, and uses of the more important minerals and mineral fuels of economic value. Lectures and field excursions. MR. SCHWARTZ.

GERMAN

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor CARL SCHLENKER; Assistant Professor JAMES DAVIES; Instructors HARRY S. CANNON, LYNWOOD DOWNS, RICHARD JENTE.

1. BEGINNING A. Pronunciation, conversation, grammar, and composition; selected readings in easy prose and verse.

2. BEGINNING B. Continuation of Course I.

3. BEGINNING C. Selected texts from modern writers.

10. RAPID READING. Modern narrative prose.

11. ADVANCED RAPID READING. Continuation of Course 10. Representative works of the eighteenth and nineteenth centuries.

28-29. CHEMICAL GERMAN. Selections from more difficult works on chemistry.

31-32. MEDICAL GERMAN. Readings from general works on physiology, anatomy, and bacteriology.

50-51-52. COMPOSITION. Aims to develop grammatical correctness. Translations from English selections. Essay-writing on assigned subjects. MR. JENTE.

62. NINETEENTH-CENTURY PROSE. Narrative readings from modern novelists. MR. CANNON.

63. MODERN DRAMA. Plays of modern dramatists; Hauptmann, Sudermann, Fulda, and others. MR. DAVIES, MR. DOWNS.

64. CLASSIC DRAMA. Plays of Lessing, Goethe, and Schiller. MR. DAVIES, MR. DOWNS.

77. GOETHE'S FAUST I. MR. SCHLENKER.

HISTORY AND PHILOSOPHY OF EDUCATION

COLLEGE OF EDUCATION

Professor FLETCHER H. SWIFT; Assistant Professor ROSS L. FINNEY; Instructor JEAN H. ALEXANDER.

COURSES

1. 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 Public Education in the United States, 5. MR. SWIFT, MISS ALEXANDER.

3. EDUCATIONAL SOCIOLOGY. The school as a community factor; the present peculiar relation of the school to social problems; the function of the school in these relations. MR. FINNEY.

5. PUBLIC EDUCATION IN THE UNITED STATES. A brief survey of the factors determining the problem of public education in America, followed by a brief account of the development and organization of typical state school systems. MR. SWIFT.

101-102-103. FOUNDATIONS OF MODERN EDUCATION. Interpretative historical study of elements in modern education derived from Hebrews, Greeks, Romans, Middle Ages, etc. Emphasis upon secondary and higher education, origin and results of monopoly of cultural conception of education and cultural studies. MR. SWIFT.

HOME ECONOMICS

Professor ——————; Associate Professors ALICE BIESTER, HARRIET GOLDSTEIN, MARION WELLER; Assistant Professors ALICE M. CHILD, AMY P. MORSE, E. MAUDE PATCHIN, ETHEL L. PHELPS, LENORE RICHARDS, LUCY A. STUDLEY, NOLA TREAT; Lecturer MARTHA B. MOORHEAD; Instructors EDLA ANDERSON, CARLOTTA BROWN, HALLY J. FISHER, VETTA GOLDSTEIN, RUTH M. LINDQUIST, MABEL C. MCDOWELL; Extension Specialists MARY L. BULL, LUCY CORDINER, ADELE KOCH, JULIA NEWTON, EUNICE RYAN, JUNIATA L. SHEPPARD.

General statement.—The following courses are planned primarily for students majoring in home economics, and are required in the courses of study in home economics, outlined on pages 46 to 51. They are open for election to students in other courses who offer the prerequisites as stated on pages 136 to 137.

COURSES

3. TEXTILES. Textile fibers, their structure, properties, and chemical reactions; fabrics, their structure and processes of manufacture; art and economic consideration in selection and purchase of materials for clothing and household-furnishing. MISS WELLER, MISS PHELPS.

4. TEXTILES. A condensed course for students in Science, Literature, and the Arts and Education. MISS WELLER, MISS PHELPS.

5-6. TEXTILES. Same as Course 4. For teachers. Extended through two quarters. MISS WELLER.

1. GARMENT-MAKING. Instruction and laboratory practice in hand sewing, reading and adaptation of commercial patterns, use of the sewing machine, designing, cutting, and making simple garments from washable materials. MISS MCDOWELL.

13. DRESSMAKING. Quality, suitability, and cost of materials adapted to technique in construction of wool dresses; adaptation of art principles in selection of designs; instruction and practice in methods of construction; construction of dress form. MISS PATCHIN, MISS MCDOWELL.

17. ADVANCED CLOTHING CONSTRUCTION. Laboratory course involving application of principles of costume-modeling in the construction of one high-grade garment, suit, coat, or dress. One day a week devoted to a millinery problem. MISS PATCHIN, MISS CARLOTTA BROWN.

18. COMMERCIAL CLOTHING MANUFACTURE. Laboratory practice upon commercial basis. Shop organization, with problems involving clothing design and construction.

21. 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. MISS CHILD.

22. FOOD ECONOMICS. Cost and nutritive value of typical foods; the study of dietaries; preparation and serving of meals, the cost bearing a definite relation to the family budget. MISS CHILD.

23. NUTRITION I. (1) The groups of compounds occurring in the cell and in food; (2) digestion, and (3) absorption. MISS BIESTER, MISS ANDERSON.

24. CAMP COOKERY. The simpler cookery processes; and such adaptations as are practicable in the several types of out-of-door camps. Not open to home economics students. For prospective foresters, engineers, and others. (Given in alternate years. Not offered in 1922-23.) MISS CHILD.

25. FOOD AND ITS PREPARATION. Chemical composition and physiological significance of foodstuffs. Principles of cookery underlying the preparation of foods: planning and preparation of normal and special diets. MISS CHILD.

34. HOME MANAGEMENT: OPERATION AND MAINTENANCE, LECTURES. Discussion of management responsibilities of home-maker with special emphasis on budgets and household accounts. MISS STUDLEY.

35. HOME MANAGEMENT: OPERATION AND MAINTENANCE, LABORATORY PRACTICE. Twelve weeks actual experience in a home management house with various household management problems including the care and training of a child of pre-school age. MISS STUDLEY, MISS LINDQUIST.

37. HEALTH CARE OF THE FAMILY. (a) First aid; communicable diseases; their transmission and prevention; hygiene of infancy, maidenhood, maturity. (b) The care of the sickroom; observation and care of the patient; elementary symptomatology. MISS MOORHEAD, MISS FISHER.

38. FIRST AID. Bed-making, general care and observation of patient; emergencies and first aid treatment. MISS FISHER.

40, 42, and 43. See Home Economics Education, page 86.

44. METHODS IN HOME ECONOMICS EXTENSION WORK. Study of state and national plans for home economics extension work; methods of organization and practical presentation of subject-matter; preparation of illustrative material; field work. MISS NEWTON.

45. HOME ECONOMICS SURVEY. A discussion of the historical development of home economics with special emphasis upon current problems.

46, 47, 48, 49. See Home Economics Education, page 86.

51. DRAWING AND DESIGN. Composition, perspective, color theory, and color harmonies applied to costume design and interiors; harmony, proportion, emphasis, balance, and rhythm, in design. MISS V. GOLDSTEIN.

52. ART HISTORY AND APPRECIATION. The historical development of art, architecture, decoration, furniture, and costumes, studied with special emphasis on design and influence upon modern styles. MISS H. GOLDSTEIN, MISS V. GOLDSTEIN.

53. ADVANCED DESIGN. Problems in design for house furnishings and for costume, including dress-modeling. MISS H. GOLDSTEIN, MISS V. GOLDSTEIN.

54. INTERIOR DESIGN. Special problems in interior decoration to be worked out as far as possible in actual materials. Special emphasis on color and texture combinations. MISS MORSE.

55. DECORATIVE NEEDLEWORK AND OTHER CRAFTS. Applied design in needlework, lace, and appliqué, in problems relating to dress and house furnishings. MISS MORSE.

57. WEAVING AND OTHER CRAFTS. Applied design in two and four harness hand-loom weaving, batik and block printing in problems relating to dress and house-furnishing. MISS MORSE.

58. COSTUME DESIGN. A study of figure construction; line, color, and textures for beautiful arrangements and with reference to individual types. Laboratory work with fabrics and designs carried out in pencil and water colors. MISS H. GOLDSTEIN.

61. LARGE QUANTITY COOKERY AND MARKETING. Application of principles of cookery to large quantity preparation; planning of meals for dining-hall and cafeteria; calculation of cost and calories in standard servings; study of problems involved in purchase of institution supplies. MISS RICHARDS.

63. INSTITUTION EXPERIENCE. Experience in the minor problems of administration. MISS RICHARDS, MISS TREAT.

70. Food Preparation in Relation to Social Work. The principles underlying cookery with special emphasis on the preparation of foods to be used in homes with limited incomes. Miss Lindquist.

71. Elementary Dietetics for the Social Worker. Involves principles underlying adequate feeding. Food habits of different economic and racial groups forming the basis for actual planning and preparation of meals.

72. Home Management Problems. Involves the making of sound budgets. Studies are based upon racial groups and the size of the family together with the income. Miss Lindquist.

103. 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. Miss Biester.

105. Experimental Cookery. An intensive study of problems in foods and food preparation with individual laboratory problems. Miss Child.

108. Nutrition II. Metabolism including work on tissues, blood, milk, and urine. Miss Anderson.

109. Advanced Nutrition. Selected quantitative methods applicable to investigations relating to digestion and metabolism. Miss Biester, Miss Anderson.

110. Special Problems in Dietetics. An intensive study of problems relating to diet involving assigned readings, discussions, and field work. Miss Biester.

111. Special Food Problems. A continuation of experimental cookery involving more advanced problems. Miss Child.

122. Advanced Textiles. An experimental study of textile problems such as shrinkage and other laundering applications; textile legislation; and special economic problems. Miss Weller, Miss Phelps.

123. Clothing Economics. General consideration of the economic problems in clothing production; women's responsibility for conditions in textiles and clothing industries; study of the budget for clothing and household textiles; hygiene and standardization of dress. Miss Weller.

126. Textile Analysis and Related Problems. Problems and application of quantitative methods in textile analysis with special reference to establishing standards for fabrics. Miss Weller, Miss Phelps.

131. Home Management: House-Planning and Equipment. House-planning, house-furnishing and equipment, and construction and furnishing budgets. Types of domestic architecture; site; floor plans;

building materials; details of construction; heating; ventilating; lighting; plumbing; walls; rugs; furniture; color; hangings; pictures; gardens. MISS MORSE.

151. INSTITUTION MANAGEMENT PROBLEMS. Lectures and discussions of the problems involved in institution management; organization; service; institution-planning, decoration, and equipment; budgets, and the study of different types of institutions. MISS TREAT.

HOME ECONOMICS EDUCATION

COLLEGE OF EDUCATION

Professor ——————; Associate Professor HARRIET GOLDSTEIN; Assistant Professors ALMA L. BINZEL, CLARA M. BROWN, MAUDE J. MILLER; Instructors ELIZABETH BACON, AMANDA EBERSOLE, AURA KEEVER.

General statement.—The University teacher's certificate will be granted only to graduates of the College of Education. Students expecting to receive this certificate upon graduation shall be registrants in the College of Education from the beginning of the junior year. No formal application is necessary for transfer from the College of Agriculture, Forestry, and Home Economics to the College of Education if such transfer is made at the beginning of the junior year. However, no student may transfer who has not earned 90 credits and 90 honor points.

COURSES

40. CHILD-TRAINING. Application of modern science especially child psychology in training and educating children. Emphasis placed on the conservation of the child as an obligation of the home and the nation through training for parenthood. MISS BINZEL.

42. SPECIAL METHODS OF TEACHING HOME ECONOMICS. Curricula, equipment, methods of teaching for home economics. Required of all students preparing to teach. MISS CLARA BROWN, MISS MILLER.

43. ORGANIZATION AND METHODS FOR RELATED ART-TEACHING. Organization of a related art course and methods of teaching art principles as applied to familiar objects and processes. MISS H. GOLDSTEIN.

46. OBSERVATION AND TEACHING: RELATED ART. A course similar to 47, but dealing with the teaching of related art. MISS CLARA BROWN, MISS BACON.

47. OBSERVATION AND TEACHING: FOODS AND HOME MANAGEMENT. Observation of teaching in regular classes; criticism and discussion of class practice, lesson plans, methods, result, and examinations; preparation of lesson plans, and directed teaching of foods and cookery, and home management. MISS MILLER.

48. OBSERVATION AND TEACHING: TEXTILES AND CLOTHING. A course similar to 47, but dealing with the teaching of textiles and clothing. MISS CLARA BROWN, MISS BACON, MISS EBERSOLE.

49. OBSERVATION AND TEACHING: GENERAL HOME ECONOMICS. A combination of 47 and 48 giving the student experience in teaching both fields of work. Required of students in the general teaching course. Those who have completed 46, 48, or 49 may register and receive 2 credits. MISS CLARA BROWN, MISS MILLER.

141. PROBLEMS IN HOME ECONOMICS EDUCATION. Problems of administration and supervision of home economics, study of curricula for the day, part-time and evening schools, consideration of home project, the hot lunch, and other related work.

HORTICULTURE

Professor WILLIAM H. ALDERMAN; Associate Professors WILFRID G. BRIERLEY, LEROY CADY; Assistant Professor WILLIAM T. TAPLEY; Instructors JOHN H. BEAUMONT, JOHN W. BUSHNELL, FRED A. KRANTZ; Extension Specialist ROGER S. MACKINTOSH.

COURSES

6. 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. MR. ALDERMAN.

21. SMALL-FRUIT CULTURE. Cultural practices for each of the small fruits. Brief consideration is given to their botanical relationships and the history of their commercial development. Lectures, problems, and survey of literature. MR. BRIERLEY.

32. VEGETABLE-GROWING. Fundamentals of vegetable-growing applied to commercial and home gardens, scope of vegetable-gardening and place in agriculture. Capital required, locations, soil, equipment, marketing, storage, systems of production. Cultural methods for the various crops. MR. TAPLEY, MR. BUSHNELL.

33. VEGETABLE-FORCING. Commercial growing of vegetables in the greenhouse; types, construction, and management of forcing structures, soils, fertilization, soil sterilization, relation of industry to out-door vegetable-farming, crop production, and marketing. MR. TAPLEY.

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. MR. CADY.

56. PROPAGATION AND NURSERY PRACTICE. Methods of propagating plants by seed, cuttings, layers, and grafting. Practical work in management of nursery stock, bulbs, and plants. Lectures, reference reading, and field trips. MR. CADY.

72. PLANT MATERIALS. Trees, shrubs, herbaceous plants, their native habitats and soils. A working knowledge of plant materials and their use in landscape design. Lectures, assigned readings, and problems. MR. CADY.

73. HISTORY OF LANDSCAPE DESIGN. Literature and development of landscape design and of the influences that have affected the different periods of the history. Lecture and assigned readings. MR. CADY.

74. PRINCIPLES OF LANDSCAPE DESIGN. Simple composition as applied to landscape-designing. Methods of presentation, drafting, and a study of the principles involved in landscape-planning especially of small properties. Lectures and laboratory.

75. LANDSCAPE DESIGN I. Landscape design as applied to country estates, city parks, play grounds and public institutions. Lectures, field trips, assigned readings, and reports.

76. LANDSCAPE DESIGN II. A continuation of 75. Landscape design as applied to larger landscape problems. Lectures, field trips, assigned readings, and reports.

91. ADVANCED GENERAL HORTICULTURE. For students in agricultural education. Emphasis given to advanced problems in orchard and garden management, judging and exhibiting, management of school gardens, ornamental planting of home and school grounds. MR. ALDERMAN, MR. CADY, MR. TAPLEY.

93. JUDGING HORTICULTURAL CROPS. The principles and practice of judging and exhibiting fruits, vegetables, and flowers. MR. ALDERMAN. MR. BRIERLEY, MR. CADY, MR. TAPLEY.

107. ORCHARD MANAGEMENT. A detailed study of the various operations in orchards and berry fields. Operating costs and profits. Lectures, laboratory, and individual problems. MR. BRIERLEY.

109. PRINCIPLES OF GENETICS. Lectures and laboratory work designed to familiarize the student with the underlying principles of breeding, heredity, variation, biometry, and evolution are emphasized. Same as Agronomy 131. MR. BEAUMONT, MR. HAYES.

110. HORTICULTURAL CROP-BREEDING. Applied genetics are emphasized. The method of breeding each of the important horticultural crops with special attention to experiment station investigations and to the methods used by plant breeders. MR. BEAUMONT.

111. SYSTEMATIC POMOLOGY. Fruit varieties. Classification, description, identification, and elements of judging. Lectures, laboratory, and a survey of the literature. MR. ALDERMAN, MR. BRIERLEY.

131. ADVANCED VEGETABLE PRODUCTION. The business of vegetable-gardening, special problems, variety improvement, production of seed, investigation and research, reviews and reports on recent literature. MR. TAPLEY.

132. SYSTEMATIC OLERICULTURE. The origin, botany, varieties, and types of the different vegetables, their characteristics and adaptation to different cultural and market conditions, identification and classification studies, judging and exhibiting. MR. TAPLEY.

133. COMMERCIAL TRUCK-GROWING. Truck-growing centers of the United States, cultural methods, special machinery and equipment, market methods, shipping points. Adaptation of the truck crops to Minnesota, commercial production for canneries, handling and shipping. MR. TAPLEY.

135. POTATO PRODUCTION. Origin, botany, regional distribution, economic importance, group classification, standardization of varieties according to soil, climate, and markets. Identification, exhibiting, judging, cultural methods, seed selection and certification, marketing and utilization. MR. KRANTZ.

151. ADVANCED FLORICULTURE. Lectures, assigned readings, laboratory, and special problems dealing with the culture, botany, and history of florists' plants and methods of greenhouse management. MR. CADY.

191-192. SPECIAL PROBLEMS. Problems based upon the work given in the preceding courses. MR. ALDERMAN.

193-194-195. HORTICULTURAL SEMINAR. Reports and discussions of problems and investigational work. Horticultural staff.

MILITARY SCIENCE AND TACTICS

Professor GIRARD STURTEVANT, Colonel, Infantry; Assistant Professors JAMES E. WARE, Lieutenant Colonel, Retired; HENRY H. RUTHERFORD, Lieutenant Colonel, Medical Corps; LAURENCE T. WALKER, Major, Coast Artillery Corps; LEE R. WATROUS, JR., Major, Coast Artillery Corps; FREDERICK R. WUNDERLICH, Major, Dental Corps; EDWARD G. SHERBURNE, Major, Infantry; JAMES E. WATSON, Captain, Signal Corps; NEWTON W. SPEECE, Captain, Infantry; ANDREW C. TYCHSEN, Captain, Infantry; RUSSELL C. THROCKMORTON, Captain, Infantry; LEO J. FARRELL, Captain, Infantry; HAL M. ROSE, Captain, Cavalry; Instructors JOSEPH HAVLICEK, Regimental Commissary Sergeant, Retired; CARL JENSEN, Regimental Supply Sergeant, Retired; JOHN MCWILLIAMS, 1st Sergeant, Retired; HENRY DAHL, 1st Sergeant,

Retired; HARRY E. STRIDER, Technical Sergeant, Signal Corps; ALFRED BRANDT, Technical Sergeant, Infantry; AUBREY DUNKUM, Staff Sergeant, Coast Artillery Corps; CLARENCE E. LANGE, Sergeant, Field Artillery; JOE WEIR, Sergeant, Infantry; EDMUND T. MCCANN, Sergeant, Infantry; HENRY W. BROWN, Sergeant, Coast Artillery Corps; EARL J. BLONSCHINE, Private, 1st Class, Coast Artillery Corps.

COURSES

1-2-3. FIRST-YEAR BASIC COURSE R.O.T.C. Practical instruction in schools of the soldier, company, and battalion; signals, ceremonies, first aid.

4-5-6. SECOND-YEAR BASIC COURSE R.O.T.C. Practical and theoretical instruction in schools of the company and battalion; advance and rear guard drill; practical and theoretical instruction in guard duty. Gallery practice. Ceremonies. Infantry, coast artillery, and signal corps.

51-52-53. FIRST-YEAR ADVANCED COURSE R.O.T.C.

54-55-56. SECOND-YEAR ADVANCED COURSE R.O.T.C.

MUSIC

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor CARLYLE M. SCOTT; Assistant Professor DONALD N. FERGUSON; Instructors GEORGE FAIRCLOUGH, GERTRUDE HULL, ABE PEPINSKY, GERTRUDE REEVES, KARL SCHEURER.

General statement.—Credit is offered to students in the College of Agriculture, Forestry, and Home Economics who may wish to elect work in the Department of Music. Nine credits may be obtained. The following courses are recommended:

COURSES

1-2-3. HARMONY. Chords, their construction, relations, and progressions. Written exercises on basses, the harmonization of given melodies. MR. SCOTT.

10-11-12. ORGAN. MR. FAIRCLOUGH.

16-17-18. PIANOFORTE. Open to juniors who have mastered technical difficulties of the degree of Czerney's *School of Velocity* and the easier Haydn and Mozart sonatas. MR. SCOTT, MR. FERGUSON, MISS REEVES.

22-23-24. VIOLIN. Candidate must be able to play the first ten of Kreutzer's forty etudes, and easier Handel and Mozart sonatas. MR. SCHEURER.

28-29-30. VOICE. MISS HULL.

40-41-42. ORCHESTRA. MR. PEPINSKY.

43-44-45. CHOIR. MR. SCOTT.

46-47-48. APPRECIATION OF MUSIC. A non-technical course.

PHYSICAL EDUCATION

FOR MEN

Professors FRED W. LUEHRING, Director; T. NELSON METCALF; Associate Professor LOUIS J. COOKE, Assistant Director; Assistant Professor WILLIAM K. FOSTER; Instructors EDWIN S. BROWN, PERCY C. GLIDDEN, CARL B. ROEMER; Assistants FRANK GILMAN, HARRY GOLDIE, FRED W. WHITTEMORE.

General statement.—The purpose of the department is to provide all men of the University opportunity for exercise in order to maintain and build up their general health. It also provides special training for the correction of physical defects and functional derangements.

A physical examination is required of all new matriculants, and of all others using the department privileges, at the beginning of the year, and as often during their college course as their physical condition may indicate. Students taking the required work in physical education are examined at the close of the year. A study of these records shows a marked improvement in the standard of health of the average student during his college course.

The gymnasium, swimming-pool, and baths are open to all students of the University, who are free to use the apparatus and to pursue a course in physical training under the supervision of the director and his assistants.

Those students taking the required course in physical education, who can not swim must make a reasonable effort, as determined by the department, to pass the swimming and life-saving requirements, and will be assigned special hours for instruction.

COURSES

1. PERSONAL HYGIENE. Two hours per week; first six weeks of each quarter. Examination at close of course. DR. COOKE, DR. BROWN, MR. FOSTER.

2-3-4. GYMNASIUM AND SWIMMING. Two hours a week for the winter quarter. Required qualifications in swimming, life-saving, bar-vaulting, jumping, sprinting, running, and on heavy apparatus. MR. FOSTER, MR. GLIDDEN, MR. ROEMER.

5-6-7. ADVANCED LEADERS. Three hours a week. MR. FOSTER.

8-9-10. CORRECTIVE GYMNASTICS. Three to six hours a week instead of regular gymnasium or military drill in case of physical disability. DR. BROWN.

11-12. WRESTLING. Three times per week. Students admitted by special assignment. MR. GILMAN.

13-14-15. INTERMEDIATE SWIMMING. Life-saving, efficiency swimming, and fancy diving. Instruction is given in rescuing and restoring the apparently drowned and other useful swimming accomplishments. MR. GLIDDEN.

16-17-18. ADVANCED SWIMMING. Life-saving, efficiency swimming, and fancy diving. Instruction is given in rescuing and restoring the apparently drowned and other useful swimming accomplishments. MR. GLIDDEN.

19-20. BOXING. By special arrangement a few students may be accommodated in this class which meets twice a week. MR. GOLDIE.

21-22-23. INTRAMURAL ATHLETICS. Competitive games in the various athletic leagues in football, basket-ball, hockey, track, field events, baseball, tennis, swimming, bowling, etc. MR. WHITTEMORE.

PHYSICAL EDUCATION FOR WOMEN

Professor J. ANNA NORRIS; Assistant Professors MAY S. KISSOCK, ALICE H. TOLG; Instructors GERTRUDE M. BAKER, HENRIETTA BROWNING.

General statement.—This department aims primarily to promote the health of the women students. It gives physical examination and advice to all on entrance; plans systematically to keep in close touch with them during their first year in college; conducts yearly consultations with, and examines when necessary, all upper-class students; gives courses in hygiene; organizes physical work to meet the varying needs and physical tastes of students; coöperates closely with the Women's Athletic Association in encouraging and organizing athletic sports; holds regular office hours for the purpose of consultation with all students who desire its advice.

Work in this department is required of all newly entering students (see Courses 1-2-3 and 4), of all sophomores who can not pass the swimming examination (see Courses 22-23), and of all students permitted, for reasons connected with their physical condition, to carry less than the minimum number of credit hours. Physical examinations or consultations required annually of all students.

Elective classes arranged in gymnastics, dancing, swimming, field-hockey, basket-ball, and other organized games.

For a special four-year professional course designed to prepare graduates for the responsible direction of physical education activities see bulletin of the College of Education.

Six credits is the maximum number that can be gained by taking courses in exercise (Course 34-35-36, 40-41-42, 43-44-45).

Shower Bath Fees.

Elementary Physical Training, per quarter	$2.50
All other exercise courses including swimming, per quarter	2.00
Maximum fee for two or more courses, per quarter	3.50

COURSES

1-2-3. ELEMENTARY PHYSICAL TRAINING. Lighter forms of gymnastics, apparatus work, orthopedic exercise, folk dancing, indoor and outdoor games. Individual health consultations. MISS KISSOCK, DR. TOLG, MISS BROWNING.

4. PRELIMINARY HYGIENE. One lecture a week. The most essential aspects of the care of the personal health. DR. NORRIS.

7-8-9. SOPHOMORE PHYSICAL TRAINING. Floor work, apparatus, and indoor and outdoor games.

10-11-12. SOPHOMORE ORTHOPEDIC GYMNASTICS. For those not able to take regular class work.

13-14-15. SOPHOMORE INTERPRETIVE DANCING. An art and a phase of physical education designed to develop a sense of beauty and body control through rhythmic movements prompted by the imagination. MISS BAKER.

16-17-18. SOPHOMORE ORGANIZED GAMES AND FOLK DANCES. Suitable in strength for C-D girls. Conducted outdoors when weather permits.

19-20-21. SOPHOMORE MAJOR SPORTS. Hockey in fall, basket-ball in winter, baseball in spring. Suitable in strength for A-B girls. MISS KISSOCK.

22-23. SOPHOMORE ELEMENTARY SWIMMING. For beginners.

28-29. SOPHOMORE ADVANCED SWIMMING.

32. PERSONAL HYGIENE. Care of the personal health; elements of anatomy and physiology. MISS BROWNING.

33. HYGIENE OF THE FAMILY. Eugenics, prenatal care, maternity, puberty, sex education. DR. NORRIS.

35. INTERMEDIATE PHYSICAL TRAINING. Gymnastics and apparatus work. Written abstracts of prescribed reading.[1]

37. GENERAL SWIMMING. For both beginners and advanced swimmers and divers. Shower bath tickets may be bought of the matron. No registration necessary.

43-44-45. FOLK DANCING AND ORGANIZED GAMES. Graded games, folk dances, and track for school and playground, two hours. A consideration of nature and function of play and practical conduct of playgrounds, one hour.[1] MISS KISSOCK.

46-47-48. HOCKEY, BASKET-BALL, AND BASEBALL. Hockey in autumn, basket-ball in winter, baseball in spring. MISS KISSOCK.

66-67-68. INTERPRETIVE DANCING. An art and a phase of physical education designed to develop a sense of beauty and body control through rhythmic movements prompted by the imagination. MISS BAKER.

[1] If taken for no credit no reading will be requested.

PHYSICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors HENRY A. ERIKSON, ANTHONY ZELENY; Assistant Professor LOUALLEN F. MILLER; Instructor JOSEPH VALASEK.

COURSES

1. ELEMENTS OF MECHANICS AND SOUND. Mechanics of solids, fluids, wave motion, and sound. A study of the simpler fundamental principles. First part of a general course 1, 21, 31, 41. Course 2 should be taken in conjunction with this course. MR. ERIKSON.

2. ELEMENTS OF MECHANICS LABORATORY. Measurements in the mechanics of solids, fluids, and wave motion; the laboratory part supplementing Course 1. MR. ERIKSON.

9. ACOUSTICS. Fundamental principles of sound. Designed primarily for the students in the Department of Music. Open also to other students. MR. ERIKSON.

21. HEAT. The principles underlying heat phenomena. Course 22 should be taken in conjunction with this course. MR. MILLER.

22. HEAT LABORATORY. The laboratory part supplementing Course 21. MR. MILLER.

31. OPTICS. The principles underlying light phenomena. Course 32 should be taken in conjunction with this course. MR. VALASEK.

32. OPTICS LABORATORY. The laboratory part supplementing Course 31. MR. VALASEK.

41. MAGNETISM AND ELECTRICITY. The principles underlying magnetic and electric phenomena. Course 42 should be taken in conjunction with this course. MR. ZELENY.

42. MAGNETISM AND ELECTRICITY. The laboratory part supplementing Course 41. MR. ZELENY.

PHYSIOLOGY

MEDICAL SCHOOL

Professors ELIAS P. LYON, JESSE F. MCCLENDON, FREDERICK H. SCOTT; Associate Professors RICHARD O. BEARD, FRANCIS B. KINGSBURY, CHAUNCEY J. V. PETTIBONE; Assistant Professor CHARLES C. GAULT.

COURSES

4. HUMAN PHYSIOLOGY. Lectures and laboratory work. DR. LYON, DR. BEARD, or DR. GAULT, and assistants.

57-58.[1] HUMAN PHYSIOLOGY. An intermediate course. DR. LYON, DR. SCOTT, DR. GAULT, and assistants.

59. PHYSIOLOGIC CHEMISTRY. Intermediate course. DR. PETTIBONE and assistants.

100-101. PHYSIOLOGIC CHEMISTRY. The components of the animal body; foods, digestion, the excreta and metabolism. DR. MCCLENDON, DR. PETTIBONE, DR. KINGSBURY, and assistants.

103. PHYSIOLOGY OF MUSCLE, NERVE, BLOOD, CIRCULATION, AND DIGESTION. DR. LYON, DR. SCOTT, DR. GAULT, and assistants.

104. PHYSIOLOGY OF THE NERVOUS SYSTEM AND SPECIAL SENSES. Respiration, metabolism, nutrition, and excretion. DR. LYON, DR. SCOTT, DR. BEARD, and assistants.

PLANT PATHOLOGY AND BOTANY

Professors EDWARD M. FREEMAN, ELVIN C. STAKMAN; Assistant Professor ALVIN H. LARSON; Instructors HENRY D. BARKER, LOUISE DOSDALL, JULIAN G. LEACH, JAMES L. SEAL; Extension Specialist RAYMOND C. ROSE.

COURSES

1. PLANT PATHOLOGY. Plant diseases due to fungi, bacteria, and slime molds; life histories and preventive methods. Lectures, laboratory, and reference. Not open to those who have completed 10. MR. STAKMAN, MR. LEACH, MR. SEAL.

7-8. WEEDS AND GRASSES. Agricultural and applied botanical study of weeds and grasses with special reference to agricultural importance. MR. LARSON.

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. MR. LARSON.

10. FOREST PATHOLOGY. Diseases of forest and shade trees, and the rotting of timber. Symptoms, etiology, and control. Lectures, laboratory, and reference work. Not open to those who have completed 1. MR. STAKMAN, MR. LEACH, MR. SEAL.

12. SEED PROBLEMS. Special seed problems are assigned. Advanced work in seed-testing methods. MR. LARSON.

14. PLANT DISEASE CONTROL. A detailed study of methods of controlling diseases of plants of parasitic origin. Spray materials and spray machinery. Practical applications. MR. BARKER.

[1] Courses 57-58 and 59 constitute a sequence recommended for students who wish a knowledge of human physiology, but who do not desire the detailed consideration given in Courses 100-101, 103, and 104. A student can not receive credit for both of these sequences.

ADVANCED COURSES

105-106-107. MYCOLOGY. Morphology, taxonomy, and biology of fungi. Lectures, laboratory, greenhouse, and field work. MISS DOSDALL.

108. METHODS. Plant pathological methods including mycological and bacteriological technique. Laboratory, lecture, and greenhouse work. Special problems. MR. LEACH.

110. PRINCIPLES OF PATHOLOGY. Comparative biology of plant pathogens; pathological plant anatomy; parasitism, biological, specialization, resistance, and immunity. MR. STAKMAN, MR. BARKER.

111. DISEASES OF FIELD CROPS. Detailed study of diseases of cereal and forage crops, including symptomatology, etiology, and practical methods of control. Laboratory, lecture, and field work. MR. STAKMAN, MR. BARKER.

112.[1] DISEASES OF FRUIT CROPS. Special study of diseases of fruit crops, especially those important in Minnesota. Laboratory, lecture, and greenhouse work. (Given in alternate years. Offered in 1922-23.) MR. LEACH.

113.[1] DISEASES OF VEGETABLE CROPS. A detailed study of diseases of potatoes and other vegetable crops. Lecture, reference, laboratory and greenhouse work. MR. LEACH.

114. ADVANCED FOREST PATHOLOGY. A detailed study of wood rots, including a study of the deterioration of wood products caused by fungi. Lectures, laboratory, and greenhouse work. MR. STAKMAN, MR. LEACH.

POLITICAL SCIENCE

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors CEPHAS D. ALLIN, ROBERT E. CUSHMAN, JEREMIAH S. YOUNG.

COURSES

1. AMERICAN GOVERNMENT. Organization and actual workings of the national government; nature and origin of the American governmental system.

7. STATE GOVERNMENT. Comparison of American state governments, especially Minnesota; relation of states to the United States and to local units of government; recent experiments such as initiative and referendum, the recall and primaries; social and economic legislation. MR. CUSHMAN.

51-52-53. BUSINESS LAW. Principles covering ordinary business transactions, contracts—formation, operation, interpretation, breach, and

[1] Courses 112 and 113 will ordinarily alternate with each other. One but not both will be given in 1922-23.

discharge. Agency and service. Negotiable instrument. Business associations—partnership and private corporations. Properties—personal and real. MR. YOUNG.

POULTRY HUSBANDRY

ANIMAL INDUSTRY GROUP

Professor ARTHUR C. SMITH; Extension Specialists NORTON E. CHAPMAN, CORA E. COOKE.

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. MR. 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. MR. 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. MR. SMITH.

5. ADVANCED POULTRY-JUDGING. Practice in close selection for standard values of all different color patterns and principal types; mating to produce high standard quality. MR. SMITH.

PSYCHOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Associate Professors RICHARD M. ELLIOTT, WILLIAM S. FOSTER, KARL S. LASHLEY, DONALD G. PATERSON, HERBERT WOODROW; Lecturer HARRY M. JOHNSON.

COURSES

1-2. GENERAL PSYCHOLOGY. An introductory survey of psychology; its material, fundamental laws, applications, and relations to other sciences. Two lectures, one recitation per week. MR. ELLIOTT, MR. FOSTER.

1-6. GENERAL PSYCHOLOGY FOR BUSINESS STUDENTS. Offered only to business and pre-business students. MR. ELLIOTT, MR. FOSTER, MR. PATERSON.

3. PSYCHOLOGY APPLIED TO DAILY LIFE. Measurement of mental traits, development of intelligence, organization of personality, with applications to selected problems in medicine, law, education, sociology, and daily life. MR. ELLIOTT, MR. FOSTER, MR. PATERSON.

4-5. INTRODUCTORY LABORATORY PSYCHOLOGY. Simple experiments providing the beginner illustrative material and training in the methods of laboratory psychology. Required for all advanced courses in general psychology. Four laboratory hours per week. MR. FOSTER and others.

7. INTRODUCTORY LABORATORY PSYCHOLOGY. Identical with 4-5. Eight laboratory hours per week. MR. FOSTER and others.

9. ANIMAL BEHAVIOR. An account of the evolution of instinct, habit, and intelligence in animals. The application of animal studies to problems of human psychology. Lectures, demonstrations, and reading on assigned topics. MR. LASHLEY.

101-102-103. EXPERIMENTAL PSYCHOLOGY. The theory and technique of leading methods of experimental investigation in human psychology. Individual minor research problems in the third quarter. One lecture, four laboratory hours per week. MR. WOODROW, MR. JOHNSON.

108-109. ADVANCED GENERAL PSYCHOLOGY. A systematic presentation of the laws of the normal, adult mind, based upon the study of experimental results. Lectures, recitations, and reports. MR. JOHNSON.

114-115. HUMAN BEHAVIOR. An analysis of the development and organization of human behavior. Consciousness or mind, as properties of the living body, are discussed in their dependence upon response. MR. ELLIOTT.

124. PSYCHOLOGY OF LEARNING. Critique of current theories concerning the nature of the learning process. Problems and methods bearing upon the physiology of learning. Not open to students who take neuropsychology. MR. LASHLEY.

125-126. PSYCHOLOGY OF INDIVIDUAL DIFFERENCES. Experimental and statistical study of the influence of sex, race, immediate ancestry, and environment, in the causation of individual differences in mental traits. Each student participates in investigation of problems and in analysis of results. MR. PATERSON.

RURAL PUBLICATIONS AND JOURNALISM

Professor WILLIAM P. KIRKWOOD; Extension Specialist EDWIN C. TORREY.

General statement.—The aim of this division is to give practical training in agricultural journalism and in agricultural publicity and bulletin-writing.

COURSES

10-11-12. AGRICULTURAL JOURNALISM. Gathering and writing agricultural news and writing articles for the agricultural press and other class papers; farm paper-editing. Lectures and practical work. MR. KIRKWOOD.

19. AGRICULTURAL PUBLICITY. Mediums and methods through which information may be brought to attention of communities and people of the open country. MR. KIRKWOOD.

RHETORIC

Assistant Professors ROBERT C. LANSING, HARRY J. BURTIS; Instructors MINNIE M. CLAUSEN, RUTH MOHL, EVELYN A. TRIPP.

General statement.—Rhetoric credits will not be granted officially until the close of the second quarter of the senior year.

Any instructor who finds that a student is deficient in English will submit the name of the student together with the evidence to the chairman of the Students' Work Committee. If the evidence warrants, the committee will send the student to the Section of Rhetoric for such additional work in English as is needed. This work the student must take, without credit, to validate his freshman and sophomore rhetoric credits.

Students whose work in the rhetoric courses shows at any time an inadequate knowledge of the conventions of English will be required to drop the course and enter a class in elementary rhetoric. These students will be required to complete three additional credit hours in rhetoric.

COURSES

1. RHETORIC I. Note-taking, gathering and organizing material, oral and written exposition, paragraph structure, supplementary reading. MR. LANSING, MISS CLAUSEN, MISS TRIPP.

2. RHETORIC II. Sentence structure, diction, exposition, supplementary reading. MR. LANSING, MISS CLAUSEN, MISS TRIPP.

3. RHETORIC III. Description, narration, supplementary reading. MR. LANSING, MISS CLAUSEN, MISS TRIPP.

4. ELEMENTARY RHETORIC. Elementary grammatical and rhetorical principles. MISS TRIPP.

11. ARGUMENTATION. Gathering evidence, reasoning, briefing, formal and informal argument, persuasion, debating. MR. LANSING, MR. BURTIS.

22. PUBLIC SPEAKING. A practical course in fundamentals of speech-making. Rules of order and practice in conducting assemblies included. MR. BURTIS.

24. ADVANCED PUBLIC SPEAKING. Problems of speech and leadership of county agents, teachers, and college graduates in general. MR. BURTIS.

31. SURVEY OF ENGLISH LITERATURE I. Survey of English literature of the sixteenth, seventeenth, and eighteenth centuries. MR. LANSING.

32. SURVEY OF ENGLISH LITERATURE II. Survey of English literature of the nineteenth century. MR. LANSING.

ROMANCE LANGUAGES

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors EVERETT W. OLMSTED, IRVILLE C. LECOMPTE, COLBERT SEARLES; Associate Professors RUTH S. PHELPS; Assistant Professors FRANCIS B. BARTON,[1] JULES T. FRELIN, JOSEPH E. GILLET, GUSTAVE VAN ROOSBROECK; Professorial Lecturer ANTONIO HERAS; Instructor NELSON F. COBURN.

COURSES

French

1-2. BEGINNING FRENCH.

3-4. INTERMEDIATE FRENCH.

20. ORAL AND WRITTEN FRENCH.

21-22-23. SURVEY OF FRENCH LITERATURE. An outline of the history of French literature from 1600 to present day. MR. SEARLES, MR. LECOMPTE, MR. VAN ROOSBROECK.

50-51-52. ELEMENTARY FRENCH CONVERSATION. MISS PHELPS, MR. FRELIN.

53-54-55. ELEMENTARY FRENCH COMPOSITION. MISS PHELPS, MR. FRELIN.

Spanish

1-2. BEGINNING SPANISH.

3-4. INTERMEDIATE SPANISH.

20. ORAL AND WRITTEN SPANISH.

50-51-52. SPANISH CONVERSATION. MR. COBURN.

53-54-55. SPANISH COMPOSITION. MR. COBURN.

65-66-67. SURVEY OF SPANISH LITERATURE. An outline of the history of Spanish literature from 1500 to the present day. MR. GILLET.

SOCIOLOGY AND SOCIAL WORK

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor LUTHER L. BERNARD; Associate Professor MANUEL C. ELMER; Assistant Professors ROSS L. FINNEY, GUSTAV A. LUNDQUIST; Lecturers OTTO W. DAVIS, WILLIAM W. HODSON; Instructors LOUIS A. BOETTIGER, HUGH S. CARTER, CHARLES R. HOFFER, LEE O. LANTIS, GEORGE S. H. ROSSOUW.

COURSES

1. INTRODUCTION TO SOCIOLOGY. Origin and development of human societies; various agencies which have determined the type of social life; social organization, institutions, and progress; bearing of sociology upon other

[1] Absent on leave, 1922-23.

social sciences and arts. MR. BERNARD, MR. ELMER, MR. FINNEY, MR. LUNDQUIST, MR. BOETTIGER, MR. CARTER, MR. HOFFER, MR. LANTIS, MR. ROSSOUW.

3. EDUCATIONAL SOCIOLOGY. The school as a community factor; the present peculiar relation of the school to social problems; the function of the school in these relations. (Same as Hist. and Philos. of Educ. 3.) MR. FINNEY.

6. MODERN SOCIAL REFORM MOVEMENTS. A survey of attempts to overcome certain social maladjustments; child labor, the city, bad housing, poverty, degeneracy; movements for public health, industrial democracy, social insurance, protection of infancy and youth, public recreation, etc. MR. ELMER, MR. FINNEY, MR. BOETTIGER, MR. ROSSOUW.

14. RURAL SOCIOLOGY. The background and evolution of country life; rural conveniences, communication, coöperation; rural social institutions, especially the family, school, church, and social center; rural leadership, surveys, organization, social agencies. MR. BERNARD, MR. LANTIS, MR. HOFFER, MR. LUNDQUIST.

51. THE OCCURRENCE OF THE SOCIALLY INADEQUATE. The significance of the socially inadequate in contemporary and industrial societies and the description of the methods used in their care.

52. ELEMENTARY CASE WORK. The methods of case work as applied to the treatment of the socially inadequate.

53. ELEMENTS OF CRIMINOLOGY. The causes of crime; nature of the criminal; criminal procedure; methods of treatment (prisons, reformatories, parole, probation); the juvenile offender, juvenile courts; preventive methods. MR. ELMER.

55. HOUSING PROBLEMS. An examination of housing evils and their causes; the various movements for the prevention or improvement of bad housing; town- and city-planning; garden cities. Lectures, readings, field work, and essay. MR. DAVIS.

60. 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. MR. HODSON.

101. SOCIAL ORGANIZATION. The organization and structure of social groups; the selection of group types and values; the disorganization and reorganization of institutions; purposive social organization. MR. BERNARD.

102. SOCIAL CONTROL. Nature, purpose, and methods of social control; institutional and non-institutional controls; the evolution of sanctions in social control; the revision of the social controls under the influence of modern science. MR. BERNARD.

110. METHODS OF COMMUNITY ORGANIZATION AND SOCIAL WORK IN SMALL TOWNS AND COUNTRY. Concrete problems and methods are emphasized. MR. BERNARD.

114. RURAL SOCIAL INSTITUTIONS. A detailed study of the problems of organization and efficiency of selected rural institutions, especially religious, educational, civic, and recreational. For advanced students. Lectures, discussion, reports. MR. LUNDQUIST.

119. THE FAMILY. The evolution of the family; its various forms and their relations to other social institutions; the service of the family in social evolutions; contemporary problems of the family (standards of living, birth rate, feminism, etc.) MR. ELMER.

120. SOCIAL PROGRESS. The basis for social progress in human nature; analysis of fundamental social institutions with regard to their contributions to human advance; necessary social readjustments to convert drift into progress. MR. BERNARD.

122. METHODS OF SOCIAL INVESTIGATION. Methods of gathering and presenting community facts; social statistics; social surveys. Lectures, problems, and field work. MR. ELMER.

123. SOCIAL STATISTICS. A study and analysis of social statistics and their bearing upon group life. The course is especially designed to give social workers and public health officials the training necessary to carry on their work successfully. MR. ELMER.

128. CHARITABLE ADMINISTRATION, FINANCE, AND PUBLICITY. Methods of organizing charitable agencies, of financing them, and of making the public aware of their work. Lectures and practice work. MR. DAVIS.

134. LEGAL PROTECTION OF THE CHILD. Relation of law to child welfare. A survey of existing children's protective legislation, of its administration and its future development. MR. HODSON.

140. HISTORY OF SOCIAL THEORY. A rapid survey of the leading social theories from the time of the Greeks, with special reference to the more recent development of sociology. The theories are related to their social backgrounds. Mr. Bernard.

141. CONTEMPORARY SOCIAL THEORY. An intensive study of developments in the social theory of the late nineteenth and twentieth centuries. MR. BERNARD.

SOILS

Professor FREDERICK J. ALWAY; Assistant Professor CLAYTON O. ROST; Instructor PAUL R. MCMILLER; Extension Specialist GEORGE H. NESOM.

COURSES

4. SOILS. Origin, formation, composition, and classification of soils; physical properties, moisture relations; principles of tillage. Lectures, laboratory and field work. MR. ROST.

5. SOIL FERTILITY. Principles of soil fertility; soil organisms; use of lime, commercial fertilizers, stable manure, and green manures in relation to crop production. Lectures and laboratory work. MR. ALWAY, MR. ROST.

101. CHEMICAL ANALYSIS OF SOILS. A laboratory course on the chemical examination of soils, including both fusion and extraction methods for mineral nutrients. MR. ROST.

102. SPECIAL PROBLEMS IN SOILS. Individual laboratory or field work upon some special soil problem in soil physics, soil chemistry, or soil management. Arrangement must be made in advance. MR. ALWAY.

104. SOIL-SURVEYING. Field practice in surveying soils and the preparation of soil maps. MR. MCMILLER.

105. MINNESOTA SOILS. Detailed study of the soils of Minnesota. Origin, formation, and classification; physical and chemical characteristics; moisture relations; response to manures, fertilizers, and soil amendments; naturally unproductive types and their reclamation. Lectures and laboratory. MR. ALWAY.

107. FERTILIZERS AND MANURES. Sources, composition, and uses of the various fertilizers, manures, and soil amendments. Lectures and laboratory work. MR. ROST.

108. PHYSICAL PROPERTIES OF SOILS. The determination of physical constants of soils, including mechanical composition, moisture equivalent, and hygroscopic coefficient. MR. MCMILLER.

VETERINARY MEDICINE

ANIMAL INDUSTRY GROUP

Professors CLIFFORD P. FITCH, WILLARD L. BOYD, MYRON H. REYNOLDS; Assistant Professors HOWARD C. H. KERNKAMP, WILLIAM A. BILLINGS; Instructor EARL A. HEWITT.

COURSES

2. ANATOMY OF DOMESTIC ANIMALS. Anatomy of the common farm animals with special reference to bones, muscles, and viscera. Lectures and demonstrations. MR. KERNKAMP.

3-4. COMPARATIVE PHYSIOLOGY. A recitation and lecture course in physiology with special reference to the physiology of domesticated animals. Special emphasis is given to digestion and metabolism. MR. HEWITT.

6. PHYSIOLOGY AND HYGIENE OF BREEDING. Anatomy and physiology of reproduction. Embryology, obstetrics, sterility, hygiene, and common diseases of breeding animals. MR. BOYD.

8. VETERINARY STUDIES. Study of causes, prevention, treatment of common diseases; simple surgical operations; lameness and unsoundness; common medicines. Planned especially for students taking only one quarter veterinary work. Not open to those who have completed 12-13. MR. REYNOLDS.

12. INFECTIOUS DISEASES. Etiology, morbid anatomy, symptomatology, diagnosis, prevention, and the basis of treatment of the common infectious diseases of animals. Special instruction will be given in preparation and use of vaccines, bacterins, serums, and antitoxins. Those who have completed Course 8 can obtain only half credit for this course. MR. FITCH, MR. BILLINGS.

13. NON-INFECTIOUS DISEASES. General principles of diagnosis, causes, morbid anatomy, symptomatology, prevention, and the basis of treatment of the non-infectious diseases of animals. Those who have completed Course 8 can obtain only half credit for this course. MR. BOYD.

101-102. ADVANCED ANATOMY OF DOMESTIC ANIMALS. Advanced study of the structures involved in the type, conformation, and nutrition of the common farm animals. Dissection of farm animals, including a study of the osseous, muscular, and other principal anatomical structures. Limited to nine students. MR. KERNKAMP.

103-104. ADVANCED COMPARATIVE PHYSIOLOGY. An advanced course in physiology of the domestic animals, including laboratory work with special emphasis on animal nutrition. MR. HEWITT.

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

TABULAR STATEMENT AND PROGRAM OF COURSES

1922-1923

TABULAR STATEMENT AND PROGRAM OF COURSES

CLASS HOUR SCHEDULE

	University Farm	Minneapolis Campus
I Hr	8:15- 9:05	8:30- 9:20
II Hr	9:15-10:05	9:30-10:20
III Hr	10:15-11:05	10:30-11:20
IV Hr	11:15-12:05	11:30-12:20
V Hr	12:15- 1:05	12:30- 1:20
VI Hr	1:30- 2:20	1:30- 2:20
VII Hr	2:30- 3:20	2:30- 3:20
VIII Hr	3:30- 4:20	3:30- 4:20
IX Hr	4:30- 5:20	4:30- 5:20

Convocation—Thursdays, IV Hour, University Armory

Final examinations.—Final examinations will be given during the last four days of the quarter. A detailed schedule will be published in the *Official Daily Bulletin.*

CLASS SCHEDULE

Other schools and colleges.—For programs of classes given in other schools and colleges of the University, not listed below, send to the registrar, University of Minnesota, Minneapolis.

Abbreviations.—The following abbreviations are used to indicate names of buildings, those marked with an asterisk (*) are located on the Minneapolis campus; all others are at University Farm.

A, *Armory
AB, *Animal Biology
Ad, Administration
BB, Beef Barn
C, *Chemistry
Ch, Agricultural Chemistry
DB, Dairy Barn
DH, Dairy Hall
DiH, Dining Hall
Ed, *Education
En, Agricultural Engineering
IA, *Institute of Anatomy
MA, *Mechanic Arts
ME, *Main Engineering
MH, *Millard Hall
MS, Meat Shop
Mu, *Music
P, *Pillsbury Hall
Ph, *Physics
PHP, *Public Health and Pathology
PP, Plant Pathology
Psy, *Psychology

FH, Farm House
F, *Folwell Hall
G, *Greenhouse
Gy, Gymnasium
HE, Home Economics
Hr, Horticulture
SS, Soil Survey
St, Stock Pavilion
UHS, *University High School
Ve, Veterinary
WGm, *Women's Gymnasium

Explanation of course numbers.—All undergraduate courses are numbered from 1 to 100. All courses open to undergraduates and graduates are numbered from 100 to 200. The letters f (fall), w (winter), and s (spring), indicate the quarters in which the course is offered. For example: 5f,w,s indicates that Course 5 is a one-quarter course given in the fall and repeated in the winter and again in the spring; 10f-11w-12s indicates that Course 10-11-12 is a three-quarter course running through three quarters; 25f,w-26w,s indicates a two-quarter course given in the fall and winter quarters and repeated in the winter and spring quarters.

See 1921-22 program in Dept of Agr. Catalog for 1921-22

PROGRAM

1922-23

AGRICULTURAL BIOCHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
2f	Quantitative Methods..... (5 cred.; jr., sr.; prereq., Chem. 10 cred.)	VI, VII, VIII, IX	MWF	7Ch	Mr. Willaman
3f,w,s†	Types of Carbon Compounds..... (6 cred.; soph., jr., sr.; prereq., Chem. 10 cred.)	I	MTWThFS	201Ch	Mr. Anderson
7f-8w	General Agricultural Biochemistry... (10 cred.; soph., jr., sr.; prereq., Chem. 10 cred.)				
	Lect.	II	TThS	201Ch	Mr. Anderson
	Lab.	VI, VII, VIII	MW	203Ch	Mr. Anderson
7w-8s	General Agricultural Biochemistry... (Same as 7f-8w)				
	Lect.	III	TThS	201Ch	Mr. Anderson
	Lab.	VI, VII, VIII	MF	203Ch	Mr. Anderson
15f,s	Principles of Animal Nutrition..... (3 cred.; jr., sr.; prereq., 7-8)	III	MWF	3St	Mr. Palmer
101f†-102w‡	Agricultural Quantitative Analysis... (6 cred.; jr., sr.; prereq., 7-8)	VI,VII,VIII	MWF	7Ch	Mr. Morrow
103s	Dairy Chemistry..... (5 cred.; jr., sr.; prereq., 7-8)				
	Lect.	VI	MWF	251Ch	Mr. Palmer
	Lab.	VII,VIII,IX	MWF	7Ch	Mr. Palmer
106f	Chemical Technology of Agricultural Products ..... (5 cred.; sr.; prereq., 101-102)	Ar	Ar	Ar	Mr. Bailey
108s‡	Chemistry of Wheat and Wheat Products ..... (3 cred.; jr., sr.; prereq., 3 or 7-8)	II	MWF	201Ch	Mr. Bailey
109s	Selected Flour Laboratory Methods.. (3 cred.; special students, see course descrip.; prereq., 101-102 or Chem. 131-132)	VI, VII, VIII, IX	MW	7Ch	Mr. Bailey
110s‡	Flour Laboratory Methods..... (5 cred.; jr., sr.; prereq., same as 109)	VI, VII, VIII, IX	MWF	7Ch	Mr. Bailey
111f†-112w‡	Phytochemistry ..... (6 cred.; sr.; prereq., Biol. 9 cred., org. chem.)	III	MWF	201Ch	Mr. Morrow
41w	Apprentice Teaching..... (Same as 41f)				
	Sec. 1	II	MWF	4Ad	Mr. Lathrop
	2*	VII	MTWThF**	UHS	Mr. Dickinson
41s	Apprentice Teaching..... (Same as 41f)	Ar	Ar	Ar	Mr. Field

† Offered also in the Summer Session.
‡ Offered also in the summer quarter (eleven weeks).

No.	Title	Hour	Day	Bldg.	Instructor
42f‖	Teaching ..... (3 cred.; jr., sr.;§¶ prereq., 41, Agron. 121, 122, 123)				
	Sec. 1	I	MWF	317Ad	Mr. Field, Mr. Dickinson
	2	II	MWF	317Ad	Mr. Field
	3	III	MWF	4Ad	Mr. Dickinson
	4	IV	MWF	4Ad	Mr. Field
42w	Teaching ..... (Same as 42f)				
	Sec. 1	I	MWF	317Ad	Mr. Field, Mr. Lathrop
	2	III	MWF	4Ad	Mr. Lathrop, Mr. Dickinson
	3	IV	MWF	317Ad	Mr. Field
	4	IV	MWF	4Ad	Mr. Lathrop
	5*	VII	MTWThF**	UHS	Mr. Dickinson
42s	Teaching ..... (Same as 42f)	Ar	Ar	Ar	Ar
63f-64w-65s	General Agriculture..... (9 cred.; no prereq.)	Ar	Ar	Ar	Mr. Storm, Mr. Mayne, Mr. Field
75w,s	Visual Presentation..... (3 cred.; jr., sr.; prereq., 11)				
	Lect.	VIII	M	317Ad	Mr. Dickinson
	Lab.	VIII, IX	WF	317Ad	
81s	Extension Work..... (3 cred.; jr., sr.; prereq., 6 cred. in farm mgt., 6 cred. in farm crops, 15 cred in an. ind., 6 cred. in agr. educ.)	VI	MWF	317Ad	Mr. Storm
82f,w,s†	Agricultural Extension Field Course (3 to 10 cred.; jr., sr.; prereq., 81††)	Ar	Ar	Ar	Mr. Storm
113f†-114w‡	Biochemical Laboratory Methods.... (4 cred.; sr.; prereq., quant. anal., parallel 111-112)	VI, VII, VIII	TTh	7Ch	Mr. Morrow
116w	Advanced Animal Nutrition..... (2 cred.; jr., sr.; prereq., 15 or equiv.)	III	TTh	251Ch	Mr. Palmer, Miss Kennedy
117f,w,s‡	Laboratory Problems in Animal Nutrition ..... (3 to 5 cred.; jr., sr.; prereq., 116, instructor's permission)	Ar	Ar	Ar	Mr. Palmer, Miss Kennedy
118f,w,s‡	Laboratory Problems in Biochemistry (3 or 5 cred.; sr.; prereq. 111-112, 113-114; or 103 or 110)	Ar	Ar	Ar	Ar

* Offered on Minneapolis campus.

** For part of quarter only.

† Offered also during the Summer Session.

†† Broad curriculum approved by the Agricultural Education Division and a position approved by the Agricultural Extension Division are also prerequisites to this course.

‖ It may be possible for a limited number to take this course in the spring quarter. Approval of Mr. Field is required before registering.

§ Offered only to those preparing to teach.

¶ Registration limited. Students are admitted to this course only when approved by Mr. Field.

AGRICULTURAL ECONOMICS

See Economics, page 120.

AGRICULTURAL EDUCATION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
11f	Principles of Vocational Education.. (3 cred.; jr., sr.§; no prereq.)	I	MWF	24Ad	Mr. Dyer
11w	Principles of Vocational Education.. (Same as 11f)	II	TThS	307Ad	Mr. Dyer
11s	Principles of Vocational Education.. (Same as 11f)	I	MWF	317Ad	Mr. Dyer
21f	Vocational Education..... (3 cred.; jr., sr.§; no prereq.)	III	TThS	307Ad	Mr. Mayne
41f	Apprentice Teaching..... (2 cred.; jr., sr.§¶; prereq., 131)				
	Sec. 1	IV	MWF	317Ad	Mr. Dickinson
	2*	VII	MTWThF	UHS	Mr. Dickinson
121w	Teachers' Course, Home and School Gardening ..... (2 cred; prereq., division approval)	Ar	Ar	Ar	Mr. Field
131f,w,s‡	Methods in Teaching High School Agriculture ..... (5 cred.; jr.,** sr.§; prereq., 11)	III	MTWThF	317Ad	Mr. Field
151w,s	Organization and Management..... (5 cred.; sr.; prereq., 11, 21)	IV	MTWFS	317Ad	Mr. Storm, Mr. Dyer, Mr. Lathrop
153f,‡	Consolidated Rural Schools..... (3 cred.; jr., sr.; no prereq.§)	I	TThS	317Ad	Mr. Dyer
154f	Rural Education and Community Life (3 cred.; jr., sr.; no prereq.)	II	TThS	317Ad	Mr. Dyer
154w‡	Rural Education and Community Life (Same as 154f)	I	TThS	317Ad	Mr. Dyer
155s	Consolidated Rural School Problems (3 cred.; jr., sr.; prereq., 11, 153 or equiv.)	Ar	Ar	Ar	Mr. Dyer
161f-162w-163s	Fundamentals of Agriculture..... (9 cred.; jr., sr.§; no prereq.)	Ar	Ar	Ar	Mr. Storm
164w‡	Fundamentals of Agriculture..... (3 cred.; consol. school princ.)	Ar	Ar	Ar	Mr. Field
176s‡	Advanced Visual Presentation..... (3 cred.; jr., sr.; prereq., 75)	Ar	Ar	Ar	Mr. Dickinson
181w	Agricultural Statistics and Graphic Representation ..... (3 cred.; soph., jr., sr.; prereq., Farm Eng. 3, 11)	Ar	Ar	Ar	Ar

* Offered on Minneapolis campus.
** Open to juniors on the approval of the chief of the division.
‡ Offered also in the summer quarter (eleven weeks)
§ Offered only to those preparing to teach.
¶ Registration limited. Students are admitted to this course only when approved by Mr. Field.

No.	Title	Hour	Day	Bldg.	Instructor
191f-192w-193s¶	Seminar in Agricultural Education.. (6 cred.; sr.; prereq., Agr. Educ. 11 cred.)	Ar	Ar	Ar	Mr. Storm, Mr. Field, Mr. Dyer, Mr. Lathrop

AGRONOMY AND FARM MANAGEMENT

No.	Title	Hour	Day	Bldg.	Instructor
1f,w,s†	Farm Crops..... (3 cred.; no prereq.)	III, IV	MWF	2Ad	Mr. Steinmetz
11s	Farm Machinery..... (3 cred.; jr., sr.; no prereq.)	VI, VII, VIII	WF	BAd	Mr. Bassett
101s	Farm Management I..... (3 cred.; jr., sr.; prereq., 1, Econ. 6)	II	TThS	24Ad	Mr. Pond
102f	Farm Management II: Organization.. (3 cred.; sr.; prereq., 1, Econ. 6, An. Husb. 6 or 8, Soils 5)	II	MWF	24Ad	Mr. Boss, Mr. Garey
102w	Farm Management II: Organization (Same as 102f)	I	MWF	24Ad	Mr. Boss, Mr. Garey
103w	Farm Management II: Operation.... (3 cred.; sr.; prereq., 102)	II	MWF	24Ad	Mr. Boss, Mr. Garey
103s†	Farm Management II: Operation.... (Same as 103w)	I	MWF	24Ad	Mr. Boss, Mr. Garey
104s	Farm Management III..... (3 cred.; sr.; prereq., 101, 102)	II	MWF	24Ad	Mr. Boss
121f	Cereal Crops..... (3 cred.; jr., sr.; prereq., 1)				
	Sec. 1	VI, VII, VIII	TTh	2Ad	Mr. McGinnis
	2	VI, VII, VIII	WF	2Ad	
122w	Corn and Potato Crops..... (3 cred.; jr., sr.; prereq., 1)				
	Sec. 1	VI, VII, VIII	TTh	2Ad	Mr. McGinnis
	2	I, II	TThS	2Ad	
123s	Forage and Fiber Crops..... (3 cred.; jr., sr.; prereq., 1)				
	Sec. 1	VI, VII, VIII	TTh	2Ad	Mr. Arny
	2	I, II	MWF	2Ad	Mr. Steinmetz
131f	Principles of Genetics..... (3 cred.; jr., sr.; prereq., Bot. 9 cred., An. Biol. 9 cred.)				
	Lect.	I	ThS	24Ad	Mr. Griffee
	Sec. 1 Lab.	I, II	T	24Ad	Mr. Beaumont
	2	III, IV	T	212Hr	
	3	VI, VII	W	212Hr	
132s†	Farm Crops Plant-Breeding..... (3 cred.; jr., sr.; prereq., 131)	I	ThS	24Ad	Mr. Hayes
		I, II	T	4Ad	Mr. Griffee
133w	Judging and Grading Farm Crops... (3 cred.; jr., sr.; prereq., 121, 122)	I, II	MWF	2Ad	Mr. Arny

† Offered also in the Summer Session.

¶ Registration limited. Students are admitted to this course only when approved by Mr. Field.

ANIMAL BIOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
9f-10w*	Histology (10 cred.¶; soph., jr., sr.; prereq., 14-15-16)	III, IV	MTWFS	201,211AB	Mr. Downey
11s*	Cytology and Technique (5 cred.; soph., jr., sr.; prereq., 1-2 or 14-15-16)	III, IV	MTWFS	201,211AB	Mr. Nachtrieb
14f-15w-16s*	General Zoology, (Agr., For., and H. E.) (9 cred.¶; no prereq.)	VI, VII, VIII	TTh	101,313AB	Ar
17f*	General Physiology I (5 cred.; soph., jr., sr.; prereq., 14 cred. or 9 cred. and Chem. or Phys. 10 cred.)	VI, VII, VIII VI, VII, VIII, IX	MW F	10AB	Mr. Lund
18w*	General Physiology II (Same as 17f)	VI, VII, VIII VI. VII, VIII, IX	MW F	10AB	Mr. Lund
19s*	Principles of Animal Behavior (5 cred.; soph., jr., sr.; prereq., 14-15-16 or 14-15 and Chem. Phys., or Psychol. 10 cred.)	VI, VII, VIII VI, VII, VIII, IX	MW F	10AB	Mr. Lund
37f-38w-39s*	General Entomology (9 cred.‡; soph., jr., sr.; prereq., 14-15-16)	I, II	MWF	202AB	Mr Oestlund
44f*	Animal Parasites (3 cred.; prereq., 14-15-16)	VI, VII	MWF	202AB	Mr. Riley
44s*	Animal Parasites (Same as 44f)	VI, VII, VIII	WF	202AB	Mr. Riley
45	Relation of Insects to Disease (3 cred.; prereq. 1-2 or 14-15-16)	VI, VII, VIII	MW	208,210AB	Mr. Riley
46w-47s*	Ornithology (6 cred.‡; jr., sr.; prereq., 14-15-16)	VI, VII, VIII	TTh	211 314AB	Mr. Roberts
48s*	General Ecology (5 cred.; prereq., 14-15-16)	VI, VII, VIII VI, VII, VIII, IX	MW F	204AB	Mr. Chapman
107s*	Protozoology (3 cred.; jr., sr.; prereq., 14 cred. incl. 14-15-16)	I, II	MWF	211,213AB	Mr. Sigerfoos
109f-110w-111s*	General Physiology (15 cred.‡; jr., sr.; prereq., 10 cred.)	VI, VII VIII VI, VII, VIII, IX	MW F	10AB	Mr. Lund
117f-118w-119s*	Ecology of Insects (9 cred.‡; jr., sr.; prereq., 43)	VI, VII, VIII	TTh	204AB	Mr. Chapman
124†*	Advanced Ecology (5 cred.; jr., sr.; prereq., 117-118-119)	Ar	Ar	Ar	Ar
125f-126w-127s*	Advanced Entomology (9 cred.‡; jr., sr.; prereq., 37-38-39 or 43)	III, IV	TThS	204AB	Mr. Oestlund

* Offered on the Minneapolis campus.

† Offered also in the Summer Session.

‡ The full course must be completed before credit will be allowed.

¶ The full course must be completed before credit will be allowed except that students in Home Economics may receive credit for the first two quarters' work when Botany 8 has been satisfactorily completed.

No.	Title	Hour	Day	Bldg.	Instructor
130w*	Biology and Taxonomy of the Aphididae ..... (3 cred.; jr., sr.; prereq., 19 cred. incl. 14-15-16)	III, IV	MWF	204AB	Mr. Oestlund
139f-140w	Histology and Development of Insects ..... (6 cred.‡; jr., sr.; prereq., 37-38-39)	II, III, IV	TTh	324Ad	Mr. Riley
144f-145w-146s*	Animal Parasites and Parasitism.... (9 cred.‡; jr., sr.; prereq., 37-38-39)	VI, VII, VIII	WF	202AB	Mr. Riley
181f-182w*	Embryology ..... (6 cred.‡; jr., sr.; prereq., 11)	VI, VII	MWF	201,211AB	Mr. Nachtrieb
183s*	Genetics and Eugenics..... (3 cred.; jr., sr.; prereq., 14-15-16, 5 cred. in an. biol. or bot.)	VI	MWF	211AB	Mr. Nachtrieb

ANIMAL HUSBANDRY

ANIMAL INDUSTRY GROUP

No.	Title	Hour	Day	Bldg.	Instructor
2s	Livestock-Judging ..... (3 cred.; jr., sr.; prereq., 3-4 or 11-12)	III, IV	MWF	CSt	Mr. Anderson
3f-4w	Market Classes of Livestock.....	I	M	WSt	Mr. Ferrin
	(6 cred.; soph., jr., sr.; prereq., 1)	I, II	WF	WSt	Mr. Ferrin
5w	Livestock-Breeding ..... (3 cred.; jr., sr.; prereq., Agron. 131)	IV	MWF	3St	Mr. Peters
6w	Livestock-Feeding ..... (5 cred.; jr., sr.; prereq., Agr. Biochem. 15)	III	MTWFS	3St	Mr. Ferrin
7f	Meats ..... (3 cred.; sr.; prereq., 2, Agr. Biochem. 15)	VI, VII, VIII	TTh	MS	Mr. Anderson
8s	Fundamentals of Feeding..... (3 cred.; jr., sr.; prereq., Agr. Biochem. 15)	I	TThS	3St	Mr. Harvey, Mr. Rayburn
9s	Pedigrees and Herd Books..... (3 cred.; jr., sr.; prereq., 5)	II	TThS	3St	Mr. Ferrin
10f,w	Market Classes of Livestock..... (5 cred.; no prereq.)	I, II	MTWFS	CSt	Mr. Carnes
11f-12w	Types and Breeds of Livestock..... (6 cred.; soph., jr., sr.; prereq., 10)	Not offered in 1922-23			
101f	Advanced Stock-Judging..... (3 cred.; sr.; prereq., 2)	VII, VIII	MWF	CSt	Mr. Ferrin
102s	Horse Husbandry..... (3 cred.; jr., sr.; prereq., 2, 5, 6)				
	Lect.	II	TTh	WSt	Mr. Peters
	Lab.	VI, VII, VIII	F	CSt	
103s	Beef Cattle Husbandry..... (3 cred.; jr., sr.; prereq., 2, 5, 6)				
	Lect.	III	MW	WSt	Mr. Carnes
	Lab.	VI, VII, VIII	T	BB	

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

* Offered on the Minneapolis campus.

‡ The full course must be completed before credit will be allowed.

104s	Sheep Husbandry..... (3 cred.; jr., sr.; prereq., 2, 5, 6)				
	Lect.	IV	WF	3St	Mr. Anderson
	Lab.	VI, VII, VIII	M	CSt	
105s	Swine Husbandry..... (3 cred.; jr., sr.; prereq., 2, 5, 6)				
	Lect.	III	TS	3St	Mr. Ferrin
	Lab.	VI, VII, VIII	Th	CSt	
106w	Advanced Meats..... (3 cred.; jr., sr.; prereq., 7)	VI, VII, VIII	WF	MS	Mr. Anderson
107s	Meat Problems..... (3 cred.; sr.; prereq., 106)				
	Lect.	IV	TS	MS	Mr. Anderson
	Lab.	VI, VII, VIII	W	MS	
108s	Seminar ..... (3 cred.; sr.; prereq., 5, 6)	II	MWF	3St	Mr. Peters

ANTHROPOLOGY AND AMERICANIZATION TRAINING

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f*	Introduction to Anthropology..... (5 cred.; 3rd qr. fr., soph., jr., sr.; no prereq.)				
	Sec. 1	II	MWThFS	15F	Mr. Jenks
	2	VI	MTWThF	15F	Mr. Grace
1w*	Introduction to Anthropology..... (Same as 1f)	VI	MTWThF	15F	Mr. Grace
1s*	Introduction to Anthropology..... (Same as 1f)				
	Sec. 1	II	MWThFS	15F	Mr. Grace
	2	VI	MTWThF	25F	Mr. Grace
4w*	Cultural Anthropology..... (3 cred.; soph., jr., sr.; prereq., 1)	II	MWF	25F	Mr. Jenks
5f,w,s*	General Immigration..... (3 cred.; soph., jr., sr.; prereq., 1)	III	TThS	15F	Mr. Grace
12f,w,s	Ethnology ..... (3 cred.; soph., jr., sr.; prereq., 1)	II	TThS	25F	Miss Speaker
108s*	Philippine Peoples..... (3 cred.; jr., sr.; prereq., 3 courses)	II	MWF	25F	Mr. Jenks
112s*	The American Negro..... (3 cred.; jr., sr.; prereq., 3 courses)	IV	MWF	15F	Mr. Jenks
113f*	The Older Immigrants..... (3 cred.; jr., sr.; prereq., 3 courses)	III	MWF	15F	Mr. Jenks
114w*	The Newer Immigrants..... (3 cred.; jr., sr.; prereq., 3 courses)	III	MWF	15F	Mr. Jenks
115s*	Americanisms and Assimilation..... (3 cred.; jr., sr.; prereq., 3 courses)	III	MWF	15F	Mr. Jenks
117w*	The Immigrant Woman..... (3 cred.; jr., sr.; prereq., 3 courses)	II	TThS	15F	Miss Speaker
118f*	Government and the Immigrant..... (3 cred.; jr., sr.; prereq., 3 courses incl. 5)	IV	MWF	Ar	Mr. Grace

* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
120w*	The American Indian..... (3 cred.; jr., sr.; prereq., 3 courses incl. 12)	IV	MWF	25F	Mr. Grace
123w-124s*	Problems in Anthropology..... (6 cred.; jr., sr.; prereq., 3 courses)	Ar	Ar	Ar	Mr. Jenks

ARCHITECTURE

COLLEGE OF ENGINEERING AND ARCHITECTURE

No.	Title	Hour	Day	Bldg.	Instructor
21f-22w-23s*	Freehand Drawing..... (6 cred.; jr., sr.; no prereq.)				
	Sec. 1	II, III	MWF	401ME	Mr. Johnson
	2	VI, VII	MWF	401ME	Mr. Johnson

For additional courses see the bulletin of the College of Engineering and Architecture.

ART EDUCATION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
29f-30w-31s*‡	Fundamental Principles of Design... (9 cred.; no prereq.)				
	Lect.	III	TThS	401,404F	Miss Raymond
	Sec. 1 Lab.	II	TThS	401,404F	Mrs. Hanley
	2	IV	TThS	401,404F	Miss Raymond
32Af-33Aw-34As*	Still Life..... (3 cred.; no prereq.)				
	Sec. 1	I. II, III	M	401,404F	Miss Raymond
	2	II, III, IV	M	401,404F	Miss Raymond
32Bf-33Bw-34Bs*	Composition ..... (3 cred.; no prereq.)				
	Sec. 1	I, II, III	W	401,404F	Miss Raymond
	2	II, III, IV	W	401,402F	Miss Raymond
32Cf-33Cw-34Cs*	Sketch ..... (3 cred.; no prereq.)				
	Sec. 1	I, II, III	F	401,402F	Mrs. Martin
	2	II, III, IV	F	401,402F	Mrs. Hanley
	3	I	TThS	401,402F	Mrs. Hanley
40f-41w-42s*	Principles of Harmony in Form and Color ..... (9 cred.; soph., jr., sr.; prereq., 29-30-31 or instructor's permission)				
	Lect.	II	TThS	406F	Miss Raymond
	Sec. 1 Lab.	I	TThS	406F	Miss Raymond
	2	III	TThS	406F	Miss Raymond

For additional courses see the bulletin of the College of Education.

* Offered on the Minneapolis campus.

‡ Home Economics students with credit in H. E. 51 and 53 will be admitted to the last quarter of the course.

BACTERIOLOGY AND IMMUNOLOGY

MEDICAL SCHOOL

No.	Title	Hour	Day	Bldg.	Instructor
1f-w-s*†	General Bacteriology.....	VI,VII,VIII	MWF	MH	Ar
	(5 cred.; soph., jr., sr.; prereq., Chem. 10 cred. and Biol. 10 cred.)				
103w*	Special Bacteriology for Students of Agriculture	III, IV	TS	MH	Ar
	(4 cred.; jr., sr.; prereq., 1)	IV	Th	MH	Ar
105f*	Household Bacteriology.....	VII, VIII	TTh	MH	Ar
	(3 cred.; jr., sr.; prereq., 1)				

BEE CULTURE

No.	Title	Hour	Day	Bldg.	Instructor
1f,w,s†	Elementary Bee Science.....				
	(3 cred.; no prereq.)				
	Sec. 1	III	MWF	FH	Mr. Jager
	2	III	TThS	FH	
2f,w,s†	Industrial Beekeeping				
	(3 cred.; prereq., 1)				
	Sec. 1 Lect.	IV	MW	FH	Mr. Jager
	Lab.	IV	F	FH	
		One additional hour to be arranged			
	2 Lect.	IV	TS	FH	
	Lab.	Two additional hours to be arranged			
3s§	Advanced Beekeeping.....				
	(3 cred.; prereq., 1, 2)				
	Lect.	VII	MW	FH	Mr. Jager
	Lab.	VII	F	FH	
		One additional hour to be arranged			
4††	Queen-Raising	....	....		Mr. Jager
	(5 cred.; prereq., 1, 2, 3)				
5††	Bee Diseases.....	....	....		Mr. Jager
	(3 cred.; prereq., 1, 2, 3)				
6f§	Bee Products.....				
	(3 cred.; prereq., 1, 2, 3)				
	Lect.	VI	MW	FH	Mr. Jager
	Lab.	VI	F	FH	
		One additional hour to be arranged			

BOTANY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	General Botany.....				
	(10 cred.; no prereq.)				
	Sec. 1 Lab.	I, II	MWF	212,214,220P	Mr. Durand in charge
	Quiz	I	T	212,214,220P	
	Lect.	II	TThS	210P	
	2 Lab.	VI, VII	MWF	212,214,220P	
	Quiz	VII	Th	212,214,220P	
	Lect.	VI, VII	T	210P	
		VI	Th	210P	

For additional courses see the bulletin of the Medical School.

* Offered on the Minneapolis campus.

† Offered also in the Summer Session.

†† Offered only in the Summer Session provided a sufficient number of students register.

§ Offered provided a sufficient number of students register.

No.	Title	Hour	Day	Bldg.	Instructor
1w-2s*	General Botany..... (Same as 1f-2w)				
	Lab.	III, IV	MWF	212,214,220P	Mr. Durand in charge
	Quiz	IV	T	212,214,220P	
	Lect.	III	TThS	210P	
1s-2f*	General Botany..... (Same as 1f-2w)				
	Lab.	I, II	TThS	212,214,220P	Mr. Durand in charge
	Quiz	I	W	212,214,220P	
	Lect.	II	MWF	210P	
4f-5w-6s*	General Botany..... (9 cred.; students in Agr. and For.)				
	Lect.	VIII	TTh	212,214,220P	Mr. Durand
	Lab.	VI, VII	TTh	212,214,220P	
7s*	Taxonomy of Flowering Plants..... (5 cred.; prereq., 2, 5, or 8)				
	Lect.	VI	MWF	212,214,220P	Mr. Rosendahl, Mr. Johnson
	Lab.	VII, VIII, IX	MF	210P	
8s*	General Botany..... (5 cred.; students in H. E.; no prereq.)				
	Lect.	II	TThS	210P	Mr. Durand
	Lab.	I, II	MWF	212,214,220P	
12f*	General Morphology of Algae..... (3 cred.; prereq., 2 or 6)	I, II	TThS	213AB	Miss Tilden
13w*	General Morphology of Fungi..... (3 cred.; prereq., 2 or 6)	I, II	TThS	213AB	Mr. Johnson
20f*	Forest Ecology..... (3 cred.; soph., jr., sr.; prereq., 2 or 5, and For. 1)	I, II, III	TTh	G	Mr. Cooper
21s*	Elementary Ecology..... (5 cred.; prereq., 2 or 5)	III, IV	MTWFS	G	Mr. Cooper
22f,s*	Elementary Plant Physiology..... (5 cred.; prereq., 2 or 5, org. chem. advised)	III, IV	MTWFS	G	Mr. Knight
48f*	Plant Industry..... (5 cred.; jr., sr.; no prereq.)	VIII	MTWThF	Ar	Mr. Rosendahl, Mr. Freeman
51f*	Histological Methods..... (3 cred.; jr., sr.; prereq., 15 cred.)	I, II	MWF	213AB	Mr. Rosendahl
62w*	General Morphology of Bryophytes and Pteridophytes..... (3 cred.; jr., sr.; prereq., 15 cred.)	VI, VII, VIII	TTh	Ar	Mr. Huff
63s*	General Morphology of Gymnosperms and Angiosperms..... (3 cred.; jr., sr.; prereq., 7 or 62)	VI, VII, VIII	TTh	Ar	Mr. Butters
107w*	Morphology and Taxonomy of the Bryophytes ..... (5 cred.; jr., sr.; prereq., 7, 62)	Ar	Ar	106AB	Mr. Durand
108w*	Morphology and Taxonomy of the Pteridophytes ..... (5 cred.; jr., sr.; prereq., 7, 62)	Ar	Ar	4AB	Mr. Butters

* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
110w*	Morphology and Taxonomy of the Gymnosperms ..... (5 cred.; jr., sr.; prereq., 7, 63)	Ar	Ar	4AB	Mr. Butters
113f-114w-115s*	Advanced Taxonomy..... (9 cred.; jr., sr.; prereq., 15 cred. incl. 7)	VI, VII	MWF	213AB	Mr. Rosendahl
118w*	Cytology ..... (3 cred.; jr., sr.; prereq., 18 cred.)	VI, VII, VIII	TTh	213AB	Mr. Rosendahl
127s*	Anatomy of Vascular Plants..... (5 cred.; jr., sr.; prereq., 18 cred.)	III, IV	MTWFS	G	Mr. Cooper
131f*	Field Ecology..... (5 cred.; jr., sr.; prereq., 20 or 21)	Ar	Ar	G	Mr. Cooper
132w*	Ecological Anatomy..... (5 cred.; jr., sr.; prereq., 21)	III, IV	MTWFS	G	Mr. Cooper
133s*	Forest Geography of North America (5 cred.; jr., sr.; prereq., 21)	VI, VII	MWF	G	Mr. Cooper
141f*	Physical Phases of Plant Physiology (5 cred.; jr., sr.; prereq., 22, org. chem. advised)	I, II	MTWThF	G	Mr. Knight, Mr. Harvey, Mr. Farabaugh
142w*	Plant Metabolism..... (5 cred.; jr., sr.; prereq., same as 141)	I, II	MTWThF	G	Mr. Knight, Mr. Harvey, Mr. Farabaugh
143s*	Plant Metabolism and Growth..... (5 cred.; jr., sr.; prereq., same as 141)	I, II	MTWThF	G	Mr. Knight, Mr. Harvey, Mr. Farabaugh
144s*	Plant Microchemistry..... (5 cred.; jr., sr.; prereq., same as 141)	III, IV	MTWFS	G	Mr. Harvey

CHEMISTRY

SCHOOL OF CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	General Inorganic Chemistry..... (8 cred.; no prereq.)				
	Lect.	VII	MWF	100C	
	Lab.	VIII, IX	MW	210C	
3s*	General Inorganic Chemistry..... (4 cred.; prereq., 1-2)				
	Lect.	VII	MF	100C	
		IV	S	100C	
	Lab.	VIII, IX	MF	210C	
9f-10w*	General Inorganic Chemistry..... (10 cred.; prereq., 1 yr. h. s. chem.)				
	Lect.	VII	MWF	100C	
	Lab.	VIII, IX	MWF	210C	
11f*	Qualitative Chemical Analysis..... (4 cred.; prereq., 3)				
	Lect.	IV	MWF	225C	Miss Cohen
	Lab.	VI, VII	MW	290C	Miss Cohen

For additional courses see the bulletin of the College of Science, Literature, and the Arts.
* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
11s*	Qualitative Chemical Analysis..... (Same as 11f)				
	Lect.	VI	MWF	100C	Mr. Henderson, Mr. Fosse
	Lab.	VI, VII or VIII, IX	TTh	210C 210C	
12f*	Qualitative Chemical Analysis..... (5 cred.; prereq., 9-10)				
	Lect.	II	TThS	Ar	Ar
	Lab.	VI, VII, VIII	MW	Ar	Ar
12s*	Qualitative Chemical Analysis..... (Same as 12f)				
	Lect.	II	MWF	100C	Mr. Sneed
	Lab.	I, II, III	ThS	210C	Mr. Sneed
13f*	Qualitative Chemical Analysis..... (5 cred.; prereq., 12)				
	Lect.	II	TTh	325C	Mr. Sneed
	Lab.	VI,VII,VIII	MWF	290C	Mr. Sneed
13w*	Qualitative Chemical Analysis..... (Same as 13f)				
	Lect.	II	TTh	ArC	Mr. Fosse
	Lab.	VI,VII,VIII	MWF	290C	Mr. Fosse
20w-21s*	Quantitative Analysis..... (10 cred.; soph., jr., sr.; prereq., 12, 13)				
	Lect.	VI	M	325C	Mr. Geiger
	Rec.	VI	F	315C	Mr. Geiger
	Lab.	VII, VIII, IX	MF	310C	Mr. Sidener, Mr. Geiger
		VI, VII, VIII, IX	W	310C	Mr. Sidener, Mr. Geiger
35f-36w*	Organic Chemistry..... (10 cred.‡; jr., sr.; prereq., 15 cred. in chem.)				
	Lect.	III	MWF	325C	Mr. Hunter
	Lab.	VI, VII, VIII	TTh	390C	Mr. Hunter
	Rec.	III	Th	C	Mr. Lauer
140f-141w-142s*	Physical Chemistry..... (9, 12, or 15 cred.†; jr., sr.; prereq., 2 yrs. chem., 1 yr. physics)				
	Lect.	IV	MWF	325C	Mr. MacDougall
	Lab.	VI, VII, VIII	F	117C	Mr. MacDougall
	Rec.	IV	S	115C	Ar

For additional courses see the bulletin of the School of Chemistry.

* Offered on the Minneapolis campus.

† Offered in the Summer Session.

‡ Offered also during the Summer Session.

CIVIL ENGINEERING

COLLEGE OF ENGINEERING AND ARCHITECTURE

No.	Title	Hour	Day	Bldg.	Instructor
53s*	Municipal Engineering..... (3 cred., jr., sr.; no prereq.)	III	MWF	ME	Mr. Bass

For additional courses see the bulletin of the College of Engineering and Architecture.

DAIRY HUSBANDRY

ANIMAL INDUSTRY GROUP

No.	Title	Hour	Day	Bldg.	Instructor
1f,w,s	Elements of Dairying..... (5 cred.; no prereq.) (Limited to 45)				
	Lect.	III	TWS	39DH	Mr. Keithley
	Lab.	III, IV	MF	LabDH	Mr. Dahle, Mr. Anderson
2w	Dairy Bacteriology..... (5 cred.; soph., jr., sr.; prereq., Bact. 1) (Limited to 12)	VI,VII,VIII	MWF	40DH	Mr. Macy
2s	Dairy Bacteriology..... (Same as 2w) (Limited to 12)	I, II, III	MWF	40DH	Mr. Macy
4†	Cheese Factory Practice..... (3 cred.; jr., sr.; prereq., 1)	....	....	....	Mr. Keithley
5†	Creamery Practice..... (3 cred.; jr., sr.; prereq., 1)	....	....	....	Mr. Keithley
6f	Judging Dairy Cattle..... (1 cred.; jr., sr.; prereq., An. Husb. 1)	VI, VII, VIII	Th	DB	Mr. Rayburn
101f	Milk Production..... (5 cred.; jr., sr.; prereq., 1)	IV	MTWFS	39DH	Mr. Eckles
102s	Market Milk..... (3 cred.; jr., sr.; prereq., 1, 2)	IV	MW	39DH	Mr. Keithley,
		II, III	Th	39DH	Mr. Macy.
103w	Dairy Stock-Feeding..... (3‡ cred.; sr.; prereq., 101, Agr. Biochem. 15)	III	MWF	32DH	Mr. Eckles
104s	Advanced Study of Dairy Breeds.... (3 cred.; jr., sr.; prereq., 6, 101)	VI, VII, VIII	MW	40DH	Mr. Rayburn
		VI	F	40DH	Mr. Rayburn
105f	Seminar I..... (1 cred.; sr.; prereq., 3 courses in Dy. Husb.)	II	S	32DH	Mr. Eckles
106w	Seminar II..... (Same as 105f)	II	S	32DH	Mr. Eckles
107s	Seminar III..... (Same as 105f)	II	S	32DH	Mr. Eckles
111f	Dairy Products I..... (3 cred.; jr., sr.; prereq., 1, 2)	I	MW	39DH	Mr. Keithley,
		II, III	Th	39DH	Mr. Dahle
112s	Dairy Products II.....	IV	TF	39DH	Mr. Keithley, Mr. Dahle,
	(3 cred.; jr., sr.; prereq., 1, 2)	VI, VII	T	39DH	Mr. Keithley, Dr. Dahle

* Offered on the Minneapolis campus.
† Offered in the Summer Session.
‡ Only two credits allowed those who have completed Animal Husbandry 8.

ECONOMICS

SCHOOL OF BUSINESS

No.	Title	Hour	Day	Bldg.	Instructor
5f†	Principles of Economics (Agriculture and Forestry)..... (5 cred.; soph., jr., sr.; no prereq.)	II	MTWThF	251Ch	Ar
5w	Principles of Economics (Agriculture and Forestry)..... (Same as 5f)				
	Sec. 1	I	MTWThF	215En	
	2	II	MTWThF	215En	
	3	III	MTWThF	4PP	
5s	Principles of Economics (Agriculture and Forestry) ..... (Same as 5f)	III	MTWThF	307Ad	
5w,s	Principles of Economics (Home Economics) ..... (Same as 5f)	II	MTWThF	203HE	Ar
6f‡	Agricultural Economics..... (3 cred.; soph., jr., sr.; prereq., 3-4 or 5)	II	TThS	307Ad	Ar
6w,	Agricultural Economics..... (Same as 6f)				
	Sec. 1	I	TThS	1PP	
	2	III	TThS	1PP	
13f	Agricultural Statistics..... (5 cred.; soph., jr., sr.; prereq., 3-4 or 5)				
	Lect.	III	TThS	1PP	Mr. Working
	Lab.	VI, VII	TTh	4Ad	
20s	Economic Geography of Agriculture.. (5 cred.; no prereq.)	IV	MTWFS	307Ad	Mr. Black, Mr. Holmes
21w	Economic History of Agriculture.... (5 cred.; no prereq.)	IV	MTWFS	215En	Mr. Price
25f-26w*	Principles of Accounting..... (8 cred.‡; soph., jr., sr.; prereq., 3-4 or 5 or parallel)				Mr. Heilman in charge
	Sec. 1 Lect.	I	MWF	301MA	
	2	II	MWF	301MA	
	3	II	MWF	303MA(f)	
	4	III	MWF	301MA	
	5	IV	MWF	301MA	
	6	V	MWF	301MA	
	7	I	TThS	301MA	
	8	II	TThS	301MA	
	9	III	TThS	301MA	
	10	VI	MWF	301MA	

* Offered on the Minneapolis campus.
† Offered also in the Summer Session.
‡ The full course must be completed before credit will be given.

No.	Title	Hour	Day	Bldg.	Instructor
	Sec. 1 Lab.	VI, VII	M	303MA	
	2	VII, VIII	M	301MA	
	3	III, IV	T	303MA	
	4	I, II	T	303MA	
	5	VII, VIII	T	301MA	
	6	VIII, IX	T	303MA	
	7	VI, VII	W	303MA	
	8	VII, VIII	W	301MA	
	9	II, III	Th	303MA	
	10	VII, VIII	Th	301MA	
	11	VI, VII	Th	303MA	
	13	VI, VII	F	303MA	
	14	VII, VIII	F	301MA	
	15	III, IV	F	303MA	
	16	III, IV	S	303MA	
	18	VIII, IX	W	303MA	
25w-26s*	Principles of Accounting..... (Same as 25f-26w)				
	Sec. 1 Lect.	II	MWF	303MA	Mr. Heilman
	2	I	TThS	301MA(w) 303MA(s)	Mr. Heilman
	3	III	MWF	102MA	
	4	IV	MWF	209MA(w) 303MA(s)	
	5	VI	MWF	109MA(w) 303MA(s)	
	Sec. 1 Lab.	VI, VII	T	303MA	Mr. Heilman in charge
	2	III, IV	W	303MA(w) 301MA(s)	
	3	VIII, IX	M	303MA	
	4	VIII, IX	M	Ar	
	5	II, III	S	Ar	
	6	VII, VIII	F	Ar	
28f,s	Principles of Accounting..... (5 cred.; soph., jr., sr.; in Agr., For., and H. E. only; prereq., 3-4 or 5)				
	Lect.	III	MWF and	4PP	
		VII	Th	24Ad	Mr. Heilman, Mr. Miller
	Lab.	VIII, IX	Th	24Ad	Mr. Heilman, Mr. Miller
50s	Farm Finance..... (3 cred.; jr., sr.; prereq., 3-4 or 5 and 6)	II	MWF	307Ad	Mr. Dowrie
73w*	Railway Traffic and Rates..... (3 cred.; jr., sr.; prereq., 3-4 or 5 and 6)	VI	MWF	213MA	Mr. Cummings
85f,s	Principles of Marketing..... (3 cred.; jr., sr.; prereq., 3-4 or 5 and 6)	II	TThS	1PP	Mr. Price, Mr. Anderson
90s	Economics of Consumption..... (3 cred.; jr., sr.; prereq., 3-4 or 5 and 6)	IV	MWF	4PP	Mr. Garver

* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
91w	Principles of Organization and Management ..... (3 cred.; jr., sr.; prereq., 3-4 or 5)	I	TThS	209MA	Ar
91s	Principles of Organization and Management ..... (Same as 91w)	I	MWF	209MA	Ar
103f-104w*	Value and Distribution..... (6 cred.‡; jr., sr.; prereq., 3-4 or 5 and 6)				
	Sec. 1	I	MWF	102MA	Mr. Garver
	2	II	MWF	102MA	Mr. Garver
	3	VII	MWF	Ar	Mr. Working
106w	Land Economics..... (3 cred.; jr., sr.; prereq., see footnote §)	VII	MWF	307Ad	Mr. Black
106s*	Land Economics..... (Same as 106w)	VII, VIII	TTh	202MA	Mr. Black
107s	Land Tenure..... (3 cred.; jr., sr.; prereq., 106)	VII	MWF	307Ad	Mr. Black
108w	Marketing of Farm Products..... (3 cred.; jr., sr.; prereq., 85)	I	TThS	323Ad	Mr. Price, Mr. Anderson
110s-111f	Practice Course in Marketing..... (3 cred.; jr., sr.; prereq., 25-26 or 28, 85, 108)	Ar	Ar	Ar	Mr. Price
112f*	Business Statistics..... (3 cred.; jr., sr.; prereq., 13 or 14)	II	TThS	202MA	Mr. Mudgett
113w*	Theory of Statistics..... (3 cred.; jr., sr.; prereq., 13 or 14)	II	TThS	213MA	Mr. Mudgett
116f	Economics of Agricultural Production ..... (3 cred.; jr., sr.; prereq., see footnote §)	I	TThS	310En	Mr. Black
116w	Economics of Agricultural Production (Same as 116f)	III	TThS	307Ad	Mr. Black
117w	Prices of Farm Products..... (3 cred.; jr., sr.; prereq., see footnote §)	II	TThS	1PP	Mr. Working
126f	Principles of Coöperation..... (3 cred.; jr., sr.; prereq., 85 or see footnote §)	III	MWF	251Ch	Mr. Black, Mr. Miller
127w-128s	Marketing Organization and Management ..... (6 cred.; jr., sr.; prereq., 25-26 or 28, 85)	III	MWF	251Ch	Mr. Black, Mr. Miller
131f-132w-133s*	Cost Accounting..... (9 cred.; jr., sr.; prereq., 25-26)				
	Sec. 1	II	TThS	109MA	Mr. Noble
	2	III	TThS	109MA	Mr. Noble
143f-144w*	The Financial System..... (8 cred.‡; jr., sr.; prereq., 3-4 or 5 and 6)				
	Lect.	IV	T		Mr. Dowrie, Mr. Ebersole, Mr. Stehman

* Offered on the Minneapolis campus.

‡ The full course must be completed before credit will be given.

§ Senior classification, or 13 credits in economics and farm management, and 5 credits in other social sciences (political science, sociology, or history).

No.	Title	Hour	Day	Bldg.	Instructor
	Sec. 1	II	TThS	311F	
	2	III	MWF	202MA	
	3	II	MWF	109MA	
	4	VIII	MTW	209MA	
	5	VI	MWF	209MA	
	6	III	TThS	209MA	
145s*	Foreign Exchange..... (3 cred.; jr., sr.; prereq., 143-144)	II	TThS	102MA	Mr. Myers
149s*	Business Cycles..... (3 cred.; sr.; prereq., 143-144)	VIII	MTW	209MA	Mr. Ebersole
150s	Advanced Farm Finance..... (3 cred.; sr.; prereq., 143-144)	Ar	Ar	Ar	Mr. Dowrie
155s*	Corporation Finance..... (3 cred.; jr., sr.; prereq., 143-144)				
	Lect.	III	S	LitTh	Mr. Stehman
	Sec. 1 Lab.	II	TTh	109MA	
	2	III	TTh	102MA	
	3	III	MW	202MA	
	4	IV	MW	209MA	
	5	VI	TTh	213MA	
	6	VII	TTh	102MA	
167w*	Industrial Relations..... (3 cred.; jr., sr.; prereq., 161)	II	TThS	209MA	Ar
168s*	Personnel Management..... (3 cred.; jr., sr.; prereq., 167)	II	TThS	209MA	Ar
176f*	Commercial Policies..... (3 cred.; jr., sr.; prereq., 3-4, or 5 and 6)	I	MWF	202MA	Mr. Blakey
177w*	Foreign Trade..... (3 cred.; jr., sr.; prereq., 176)	I	MWF	202MA	Mr. Blakey
180f-181w-182s	Senior Seminar in Economics..... (9 cred.; sr.; prereq., see footnote §)	Ar	Ar	Ar	Ar
191f-192w*	Public Finance..... (6 cred.‡; jr., sr.; prereq., 3-4 or 5 and 6)	III	MWF	209MA	Mr. Blakey
193s*	State and Local Taxation..... (3 cred.; jr., sr.; prereq., 191-192)	III	MWF	209MA	Mr. Blakey

EDUCATIONAL ADMINISTRATION AND SUPERVISION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
119w*	The Elementary School Curriculum.. (3 cred.; sr.; prereq., 1 or 101-102-103, 3)	I	MWF	Ar	Mr. Neale

For additional courses see the bulletin of the College of Education.

EDUCATIONAL PSYCHOLOGY

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
55f,s*	Educational Psychology..... (3 cred.; soph., jr., sr.; prereq., Psychology 6 cred.)				
	Sec. 1	I	MWF	Psy	
	2	I	TThS	Psy	

* Offered on the Minneapolis campus.

‡ The full course must be completed before credit will be given.

§ Senior classification or 13 credits in economics and farm management, and 5 credits in other social sciences (political science, sociology, or history).

No.	Title	Hour	Day	Bldg.	Instructor
55w*	Educational Psychology..... (See 55f,s)	I	MWF	Psy	
106f-107w-108s*	Advanced Educational Psychology... (9 cred.; jr., sr.; prereq., 45 or equiv.)	III	MWF	Psy	Mr. Van Wagenen
111s*	Educational Diagnosis..... (3 cred.; jr., sr.; prereq., 45 or equiv.)	II	MWF	Psy	Mr. Van Wagenen

For additional courses see the bulletin of the College of Education.

ENGLISH

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s*	General Survey of English Literature (9 cred.; soph., jr., sr.; prereq., Rhet. 1, 2, 3)				
	Sec. 1 Lect.	II	M	Ar	Ar
	Rec.	II	WF	114F	Ar
	2 Lect.	VII	T	Ar	Ar
	Rec.	VII	MF	205F	Ar
6f*	Chaucer ..... (4 cred.; soph., jr., sr.; prereq., 1-2-3 or parallel)	VII	MWThF	204F	Mr. Malone
6w*	Chaucer ..... (Same as 6f)	IV	MWFS	205F	Ar
6s*	Chaucer ..... (Same as 6f)	II	TWFS	204F	Mr. Malone
8f,w*	Shakespeare ..... (4 cred.; soph., jr., sr.; prereq., 1-2-3 or parallel)				
	Sec. 1	I	TWFS	204F	Mr. Stoll
	2	VI	MTThF	204F	Mr. Stoll
8s*	Shakespeare ..... (Same as 8f,w)				
	Sec. 1	I	TWFS	204F	Ar
	2	IV	MWFS	204F	Ar
40f*	Bible as Literature..... (4 cred.; soph., jr., sr.; prereq., 1-2-3 or parallel)	Not offered in 1922-23			
41s*	Browning and Tennyson..... (4 cred.; soph., jr., sr.; prereq., 1-2-3 or parallel)				
	Lect.	III	MW	301F	Mr. Burton
	Sec. 1 Rec.	III	F	301F	
	3	III	Th	Ar	
	4	II	T	301F	
	5	IV	T	Ar	
	6	VI	T	Ar	
44f-45w*	American Literature..... (6 cred.‡; soph., jr., sr.; prereq., 1-2-3 or parallel)	IV	MWF	301F	Mr. Moore

* Offered on the Minneapolis campus.

‡ The full course must be completed before credit will be given.

No.	Title	Hour	Day	Bldg.	Instructor
51f*	Spenser ..... (3 cred.; jr., sr.; prereq., 1-2-3)	Not offered in 1922-23			
53f*	Seventeenth-Century Lyrists..... (4 cred.; jr., sr.; prereq., 1-2-3)	III	MTWF	204F	Mr. Moore
58w-59s*	Nineteenth-Century Prose..... (6 cred.‡; jr., sr.; prereq., 1-2-3)	II	TThS	205F	Mr. Beach
62w*	Milton ..... (4 cred.; jr., sr.; prereq., 1-2-3)	VII	MTWF	204F	Mr. Stoll
64s*	Bacon ..... (3 cred.; jr., sr.; prereq., 1-2-3)	Not offered in 1922-23			
66s*	English Novel..... (4 cred.; jr., sr.; prereq., 1-2-3)				
	Lect.	IV	MWF	301F	Mr. Burton
	Sec. 1 Rec.	IV	T	301F	
	2	III	T	205F	
	3	IV	S	301F	
	4	III	S	205F	
70s*	Masterpieces of Elizabethan Drama.. (4 cred.; jr., sr.; prereq., 8)	VII	MTWF	204F	Mr. Stoll

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

No.	Title	Hour	Day	Bldg.	Instructor
3f,w	Economic Entomology..... (3 cred.; soph., jr., sr.; prereq., An. Biol. 9 cred.)	VI, VII, VIII	WF	306Ad	Mr. Ruggles
4f	Economic Vertebrate Entomology.... (3 cred.; jr., sr.; prereq., An. Biol. 9 cred.)	Ar	Ar	Ar	Mr. Washburn
6w	Insects of Forest Products..... (3 cred.; soph., jr., sr.; prereq., An. Biol. 9 cred.)	I, II	MWF	306Ad	Mr. Graham
7s	General Forest Entomology..... (1 cred.; soph., jr., sr.; prereq., 6)	Given at Itasca Park			Mr. Graham
8f	Varieties and Habits of Fur-Bearing Animals ..... (3 cred.; soph., jr., sr.; prereq., An. Biol. 9 cred.)	Ar	Ar	Ar	Ar
12w	Forest Zoology..... (3 cred.; jr., sr.; prereq., An. Biol. 9 cred.)	Ar	Ar	Ar	Mr. Washburn
20w	Home Economic Entomology..... (3 cred.; soph., jr., sr.; prereq., An. Biol. 6 cred.)	VI, VII, VIII	TTh	306Ad	Mr. Riley, Mr. Ruggles
37f-38w-39s*	General Entomology..... (9 cred.; soph., jr., sr.; prereq., An. Biol. 9 cred.)	I, II	MWF	202AB	Mr. Oestlund
4f,s	Introductory Course in Animal Parasites and Parasitism..... (3 cred.; soph., jr., sr.; prereq., An. Biol. 9 cred.)	VI, VII, VIII	WF	324Ad	Mr. Riley

* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
117f-118w-119s*	General Ecology of Insects..... (9 cred.; jr., sr.; prereq., 37-38-39 or equiv.)	VI, VII, VIII	TTh	204AB	Mr. Chapman
125f-126w-127s*	Advanced General Entomology..... (9 cred.; jr., sr.; prereq., 37-38-39 or equiv.)	III, IV	TThS	204AB	Mr. Oestlund
130w*	Biology and Taxonomy of Aphididae (5 cred.; sr.; prereq., 37-38-39 or equiv.)	III, IV	MWF	204AB	Mr. Oestlund
139f-140w*	Histology and Development of Insects (6 cred.; jr., sr.; prereq., 37-38-39 or equiv.)	III, IV	MWF	208, 210AB	Mr. Riley
144f-145w-146s*	Animal Parasites and Parasitism.... (3 to 9 cred.; jr., sr.; prereq., An. Biol. 9 cred.)	VI, VII, VII	WF	202AB	Mr. Riley
150f†	Insecticides and Their Action..... (3 or 6 cred.; jr., sr.; prereq., 37-38-39, Agr. Biochem. 7-8, or equiv.)	Ar	Ar	Ar	Ar
197f,w,s†	Introduction to Research..... (5 or more cred.; sr.; prereq., 37-38-39 or 44-45 and other work as prescribed by the division)	Ar	Ar	Ar	Mr. Oestlund, Mr. Ruggles, Mr. Chapman, Mr. Riley, Mr. Washburn

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

FARM ENGINEERING

No.	Title	Hour	Day	Bldg.	Instructor
3f,s	Mechanical Drawing..... (2 cred.; no prereq.)	III, IV	MWF	303En	Mr. Jacobson
4s	Blacksmithing ..... (2 cred.; no prereq.)	VI, VII, VIII	TTh	20En	Mr. Johnston
5f	Framing and Building Construction. (3 cred.; no prereq.)	I, II	TThS	48En	Mr. White
7w	Farm Structures..... (3 cred.; jr., sr.; prereq., 3)				
	Lect.	IV	TS	305En	Mr. White
	Lab.	VII, VIII, IX	M	305En	Mr. White
8f,w	Farm Engineering..... (5 cred.; no prereq.)	I	MTWFS	107En	Mr. Boss
11f,w,s	Applied Mathematics..... (5 cred.; no prereq.)	III	MTWFS	215En	Mr. Roe
13w	Farm Motors I..... (3 cred.; no prereq.)	III, IV	MWF	Ar	Mr. Torrance
13s	Farm Motors I..... (Same as 13f)	VI, VII, VIII	MF	Ar	Mr. Torrance
14s	Farm Motors II..... (3 cred.; prereq., 13)	VI, VII, VIII	TTh	Ar	Mr. Torrance
17s	Advanced Blacksmithing..... (2 cred.; no prereq.)	VI, VII, VIII	WF	20En	Mr. Johnston
18f	Surveying ..... (5 cred.; jr., sr.‡; prereq., 3, 11, or equiv.)	1:15-5:20	MWF	215En	Mr. Roe

* Offered on the Minneapolis campus.
† Offered also during the Summer Session.
‡ Open also to sophomores in Forestry.

No.	Title	Hour	Day	Bldg.	Instructor
23f	General Physics..... (5 cred.; no prereq.)				
	Lect.	III	TThS	101En	Mr. Stewart
	Sec. 1 Lab.	I, II	TS	102En	Mr. Tyler
	2	VI, VII	TTh	102En	Mr. Tyler
23s	General Physics..... (Same as 23f)				
	Sec. 1 Lect.	III	TThS	101En	Mr. Stewart
	2	IV	MWF	101En	Mr. Stewart
	Sec. 1 Lab.	I, II	WF	102En	Mr. Tyler
	2	I, II	TS	102En	Mr. Tyler
	3	VI, VII	TTh	102En	Mr. Tyler
	4	VI VII, VIII IX	M	102En	Mr. Tyler
	5	VI, VII, VIII, IX	F	102En	Mr. Tyler
24w	Agricultural Physics I..... (4 cred.; prereq., 8, 11, 23, or equiv.)				
	Lect.	III	MWF	101En	Mr. Stewart
	Lab.	VI, VII, VIII	T	103En	Mr. Stewart
25s	Agricultural Physics II..... (4 cred.; prereq., 24)				
	Lect.	III	MWF	101En	Mr. Stewart
	Lab.	VI, VII, VIII	T	103En	Mr. Stewart
28w	Land-Clearing ..... (3 cred.; jr., sr.; no prereq.)	I	TThS	Ar	Mr. Thompson, Mr. Schwantes
31s	Principles of Drainage..... (5 cred.; jr., sr.; prereq., 3, 11, or equiv.)	1:15-5:20	MWF	215En	Mr. Roe, Mr. Elliott
34w	Household Mechanics and Heat.... (4 cred.; prereq., 23 or equiv.)	I, II	MWF	103En	Mr. Stewart
35s	Household Electricity and Light..... (4 cred.; prereq., 34)	I, II	MWF	101,103En	Mr. Stewart
37s	Rural Sanitation..... (3 cred.; jr., sr.; prereq., Farm Eng. 8)	I	TThS	101En	Mr. Stewart
38s	Advanced Mechanical Drawing..... (2 cred.; jr., sr.; prereq., 3, Arch. 21-22-23)	VI, VII, VIII	TTh	303En	Mr. Jacobson
10f,s	Mechanical Training..... (3 cred.; no prereq.)	I, II	MWF	106En	Mr. Dent
01s	Advanced Drainage..... (3 cred.; sr.; prereq., 31)	Ar	Ar	Ar	Mr. Roe
36f	Experimental Physical Analyses..... (5 cred.; jr., sr.; prereq., 25)	Not offered in 1922-23			Mr. Stewart

FORESTRY

No.	Title	Hour	Day	Bldg.	Instructor
f,s	General Forestry..... (4 cred.; no prereq.)	II	MTWF	302Hr	Mr. Cheyney
	Elementary Dendrology..... .... (2 cred.; no prereq.)	....	....	....	Mr. Wentling

† Offered only during the Summer Session at Itasca Park.

No.	Title	Hour	Day	Bldg.	Instructor
3w	Dendrology ..... (3 cred.; soph., jr., sr.; prereq., Bot. 4)				
	Lect.	I	TThS	301Hr	Mr. Wentling
4s	Dendrology ..... (5 cred.; soph., jr., sr.; prereq., 3)				
		I	TThS	301Hr	Mr. Wentling
	Lect.	II, III, IV	T	301Hr	
	Lab.	II, III	Th	301Hr	Mr. DeFlon
5†	Elementary Sylviculture..... (2 cred.; no prereq.)	....	....	....	Mr. Wentling
9†	Elementary Mensuration..... (2 cred.; no prereq.)	....	....	....	Mr. Allison
10w	Forest Mensuration..... (5 cred.; jr., sr.; prereq., 3-4)	IV	MTWFS	302Hr	Mr. Hansen
11f	Forest Valuation..... (5 cred.; jr., sr.; prereq., 10, 41)	I	MTWThF	302Hr	Mr. Allison
20w	Grazing ..... (3 cred.; jr., sr.; no prereq.)	III	TThS	302Hr	Mr. Allison
23††	Factory Experience..... (3 to 5 cred.; jr., sr.; prereq., 33-34)	....	....	....	....
26f,w	Tree Crops..... (1 cred.; not open to students in Forestry; no prereq.)	IV‡	TS	307Ad	Mr. Cheyney
27w	Groves and Windbreaks..... (3 cred.; no prereq.)	I	MWF	301Hr	Mr. Wiggin
28w	Logging ..... (3 cred.; jr., sr.; prereq., 3-4)	II	TThS	302Hr	Mr. Cheyney
29f	Sawmill and Wood-Working Machinery ..... (3 cred.; jr., sr.; prereq., 3-4)	IV	MWF	302Hr	Mr. Cheyney
30s	Wood-Seasoning ..... (3 cred.; jr., sr.; prereq., 33-34)	III	MWF	302Hr	Mr. Cheyney
32w	Lumber Distribution..... (5 cred.; jr., sr.; prereq., 33 parallel)	I	MTWThF	302Hr	Mr. Cheyney
33f-34w	Wood Structure and Identification... (6 cred.; jr., sr.; prereq., 3-4, Bot. 4-5-6)	VI, VII, VIII	TTh	303Hr	Mr. Wentling
35w	Seeding and Planting..... (3 cred.; jr., sr.; prereq., 3-4)	III	MWF	301Hr	Mr. Wiggin
36w	Forest Policy and Administration... (5 cred.; sr.; prereq., 11, 43, 28 parallel)	IV	MTWThF	301Hr	Mr. Allison
39f	Wood Preservation..... (3 cred.; jr., sr.; prereq., 33 parallel)	III	TThS	301Hr	Mr. Allison
41f	Sylvics ..... (3 cred.; jr., sr.; prereq., 3-4, Bot. 4-5-6)	II	MWF	301Hr	Mr. Wentling
43s	Sylviculture Laboratory..... (5 cred.; jr., sr.; prereq., 35)	Offered at Itasca Park			Mr. Wentling
44s	Wood Pulp and Paper..... (3 cred.; jr., sr.; prereq., 33-34, Chem. 3 or 10)	II	MWF	301Hr	Mr. Allison
46s	Forest Regulation Laboratory..... (5 cred.; jr., sr.; prereq., 11)	Offered at Itasca Park			Mr. Allison

†† Arrangements for this course must be made in advance.

† Offered only during the Summer Session at Itasca Park.

‡ In the fall quarter this course follows hygiene lectures the last six weeks of the quarter. In the winter quarter it will be given the first six weeks of the quarter.

No.	Title	Hour	Day	Bldg.	Instructor
47f-48w	Forest Products..... (6 cred.; soph., jr., sr.; no prereq.)	II	TThS	301Hr(f) (w)	Mr. Wentling, Mr. Allison
101w	Advanced Dendrology..... (3 cred.; jr., sr.; prereq., 3-4, Bot. 4-5-6)	Ar	Ar	Ar	Mr. Wentling
106w	Investigative Methods in Forestry... (3 cred.; sr.; prereq., 43)	II	MWF	301Hr	Mr. Hansen
107f	Uses of Wood I..... (3 cred.; sr.; prereq., 33-34)	IV	MWF	303Hr	Mr. Wentling
108w	Uses of Wood II..... (3 cred.; sr.; prereq., 33-34)	IV	MWF	303Hr	Mr. Wentling
109s	Uses of Wood III..... (3 cred.; sr.; prereq., 107, 108)	VI, VII, VIII	WF	303Hr	Mr. Wentling
110w	Mechanical and Physical Properties of Wood..... (2 cred.; sr.; prereq., 33-34)	III, IV	TS	303Hr	Mr. Wentling
112w	Advanced Forest Mensuration..... (3 cred.; sr.; prereq., 10)	Ar	Ar	Ar	Mr. Hansen
113w	Advanced Forest By-Products..... (3 cred.; sr.; prereq., 33-34, Chem. 35-36 or Agr. Biochem. 3)	Ar	Ar	Ar	Mr. Allison
119f	Advanced Wood Structures I..... (3 cred.; sr.; prereq., 33-34)	VI, VII, VIII	WF	303Hr	Mr. Wentling
120w	Advanced Wood Structures II..... (3 cred.; sr.; prereq., 119)	V, VII, VIII	WF	303Hr	Mr. Wentling

FRESHMAN LECTURES

No.	Title	Hour	Day	Bldg.	Instructor
1f	Agriculture and Forestry..... (No cred.; required of all freshmen in Agr. and For.)	III	Th	107En	Mr. Freeman
2f	Home Economics..... (No cred.; required of all freshmen in H. E.)	III	Th	203HE	Mr. Freeman

GEOLOGY AND MINERALOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	General Geology..... (10 cred.†; soph., jr., sr.; prereq., chemistry)				
	Sec. 1	I	TWThFS	210P	Mr. Thiel
	2	III	MTThFS	110P	Mr. Emmons
	3	VII	MTWThF	110P	Mr. Allison
1w-2s*	General Geology..... .... (Same as 1f-2w)	II	MWThFS	210P	Mr. Werner
1s-2w*	General Geology..... (Same as 1f-2w)	III	MTThFS	110P	Mr. Emmons
7f-8w*	General Geology Laboratory..... (2 cred.†; soph., jr., sr.; supports 1-2)	Ar	Ar	112P	Mr. Allison

* Offered on the Minneapolis campus.

† Both quarters must be completed before credit will be given.

No.	Title	Hour	Day	Bldg.	Instructor
7w-8s*	General Geology Laboratory.....	Ar	Ar	112P	Mr. Allison
	(Same as 7f-8w)				
7s*	General Geology Laboratory.....	Ar	Ar	112P	Mr. Allison
	(Same as 7f-8w)				
11f-12w*	Introduction to Geology.....	VIII	MTWThF	200aP	Mr. Werner
	(8 cred.†; soph., jr., sr.; no prereq.)				
21w-22s*	Essentials of Mineralogy.....				
	(6 cred.†; soph., jr., sr.; prereq., chemistry)				
	Lect.	IV	MWF	210P	Mr. Gruner
	Sec. 1 Lab.	VII, VIII, IX	F	100P	Mr. Gruner
	2	III	MWF	100P	Mr. Gruner
29f*	General Physiography.....	III	MTThFS	210P	
	(5 cred.; soph., jr., sr.; no prereq.)				
34w*	Meteorology	III	MTThFS	210P	
	(5 cred.; soph., jr., sr.; no prereq.)				
37s*	Economic and Commercial Geography	III	MTThFS	210P	
	(5 cred.; soph., jr., sr.; no prereq.)				
51f-52w*	Economic Geology.....	II	MWF	210P	Mr. Schwartz
	(6 cred.†; jr., sr.; prereq., 1-2)				

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

GERMAN

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f*	Beginning A.....				
	(5 cred.; no prereq.)				
	Sec. 1	I	TWThFS	207F	Ar
	2	III	MTThFS	207F	Ar
	3	IV	MTWFS	207F	Ar
	4	VI	MTWThF	207F	Ar
1w*	Beginning A.....				
	(Same as 1f)				
	Sec. 1	II	MWThFS	207F	Ar
	2	VII	MTWThF	207F	Ar
1s*	Beginning A.....				
	(Same as 1f)				
	Sec. 1	II	MWThFS	209F	Ar
	2	VI	MTWThF	209F	Ar
2f*	Beginning B.....				
	(5 cred.; prereq., 1 or 1 yr. h. s.)				
	Sec. 1	II	MWThFS	212F	Ar
	2	VII	MTWThF	209½F	Ar
2w*	Beginning B.....				
	(Same as 2f)				
	Sec. 1	I	TWThFS	207F	Ar
	2	III	MTThFS	207F	Ar
	3	IV	MTWFS	207F	Ar
	4	VI	MTWThF	207F	Ar
2s*	Beginning B.....				
	(Same as 2f)				
	Sec. 1	II	MWThFS	207F	Ar
	2	VII	MTWThF	207F	Ar

* Offered on the Minneapolis campus.

† Both quarters must be completed before credit will be given.

No.	Title	Hour	Day	Bldg.	Instructor
3f*	Beginning C.....				
	(5 cred.; prereq., 2)				
	Sec. 1	III	MTThFS	209F	Ar
	2	VII	MTWThF	209F	Ar
3w*	Beginning C.....				
	(Same as 3f)				
	Sec. 1	II	MWThFS	212F	Ar
	2	VI	MTWThF	209½F	Ar
3s*	Beginning C.....				
	(Same as 3f)				
	Sec. 1	I	TWThFS	207F	Ar
	2	III	MTThFS	207F	Ar
	3	IV	MTWFS	207F	Ar
	4	VI	MTWThF	207F	Ar
10f*	Rapid Reading.....				
	(5 cred.; prereq., 3 or 2 yrs. h. s.)				
	Sec. 1	II	MWThFS	209F	Ar
	2	IV	MTWFS	209½F	Ar
	3	VI	MTWThF	209F	Ar
10w*	Rapid Reading.....				
	(Same as 10f)				
	Sec. 1	III	MTTHFS	209F	Ar
	2	VII	MTWThF	209F	Ar
10s*	Rapid Reading.....				
	(Same as 10f)				
	Sec. 1	II	MWThFS	212F	Ar
	2	VII	MTWThF	209½F	Ar
11f*	Advanced Rapid Reading.....	II	MWThFS	209½F	Ar
	(5 cred.; prereq., 10 or 3 yrs. h. s.)				
11w*	Advanced Rapid Reading.....				
	(Same as 11f)				
	Sec. 1	II	MWThFS	209F	Ar
	2	VI	MTWThF	209F	Ar
11s*	Advanced Rapid Reading.....	III	MTThFS	209F	Ar
	(Same as 11f)				
28w-29s*	Chemical German.....	I	TThS	209F	Ar
	(6 cred.‡; prereq., 15)				
31f-32w*	Medical German.....	I	MWF	209F	Ar
	(6 cred.‡; prereq., 10 or 15)				
31w-32s*	Medical German.....				
	(Same as 31f-32w)				
	Sec. 1	I	MWF	209½F	Ar
	2	I	TThS	209½F	Ar
31s*	Medical German.....	I	MWF	209F	Ar
	(5 cred.; prereq., same as 31f-32w)				
32f*	Medical German.....	I	MWF	209½F	Ar
	(5 cred.; prereq., 31)				
50f-51w-52s*	Composition	IV	TS	209F	Mr. Jente
	(3 cred.‡; jr., sr.; prereq., 11, 14 or 4 yrs. h. s.)				

* Offered on the Minneapolis campus.

‡ The full course must be completed before credit will be given.

No.	Title	Hour	Day	Bldg.	Instructor
62s*	Nineteenth-Century Prose..... (5 cred.; prereq., 11 or 4 yrs. h. s.)	II	MWThFS	209½F	Ar
63f*	Modern Drama..... (3 cred.; jr., sr.; prereq., 11)	IV	MWF	209F	Mr. Downs
64w*	Classic Drama..... (3 cred.; jr., sr.; prereq., 62 or 63)	IV	MWF	209F	Mr. Downs
77s*	Goethe's Faust I..... (3 cred.; jr., sr.; prereq., 6 cred. above 60)	IV	MWF	209F	Mr. Schlenker

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

HISTORY AND PHILOSOPHY OF EDUCATION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
1f*	Brief Course in the History of Education ..... (5 cred.; jr., sr.; prereq., 6 cred. in psychol.)				
	Sec. 1	I	MTWThF	102Ed	Miss Alexander
	2	II	MTWThF	205Ed	Miss Alexander
	3	IV	MTWFS	205Ed	Miss Alexander
1w,s*	Brief Course in the History of Education ..... (See 1f)	II	MTWThF	205Ed	Miss Alexander
3f*	Educational Sociology..... (3 cred.; jr., sr.; prereq., 6 cred. in psychol.)				
	Sec. 1	II	MWF	205Ed	Mr. Finney
	2	III	MWF	205Ed	Mr. Finney
3w,s*	Educational Sociology..... (See 3f)	III	MWF	205Ed	Mr. Finney
5s	Public Education in the United States (3 cred.; jr., sr.; prereq., 6 cred. in psychol.)	VII	MWF	317Ad	Miss Alexander
101f-102w-103s*	Historical Foundations of Modern Education ..... (9 cred.; jr., sr.; prereq., Psychol. 6 cred., Hist. 6 cred.)	VIII	MWF	205Ed	Mr. Swift

For additional courses see the bulletin of the College of Education.

HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
3f,w,s	Textiles ..... (5 cred.; no prereq.)				
	Sec. 1	I, II	MTWThF	211,307HE	Miss Weller, Miss Phelps
	(Sections limited to 20 students each) 2	III, IV	MTWFS	211,307HE	Miss Weller, Miss Phelps

* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
4f,w,s	Textiles (S. L. and A.)..... (3 cred.; no prereq.; not open to students in H.E.) (Limited to 20)	VI, VII	MWF	211,307HE	Miss Phelps
11f,w,s	Garment-Making ..... (3 cred.; no prereq.)				
	Sec. 1	I, II	MWF	304HE	Miss McDowell, Miss Ebersole
	(Limited to 20 each) 2	I, II	TThS	304HE	Miss McDowell, Miss Ebersole
	3	VI, VII, VIII	TTh	304HE	Miss McDowell, Miss Ebersole
13f,s	Dressmaking ..... (5 cred.; soph., jr., sr.; prereq., 3, 11, 51, home pract. in garment-making)				
	Sec. 1	III, IV	MTWFS	304HE	Miss McDowell, Miss Patchin
	(Limited to 20 each) 2	I, II	TWThFS	305HE(f) 114HE(s)	Miss McDowell, Miss Patchin
13w	Dressmaking ..... (Same as 13f,s) (Limited to 20)	III, IV	MTWFS	304HE	Miss McDowell, Miss Patchin
15w-16s	Advanced Clothing Construction..... (3 cred.; prereq., 13, 53; open only to teachers)	III, IV	S	305HE	Miss Patchin, Miss Carlotta Brown
17f,w†	Advanced Clothing Construction.... (3 cred.; sr.; prereq., 13, 53) (Limited to 20)	III, IV	MWF	305HE	Miss McDowell, Miss Patchin, Miss Carlotta Brown
17s	Advanced Clothing Construction..... (Same as 17f,w)				
	Sec. 1	III, IV	MWF	305HE	
	2	I, II	TThS	305HE	Miss McDowell, Miss Patchin, Miss Carlotta Brown
18w,s	Commercial Clothing Manufacture... (4 cred.; sr.; prereq., 17 or parallel)	VI, VII, VIII, IX	MWF	305HE	Miss Patchin
21f,w	Foods and Cookery..... (5 cred.; soph., jr., sr.; prereq., Chem. 10 cred., Physiol. 4 parallel)				
	Sec. 1	VI, VII	MTWThF	209HE	Miss Child
	(Limited to 20) 2	III, IV	MTWFS	209HE	Miss Child
21s	Foods and Cookery..... (Same as 21f,w) (Limited to 20)	VI, VII	MTWFS	209HE.	Miss Child
22f	Food Economics..... (5 cred.; soph., jr., sr.; prereq., 21) (Limited to 20)	III, IV	MTWFS	205,207HE	Miss Child
22w,s	Food Economics..... (Same as 22f)				
	Sec. 1	III, IV	MTWFS	205,207HE	Miss Child
	(Limited to 20 each) 2	VI, VII	MTWThF	104,105,106HE	Ar

† Offered also in the Summer Session.

No.	Title	Hour	Day	Bldg.	Instructor
23f	Nutrition I.....				
	(5 cred.; jr., sr.; prereq., 22, Agr. Biochem. 3, Bact. 1)				
	Sec. 1	I, II	MTWThF	211,213HE	Miss Anderson
	(Limited to 25) 2	VI, VII, VIII IX	MWF	211,213HE	Miss Anderson
23w	Nutrition I.....	VI, VII, VIII.			
	(Same as 23f)	IX	MWF	211,213HE	Miss Anderson
	(Limited to 25)				
24s	Camp Cookery.....	Not offered in 1922-23			
	(4 cred.; no prereq.; not open to students in H.E.)				
25s	The Preparation of Food.....	VI, VII	MWF	103HE	Miss Child
	(3 cred.; dental nurses; prereq., Elementary Chemistry)				
34f,w,s†	Home Management: Operation and Maintenance, Lectures.....	VIII	MWF	203HE	Miss Studley
	(3 cred.; jr.‡, sr.; prereq., 22, 35 parallel, Econ. 5 or parallel)				
35f,w,s†	Home Management: Operation and Maintenance, Laboratory.....	Ar	Ar	Ar	Miss Lindquist, Miss Studley
	(6 cred.; jr.‡, sr.; prereq., 22, 37 and H.E. Educ. 40 or parallel. 34 parallel, home practice in foods and cookery advised)				
37f,s†	Health Care of the Family.....				
	(3 cred.; jr., sr.; prereq., Chem. 5 cred., Bact. 1)				
	Lect.	I	S	213HE	Miss Moorhead
	(Lab. sections limited Sec. 1 Lab.	VI, VII	TTh	WH	Miss Fisher
	to 30) 2	VI, VII	MF	WH	Miss Fisher
38w	First Aid.....	II, III	F	WH	Miss Fisher
	(1 cred.; Phys. Educ. students; prereq., An. Biol. 9)				
44s	Methods in Home Economics Extension Work.....	IV	MWF	309HE	Miss Newton
	(3 cred.; sr.; prereq., H.E. Educ. 42)				
45w,s	Home Economics Survey.....	IV	TS	203HE	
	(2 cred.; sr.; no prereq.)				
51f,w,s	Drawing and Design.....				
	(3 cred.; no prereq.)				
	Sec. 1	I, II	MWF	401HE	Miss Bacon, Miss V. Goldstein
	(Limited to 20 each) 2	I, II	TThS	401HE	Miss Bacon, Miss V. Goldstein
	3	VI, VII, VIII	TTh	402HE	Miss Bacon, Miss V. Goldstein

† Offered also in the Summer Session.
‡ Open to juniors only in their third quarter.

No.	Title	Hour	Day	Bldg.	Instructor
52f,s	Art History and Appreciation..... (3 cred.; jr., sr.; prereq., 51)				
	Sec. 1	II	MWF	309HE	Miss V. Goldstein
	2	VIII	MWF	309HE	Miss V. Goldstein
52w	Art History and Appreciation..... (Same as 52f,s)	VIII	MWF	309HE	Miss H. Goldstein
53f,s	Advanced Design..... (4 cred.; jr., sr.; prereq., 51)				
	Sec. 1	VI,VII,VIII	MWF	402HE	Miss H. Goldstein, Miss V. Goldstein
	(Limited to 20 each) 2	I, II	MWThF	402HE	Miss H. Goldstein, Miss V. Goldstein
53w	Advanced Design..... (Same as 53f,s) (Limited to 20)	I, II	MWThF	402HE	Miss H. Goldstein, Miss Patchin, Miss V. Goldstein
54s	Interior Design..... (3 cred.; sr.; prereq., 52, 53, 131)	VI, VII	MWF	401HE	Miss Morse
55f,s	Decorative Needlework and Other Crafts ..... (3 cred.; jr., sr.; prereq., 51, 53 or parallel) (Limited to 12)	VI, VII, VIII	TTh	401HE	Miss Morse
57w	Weaving and Other Crafts..... (3 cred.; jr., sr.; prereq., 3, 51, 53) (Limited to 12)	VI, VII, VIII	TTh	401HE	Miss Morse
58w	Costume Design..... (3 cred.; jr., sr.; prereq., 55)	VI, VII	MWF	402HE	Miss H. Goldstein
61f,w,s	Large Quantity Cookery and Marketing ..... (4 cred.; jr., sr.; prereq., 22)				
	Lect.	I	S	309HE	Miss Richards
	(Limited to 10) Lab.	I, II, III	TTh	DH	Miss Richards
63f,w,s	Institution Experience..... (3 cred.; jr., sr.; prereq., 22)				
	Lect.	II	S	309HE	Miss Treat, Miss Richards
	Lab.	Arrange 6 hrs. of which 3 must be IV-hr. periods			
70w	Food Preparation in Relation to Social Work..... (3 cred.; soph.‡, jr., sr.; prereq., An. Biol. 1-2, Chem. 10 cred. advised)	VI, VII	MWF	107HE	Miss Lindquist
71s	Elementary Dietetics for Social Workers ..... (3 cred.; soph.‡, jr., sr.; prereq., 70, Physiol. 4 or parallel)	VI, VII	MWF	107HE	

‡ Open to sophomores only in their third quarter. Not open to students in Home Economics except by special permission of the head of the division.

No.	Title	Hour	Day	Bldg.	Instructor
72f	Home Management Problems..... (3 cred.; soph.‡, jr., sr.; prereq., 71, Econ. 5 or parallel)	VI	MWF	106HE	Miss Lindquist
103f,w,s	Dietetics ..... (5 cred.; sr.; prereq., 108) (Limited to 20)	VI, VII	MTWThF	203,207HE	Miss Biester
105f,w†	Experimental Cookery..... (3 cred.; jr., sr.; prereq., 22, 23) (Limited to 12)	I, II	MWF	207HE	Miss Child
108f,w,s†	Nutrition II..... (5 cred.; jr., sr.; prereq., 23) (Limited to 25)	III, IV	MTWFS	211,213HE	Miss Anderson
109s	Advanced Nutrition..... (5 cred.; jr., sr.; prereq., 108, Agr. Biochem. 2)				
	Lect.	III	TS	106HE	Miss Biester, Miss Anderson
	(Limited to 15) Lab.	VI, VII, VIII, IX	TTh	311HE	
110s	Special Problems in Dietetics..... (3 cred.; sr.; prereq., 103)				
	Lect.	VIII	MW	213HE	Miss Biester
	(Limited to 20) Lab.	One full afternoon		Ar	
111s†	Special Food Problems..... (3 cred.; sr.; prereq., 105, Agr. Biochem. 2)	VI,VII,VIII	TTh	107HE	Miss Child
122w,s	Advanced Textiles..... (3 cred.; jr., sr.; prereq., 3, Agr. Biochem. 2, Econ. 5 or parallel) (Limited to 16)	VI, VII	MWF	307,311HE	Miss Phelps, Miss Weller
123w,s	Clothing Economics..... (2 cred.; jr., sr.; prereq., 13, Econ. 5)				
	Sec. 1	III (for teachers)	TTh	313HE	Miss Weller
	2	III, IV	S	313HE	Miss Weller
126s	Textile Analysis and Related Problems (3 cred.; jr., sr.; prereq., 122, Agr. Biochem. 2)	III, IV	MWF	311,313HE	Miss Weller, Miss Phelps
131f,w,s	Home Management: House-Planning and Equipment..... (5 cred.; sr.; prereq., 52, 53) (Limited to 20)	III, IV	MTWFS	401HE	Miss Morse
151s	Institution Management Problems.... (4 cred.; sr.; prereq., 61, 63)	IV	TS	106HE	Miss Treat
		III, IV	M	106HE	Miss Treat

HOME ECONOMICS EDUCATION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
40f	Child-Training ..... (3 cred.; jr., sr.; prereq., H.E. 37, Psychol. 1-2)	IV	MWF	203HE	Miss Binzel

† Offered also in the Summer Session.

‡ Open to sophomores only in their third quarter. Not open to students in Home Economics except by special permission of the head of the division.

42f,w,s†	Special Methods of Teaching Home Economics ..... (5 cred.; jr., sr.; prereq., H.E. 13, 22, Psychol. 1-2, Agr. Educ. 11 or Educ. 45)	VIII	MTWThF	313HE	Miss Miller, Miss Clara Brown
43w	Organization and Methods for Related Art Teaching..... (3 cred.; sr.; prereq., 42, H.E. 52, 53, 131)	IV	MWF	402HE	Miss H Goldstein
46f,w	Observation and Teaching: Related Art ..... (8 cred.; sr.; prereq., 42, H.E. 13, 52)				
	Lect.	IX	TTh	213HE	Miss Brown
	Teaching	Ar	Ar	Ar	Miss Bacon
47f,w	Observation and Teaching: Foods and Home Management..... (8 cred.; sr.; prereq., 42, H.E. 34, 35)				
	Lect.	IX	TTh	213HE	Miss Miller
	Teaching	Ar	Ar	Ar	
48f,w	Observation and Teaching: Textiles and Clothing..... (8 cred.; sr.; prereq., 42)				
	Lect.	IX	TTh	213HE	Miss Clara Brown,
	Teaching	Ar	Ar	Ar	Miss Ebersole, Miss Keever
49f,w	Observation and Teaching: General Home Economics..... (8 cred.; sr.; prereq., 42)				
	Lect.	IX	TTh	213HE	Miss Miller, Miss Brown, Miss Keever
	Teaching	Ar	Ar	Ar	
41s†	Problems in Home Economics Education ..... (3 cred.; sr.; prereq., 42, Educ. Psychol.)	VI	MWF	213HE	Miss Clara Brown

HORTICULTURE

No.	Title		Hour	Day	Bldg.	Instructor
f	Fruit-Growing ..... (3 cred.; no prereq.)					
	(Laboratory sections limited to 20)	Sec. 1. Lect.	II	MW	102Hr	Mr. Alderman
		2	IV	TS	102Hr	Mr. Alderman
		Sec. 1 Lab.	I, II	T or F	8Hr	Mr. Alderman
		2	VII, VIII	M	8Hr	Mr. Alderman
w	Small Fruit Culture..... (3 cred.; soph., jr., sr.; prereq., 6 or 32, Bot. 9 cred.)		IV	MWF	210Hr	Mr. Brierley

† Offered also in the Summer Session.

No.	Title	Hour	Day	Bldg.	Instructor
32s	Vegetable-Growing				
	(3 cred.; no prereq.)				
	Sec. 1 Lect.	II	MW	102Hr	Mr. Tapley, Mr. Bushnell
	(Laboratory section 2	IV	TS	102Hr	
	limited to 30) Sec. 1 Lab.	I, II	T or F	8Hr	
	2	VII, VIII	M	8Hr	
33w	Vegetable-Forcing	I	TTh	210Hr	Mr. Tapley
	(3 cred.; soph., jr., sr.; prereq., 32, Bot. 9 cred.)	VI, VII	F	8Hr	Mr. Tapley
50s	Floriculture	III	MWF	102Hr	Mr. Cady
	(3 cred.; no prereq.)				
56f	Propagation and Nursery Practice...	I	ThS	102Hr	Mr. Cady
	(3 cred.; soph., jr., sr.; no prereq.)	VI, VII	T	8aHr	Mr. Cady
72f	Plant Materials.....	IV	MWF	102Hr	Mr. Cady
	(3 cred.; no prereq.)				
73s	History of Landscape Design.....	II	TThS	102Hr	Mr. Cady
	(3 cred.; soph., jr., sr.; no prereq.)				
74w	Principles of Landscape Design.....	II	TThS	102Hr	
	(3 cred.; soph., jr., sr.; prereq., 72)				
75f	Landscape Design I.....	VI, VII, VIII	TTh	Ar	
	(3 cred.; jr., sr.; prereq., 74, Draw. 10 cred.)	IX	T		
76w	Landscape Design II.....	VI, VII, VIII	TTh	Ar	
	(3 cred.; jr., sr.; prereq., 75)	IX	T		
31s	Advanced General Horticulture.....	Ar	Ar	Ar	Mr. Alderman
	(3 cred.; jr., sr. in Agr. Educ.; prereq., Bot. 9 cred.)				
93f	Judging Horticultural Crops.....	VI, VII, VIII	M	8aHr	Mr. Alderman
	(2 cred.; soph., jr., sr.; prereq., 6 or 32)				
107f	Orchard Management.....	IV	TS	210Hr	Mr. Brierley
	(3 cred.; jr., sr.; prereq., 6, Bot. 9 cred.)	VI, VII	W	8Hr	Mr. Brierley
109f	Principles of Genetics.....	See Agronomy 131			
	(3 cred.; jr., sr.; prereq., Bot. 9 cred., An. Biol. 9 cred.)				
110w	Horticultural Crops-Breeding.....	I	TThS	212Hr	Mr. Beaumont
	(3 cred.; jr., sr.; prereq., 109)				
111f	Systematic Pomology.....	II	TTh	102Hr	Mr. Brierley
	(3 cred.; jr., sr.; prereq., 6, Bot. 9 cred.)	VI, VII	Th	8Hr	Mr. Brierley
131f	Advanced Vegetable Production.....	III	TTh	210Hr	Mr. Tapley
	(3 cred.; sr.; prereq., 32, Bot. 9 cred.)	III, IV	S	8Hr	Mr. Tapley
132f	Systematic Olericulture.....	II	TTh	210Hr	Mr. Tapley
	(3 cred.; jr., sr.; prereq., 32, Bot. 9 cred.)	VI, VII	F	8Hr	Mr. Tapley
133w	Commercial Truck-Growing.....	III	TThS	210Hr	Mr. Tapley
	(3 cred.; jr., sr.; prereq., 32, Bot. 9 cred.)				
135w	Potato Production.....	III	MW	102Hr	Mr. Krantz
	(3 cred.; jr., sr.; prereq., 6 or 32, Bot. 9 cred.)	VI, VII	Th	8Hr	Mr. Krantz
151f	Advanced Floriculture.....	Ar	Ar	Ar	Mr. Cady
	(3 cred.; jr., sr.; prereq., 50, Bot. 9 cred.)				

No.	Title	Hour	Day	Bldg.	Instructor
191w-192s	Special Problems..... (6 cred.; jr., sr.; prereq., instructor's permission)	Ar	Ar	Ar	Mr. Alderman
193f-194w-195s	Horticultural Seminar..... (3 cred.; jr., sr.; prereq., 9 cred.)	Ar	Ar	Ar	Horticultural staff

MILITARY SCIENCE AND TACTICS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	First-Year Basic Course..... (No cred.; fr.; must be legally eligible for enrolment in R.O.T.C.)	VI	MWF	A	Ar
3s*	First-Year Basic Course..... (No cred.; fr.; prereq., 1-2)	VII, VIII, IX	W	A	Ar
4f-5w*	Second-Year Basic Course..... (No cred.; soph.; prereq., 1-2-3)	I	MWF	A	Ar
		III	MWF	A	Ar
		VIII	MWF	A	Ar
6s*	Second-Year Basic Course..... (No cred.; soph.; prereq., 4-5)	VII, VIII, IX	W	A	Ar
51f-52w*	First-Year Advanced Course..... (6 cred.; jr.; prereq., Second-Year Basic Course)	III	TS	A	Ar
		VII, VIII, IX	Th	A	Ar
53s*	First-Year Advanced Course..... (3 cred.; jr.; prereq., 51-52)	III	TS	A	Ar
		VII, VIII, IX	T or W	A	Ar
54f-55w*	Second-Year Advanced Course..... (6 cred.; sr.; prereq., 51-52, 53)	IV	TS	A	Ar
		VII, VIII, IX	Th	A	Ar
56s*	Second-Year Advanced Course..... (3 cred.; sr.; prereq., 54-55)	IV	TS	A	Ar
		VII, VIII, IX	T or W	A	Ar

MUSIC

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s*	Harmony ..... (9 cred.‡; jr., sr.; no prereq.)	II	MWF	Mu	Ar
10f-11w-12s*	Organ ..... (6 or 12 cred.‡; jr., sr.; no prereq.)	VI	MWF	Mu	Ar
16f-17w-18s*	First-Year Piano..... (6 or 12 cred.‡; jr., sr.; no prereq.)	Ar	Ar	Mu	Mr. Fairclough
22f-23w-24s*	Violin ..... (6 or 12 cred.‡; jr., sr.; no prereq.)	Ar	Ar	Mu	Ar
28f-29w-30s*	Voice ..... (6 or 12 cred.‡; jr., sr.; no prereq.)	Ar	Ar	Mu	Miss Hull
40f-41w-42s*	Orchestra ..... (3 cred.‡; jr., sr.; no prereq.)	Ar	Ar	Ar	Mr. Pepinsky
43f-44w-45s*	Choir ..... (3 cred.; jr., sr.; no prereq.)	IX	M	Mu	Mr. Scott
46f-47w-48s*	Appreciation of Music..... (3 cred.‡; jr., sr.; no prereq.)	VI	M	Mu	Miss Reeves

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

* Offered on the Minneapolis campus.

‡ The full course must be completed before credit will be given.

PHYSICAL EDUCATION

FOR MEN

No.	Title	Hour	Day	Bldg.	Instructor
1f,w,s*	Personal Hygiene..... (No cred.; required of all freshmen; no prereq.)				
	Sec. 1	II	TTh	A	Dr. Cooke, Mr. Roemer, Mr. Glidden
	2	III	TTh	A	Dr. Cooke, Mr. Roemer, Mr. Glidden
	3	IV	TS	A	Dr. Brown, Mr. Roemer, Mr. Glidden
	4	VII	TTh	A	Dr. Brown, Mr. Roemer, Mr. Glidden
	5	VIII	TTh	A	Mr. Foster, Mr. Roemer, Mr. Glidden
2f-3w-4s*	Gymnasium ..... (No cred.; no prereq.)	Same schedule as Course 1, Hygiene			
5f-6w-7s*	Advanced Leaders..... (3 cred.‡; soph., jr., sr.; prereq., instr. permission)	Ar	TThS	A	Mr. Foster, Mr. Roeme
8f-9w-10s*	Corrective Gymnastics..... (No cred.; no prereq.)	Ar	Ar	A	Dr. Brown
11w-12s*	Wrestling ..... (No cred.; prereq., instr. permission)	Ar	Ar	A	Mr. Gilman
13f-14w-15s*	Intermediate Swimming..... (No cred.; prereq., instr. permission)	Ar	Ar	A	Mr. Glidden
16f-17w-18s*	Advanced Swimming..... (No cred.; prereq., instr. permission)	Ar	Ar	A	Mr. Foster, Mr. Glidde
19w-20s*	Boxing ..... (No cred.; prereq., instr. permission)	Ar	Ar	A	Mr. Goldie
21f-22w-23s*	Intramural Athletics..... (No cred.; prereq., instr. permission)	Ar	Ar	A	Mr. Whittemore

PHYSICAL EDUCATION

FOR WOMEN

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s*‡	Elementary Physical Training..... (No cred.; required of all new students)	IV	MWF	3,151,153WGm	Ar
		VI	MWF	3,151,153WGm	Ar
		VII	MWF	3,151,153WGm	Ar
		VIII	MWF	3,151,153WGm	Ar
		III	TThS	3,151,153WGm	Ar
4f*	Preliminary Hygiene..... (No cred.; required of all new students)	I	M	201WGm	Dr. Norris
		II	T	201WGm	Dr. Norris
		IV	T	201WGm	Dr. Norris
		VI	Th	201WGm	Dr. Norris
		III	W	201WGm	Dr. Norris

* Offered on the Minneapolis campus.

‡ The full course must be completed before credit will be given.

No.	Title	Hour	Day	Bldg.	Instructor
7f-8w-9s*‡	Sophomore Physical Training.....	IV	TS	3,153WGm	
	(No cred.; soph.; prereq., 1-2-3)	VI	TTh	3,153WGm	
10f-11w-12s*§	Sophomore Orthopedic Gymnastics...	IV	TS	3,153WGm	
	(No cred.; soph.; prereq., 1-2-3)	VI	TTh	3,153WGm	
13f-14w-15s*†	Sophomore Interpretive Dancing.....	VIII	TTh	151WGm	Miss Baker
	(No cred.; soph.; prereq., 1-2-3)	IX	TTh	151WGm	Miss Baker
16f-17w-18s*§	Sophomore Organized Games and Folk Dancing	III	MF	151WGm	Ar
	(No cred.; soph.; prereq., 1-2-3)				
19f-20w-21s*§	Sophomore Major Sports.....	IX	TTh	151WGm	Ar
	(No cred.; soph.; prereq., 1-2-3)				
22f-23w*	Sophomore Elementary Swimming...	IV	MW	51WGm	Ar
	(No cred.; soph.; prereq., 1-2-3)	VII	MW	51WGm	Ar
		II	TTh	51WGm	Ar
		III	WF	51WGm	Ar
		IV	TS	51WGm	Ar
		VII	TTh	51WGm	Ar
		VIII	TTh	51WGm	Ar
28f-29w-28s*¶	Sophomore Advanced Swimming.....	VIII	MW	51WGm	Ar
	(No cred.; soph.; prereq., 1-2-3, swimming test)	III	TTh	51WGm	Ar
32w*	Personal Hygiene.....	III	TThS	201WGm	Ar
	(3 cred.; soph., jr., sr.; prereq., An. Biol. 1-2)				
33s*	Hygiene of the Family.....	II	MWF	201WGm	Dr. Norris
	(3 cred.; jr., sr.; prereq., An. Biol. 1-2)				
35w*	Intermediate Physical Training.....	VII	TTh	153WGm	Ar
	(1 cred.; jr., sr.; prereq., 6 qtrs.)				
37f,w,s*	General Swimming.....	VIII, IX	MTThF	51WGm	No instr.
	(No cred.; no prereq.)				
43f-44w-45s*	Folk Dancing and Organized Games	VI	TThF	151WGm	Miss Kissock
	(3 cred.‡; jr., sr.; prereq., 6 qtrs.)				
46f-47w-48s*§	Hockey, Basket-Ball, Baseball.....	IX	MW	151WGm	Ar
	(No cred.; fr., jr., sr.; prereq., permission of instr.)				
66f-67w-68s*	Interpretive Dancing.....	III	MWF	151WGm	Miss Baker
	(3 cred.‡; jr., sr.; prereq., 6 qtrs.)				

For additional courses see the bulletin of the College of Education.

* Offered on the Minneapolis campus.

† The third quarter is open to students who have not taken the preceding quarters.

‡ The full course must be completed before credit will be given.

§ The second or third quarter of this course is open to students who have not had the first two quarters.

¶ No students may register for more than two quarters of swimming without permission.

PHYSICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f,w	Elements of Mechanics and Sound...				
	(3 cred.; prereq., Trigonometry)				
	Lect.	VIII	MWF	30Ph	Mr. Erikson
	Quiz	IX	F	100C	Mr. Erikson
1s*	Elements of Mechanics and Sound..				
	(Same as 1f,w)				
	Lect.	III	TThS	30Ph	Mr. Erikson
	Quiz	IX	F	100C	Mr. Erikson
2f,w,s*	Elements of Mechanics Laboratory..				
	(1 cred.; prereq., 1 or parallel)				
	Sec 1	VI, VII	T	16Ph	Mr. Erikson
	2	VIII, IX	T	16Ph	Mr. Erikson
	3	VIII, IX	Th	30Ph	Mr. Erikson
9s*	Acoustics	Ar	Ar	30Ph	Mr. Erikson
	(3 cred.; no prereq.)				
21f*	Heat				
	(3 cred.; prereq., 1)				
	Lect.	III	TThS	30Ph	Mr. Miller
	Quiz	IX	W	100C	Mr. Miller
22f*	Heat Laboratory.....				
	(1 cred.; prereq., 2, 21 or parallel)				
	Sec. 1	VI, VII	M	23Ph	Mr. Miller
	2	VIII, IX	M	23Ph	Mr. Miller
	3	VI, VII	T	23Ph	Mr. Miller
	4	VIII, IX	T	23Ph	Mr. Miller
31f,s*	Optics				
	(3 cred.; prereq., 1)				
	Lect.	I	TThS	30Ph	Mr. Valasek
	Quiz	IX	M	100C	Mr. Valasek
32f,s*	Optics Laboratory.....				
	(1 cred.; prereq., 2, 31 or parallel)				
	Sec. 1	VI, VII	Th	23Ph	Mr. Valasek
	2	VIII, IX	Th	23Ph	Mr. Valasek
	3	VI, VII	F	23Ph	Mr. Valasek
	4	VIII, IX	F	23Ph	Mr. Valasek
41w*	Magnetism and Electricity.....				
	(3 cred.; prereq., 1)				
	Lect.	III	TThS	30Ph	Mr. Zeleny
	Quiz	IX	W	100C	Mr. Zeleny
42w*	Electrical Laboratory.....				
	(1 cred.; prereq., 2, 41 or parallel)				
	Sec. 1	VI, VII	T	31Ph	Mr. Zeleny
	2	VIII, IX	T	31Ph	Mr. Zeleny
	3	VI, VII	Th	31Ph	Mr. Zeleny
	4	VI, VII	W	31Ph	Mr. Zeleny

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

* Offered on the Minneapolis campus.

PHYSIOLOGY

MEDICAL SCHOOL

No.	Title	Hour	Day	Bldg.	Instructor
4f,w,s*†	Human Physiology..... (5 cred.; prereq., 1 qtr. an. biol., 1 qtr. chem.)				
	Lect.	III	Th and		
		IV	MWF	315MH	Dr. Beard and
	Lab.	II, III, IV	S		others
	Dem.	III, IV	T		
57w-58s*†	Human Physiology..... (4 cred.; jr., sr.; prereq., An. Biol. 1, 2 or 5, 6, 7; Chem. 1, 2, 3 or 4, 5)	I	TThS	301MH	Dr. Lyon,
	Lab. Div. A	II, III, IV	T		Dr. Gault,
	Lab. Div. B	V, VII, VIII	W		and others
59s*†	Physiologic Chemistry..... (4 cred.; jr., sr.; prereq., same as 57-58)	I	TThS	310MH	Dr. Pettibone
	Lab. Div. B	II, III, IV	T		and others
	Lab. Div. A	VI, VII, VIII	W		
100f-101w*†	Physiologic Chemistry..... (12 cred.; jr., sr.; prereq., an. biol., org. chem., physics)	IV	MWF	310MH	Dr. McClendon
	Lab. Div. A	I, II, III	TTh		Dr. Pettibone
	Lab. Div. B	I, II, III	FS		Dr. Kingsbury
103f*†	Physiology of Muscles, etc..... (8 cred.; jr., sr.; prereq., same as 100-101)	IV, VI, VII, VIII	MWF	301MH	Dr. Scott and others
104w*†	Physiology of Nervous System, etc.. (8 cred.; jr., sr.; prereq., same as 100-101)	IV, VI, VII, VIII	MWF	301MH	Dr. Lyon, Dr. Scott, and others

For additional courses see the bulletin of the Medical School.

PLANT PATHOLOGY AND BOTANY

No.	Title	Hour	Day	Bldg.	Instructor
1f†	Plant Pathology..... (5 cred.; jr., sr.; prereq., Bot. 9 cred.)	VI, VII, VIII, IX	MWF	1,2PP	Mr. Stakman, Mr. Leach, Mr. Seal
7w-8s	Weeds and Grasses..... (6 cred.; soph., jr., sr.; prereq., Bot. 9 cred.)	VI, VII, VIII	WF	3PP	Mr. Larson
9f†	Weeds and Seed-Testing..... (3 cred.; soph., jr., sr.; prereq., Bot. 9 cred.)	VI, VII, VIII	WF	3,4PP	Mr. Larson
10f	Forest Pathology..... (5 cred.; soph., jr., sr.; prereq., Bot. 9 cred.)	VI, VII, VIII, IX	MWF	1,2PP	Mr. Stakman, Mr. Leach, Mr. Seal
12w	Seed Problems..... (3 cred.; jr., sr.; prereq., 9)	Ar	Ar	Ar	Mr. Larson

* Offered on the Minneapolis campus.
† Offered also in the Summer Session.

No.	Title	Hour	Day	Bldg.	Instructor
14s	Plant Disease Control..... (5 cred.; jr., sr.; prereq., 1, Entom. 3)	Ar	Ar	Ar	Mr. Barker
105f-106w-107s	Mycology ..... (9 cred.; jr., sr.; prereq., Bot. 7, 11 or equiv.)	III, IV	MWF	1,32PP	Miss Dosdall
108f	Methods ..... (3 cred.; jr., sr.; prereq., 1 or 10, Bact. 1)	I, II	MWF	1,2PP	Mr. Leach
110w	Principles of Pathology..... (3 cred.; jr., sr.; prereq., 1 or 10, Bact. 1)	I, II	MWF	1,2PP	Mr. Stakman, Mr. Barker
111w†	Diseases of Field Crops..... (3 cred.; jr., sr.; prereq., 1 or 10)	VI, VII	MWF	1,2PP	Mr. Stakman, Mr. Barker
112s‡	Diseases of Fruit Crops..... (3 cred.; jr., sr.; prereq., 1 or 10)	VI, VII	MWF	1,2PP	
113s‡	Diseases of Vegetable Crops..... (3 cred.; jr., sr.; prereq., 1 or 10)	VI, VII	MWF	1,2PP	Mr. Leach
114w	Advanced Forest Pathology..... (3 cred.; jr., sr.; prereq., 1 or 10)	VIII, IX	MWF	1,2PP	Mr. Stakman, Mr. Leach

POLITICAL SCIENCE

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f*	American Government..... (5 cred.; soph., jr., sr.; no prereq.)				
	Sec. 1	IV	MTWFS	LitTh	Ar
	2	VII	MTWThF	306D	Ar
1w*	American Government..... (Same as 1f)				
	Sec. 1	IV	MTWFS	LitTh	Ar
	2	VII	MTWThF	306D	Ar
1s*	American Government..... (Same as 1f)				
	Sec. 1	IV	MTWFS	LitTh	Ar
	2	VII	MTWThF	LitTh	Ar
7f*	State Government..... (5 cred.; soph., jr., sr.; prereq., 1)	VI	MTWThF	306D	Mr. Cushman
7w*	State Government..... (Same as 7f)	VI	MTWThF	202MA	Mr. Cushman
7s*	State Government..... (Same as 7f)	VI	MTWThF	202MA	Mr. Cushman
51f-52w-53s*	Business Law..... (9 cred.; jr., sr.; prereq., Econ. 10 cred.)	II	MWF	109F	Mr. Young

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

POULTRY HUSBANDRY

No.	Title	Hour	Day	Bldg.	Instructor
1f,w	Poultry ..... (3 cred.; no prereq.)	VI	MWF	104Ve	Mr. Smith
2w	Poultry-Judging ..... (3 cred.; prereq., 1)	Ar	Ar	Ar	Mr. Smith

* Offered on the Minneapolis campus

† Offered also in the Summer Session.

‡ Courses 112 and 113 will ordinarily alternate with each other. One but not both will be given in 1922-23.

No.	Title	Hour	Day	Bldg.	Instructor
4s	Incubating and Brooding..... (3 cred.; no prereq.)	VI	MWF	104Ve	Mr. Smith
5s	Advanced Poultry-Judging..... (3 cred.; prereq., 2)	Ar	Ar	Ar	Mr. Smith

PSYCHOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	General Psychology..... (6 cred.‡; soph., jr., sr.; no prereq.)				
	Lect.	I	MW	MuAud	Mr. Elliott, Mr. Foster
	Rec.	(one hour)			
		I	Th or F or S	Psy	
		II	Th or F or S	Psy	
		VII	Th or F	Psy	
		VIII	Th or F	Psy	
1w-2s*	General Psychology..... (Same as 1f-2w)				
	Sec. 1	V	MWF	PsyAmph	
	(Sections limited to 25) 2	VI	MWF	PsyAmph	
	3	VII	MWF	PsyAmph	
1f-6w*	General Psychology for Business Students ..... (6 cred.‡; soph., jr., sr.; business and pre-business students; no prereq.)				
	Lect.	III	MW	MuAud	Mr. Elliott, Mr. Foster, Mr. Paterson
	Rec.	(one hour)			
		III	Th or F or S	Psy	
		IV	F or S	Psy	
3s*	Psychology Applied to Daily Life.... (3 cred.; soph., jr., sr.; prereq., 1-2)				
	Lect.	I	MW	LitTh	Mr. Elliott, Mr. Foster, Mr. Paterson
	Rec.	(one hour)			
		I	Th or F or S	Psy	
		II	Th or F or S	Psy	
4f-5w*	Introductory Laboratory Psychology. (4 cred.‡; soph., jr., sr.; prereq., 1-2 or parallel, or 1-6 by permission)				
	Sec. 1	I, II	TTh	211Psy	Mr. Foster
	(Sections limited to 40) 2	III, IV	TS	211Psy	
	3	VI, VII	TTh	211Psy	
	4	VIII, IX	TTh	211Psy	
7s*	Introductory Laboratory Psychology. (Same as 4f-5w)				
	Sec. 1	VI, VII	MTWF	211Psy	
	2	III, IV	MTWF	211Psy	
9s*	Animal Behavior..... (3 cred.; soph., jr., sr.; prereq., 1-2 or 1-6)	III	MWF	109Psy	Mr. Lashley

* Offered on the Minneapolis campus.

‡ The full course must be completed before credit will be given.

No.	Title	Hour	Day	Bldg.	Instructor
101f-102w*	Experimental Psychology.....	VII	MWF		
	(9 cred.§; jr., sr.; prereq., 1-2 or 4-5 or 7, or Physics, 8 cred.)	VIII	WF	116Psy	Mr. Johnson
108w-109s*	Advanced General Psychology.....	VIII, IX	M	109Psy	Mr. Johnson
	(6 cred.‡; sr.; prereq., 101-102)	IX	W	109Psy	
114w-115s*	Human Behavior.....	II	TThS	109Psy	Mr. Elliott
	(6 cred.‡; jr., sr.; prereq., 1-2 or 6, 4-5 or 7, or An. Biol. 1-2)				
124f*	Psychology of Learning.....	IV	MWF	109Psy	Mr. Lashley
	(3 cred.; jr., sr.; prereq., 1-2 or 6, 4-5 or 7)				
125f-126w*	Psychology of Individual Differences	II	MWF	109Psy	Mr. Paterson
	(6 cred.‡; jr., sr.; prereq., 1-2 or 6, 4-5 or 7 or Educ. Psychol. 126-127)				

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

PUBLICATIONS AND RURAL JOURNALISM

No.	Title	Hour	Day	Bldg.	Instructor
10f-11w-12s	Agricultural Journalism.....	VI	MWF	217En	Mr. Kirkwood
	(9 cred.; jr., sr.; prereq., 13-14-15, 16-17)				
19f	Agricultural Publicity.....	I	TThS	4PP	Mr. Kirkwood
	(3 cred.; jr., sr.; prereq., Rhet. 19 cred. or Rhet. 9 cred., Eng. 9 cred.)				

RHETORIC

No.	Title	Hour	Day	Bldg.	Instructor
1f	Rhetoric I.....				
	(3 cred.; no prereq.)				
	Sec. 1	I	MWF	310En	Miss Clausen
	2	II	MWF	311En	Miss Tripp
	3	III	MWF	310En	Miss Tripp
	4	IV	MWF	310En	Miss Clausen
	5	II	TThS	310En	Miss Tripp
	6	I	TThS	311En	Miss Clausen
1w,s	Rhetoric I.....	VII	MWF	310En	Ar
	(Same as 1f)				
2f	Rhetoric II.....	II	MWF	310En	Miss Clausen
	(3 cred.; prereq., 1)				
2w	Rhetoric II.....				
	(Same as 2f)				
	Sec. 1	II	MWF	310En	Miss Tripp
	2	IV	MWF	310En	Miss Clausen
	3	III	TThS	310En	Miss Tripp
	4	II	TThS	310En	Miss Clausen
	5	II	TThS	308En	Miss Tripp
	6	III	MWF	310En	Miss Clausen
2s	Rhetoric II.....	II	TThS	310En	Miss Clausen
	(Same as 2f)				
3f	Rhetoric III.....	III	TThS	310En	Miss Tripp
	(3 cred.; prereq., 2)				

* Offered on the Minneapolis campus.
‡ The full course must be completed before credit will be given.
§ Six credits will be allowed for the first two quarters.

No.	Title	Hour	Day	Bldg.	Instructor
3w	Rhetoric III.....	III	MWF	307En	Miss Tripp
	(Same as 3f)				
3s	Rhetoric III.....				
	(Same as 3f)				
	Sec. 1	II	MWF	310En	Miss Clausen
	2	IV	MWF	310En	Miss Clausen
	3	IV	MWF	308En	Miss Tripp
	4	I	TThS	310En	Miss Clausen
	5	II	MWF	308En	Miss Tripp
	6	III	MWF	308En	Miss Tripp
4f,w,s	Elementary Rhetoric.....	Ar	Ar	Ar	Miss Tripp
	(3 cred.; no prereq.)				
11f	Argumentation	I	MWThFS	307En	Mr. Lansing
	(3 cred.; soph., jr., sr.; prereq., 3, 22 recommended)				
11w	Argumentation	III	MTWFS	311En	
	(Same as 11f)				
11s	Argumentation				
	(Same as 11f)				
	Sec. 1	III	MTWFS	307En	Mr. Lansing
	2	IV	MTWFS	311En	Mr. Burtis
22f	Public Speaking.....				
	(3 cred.; soph., jr., sr.; prereq., 3)				
	Sec. 1	II	MTWFS	311En	Mr. Burtis
	2	IV	MTWFS	311En	Mr. Burtis
22w	Public Speaking.....				
	(Same as 22f)				
	Sec. 1	I	MTWFS	311En	Mr. Burtis
	2	IV	MTWFS	311En	Mr. Burtis
22s	Public Speaking.....	III	MTWFS	311En	Mr. Burtis
	(Same as 22f)				
24f	Advanced Public Speaking.....	III	TThS	311En	Mr. Burtis
	(3 cred.; soph., jr., sr.; prereq., 22)				
24w,s	Advanced Public Speaking.....	II	TThS	311En	Mr. Burtis
	(Same as 24f)				
31f,w,s	Survey of English Literature I.....	II	MWThFS	307En	Mr. Lansing
	(5 cred.; soph., jr., sr.; prereq., 3)				
32f,w,s	Survey of English Literature II....	IV	MWF	307En	
	(3 cred.; soph., jr., sr.; prereq., 3)				

ROMANCE LANGUAGES

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

French

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	Beginning French.....				
	(10 cred.‡; no prereq.)				
	Sec. 1	I	TWThFS	213F	Ar
	2	II	MWThFS	227F	Ar
	3	III	MTThFS	226F	Ar
	4	IV	MTWFS	201F	Ar
	5	VI	MTWThF	202F	Ar
	6	VII	MTWThF	226F	Ar
	7	VIII	MTWThF	202F	Ar

* Offered on the Minneapolis campus.

‡ The full course must be completed before credit will be given.

No.	Title	Hour	Day	Bldg.	Instructor
1w-2s*	Beginning French.....				
	(Same as 1f-2w)				
	Sec. 1	I	TWThFS	227F	Ar
	2	VII	MTWThF	202F	Ar
1s*	Beginning French.....				
	(5 cred.‡; no prereq.)				
	Sec. 1	I	TWThFS	Ar	Ar
	2	VIII	MTWThF	Ar	Ar
2f*	Beginning French.....				
	(5 cred.‡; prereq., 1)				
	Sec. 1	I	TWThFS	202F	Ar
	2	VII	MTWThF	213F	Ar
3f-4w*	Intermediate French.....				
	(10 cred.; prereq., 1-2 or 2 yrs. h. s.)				
	Sec. 1	I	TWThFS	205F	Ar
	2	II	MWThFS	204F	Ar
	3	III	MTThFS	213F	Ar
	4	VI	MTWThF	226F	Ar
	5	VIII	MTWThF	213F	Ar
3w-4s*	Intermediate French.....				
	(Same as 3f-4w)				
	Sec. 1	I	TWThFS	202F	Ar
	2	VII	MTWThF	213F	Ar
3s*	Intermediate French.....				
	(5 cred.; prereq., 1-2 or 2 yrs. h. s.)				
	Sec. 1	I	TWThFS	213F	Ar
	2	II	MWThFS	227F	Ar
	3	III	MTThFS	226F	Ar
	4	IV	MTWFS	201F	Ar
	5	VI	MTWThF	202F	Ar
	6	VII	MTWThF	226F	Ar
	7	VIII	MTWThF	202F	Ar
4f*	Intermediate French.....				
	(5 cred.; prereq., 3)				
	Sec. 1	II	MWThFS	213F	Ar
	2	III	MTThFS	124F	Ar
	3	IV	MTWFS	125F	Ar
	4	VII	MTWThF	202F	Ar
20f*	Oral and Written French.....				
	(5 cred.; prereq., 3-4 or 3 yrs. h. s.)				
	Sec. 1	III	MTThFS	205F	Mr. Frelin
	2	VIII	MTWThF	206F	Ar
20s*	Oral and Written French.....				
	(Same as 20f)				
	Sec. 1	I	TWThFS	15F	Ar
	2	II	MWThFS	213F	Ar
	3	III	MTWFS	213F	Ar
	4	VII	MTWThF	213F	Ar
21f-22w-23s*	Survey of French Literature.....				
	(9 cred.‡; prereq., 3-4 or 3 yrs. h. s.)				
	Sec. 1	II	TThS	107F	Mr. LeCompte
	2	III	TThS	301F	Mr. van Roosbroeck
	3	VII	MWF	107F	Mr. Searles

* Offered on the Minneapolis campus.

‡ The full course must be completed before credit will be given.

No.	Title	Hour	Day	Bldg.	Instructor
50f-51w-52s*	French Conversation..... (3 cred.‡; jr.†, sr.; prereq., 3-4 or 3 yrs. h. s., 53-54-55 or parallel)				
	Sec. 1	III	MW	201F	Miss Phelps
	2	VI	MW	107F	Mr. Frelin
53f-54w-55s*	French Composition..... (3 cred.‡; jr.†, sr.; prereq., 3-4 or 3 yrs. h. s.)				
	Sec. 1	III	F	201F	Miss Phelps
	2	VI	F	107F	Mr. Frelin

Spanish

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	Beginning Spanish..... (10 cred.‡; no prereq.)				
	Sec. 1	I	TWThFS	15F	Ar
	2	II	MWThFS	226F	Ar
	3	III	MTThFS	227F	Ar
	4	IV	MTWFS	226F	Ar
	5	VI	MTWThF	201F	Ar
	6	VII	MTWThF	201F	Ar
	7	VIII	MTWThF	226F	Ar
1w-2s*	Beginning Spanish..... (Same as 1f-2w)				
	Sec. 1	II	TWThFS	202F	Ar
	2	III	MTThFS		
	3	VII	MTWThF	125F	Ar
1s*	Beginning Spanish..... (5 cred.‡; no prereq.)				
	Sec. 1	II	TWThFS	201F	Ar
	2	VII	MTWThF	201F	Ar
2f*	Beginning Spanish..... (5 cred.‡; prereq., 1)				
	Sec. 1	I	TWThFS	201F	Ar
	2	VIII	MTWThF	201F	Ar
3f-4w*	Intermediate Spanish..... (10 cred.; prereq., 1-2 or 2 yrs. h. s.)				
	Sec. 1	II	MWThFS	201F	Ar
	2	III	MTThFS	202F	Ar
	3	VI	MTWThF	227F	Ar
	4	VII	MTWThF	109F	Ar
3w-4s*	Intermediate Spanish..... (Same as 3f-4w)				
	Sec. 1	I	TWThFS	201F	Ar
	2	VIII	MTWThF	201F	Ar
3s*	Intermediate Spanish..... (5 cred.; prereq., 1-2 or 2 yrs. h. s.)				
	Sec. 1	I	TWThFS	226F	Ar
	2	II	MWThFS	226F	Ar
	3	III	MTThFS	227F	Ar
	4	IV	MTWFS	226F	Ar
	5	VI	MTWThF	201F	Ar
	6	VII	MTWThF	201F	Ar
	7	VIII	MTWThF	227F	Ar

* Offered on the Minneapolis campus.
‡ The full course must be completed before credit will be given.
† Open without petition to sophomores who can satisfy the prerequisites.

No.	Title	Hour	Day	Bldg.	Instructor
(3s)-4f*	Intermediate Spanish.....				
	(Same as 3f-4w)				
	Sec. 1	I	TWThFS	301F	Ar
	2	II	MWThFS	202F	Ar
	3	III	MTThFS	308D	Ar
	4	IV	MTWFS	202F	Ar
	5	VI	MTWThF	227F	Ar
20s*	Oral and Written Spanish.....	III	MTThFS	202F	Ar
	(5 cred.; prereq., 3-4 or 3 yrs. h. s.)				
50f-51w-52s*	Spanish Conversation.....	II	MW	302D	Mr. Coburn
	(3 cred.‡; jr.†, sr.; prereq., 3-4 or 3 yrs. h. s., 53-54-55 or parallel)				
53f-54w-55s*	Spanish Composition.....	II	F	302D	Mr. Coburn
	(3 cred.‡; jr.†, sr.; prereq., 3-4 or 3 yrs. h. s.)				
65f-66w-67s*	Survey of Spanish Literature.....	II	TThS	306F	Mr. Gillet
	(9 cred.‡; jr.†, sr.; prereq., 3-4)				

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

SOCIOLOGY AND SOCIAL WORK

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f	Introduction to Sociology.....				
	(5 cred. except section 7; 3rd qtr. fr., soph., jr., sr.; no prereq.)				
	Sec. 1*	I	TWThFS	9F	
	2*	III	MTThFS	5F	
	3*	IV	MTWFS	9F	
	4, 5*	VI	MTWThF	9F	
	6*	VII	MTWThF	5F	
	7 (3 cred.)	IV	MWF	105En	Mr. Lundquist
1w	Introduction to Sociology.....				
	(Same as 1f)				
	Sec. 1*	I	TWThFS	9F	
	2*	III	MTThFS	5F	
	3*	IV	MTWFS	9F	
	4. 5*	VI	MTWThF	9F	
	6*	VII	MTWThF	5F	
	7 (3 cred.)	IV	MWF	105En	Mr. Lundquist
	8*	VIII	MTWThF	9F	
1s	Introduction to Sociology.....				
	(Same as 1f)				
	Sec. 1*	I	TWThFS	9F	
	2*	II	MWThFS	5F	
	3*	III	MTThFS	9F	
	4*	IV	MTWFS	9F	
	5, 6*	VI	MTWThF	9F	
	7 (3 cred.)	IV	MWF	105En	Mr. Lundquist
	8*	VII	MTWThF	5F	
	9*	VIII	MTWThF	9F	

* Offered on the Minneapolis campus.
† Open without petition to sophomores who can satisfy the requirements.
‡ The full course must be completed before credit will be given.

No.	Title	Hour	Day	Bldg.	Instructor
3f,w,s*	Educational Sociology..... (See Hist. and Philos. of Educ.)				
6f,w,s*	Modern Social Reform Movements.. (3 cred.; soph., jr., sr.; prereq., 1)				
	Sec. 1	II	TThS	9F	Ar
	2	IV	MWF	5F	Ar
	3	VI	MWF	6F	Ar
14f,w	Rural Sociology..... (3 cred.; soph., jr., sr.; prereq., 1 or sr. class)				
	Sec. 1*	III	MWF	9F	Mr. Hoffer
	2*	VI	MWF	25F	Mr. Lantis
	3	I	MWF	105En	Mr. Lundquist
14s*	Rural Sociology..... (Same as 14f,w)				
	Sec. 1	III	MWF	25F	Ar
	2	VI	MWF	15F	Ar
51f,w,s*	The Occurrence of the Socially Inadequate ..... (3 cred.; jr., sr.; prereq., 10 cred. in sociol., or 10 in sociol. and pol. sci., econ., or psychol.)	I	MWF	5F	Mr. Bruno
52f,w,s*	Elementary Case Work..... (3 cred.; jr., sr.; prereq., 51)	I	TThS	5F	Mr. Bruno
53f,w,s*	Elements of Criminology..... (Same as 51)	III	MWF	9F	Mr. Elmer
55w*	Housing Problems..... (Same as 51)	I	MWF	25F	Mr. Davis
60w*	Child Welfare..... (3 cred.; jr., sr.; prereq., 51, 52)	IX	MWF	9F	Mr. Hodson
101w*	Social Organization..... (3 cred.; jr., sr.; prereq., 4 courses in sociol., or Sociol. 1 and 15 cred. in sociol., anthropol., econ., educ., hist., philos., pol. sci., or psychol.)	II	TThS	9F	Mr. Bernard
102s*	Social Control..... (3 cred.; jr., sr.; prereq., same as 101)	II	TThS	9F	Mr. Bernard
110w*	Community Organization and Social Work in Small Towns and Country ..... (2 cred.; jr., sr.; prereq., same as 101)	VIII, IX	Th	9F	Mr. Bernard
114s	Rural Social Institutions..... (3 cred.; jr., sr.; prereq., same as 101)	I	MWF	105En	Mr. Lundquist
119f*	The Family..... (3 cred.; jr., sr.; prereq., same as 101)	III	TThS	9F	Mr. Elmer
120f*	Social Progress..... (3 cred.; jr., sr.; prereq., same as 101)	II	MWF	9F	
122w*	Methods of Social Investigation.... (3 cred.; jr., sr.; prereq., same as 101)	VIII	MWF	5F	Mr. Elmer

* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
123s*	Social Statistics..... (3 cred.; jr., sr.; prereq., 122)	VIII	MWF	5F	Mr. Elmer
128s*	Charitable Administration, Finance, and Publicity..... (2 cred.; jr., sr.; prereq., same as 101)	VIII, IX	Th	5F	Mr. Davis
134s*	Legal Protection of the Child..... (3 cred.; jr., sr.; prereq., same as 101, incl. 60)	IX	MWF	5F	Mr. Hodson
140w*	History of Social Theory..... (3 cred.; jr., sr.; prereq., same as 101)	II	MWF	9F	Mr. Bernard
141s*	Contemporary Social Theory..... (3 cred.; jr., sr.; prereq., same as 101)	II	MWF	9F	Mr. Bernard

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

SOILS

No.	Title	Hour	Day	Bldg.	Instructor
4f	Soils ..... (3 cred.; soph., jr., sr.; prereq., Chem. 10 cred.)				
	Lect.	III	TTh	251Ch	Mr. Rost
	Lab.	III, IV	S	253Ch	
5s	Soil Fertility..... (3 cred.; soph., jr., sr.; prereq., 4)				
	Lect.	III	TTh	251Ch	Mr. Alway,
	Lab.	III, IV	S	253Ch	Mr. Rost
101f	Chemical Analysis of Soils..... (3 to 5 cred.; jr., sr.; prereq., 5, Quant. Anal.)	Ar	Ar	Ar	Mr. Rost
102w,s	Special Problems in Soils..... (Cred. assigned according to amount of work; jr., sr.; prereq., 101 or 108)	Ar	Ar	Ar	Mr. Alway
104s	Soil-Surveying ..... (3 cred.; jr., sr.; prereq., 108)	Ar	Ar	Ar	Mr. McMiller
105w	Minnesota Soils..... (3 cred.; jr., sr.; prereq., 5)	Ar	Ar	Ar	Mr. Alway
107w	Fertilizers and Manures..... (2 cred.; jr., sr.; prereq., 5)	IV	TS	Ar	Mr. Rost
108w	Physical Properties of Soils..... (3 cred.; jr., sr.; prereq., 5)	Ar	Ar	Ar	Mr. McMiller

VETERINARY MEDICINE

No.	Title	Hour	Day	Bldg.	Instructor
2f	Anatomy of Domestic Animals..... (5 cred.; soph., jr., sr.; no prereq.)	II	MTThS	2Ve	Mr. Kernkamp
		VI	T	2Ve	
3w-4s	Comparative Physiology..... (6 cred.; soph., jr., sr.; prereq., 2)	I	TThS	2Ve	Mr. Hewitt
6f	Physiology and Hygiene of Breeding (3 cred.; jr., sr.; prereq., 3-4)	IV	MWF	9Ve	Mr. Boyd

* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
8s	Veterinary Studies..... (5 cred.; soph., jr., sr.; no prereq.)	III	MTWFS	9Ve	Mr. Reynolds
12w	Infectious Diseases..... (3 cred.; jr., sr.; prereq., 3-4, Bact. 1)	I	MWF	2Ve	Mr. Fitch, Mr. Billings
13s	Non-Infectious Diseases..... (3 cred.; jr., sr.; prereq., 3-4)	I	MWF	2Ve	Mr. Boyd
101w-102s	Advanced Anatomy of Domestic Animals ..... (6 cred.; jr., sr.; prereq., 2 or equiv.) (Limited to 9)	Ar	Ar	Ar	Mr. Kernkamp
103f-104w	Advanced Comparative Physiology... (6 cred.; jr., sr.; prereq., 3-4 or equiv.)				
	Lect.	II	TTh	9Ve	Mr. Hewitt
	Lab.	VI, VII	Th	9Ve	Mr. Hewitt

INDEX

The Bulletin *of the* University *of* Minnesota

The School of Agriculture Announcement for the Year 1922-1923

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1922

JULY

Su	Mo	Tu	W	Th	Fr	Sa
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2	3	**4**	5	6	7	8
9	10	11	12	13	14	15
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23	24	25	26	27	**28**	29
30	31	..	..	..	..	..

AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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31	..	..	..	..	..	..

1923

JANUARY

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MAY

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JULY

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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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CALENDAR

SCHOOL OF AGRICULTURE

1922			
October	2	Monday	First term begins; entrance examinations, registration, payment of fees
October	3	Tuesday	Regular class work begins
November	7	Tuesday	General Election Day; a holiday
November	11	Saturday	Armistice Day; a holiday
November	30	Thursday	Thanksgiving Day; a holiday
December	21	Thursday	First term closes; Christmas vacation begins, 4:30 p.m.
1923			
January	8	Monday	Second term begins; entrance examinations, registration, payment of fees
January	9	Tuesday	Regular class work begins
February	12	Monday	Lincoln's Birthday; a holiday
February	22	Thursday	Washington's Birthday; a holiday
March	24	Saturday	Second term closes
March	27	Tuesday	Alumni Day
March	28	Wednesday	Thirty-fourth annual commencement

THE SCHOOL OF AGRICULTURE

FACULTY

LOTUS DELTA COFFMAN, Ph.D., President
WILLIAM WATTS FOLWELL, LL.D., President Emeritus
[1]CYRUS NORTHROP, LL.D., President Emeritus
WALTER C. COFFEY, M.S., Dean of the Department of Agriculture
DEXTER D. MAYNE, Principal
RODNEY M. WEST, B.A., Registrar
JOHANNA HOGNASON, B.A., Matron, Boys' Dormitories
GEORGINA LOMMEN, M.A., Matron, Girls' Dormitories
HARRIET W. SEWALL, B.A., Librarian
WILLIAM H. ALDERMAN, B.S.A., Chief of the Division of Horticulture
FREDERICK J. ALWAY, Ph.D., Chief of the Division of Soils
ELMER O. ANDERSON, B.S., Dairy Husbandry
PHILIP A. ANDERSON, B.S., Animal Husbandry
ALBERT C. ARNY, M.S., Farm Crops
ELIZABETH L. BACON, B.A., Textiles and Clothing
WINIFRED BAILEY, B.A., Physical Training
PERCY B. BARKER, M.A., Agronomy and Farm Management
LOUIS B. BASSETT, Farm Implements
WILLIAM A. BILLINGS, D.V.M., Bacteriology
JOHN D. BLACK, Ph.D., Chief of the Division of Agricultural Economics
ANDREW BOSS, Chief of the Division of Agronomy and Farm Management
WILLIAM BOSS, Chief of the Division of Farm Engineering
WILLARD L. BOYD, D.V.S., Veterinary Medicine
CARLOTTA BROWN, Millinery
CLARA M. BROWN, B.A. in Educ., Textiles and Clothing
LEROY CADY, B.S. in Agr., Horticulture
NORRIS K. CARNES, B.S. in Agr., Animal Husbandry
EDWARD G. CHEYNEY, B.A., Chief of the Division of Forestry
JONAS J. CHRISTENSEN, B.S., Plant Diseases
CHESTER D. DAHLE, M.S., Dairy Husbandry
FRANC P. DANIELS, B.S. in Agr., Horticulture
WILLIAM H. DEAVEY, First Sergeant, U.S.A., Military Drill
FLORENCE A. DEFIEL, B.A., Biology
J. GRANT DENT, Mechanics Laboratory
HAROLD S. DIEHL, M.D., Hygiene
AMANDA EBERSOLE, B.S., Textiles and Clothing
CLARENCE H. ECKLES, M.S.A., D.Sc., Chief of the Division of Dairy Husbandry
RUSSELL C. ENGBERG, B.S. in Agr., Farm Management
HALLY J. FISHER, R.N., Home Nursing
CLIFFORD P. FITCH, M.S., D.V.M., Chief of the Division of Veterinary Medicine

[1] Died April 3, 1922.

EDWARD M. FREEMAN, Ph.D., Chief of the Division of Plant Pathology and Botany
ROBERT N. FRYE, Captain U.S.A., Military Drill
HENRY C. GILBERT, M.S., Agricultural Botany
PAUL M. GILMER, B.A., Entomology
ROSS A. GORTNER, Ph.D., Chief of the Division of Agricultural Biochemistry
THOR W. GULLICKSON, B.S., Dairy Husbandry
ALFRED L. HARVEY, B.S., Animal Husbandry
ELIZABETH HAUSE, B.A., Rhetoric
HERBERT K. HAYES, D.Sc., Crop Breeding
CARL E. HENDRICKSON, M.S., Entomology
JOHANNA HOGNASON, B.A., Mathematics
CARL F. HUFFMAN, B.S., Dairy Husbandry
MAURICE G. JACOBSON, Drawing
FRANCIS JAGER, Chief of the Division of Bee Culture
FREDERICK B. JOHNSON, B.A., Business Training
PEDER L. JOHNSRUD, B.S. in Agr., Mathematics
ALLEN D. JOHNSTON, Blacksmithing
AURA KEEVER, B.S., Textiles and Clothing
KATHERINE KESTER, B.A., Rhetoric
FRED A. KRANTZ, M.S., Horticulture
MONICA LANGTRY, B.A., Rhetoric
ROBERT C. LANSING, M.A., Chief of the Section of Rhetoric
ALVIN H. LARSON, B.S. in Agr., Agricultural Botany
GEORGINA LOMMEN, M.A., Social Training
GUSTAV A. LUNDQUIST, M.A., Rural Sociology and Economics
MARK A. MCCARTY, B.S., Animal Husbandry
GROVER C. MATTHEWS, B.S., Beekeeping
DEXTER D. MAYNE, Parliamentary Law
MAUDE J. MILLER, B.S., Foods and Home Management
PAUL L. MILLER, M.A., Coöperative Accounting
D. C. MITCHELL, B.S. in C.E., Director of Gymnasium
MARTHA B. MOORHEAD, M.D., Hygiene and Home Nursing
GEORGE H. NESOM, B.A., B.S., Soils
ESTHER E. OLSON, B.A., Business Training
WALTER H. PETERS, M.S.A., Acting Chief of the Division of Animal Husbandry
HERBERT R. PETTIGROVE, B.S., Farm Crops
ALLAN B. RAYBURN, B.S. in Agr., Dairy Husbandry
MYRON H. REYNOLDS, B.S.A., M.D., D.V.M., Veterinary Medicine
WILLIAM A. RILEY, Ph.D., Chief of the Division of Entomology and Economic Zoology
HARRY B. ROE, B.S. in Eng., Drainage and Roads
ROSE SCHAETTGEN, Violin
ARTHUR C. SMITH, B.S., Chief of the Division of Poultry Husbandry
EARL A. STEWART, B.Pd., B.S., Agricultural Physics
GIRARD STURTEVANT, Colonel, U.S.A., Commandant

VERNIE SWENSON, B.A., Rhetoric
GRACE W. TAPLEY, Vocal Music
WILLIAM T. TAPLEY, M.S., Horticulture
GEORGE S. TAYLOR, B.A., Chemistry
JAMES B. TORRANCE, B.S. in Agr., Farm Motors
ARTHUR G. TYLER, Farm Engineering
WILLIAM R. WEHREND, Instrumental Music
HALL B. WHITE, B.S. in Agr., Carpentry and Farm Buildings
GILBERT H. WIGGIN, B.S., Forestry
MABEL WILLSON, Piano
WILBERT L. WITTE, M.A., Economics and History

COMMITTEES

Executive.—The Executive Committee of the Department of Agriculture

Subcommittee on Auditing.—MR. BAILEY, MR. POND, MR. ROE, MISS LINDSTROM.

Advisory to Administration.—Principal, Preceptress, Matron Boys' Dormitories, Secretary; Chairmen of following committees: Curriculum, Students' Work and Eligibility, Enrolment and Program, Dormitory and Dining Hall, Summer Practice, Social and Entertainment, Rules.

Subcommittee Dormitory and Dining Halls.—MR. W. BOSS, MR. CADY, MISS HOGNASON, MISS LOMMEN

Curriculum.—MR. FITCH, MISS CLARA BROWN, MR. W. BOSS, MR. A. M. FIELD, MR. LANSING

Entertainment.—MR. MAYNE, MR. A. BOSS, MISS HOGNASON, MISS LOMMEN

Students' Work and Eligibility.—MR. BASSETT, MR. P. A. ANDERSON, ————, MR. WHITE, MISS HOGNASON

Rules.—MR. LUNDQUIST, MR. BARKER, MR. DANIELS

Enrolment.—MR. MAYNE, ————, MR. LUNDQUIST

Summer Practice.—MR. A. BOSS, MR. JOHNSRUD, MR. LUNDQUIST, MR. MAYNE, MR. REYNOLDS

GENERAL INFORMATION

The School of Agriculture is located at University Farm, St. Paul, Minnesota, about midway between the business portions of the cities of St. Paul and Minneapolis. The school is a part of the Department of Agriculture of the University of Minnesota, and is governed by the Board of Regents.

HOW TO GET TO THE SCHOOL

Check all baggage to Minneapolis or St. Paul, and bring checks to the school.

A charge of fifty cents is made by the school for transporting trunks at the opening of the school year. A charge of not more than fifty cents is made for the return of baggage at the close of school, provided it is ready to go on the days assigned.

Monday and Tuesday, October 2 and 3, members of the Y. M. C. A. wearing lettered badges will be at the Union Station in St. Paul, and at the Great Northern and Milwaukee stations in Minneapolis to meet and direct new students. Take the Como-Harriet or Como-Hopkins car from either St. Paul or Minneapolis, and get off at Doswell Avenue. The dormitories are about a ten-minute walk from the car line.

TIME OF OPENING AND CLOSING

The School of Agriculture will open Monday, October 2, 1922, and close March 24, 1923. The fall term will close at 4:30 p.m., Thursday, December 21, and the winter term will begin Monday, January 8, 1923.

Instruction begins promptly at the opening of each term. Students should be present the first day and remain until the close of the term. No student will be allowed to register after the second week of the term except by permission of the Students' Work Committee.

PURPOSE

The School of Agriculture was organized in 1888. Its object is to give a practical education to young men and women. It offers a course of study designed to fit young men and young women for successful farm life, and aims to give to its students the necessary preparation for useful citizenship. The school course does not aim to prepare students for college.

ADMISSION

Students should correspond with the registrar, University Farm, St. Paul, Minnesota, prior to coming to the institution, to make the necessary preliminary arrangements for registration.

Farm experience.—All male students are required to have had six months' farm practice before entrance.

Minimum age.—No student under seventeen years of age will be admitted. Exceptions to this rule may be made in the case of applicants who have completed one full year of high school work. Similar exception may

be made when no high school is immediately available to the applicant.

Scholastic preparation.—Students who have completed eighth grade work, or its equivalent, in the common schools, are admitted without examination. Each applicant for admission should send to the registrar for a certificate of admission which, when properly filled out by former teacher or superintendent and returned to the registrar, will be accepted in place of entrance examinations. Diplomas should not be sent.

Students from city or grade schools must present a dismissal card from the last school attended; they will not be admitted before finishing eighth grade work, or until their former school records have been passed upon. These records must be presented at least three weeks prior to the opening of the school.

Unclassed students.—Applicants of mature years who can not meet the above entrance requirements will be admitted for special programs. Such students can not graduate until the entrance requirements as well as the requirements of the prescribed course are fully met.

Credit for high school work.—Students will be accepted from approved high schools and be given credit toward graduation from the School of Agriculture as follows:

Minimum number of credit hours	
High school graduate	40
Non-graduate—per unit	2½
Agriculture—per unit (boys)	12½
Maximum number of credit hours	80

High school courses equivalent to courses offered in the School of Agriculture will receive the same credit as those offered in the school. The first year's work in sewing, cooking, and free-hand drawing will be allowed the same credit as that offered in the school. Additional credit in these subjects will be allowed only on the approval of the Home Economics Division.

COURSES OF STUDY

The courses of study offered cover a wide range of subjects and are largely vocational in character; but provision is made for some instruction in English, mathematics, and other academic subjects. The courses are briefly outlined on pages 17-26. Instruction is given in the workshop, laboratories, barns, and fields, as well as in the classroom. The courses require three winters of six months each for completion. The methods of instruction tend to educate students toward the farm instead of away from it and to develop in them a love for farm life by showing them its possibilities. In this respect the school has been very successful, as over eighty per cent of its graduates continue agricultural pursuits. Courses in both agriculture and home economics are offered.

HOME PROJECTS

Science with practice is the aim of the School of Agriculture. The school is organized on a plan which provides for teaching agriculture through six months of study at the school and six months of supervised

home project work on the farm. Home project work is advised for every pupil in the school. The purpose of the home project work is to give the pupils an opportunity to apply some phase of their classroom instruction to the operation of a farm or a farm home.

The students may have a free choice as to the nature of their projects but are advised to choose those connected with the class work being taken. Freshmen should select projects connected with freshman subjects; juniors, those connected with junior subjects.

Registration blanks are provided instructors in classes for which summer projects will be accepted, and the registration should be completed before the student leaves the school in the spring. At the time of registration a project book with forms suitable for recording the necessary data will be provided.

During the summer season the work of the students will be inspected by instructors from the school so far as possible. The project book must be submitted to the classroom instructors and be graded by them but must have final approval of the home project committee.

Three credits of home project work is all that any student should attempt to earn in one season. These may be counted toward graduation from the school or, in the event that a student expects to enter the College of Agriculture, Forestry, and Home Economics, they may be used as one unit toward entrance to the college.

RULES AND REGULATIONS

A pamphlet containing the rules and regulations of the school will be furnished each student at the time of registration or upon application to the registrar's office.

HOME LIFE ON THE CAMPUS

The life of the students while attending the School of Agriculture is subject to supervision. The home life of each student is carefully guarded, and everything is done to promote a healthful and moral atmosphere. The use of tobacco is strictly forbidden. Anyone not in accord with these restrictions and not willing to lend a hand toward promoting a strong moral growth should not come to the School of Agriculture.

STUDENTS IN DORMITORIES

The students' social and dormitory life is supervised and directed by two women instructors of the school faculty, one in charge of the girls' dormitories, the other in charge of the boys' dormitories. All regulations governing the campus life of the student are subject to the approval of the dean of the Department of Agriculture and the principal of the school. A feature in the social life of the boys in the dormitories has been contributed in the form of a central clubroom in Pendergast Hall.

From 8:15 a.m. to 4:30 p.m. and also after 7:30 p.m. students not at recitation or assembly are expected to be in their rooms or in the library studying or reading. The rooms shall at all times be quiet, especially in the evening, so that no student may be disturbed.

ASSEMBLY

On each school day, at 12:10 p.m., except Monday and Thursday, the students meet in the assembly hall. After the opening exercises, brief talks are given by the principal, members of the faculty, or invited guests. During the year the list of speakers will include prominent state and national officials, business men, particularly those connected with the agricultural industries, professional men, prominent clergymen of all denominations, educators from other institutions, and successful farmers. It has been found that this plan gives to the students an opportunity to hear men of prominence discuss a wide range of topics, many of which relate to rural and agricultural problems.

HOLIDAYS

On Thanksgiving Day no classes will be held, but school will continue as usual on the Friday and Saturday following.

Armistice Day, November 11; Lincoln's birthday, February 12; and Washington's birthday, February 22; will be observed as holidays.

REQUIREMENTS FOR GRADUATION

The diploma of the School of Agriculture is granted on the completion of

1. The prescribed course of study, including all of the required work and enough elective work to make a total of 108 credit hours. (Credits earned prior to 1919-20 will be reduced to current credit basis.) For boys at least half of the elective credit must be in agricultural subjects.

2. Military drill and gymnasium, 12 credit hours. In agricultural courses 1 credit in Social Problems for Boys.

3. An honorary standing in deportment.

4. An essay of not less than one thousand words upon a topic connected with agriculture or home economics, typewritten on paper of approved size for binding and filing in the library.

5. For young men, practical experience in field work at the University Farm or elsewhere, as shall appear in reports received from responsible sources.

EXPENSES

The necessary expenses for the year, including room, board, and laundry, do not exceed $250. This amount does not include traveling and personal expenses.

Each student is required to pay for breakage of apparatus used in practical work.

The cost to the student for board is the actual cost of maintaining the table (including management). Each term's board is paid in advance. No deduction in charge is made for any absence of less than five days. If students are compelled to be absent for that length of time, they are allowed half rates, if they make arrangements before leaving.

The buildings are all lighted by electric lights and warmed by steam. The sleeping rooms are each furnished with a bedstead, mattress, dressing bureau, chairs, and table.

Each student provides four sheets, one pair of blankets, one quilt, one bedspread, one pillow, three pillowcases, towels, napkins, comb and brushes, one glass tumbler, and one teaspoon.

For the boys' gymnasium work a track suit and gymnasium shoes are required.

Each girl is required to provide two large aprons suitable for the protection of her clothing while working in the foods and cooking laboratory.

For the girls' gymnasium work a uniform suit is required. This should be obtained at the school. All freshman and junior girls will be required to buy the regulation gymnasium shoes sold at the bookstore.

Each girl should be provided with a kimono or bathrobe, a pair of bedroom slippers, at least four changes of undergarments, nightgowns, and hosiery. It is suggested that each girl be provided with a good woolen skirt to be worn with wash waists, one woolen school dress, and a dress suitable for social occasions. Rubbers and umbrellas are necessities.

TABLE OF CHARGES

Tuition fee, per term. Residents of the state	$ 3.00
Non-residents	6.00
Deposit as guarantee for the return of books and other material	5.00
Gymnasium fee. Required of every student. Per term	1.00
Post-office box fee. Per term	.20
Textbook rental fee. For those not desiring to purchase their books. Per term	2.00
Health fee. Per term	2.00
Music fee. Per course	10.00
Room in dormitory. (Price subject to change.) Per week, $1.50, per term	18.00
Board. Per term. (Price subject to change)	66.00
Laundry. Per term. (Price subject to change.) Required of all in dormitories	6.00
Gymnasium suits—boys. (Price subject to change)	4.20
Girls. (Price subject to change)	8.30
Average cost drawing instruments, notebooks, stationery, and supplies. Per year	$10.00-12.00

The payments to be made to the school at time of registration are as follows:

	Fall term	Winter term
Student in dormitory (resident)	$103.20	$ 98.20
Non-resident	106.20	101.20
Day student (resident)	13.20	8.20
Non-resident	16.20	11.20

Not in attendance first term, add $5 to the winter term charges given above.

DORMITORIES

Each student in attendance at the school who expects to return the following year and who desires to room in the dormitory will, before going home, make a deposit of $2 with the cashier as evidence of good faith that he expects to return on the opening day of the following school year. Dormitory rooms will be assigned to new students in the order in which their applications are received. Each prospective student who desires to room in the dormitory will be required to send a deposit of $2, which

will be returned in case the application is received after all dormitory rooms are spoken for.

In case of either a former student or a prospective student, this two-dollar deposit will be forfeited if the student does not appear for registration on the opening day of the school term, unless he has signified in writing to the registrar at least ten days before the opening that he does not intend to return. All money orders or checks should be made payable to University of Minnesota, Department of Agriculture.

STUDENTS' HEALTH SERVICE

A health fee of $2 a quarter is paid by each student for the maintenance of the Students' Health Service. For this fee the student may receive physical examination and the professional services of the staff when needed.

The officers of the Health Service and the Students' Hospital and Dispensary are located in the Boys' New Dormitory, first floor. The services of the hospital and dispensary are available at all hours of the day and night. The telephone call is Nestor 2881. Physicians of the Health Service will be in attendance daily. Their office hours will be announced.

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

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

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

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

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

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

(d) Treatment and professional care of all students who are ill or in need of medical advice or treatment. For extended care by the Health Service, it is necessary that the student enter the Students' Hospital. To

this hospital any student may be admitted upon the recommendation of a staff physician. To all patients in the hospital the staff will furnish medical and nursing services.

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

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

3. *Education.*—Every student in the University is made familiar with the fundamentals of both personal and public hygiene. Through personal conferences in this subject, daily bulletins, exhibits, public lectures, etc., education in hygiene and right living is conducted.

CLASS TRUST FUNDS

The class of 1902 and the class of 1916 each left with the school a fund of $100 "to assist by temporary loans, at a reasonable rate of interest, deserving students needing such help." Application for loans should be made to the principal.

THE LUDDEN TRUST

The late Honorable John D. Ludden, of St. Paul, gave the University of Minnesota $10,000, to be held, invested, and reinvested by the University through its Board of Regents, and the income thereof to be collected, received, and applied by said Board of Regents to the financial assistance of students of either sex in the School of Agriculture.

Mr. Ludden imposed the following conditions: "The beneficiaries must be youths who are residents of the State of Minnesota; they must be and continue of unblemished moral character, and of temperate and industrious habits; and they must be such as by examination and trial shall evince and maintain a taste, habit, and aptitude for study and improvement; and any student who shall fail to come, or shall cease to be, within the above conditions shall forfeit all claims to the benefits of such fund. Subject to these conditions the administration of such income is entrusted to the said Board of Regents, which may make such rules therefor as they may deem judicious."

This fund produces $400 a year. Those wishing to avail themselves of its benefits should apply to the Executive Committee of the Board of Regents of the University of Minnesota. Application blanks may be obtained from the office of the dean of the Department of Agriculture.

THE DORR FUND

This fund consists of $50,000 willed by the late Caleb Dorr, of Minneapolis, for the benefit of the Department of Agriculture of the University.

The income from $20,000 of the fund is to be devoted to establishing and maintaining research fellowships in agriculture. The income from another $20,000 shall be applied to scholarships or donations to undergraduate students in the College and School of Agriculture, and the income

from the remaining $10,000 shall be used for interest-bearing loans to students in the college and school.

CALEB DORR CASH SCHOLARSHIP PRIZES

Cash prizes amounting to $200 each year are offered to the students securing the highest standings in general scholarship. Of this amount $75 will be offered each term in five prizes of $25, $20, $15, $10, $5 each. All students carrying the full work of 18 credit hours per term are eligible for these prizes. One prize of $50 will be awarded at the close of the second term for the senior student graduating from the School of Agriculture with the highest scholarship and student activity record for the first five terms.

The awards will be made on (1) class standings as recorded by instructors for the term's work, and (2) on student activities and deportment. The class standings will count for 90 per cent and the student activities for 10 per cent. In determining the grades of scholarship the merit point system adopted by the registrar's office will be used. The rating for student activities will be based on the quality of leadership as indicated by a review of the activities participated in and the general deportment of the student during attendance at school. This rating will be determined by the scholarship committee in consultation with the preceptresses and the principal of the School of Agriculture.

Records made in military drill and gymnasium will not be counted in making the scholarship awards.

Besides the above, annual scholarship prizes of $200 each, divided into smaller awards, are given for excellence in extemporaneous speaking, community betterment, essay-writing, and declamation. The rules governing these scholarships may be found in the booklet of information supplied to each student at the time of his registration.

GIDEON MEMORIAL PRIZE IN HORTICULTURE

A fund of $500 was established in memory of the late Peter Gideon, the originator of the wealthy apple. The annual income is to be divided in three prizes for the best papers on some horticultural subject.

ORGANIZATIONS

Students' debating societies.—Students are urged to unite with one of the eleven literary societies of the school for both pleasure and profit. The work is under the supervision of one of the instructors in the rhetoric section. It affords training in parliamentary practice, public speaking, debating, and dramatic work.

Students' Christian associations.—The Young Men's and Young Women's Christian associations are voluntary organizations which have for their objects the maintenance of a positive moral and religious atmosphere and the development of complete Christian manhood and womanhood, physical, intellectual, social, and spiritual. These associations carry on various lines of activity. Employment and housing bureaus are maintained for the use

of students. A general reception is given at the beginning of each term. Each Sunday morning at 8:30 a song service is held followed directly by meetings of Bible, mission, and rural study groups, while in the afternoon at 5:30 a vesper service is conducted. Each Thursday evening at 6:30 o'clock the men gather for a fellowship meeting, and the women for a Y. W. C. A. meeting. The work is under the direction of general secretaries and the supervision of a board of directors made up of professors, business men, and students. The associations are non-sectarian that all students may find in them an opportunity for Christian activity and mutual helpfulness.

PUBLICATIONS

Agrarian.—The *Agrarian* is an annual published by the senior class of the school. The book gives an outline of all school and class activities; is fully illustrated, and contains, in addition to brief articles and items of purely local interest, a number of contributions from students and faculty members, dealing with the various phases of agricultural education and with agricultural problems.

The Minnesota Farm Review.—The *Minnesota Farm Review* is a weekly newspaper owned by the alumni of the School of Agriculture, but edited by students as an educational newspaper for the whole University Department of Agriculture for the benefit of students, graduates, faculty, and members of the community. The editorial work is done under the supervision of the Division of Publications.

LIBRARY

The agricultural library is well equipped for supplying the needs of both undergraduate and graduate students. It contains over twenty thousand volumes of general and technical literature, government reports, and fifty thousand unbound pamphlets, bulletins, and reports. The general subject and author card index and the index of publications of the state experiment stations are always at the disposal of students, to aid them in locating the various sources of information which the library affords. There are complete sets of all the standard encyclopedias and dictionaries, and files of over 225 popular and technical magazines and periodicals.

The librarian and her assistants are always ready and glad to give whatever assistance they can, both to those interested in special research work and to those doing regular reference work in connection with their classes. All those wishing to read or study are made welcome and are given whatever privileges the library can provide.

ZOOLOGICAL MUSEUM

The zoological museum is on the third floor of the Administration Building, connecting with the entomology lecture room. It contains one of the finest collections of birds in the Northwest, a large series of mammals, shells, anatomical models, etc., all used in class instruction. One case is given up to models of injurious insects. Another case is devoted

to a beautiful series of Minnesota fishes, reptiles, and amphibians, and on two sides of the large room devoted to museum purposes are cases containing thousands of pinned insects. Friends of the institution who are inclined to donate zoological specimens may rest assured that they will be promptly installed and given the best of care.

COURSES OF STUDY

Figures following the names of courses indicate the number of credit hours. One credit hour is equivalent to one class period devoted to recitation or lecture or to two such periods devoted to laboratory work.

For description of the courses listed in the following outline and for schedule of classes see pages 27-42.

See page 8 for statement with reference to home project work.

Courses which may be taken either term are indicated by (f,w), those which are offered in the fall term only are indicated by (f), and those offered only in the winter term by (w).

Every student in agriculture who plans to graduate is expected to select one of the following courses of study: (a) general farming, (b) livestock production, (c) crop production, (d) farm mechanics, or (e) horticultural and nursery training.

Adults desiring a special course should consult the Enrolment Committee.

Special students of mature years, who do not desire a diploma but who wish to take special work, may, by action of the Enrolment Committee, be allowed to arrange a curriculum under the supervision of a faculty adviser. This adviser will be appointed by the Enrolment Committee after the student has consulted with the committee, and will be ordinarily a member of the division in which the student intends to take the larger part of his or her work. No special student will be eligible for a diploma until both the entrance requirements and the requirements of a prescribed course have been satisfied.

GENERAL FARMING

FRESHMAN YEAR

Required—First Term	Required—Second Term
English I, 3(f,w)	English II, 3(f,w)
Hygiene, 1(f,w)	Corn, 2(f,w)
Farm Arithmetic, 3(f,w)	Soils, 3(f,w)
Types and Market Classes, 2(f,w)	Breeds, 3(f,w)
Drawing and Farm Buildings, 3(f,w)	Animal Biology, 3(f,w)
Agricultural Botany, 3(f,w)	Military Drill, 2(f,w)[1]
Military Drill, 2(f,w)[1]	Electives, 4
Social Problems for Boys, 1(f,w)	
Electives, 3	

[1] Students excused from Military Drill are required to register for Gymnasium, 1(f,w).

ELECTIVES

Advanced Farm Arithmetic, 3(f,w)
Physiology, 3(f,w)
Blacksmithing I, 3(f,w)
Carpentry, 3(f,w)
Farm Motors I, 3(f,w)
Mechanical Laboratory, 3(f,w)
Elementary Beekeeping I, 3(f,w)
Spelling, 1(f,w)
Penmanship, 1(f,w)
Elementary Plant Propagation, 3(f)
Floriculture, 3(w)
Dramatics, ½(f,w)[3]
Debating, ½(f,w)[3]
Elementary Landscape Gardening, 3(f,w)
Band, ½(f,w)
Elementary Beekeeping II, 3(f,w)
Elements of Music I, 2(f,w)
Elements of Music II, 2(f,w)
Violin, ½(f,w)[2]
Piano, ½(f,w)[2]
Instrumental Music, ½(f,w)[2]
Vocal Music, ½(f,w)[2]
Orchestra, ½(f,w)
Chorus, ½(f,w)
Home Project, 1 to 3

JUNIOR YEAR

Required—First Term

English Grammar, 3(f,w)
Forage Crops and Potatoes, 3(f,w)
Stock-Judging, 3(f,w)
Farm Horticulture, 3(f,w)
Feeds and Feeding, 3(f,w)
Military Drill, 2(f,w)[1]
Electives, 3

Required—Second Term

Composition I, 3(f,w)
Cereal Crops, 3(f,w)
Farm Dairying, 3(f,w)
Poultry, 3(f,w)
Military Drill, 2(f,w)[1]
Electives, 6

ELECTIVES

Algebra I, 7(f,w)
Geometry I, 7(f,w)
Industrial History, 3(f,w)
Insect Pests of Plants, 3(f)
Chemistry of Plant and Animal Life I, 3(f,w)
Mechanics and Water Supply, 3(f,w)
Parliamentary Law, 1(f,w)
Management of Laying Flock, 1(f,w)
Physiology and Hygiene of Breeding, 2(f)
Orchard Fruit-Growing, 3(f)
Small Fruit-Growing, 3(w)
Elements of Bacteriology, 3(w)
Coöperative Accounting, 3(f,w)
Potato Production, 3(w)
Nursery Seeds and Seeding, 3(w)
Advanced Landscape Gardening, 3(w)
Greenhouse Construction and Management, 3(f)
Greenhouse Practice, 3(w)
Algebra II, 7(f,w)
Geometry II, 7(f,w)
Meats, 3(w)
Blacksmithing II, 3(w)
Chemistry of Plant and Animal Life II, 3(f,w)
Heat and Electricity, 3(w)
Incubating and Brooding, 3(w)
Seed-Testing, 2(w)
Advanced Plant Propagation, 3(w)
Farm Motors II, 3(f,w)
Commercial Vegetable-Gardening, 3(w)
Veterinary Studies, 5(w)
Weeds, 2(f)
American History, 3(f,w)

SENIOR YEAR

Required—First Term

Public Speaking, 3(f,w)
Civics, 3(f,w)
Breeding, 3(f,w)
Farm Management I, 3(f,w)
Military Drill, 2(f,w)[1]
Electives, 6

Required—Second Term

Composition II, 3(f,w)
Rural Sociology, 3(f,w)
Farm Management II, 3(f,w)
Military Drill, 2(f,w)[1]
Electives, 9

[1] Students excused from Military Drill are required to register for gymnasium, 1(f,w).

[2] A special fee of $10 is charged for this course.

[3] Credit for this course is allowed only under the conditions specified in the booklet of Faculty Regulations.

ELECTIVES

Livestock-Feeding and Management, 3(f)
Dairy Stock-Feeding, 3(f)
Farm Crop-Breeding, 2(w)
Drainage and Roads, 3(f)
Farm Implements, 3(f)
Animal Parasites, 3(w)
Elementary Economics, 3(f,w)
English Literature I, 5(f)
Nursery Organization, 3(w)
Advanced Public Speaking, 3(f,w)
Plant Diseases, 3(f)
Farm Buildings, 3(f)
Rural Economics, 3(f,w)
Milk Production, 3(w)
English Literature II, 5(w)
Dairy Stock Selection, 3(w)
Judging and Grading Farm Crops, 3(w)

LIVESTOCK PRODUCTION

FRESHMAN YEAR

REQUIRED—FIRST TERM

English I, 3(f,w)
Hygiene, 1(f,w)
Farm Arithmetic, 3(f,w)
Types and Market Classes 2(f,w)
Drawing and Farm Buildings, 3(f,w)
Agricultural Botany, 3(f,w)
Military Drill 2(f,w)[1]
Social Problems for Boys, 1(f,w)
Electives, 3

REQUIRED—SECOND TERM

English II, 3(f,w)
Corn, 2(f,w)
Soils, 3(f,w)
Breeds, 3(f,w)
Animal Biology, 3(f,w)
Military Drill, 2(f,w)[1]
Electives, 4

ELECTIVES

Advanced Farm Arithmetic, 3(f,w)
Physiology, 3(f,w)
Blacksmithing I, 3(f,w)
Carpentry, 3(f,w)
Farm Motors I, 3(f,w)
Elementary Beekeeping I, 3(f,w)
Mechanical Laboratory, 3(f,w)
Spelling, 1(f,w)
Penmanship, 1(f,w)
Poultry, 3(f,w)
Farm Horticulture, 3(f,w)
Elementary Beekeeping II, 3(f,w)
Dramatics, ½(f,w)[3]
Debating, ½(f,w)[3]
Elements of Music I, 2(f,w)
Elements of Music II, 2(f,w)
Violin, ½(f,w)[2]
Piano, ½(f,w)[2]
Instrumental Music, ½(f,w)[2]
Vocal Music, ½(f,w)[2]
Orchestra, ½(f,w)
Chorus, ½(f,w)
Elementary Plant Propagation, 3(f)
Floriculture, 3(w)
Elementary Landscape Gardening, 3(f,w)
Band, ½(f,w)
Home Project, 1 to 3

JUNIOR YEAR

REQUIRED—FIRST TERM

English Grammar, 3(f,w)
Forage Crops and Potatoes, 3(f,w)
Stock-Judging 3(f,w)
Physiology and Hygiene of Breeding, 2(f)
Feeds and Feeding, 3(f,w)
Military Drill, 2(f,w)[1]
Electives, 4

REQUIRED—SECOND TERM

Composition I, 3(f,w)
Meats, 3(w)
Farm Dairying, 3(f,w)
Veterinary Studies, 5(w)
Military Drill, 2(f,w)[1]
Electives, 4

[1] Students excused from Military Drill are required to register for Gymnasium, 1(f,w).

[2] A special fee of $10 is charged for this course.

[3] Credit for this course is allowed only under the conditions specified in the booklet of Faculty Regulations.

ELECTIVES

Insect Pests of Plants, 3(f)
Chemistry of Plant and Animal Life I, 3(f,w)
Mechanics and Water Supply, 3(f,w)
Algebra I, 7(f,w)
Industrial History, 3(f,w)
Parliamentary Law, 1(f,w)
Geometry I, 7(f,w)
Management of Laying Flock, 1(f,w)
Orchard Fruit-Growing, 3(f)
Small Fruit-Growing, 3(w)
Algebra II, 7(f,w)
Geometry II, 7(f,w)
Coöperative Accounting, 3(f,w)
Potato Production, 3(w)
Greenhouse Practice, 3(w)
Advanced Landscape Gardening, 3(w)
Nursery Seeds and Seeding, 3(w)
Greenhouse Construction and Management, 3(f)
Heat and Electricity, 3(w)
Cereal Crops, 3(f,w)
Advanced Plant Propagation, 3(w)
Blacksmithing II, 3(w)
Incubating and Brooding, 3(w)
Farm Motors II, 3(f,w)
Commercial Vegetable-Gardening, 3(w)
Elements of Bacteriology, 3(w)
Seed-Testing, 2(w)
Chemistry of Plant and Animal Life II, 3(f,w)
Weeds, 2(f)
American History, 3(f,w)

SENIOR YEAR

REQUIRED—FIRST TERM

Public Speaking, 3(f,w)
Civics, 3(f,w)
Livestock-Feeding and Management, 3(f) or Milk Production, 3(w)
Breeding, 3(f,w)
Farm Management I, 3(f,w)
Military Drill, 2(f,w)[1]
Electives, 3

REQUIRED—SECOND TERM

Composition II, 3(f,w)
Rural Sociology, 3(f,w)
Farm Management II, 3(f,w)
Military Drill, 2(f,w)[1]
Electives, 9

ELECTIVES

Livestock-Feeding and Management, 3(f)
Plant Diseases, 3(f)
Farm Crop-Breeding, 2(w)
Farm Buildings, 3(f)
Drainage and Roads, 3(f)
Farm Implements, 3(f)
Animal Parasites, 3(w)
Elementary Economics, 3(f,w)
English Literature I, 5(f)
Milk Production, 3(w)
Nursery Organization, 3(w)
Dairy Stock-Feeding, 3(f)
Rural Economics, 3(f,w)
Dairy Stock Selection, 3(w)
English Literature II, 5(w)
Advanced Public Speaking, 3(f,w)
Judging and Grading Farm Crops, 3(w)

CROP PRODUCTION

FRESHMAN YEAR

REQUIRED—FIRST TERM

English I, 3(f,w)
Hygiene, 1(f,w)
Farm Arithmetic, 3(f,w)
Types and Market Classes, 2(f,w)
Drawing and Farm Buildings, 3(f,w)
Agricultural Botany, 3(f,w)
Military Drill, 2(f,w)[1]
Social Problems for Boys, 1(f,w)
Electives, 3

REQUIRED—SECOND TERM

English II, 3(f,w)
Corn, 2(f,w)
Soils, 3(f,w)
Farm Horticulture, 3(f,w)
Animal Biology, 3(f,w)
Military Drill, 2(f,w)[1]
Electives, 4

[1] Students excused from Military Drill are required to register for Gymnasium, 1(f,w).

ELECTIVES

Advanced Farm Arithmetic, 3(f,w)
Poultry, 3(f,w)
Physiology, 3(f,w)
Blacksmithing I, 3(f,w)
Carpentry, 3(f,w)
Farm Motors I, 3(f,w)
Mechanical Laboratory, 3(f,w)
Breeds, 3(f,w)
Elementary Beekeeping I, 3(f,w)
Spelling, 1(f,w)
Penmanship, 1(f,w)
Elementary Beekeeping II, 3(f,w)
Dramatics, ½(f,w)[3]
Debating, ½(f,w)[3]
Elements of Music I, 2(f,w)
Elements of Music II, 2(f,w)
Violin, ½(f,w)[2]
Piano, ½(f,w)[2]
Instrumental Music, ½(f,w)[2]
Vocal Music, ½(f,w)[2]
Orchestra, ½(f,w)
Chorus, ½(f,w)
Elementary Plant Propagation, 3(f)
Floriculture, 3(w)
Elementary Landscape Gardening, 3(f,w)
Band, ½(f,w)
Home Project, 1 to 3

JUNIOR YEAR

Required—First Term

English Grammar, 3(f,w)
Forage Crops and Potatoes, 3(f,w)
Insect Pests of Plants, 3(f)
Orchard Fruit-Growing, 3(f) or Commercial Vegetable-Gardening, 3(w)
Chemistry of Plant and Animal Life I, 3(f,w)
Military Drill, 2(f,w)[1]
Electives, 3

Required—Second Term

Composition I, 3(f,w)
Cereal Crops, 3(f,w)
Seed-Testing, 2(w)
Feeds and Feeding, 3(f,w)
Chemistry of Plant and Animal Life II, 3(f,w)
Military Drill, 2(f,w)[1]
Electives, 4

ELECTIVES

Algebra I, 7(f,w)
Geometry I, 7(f,w)
Mechanics and Water Supply, 3(f,w)
Stock-Judging, 3(f,w)
Physiology and Hygiene of Breeding, 2(f)
Industrial History, 3(f,w)
Parliamentary Law, 1(f,w)
Farm Dairying, 3(f,w)
Management of the Laying Flock, 1(f,w)
Coöperative Accounting, 3(f,w)
Orchard Fruit-Growing, 3(f)
Small Fruit-Growing, 3(w)
Commercial Vegetable-Gardening, 3(w)
Advanced Landscape Gardening, 3(w)
Nursery Seeds and Seeding, 3(w)
Greenhouse Construction and Management, 3(f)
Greenhouse Practice, 3(w)
Potato Production, 3(w)
Algebra II, 7(f,w)
Heat and Electricity, 3(w)
Geometry II, 7(f,w)
Blacksmithing II, 3(w)
Incubating and Brooding, 3(w)
Elements of Bacteriology, 3(w)
Advanced Plant Propagation, 3(w)
Farm Motors II, 3(f,w)
Meats, 3(w)
Veterinary Studies, 5(w)
Weeds, 2(f)
American History, 3(f,w)

SENIOR YEAR

Required—First Term

Public Speaking, 3(f,w)
Civics, 3(f,w)
Plant Diseases, 3(f)
Farm Management I, 3(f,w)
Military Drill, 2(f,w)[1]
Electives, 6

Required—Second Term

Composition II, 3(f,w)
Rural Sociology, 3(f,w)
Farm Management II, 3(f,w)
Farm Crop-Breeding, 2(w)
Military Drill, 2(f,w)[1]
Electives, 7

[1] Students excused from Military Drill are required to register for Gymnasium, 1(f,w).

[2] A special fee of $10 is charged for this course.

[3] Credit for this course is allowed only under the conditions specified in the booklet of Faculty Regulations.

ELECTIVES

Farm Buildings, 3(f)
English Literature I, 5(f)
Drainage and Roads, 3(f)
Farm Implements, 3(f)
Breeding, 3(f,w)
Livestock-Feeding and Management, 3(f)
Animal Parasites, 3(w)
Elementary Economics, 3(f,w)
Dairy Stock-Feeding, 3(f)
English Literature II, 5(w)
Milk Production, 3(w)
Rural Economics, 3(f,w)
Dairy Stock Selection 3(w)
Advanced Public Speaking, 3(f,w)
Judging and Grading Farm Crops, 3(w)
Nursery Organization, 3(w)

FARM MECHANICS

FRESHMAN YEAR

REQUIRED—FIRST TERM

English I, 3(f,w)
Hygiene, 1(f,w)
Farm Arithmetic, 3(f,w)
Types and Market Classes, 2(f,w)
Drawing and Farm Buildings, 3(f,w)
Agricultural Botany, 3(f,w) or Animal Biology, 3(f,w)
Military Drill, 2(f,w)[1]
Social Problems for Boys, 1(f,w)
Electives, 3

REQUIRED—SECOND TERM

English II, 3(f,w)
Corn, 2(f,w)
Soils, 3(f,w)
Mechanical Laboratory, 3(f,w)
Carpentry, 3(f,w) or Blacksmithing I, 3(f,w)
Military Drill, 2(f,w)[1]
Electives, 4

ELECTIVES

Advanced Farm Arithmetic, 3(f,w)
Agricultural Botany, 3(f,w)
Animal Biology, 3(f,w)
Poultry, 3(f,w)
Elements of Music I, 2(f,w)
Elements of Music II, 2(f,w)
Penmanship, 1(f,w)
Spelling, 1(f,w)
Elementary Beekeeping I, 3(f,w)
Physiology, 3(f,w)
Breeds, 3(f,w)
Carpentry, 3(f,w)
Dramatics, ½(f,w)[3]
Debating, ½(f,w)[3]
Elementary Beekeeping II, 3(f,w)
Violin, ½(f,w)[2]
Piano, ½(f,w)[2]
Instrumental Music, ½(f,w)[2]
Vocal Music, ½(f,w)[2]
Orchestra, ½(f,w)
Chorus, ½(f,w)
Blacksmithing I, 3(f,w)
Elementary Plant Propagation, 3(f)
Floriculture, 3(w)
Elementary Landscape Gardening, 3(f,w)
Band, ½(f,w)
Home Project, 1 to 3

JUNIOR YEAR

REQUIRED—FIRST TERM

English Grammar, 3(f,w)
Forage Crops and Potatoes, 3(f,w)
Farm Horticulture, 3(f,w) or Stock-Judging, 3(f,w)
Farm Motors I, 3(f,w)
Mechanics and Water Supply, 3(f,w)
Military Drill, 2(f,w)[1]
Electives, 3

REQUIRED—SECOND TERM

Composition I, 3(f,w)
Cereal Crops, 3(f,w) or Farm Horticulture, 3(f,w)
Farm Dairying, 3(f,w)
Heat and Electricity, 3(w)
Military Drill, 2(f,w)[1]
Electives, 6

[1] Students excused from Military Drill are required to register for Gymnasium, 1(f,w).

[2] A special fee of $10 is charged for this course.

[3] Credit for this course is allowed only under the conditions specified in the booklet of Faculty Regulations.

ELECTIVES

Feeds and Feeding, 3(f,w)
Algebra I, 7(f,w)
Insect Pests of Plants, 3(f)
Parliamentary Law, 1(f,w)
Chemistry of Plant and Animal Life I, 3(f,w)
Geometry I, 7(f,w)
Farm Horticulture, 3(f,w)
Stock-Judging, 3(f,w)
Industrial History, 3(f,w)
Physiology and Hygiene of Breeding, 2(f)
Management of Laying Flock, 1(f,w)
Orchard Fruit-Growing, 3(f)
Small Fruit-Growing, 3(w)
Commercial Vegetable-Gardening, 3(w)
Coöperative Accounting, 3(f,w)
Weeds, 2(f)
Potato Production, 3(w)
Nursery Seeds and Seeding, 3(w)
Advanced Landscape Gardening, 3(w)
Greenhouse Construction and Management, 3(f)
Greenhouse Practice, 3(w)
Veterinary Studies, 5(w)
Algebra II, 7(f,w)
Meats, 3(w)
Geometry II, 7(f,w)
Blacksmithing II, 3(w)
Elements of Bacteriology, 3(w)
Chemistry of Plant and Animal Life II, 3(f,w)
Cereal Crops, 3(f,w)
Seed-Testing, 2(w)
Incubating and Brooding, 3(w)
Advanced Plant Propagation, 3(w)
American History, 3(f,w)

SENIOR YEAR

REQUIRED—FIRST TERM

Public Speaking, 3(f,w)
Civics, 3(f,w)
Farm Buildings, 3(f) or
Drainage and Roads, 3(f)
Farm Implements, 3(f)
Farm Management I, 3(f,w)
Military Drill, 2(f,w)[1]
Electives, 3

REQUIRED—SECOND TERM

Composition II, 3(f,w)
Rural Sociology, 3(f,w)
Farm Management II, 3(f,w)
Farm Motors II, 3(f,w)
Military Drill, 2(f,w)[1]
Electives, 6

ELECTIVES

Drainage and Roads, 3(f)
Farm Buildings, 3(f)
Livestock-Feeding and Management, 3(f)
Elementary Economics, 3(f,w)
Dairy Stock-Feeding, 3(f)
Plant Diseases, 3(f)
Breeding, 3(f,w)
Animal Parasites, 3(w)
English Literature I, 5(f)
Nursery Organization, 3(w)
Dairy Stock Selection, 3(w)
Advanced Public Speaking, 3(f,w)
Milk Production, 3(w)
Rural Economics, 3(f,w)
Farm Crop-Breeding, 2(w)
English Literature II, 5(w)
Judging and Grading Farm Crops, 3(w)

HORTICULTURAL AND NURSERY TRAINING

FRESHMAN YEAR

REQUIRED—FIRST TERM

English I, 3(f,w)
Hygiene, 1(f,w)
Farm Arithmetic, 3(f,w)
Agricultural Botany, 3(f,w)
Farm Horticulture, 3(f,w)
Elementary Plant Propagation, 3(f)
Types and Market Classes, 2(f,w)
Social Problems for Boys, 1(f,w)
Military Drill, 2(f,w)[1]

REQUIRED—SECOND TERM

English II, 3(f,w)
Soils, 3(f,w)
Drawing and Farm Buildings, 3(f,w)
Floriculture, 3(w)
Commercial Vegetable-Gardening, 3(w)
Military Drill, 2(f,w)[1]
Electives, 3

[1] Students excused from Military Drill are required to register for Gymnasium, 1(f,w).

ELECTIVES

Corn, 3(f,w)
Breeds, 3(f,w)
Elementary Beekeeping I, 3(f,w)
Blacksmithing I, 3(f,w)
Advanced Farm Arithmetic, 3(f,w)
Elements of Music I, 2(f,w)
Elements of Music II, 2(f,w)
Spelling, 1(f,w)
Penmanship, 1(f,w)
Physiology, 3(f,w)
Dramatics, ½(f,w)[3]
Debating, ½(f,w)[3]
Elementary Beekeeping II, 3(f,w)
Farm Motors I, 3(f,w)
Carpentry, 3(f,w)
Poultry, 3(f,w)
Chorus, ½(f,w)
Violin, ½(f,w)[2]
Piano, ½(f,w)[2]
Instrumental Music, ½(f,w)[2]
Orchestra, ½(f,w)
Vocal Music, ½(f,w)[2]
Band, ½(f,w)

JUNIOR YEAR

Required—First Term

English Grammar, 3(f,w)
Chemistry of Plant and Animal Life I, 3(f,w)
Animal Biology, 3(f,w)
Greenhouse Construction and Management, 3(f)
Elementary Landscape Gardening, 3(f,w)
Military Drill, 2(f,w)[1]
Electives, 3

Required—Second Term

Composition I, 3(f,w)
Seed-Testing, 2(w)
Farm Motors I, 3(f,w) or
Mechanical Laboratory, 3(f,w)
Advanced Landscape Gardening, 3(w)
Nursery Seeds and Seeding, 3(w)
Military Drill, 2(f,w)[1]
Electives, 4

ELECTIVES

Cereal Crops, 3(f,w)
Forage Crops and Potatoes, 3(f,w)
Feeds and Feeding, 3(f,w)
Farm Motors II, 3(f,w)
Orchard Fruit-Growing, 3(f)
Greenhouse Practice, 3(w)
Management of Laying Flock, 1(f,w)
Algebra I, 7(f,w)
Geometry I, 7(f,w)
Industrial History, 3(f,w)
Elements of Bacteriology, 3(w)
Chemistry of Plant and Animal Life II, 3(f,w)
Stock-Judging, 3(f,w)
Meats, 3(w)
Blacksmithing II, 3(w)
Mechanics and Water Supply, 3(f,w)
Heat and Electricity, 3(w)
Potato Production, 3(w)
Weeds, 2(f)
Incubating and Brooding, 3(w)
Algebra II, 7(f,w)
Geometry II, 7(f,w)
American History, 3(f,w)
Physiology and Hygiene of Breeding, 2(f)
Veterinary Studies, 5(w)

SENIOR YEAR

Required—First Term

Public Speaking, 3(f,w)
Civics, 3(f,w)
Plant Diseases, 3(f,w)
Coöperative Accounting, 3(f,w)
Insect Pests of Plants, 3(f)
Military Drill, 2(f,w)[1]
Electives, 3

Required—Second Term

Composition II, 3(f,w)
Rural Sociology, 3(f,w)
Farm Crop-Breeding, 2(w)
Advanced Plant Propagation, 3(w)
Small Fruit-Growing, 3(w)
Military Drill, 2(f,w)[1]
Electives, 4

[1] Students excused from Military Drill are required to register for Gymnasium, 1(f,w).

[2] A special fee of $10 is charged for this course.

[3] Credit for this course is allowed only under the conditions specified in the booklet of Faculty Regulations.

ELECTIVES

Judging and Grading Farm Crops, 3(w)
Farm Implements, 3(f)
Farm Management I, 3(f,w)
Livestock-Feeding and Management, 3(f)
Dairy Stock-Feeding, 3(f)
Drainage and Roads, 3(f)
Nursery Organization, 3(w)
English Literature I, 5(f)
Elementary Economics, 3(f,w)
Farm Management II, 3(f,w)
Breeding, 3(f,w)
Farm Dairying, 3(f,w)
Milk Production, 3(w)
Dairy Stock Selection, 3(w)
Animal Parasites, 3(w)
Farm Buildings, 3(f)
English Literature II, 5(w)
Advanced Public Speaking, 3(f,w)
Rural Economics, 3(f,w)

HOME ECONOMICS

FRESHMAN YEAR

REQUIRED—FIRST TERM

Biology, 3(f)
English I, 3(f,w)
Foods and Cookery I, 3(f,w)
Garment-Making I, 2(f,w)
Drawing and Design I, 1(f,w)
Social Training, 2(f)
Physical Training, 3(f,w)
Electives, 3

REQUIRED—SECOND TERM

English II, 3(f,w)
Physiology, 3(f,w)
Foods and Cookery II, 3(f,w)
Garment-Making II, 2(f,w)
Drawing and Design II, 1(f,w)
Agricultural Botany, 3(w)
Physical Training, 2(f,w)
Electives, 3

ELECTIVES

Farm Arithmetic, 3(f,w)
Advanced Farm Arithmetic, 3(f,w)
Farm Dairying, 3(f,w)
Elements of Music I, 2(f,w)
Elements of Music II, 2(f,w)
Chorus, ½(f,w)
Violin, ½(f,w)[2]
Piano, ½(f,w)[2]
Instrumental Music, ½(f,w)[2]
Vocal Music, ½(f,w)[2]
Orchestra, ½(f,w)
Elementary Beekeeping I, 3(f,w)
Dramatics, ½(f,w)[3]
Debating, ½(f,w)[3]
Typewriting I, 3(f,w)
Stenography, 3(f,w)
Spelling, 1(f,w)
Penmanship, 1(f,w)
Poultry, 3(f,w)
Elementary Beekeeping II, 3(f,w)
General Agriculture, 3(w)
Farm Horticulture, 3(f,w)
Elementary Plant Propagation, 3(f)
Floriculture, 3(w)
Elementary Landscape Gardening, 3(f,w)
Band, ½(f,w)

JUNIOR YEAR

REQUIRED—FIRST TERM

English Grammar, 3(f,w)
Foods and Cookery III, 3(f,w)
Dressmaking I, 2(f,w)
Drawing and Design III, 1(f,w)
Household Chemistry, 5(f)
Home Nursing and Hygiene I, 2(f)
Physical Training, 2(f,w)
Electives, 2

REQUIRED—SECOND TERM

Composition I, 3(f,w)
House-Planning and Furnishing, 4(f,w)
Dressmaking II, 3(f,w)
Physical Training, 2(f,w)
Electives, 8

[2] A special fee of $10 is charged for this course.

[3] Credit for this course is allowed only under the conditions specified in the booklet of Faculty Regulations.

ELECTIVES

Algebra I, 7(f,w)
Geometry I, 7(f,w)
Industrial History, 3(f,w)
Parliamentary Law, 1(f,w)
Letter-Writing, 3(f,w)
Typewriting II, 3(f,w)
Household Physics, 5(f)
American History, 3(f,w)
Management of Laying Flock, 1(f,w)
Dictation I, 3(f,w)
Incubating and Brooding, 3(w)
Elements of Bacteriology, 3(w)
Algebra II, 7(f,w)
Geometry II, 7(f,w)
General Office Practice, 3(f,w)
Insect Pests of Plants, 3(f)
Orchard Fruit-Growing, 3(f)
Small Fruit-Growing, 3(w)

SENIOR YEAR

Required—First Term

Public Speaking, 3(f,w)
Elementary Dietetics, 3(f)
Textiles and Millinery, 3(f)
Civics, 3(f,w)
Physical Training, 2(f,w)
Electives, 6

Required—Second Term

Composition II, 3(f,w)
Home Management and Household Accounts, 4(w)
Dressmaking III, 3(w)
Home Nursing and Hygiene II, 2(f)
Physical Training, 2(f,w)
Electives, 6

ELECTIVES

Elementary Economics, 3(f,w)
English Literature I, 5(f)
Advanced Public Speaking, 3(f,w)
Plant Diseases, 3(f)
Trade Garment-Making, 3(f,w)
Advanced Millinery, 3(w)
English Literature II, 5(w)
Rural Economics, 3(f,w)
Rural Sociology, 3(f,w)
Commercial Law, 3(f)[1]

[1] Not offered in 1922-23.

ADMISSION TO THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Graduates of the School of Agriculture of the University of Minnesota who have completed the two summers of supervised farm work offered in the school course, one additional school year, and one additional summer's work, or the equivalent thereof, will be admitted to the College of Agriculture, Forestry, and Home Economics.

DESCRIPTION OF COURSES

AGRICULTURAL BIOCHEMISTRY

Ross A. Gortner, Chief; George S. Taylor.

COURSES

A1-2. Chemistry of Plant and Animal Life I. The fundamental principles of chemistry necessary for an understanding of common daily phenomena. The scope of agricultural chemistry and the help which the farmer may expect from the chemical laboratories of the state are outlined. Mr. Taylor.

A3. Household Chemistry. Planned to give an understanding of the general principles of chemistry which are of everyday importance. Particular attention is given to human foods, textiles, dyeing, and cleansing agents. Mr. Taylor.

AGRONOMY AND FARM MANAGEMENT

Andrew Boss, Chief; Albert C. Arny, Percy B. Barker, Louis B. Bassett, Russell C. Engberg, Herbert K. Hayes, Herbert R. Pettigrove.

COURSES

A1. Cereal Crops. Including the history, culture, judging, and uses of the important cereal crops. Mr. Barker.

A2. Corn. The history and classification with a careful study of the culture, judging, and uses of the corn crop. Mr. Barker and Department of Agricultural Education.

A3. Forage Crops and Potatoes. A study of the grasses and legumes and other forage crops, and methods in growing them for forage, and the culture, storage, and use of potatoes. Mr. Pettigrove.

A4. General Agriculture. Soil formation, tillage, and culture. Classes and varieties of cereal and forage crops, their history, culture, and use in the provision of food and clothing. Types and breeds of livestock and their place in farming. Mr. Barker.

A5. Farm Crop-Breeding. Instruction in modern methods of propagating and breeding the various agricultural crops with plans for growing and certifying pedigreed seed. Mr. Hayes.

A6. Judging and Grading Farm Crops. A study of the factors which influence the value of crops for seed, feed, and market, with practice in the application of federal grades. Mr. Arny.

A11. Farm Implements. Studies and discussions of the selection, operation, and care of farm machinery; also the cost, depreciation, efficiency,

and adaptability of the various machines to the work to be accomplished. MR. BASSETT.

A21. FARM MANAGEMENT I (Records). Practice in taking farm inventories and in keeping labor, crop, field, and feed records. Studies of cost of production. The use of farm capital; mortgages; farm loans; contracts; deeds; taxes; insurance; general farm business methods. MR. ENGBERG.

A22. FARM MANAGEMENT II (Organization). A study of farm organization as related to types of farming, combinations of enterprises, crop rotation, soil management, field and farmstead arrangement, and the efficient use of labor and equipment. MR. BASSETT.

ANIMAL HUSBANDRY

WALTER H. PETERS, Chief; PHILIP A. ANDERSON, NORRIS K. CARNES, ALFRED L. HARVEY, MARK A. MCCARTY.

COURSES

A1. TYPES AND MARKET CLASSES. The livestock industry; demonstration of types and market classes of cattle, horses, sheep, and swine and their relation to production; score card practice and the fundamentals of livestock-judging. MR. HARVEY, MR. MCCARTY.

A2. BREEDS. The origin, identification, and adaptability of the breeds of cattle, horses, sheep, and swine. MR. HARVEY, MR. MCCARTY.

A3. STOCK-JUDGING. Practice in judging from both the type and breed standpoint. Two thirds of this time is given to beef cattle, horses, sheep, and swine, one third to dairy cattle. Same as Dy. Husb. A3. MR. HARVEY, MR. MCCARTY.

A4. MEATS. Lectures, demonstrations, and practice work in dressing, cutting, and curing meats. MR. ANDERSON, MR. HARVEY.

A5. BREEDING. Livestock improvement and variation, heredity, environment, and selection as factors therein; line-breeding, inbreeding, cross-breeding, and grading-up; the purebred sire; pedigree registration; practical breeders' problems. MR. ANDERSON, MR. CARNES.

A6. LIVESTOCK-FEEDING AND MANAGEMENT. The business side of stock-farming, buying and selling, record-keeping, economic principles involved in efficient production of beef cattle, horses, sheep, and swine. Study of the several forms of specialization in livestock production. MR. PETERS.

BEE CULTURE

FRANCIS JAGER, Chief; GROVER C. MATTHEWS.

A1. ELEMENTARY BEEKEEPING I. Fundamentals of bee behavior and of beekeeping practice during spring and early summer. Swarm control and increase. MR. MATTHEWS.

A2. ELEMENTARY BEEKEEPING II. Fundamentals of bee behavior and of beekeeping practice during late summer, fall, and winter. Production of extracted honey, comb honey, and wax. Apiary equipment. Bee diseases, queen-rearing. Marketing of honey. Wintering outside and inside. MR. MATTHEWS.

DAIRY HUSBANDRY

CLARENCE H. ECKLES, Chief; ELMER O. ANDERSON, CHESTER D. DAHLE, THOR W. GULLICKSON, CARL F. HUFFMAN, ALLAN B. RAYBURN.

COURSES

A1. FEEDS AND FEEDING. The composition of feeds and of the animal body, digestion, assimilation; a study of the various feed stuffs, and of feeding standards. MR. GULLICKSON, MR. HUFFMAN, MR. RAYBURN.

A2. FARM DAIRYING. Milk, its composition, properties, cleanly production, and care. Principles of, and practice in, separating, testing, and farm butter-making. Forms and methods of marketing. MR. ANDERSON, MR. DAHLE, MR. GULLICKSON, MR. HUFFMAN.

A3. STOCK-JUDGING. Practice in judging from both the type and breed standpoints. Two thirds of the time is given to horses, beef cattle, sheep, and hogs; one third to dairy cattle. Same as An. Husb. A3. MR. P. A. ANDERSON, MR. GULLICKSON, MR. RAYBURN.

A5. MILK PRODUCTION. Characteristics of the dairy breeds, selection, care, and management of the dairy herd, selection of the sire, calf-raising; dairy barns. MR. ECKLES.

A6. DAIRY STOCK-FEEDING. Feeding the cow for milk production and the growing animals. Formulation of rations with special attention to economy and efficiency, a study of roughages and concentrates. Rations for cows on official tests. MR. RAYBURN.

A7. DAIRY STOCK SELECTION. A study of type, comparative judging, a study of pedigrees in relation to values. Visits to noted herds near the Twin Cities. MR. RAYBURN.

ECONOMICS

JOHN D. BLACK, Chief; PAUL L. MILLER.

COURSE

A1. COÖPERATIVE ACCOUNTING. Study of nature and kind of accounts for coöperative business. Practice in properly recording business transactions, preparation and interpretation of balance sheets and income statements for various types of coöperative organizations. MR. MILLER.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

WILLIAM A. RILEY, Chief; FLORENCE A. DEFIEL, PAUL M. GILMER, CARL E. HENDRICKSON.

A1. ANIMAL BIOLOGY. Study of fundamental principles of animal life such as metabolism, respiration, digestion, growth, and reproduction. A consideration of the more important groups of the animal kingdom and their relations to man. MR. RILEY, MR. GILMER, MR. HENDRICKSON.

A3. BIOLOGY. An elementary course dealing with such topics as inheritance, reproduction, natural selection, nervous activity, and metamorphosis. MISS DEFIEL.

A11. ANIMAL PARASITES. A study of life histories and methods of prevention and control of various external and internal parasites of domestic animals. MR. RILEY.

A16. INSECT PESTS OF PLANTS. A study of life cycles of insect pests injurious to cultivated plants and methods of combating them. MR. HENDRICKSON.

FARM ENGINEERING

WILLIAM BOSS, Chief; J. GRANT DENT, MAURICE G. JACOBSON, ALLEN D. JOHNSTON, HARRY B. ROE, EARL A. STEWART, JAMES B. TORRANCE, ARTHUR G. TYLER, HALL B. WHITE.

COURSES

A1. BLACKSMITHING I. Instruction is given in the management of the forge, in bending, shaping, and welding iron, thus familiarizing the student with the operations for blacksmith repair work on the farm. MR. JOHNSTON.

A2. BLACKSMITHING II. Instruction is given in bending, shaping, and welding steel, and tempering steel tools, thus familiarizing the student with the operations necessary for blacksmith steel work on the farm. MR. JOHNSTON.

A11. FARM MOTORS I. An elementary course offering theory and practice work in gasoline and kerosene engines. MR. TORRANCE.

A12. FARM MOTORS II. An advanced course in gasoline and kerosene engines and tractors, giving attention to adjustments, care, and operation. MR. TORRANCE.

A16. MECHANICAL LABORATORY. Instruction and laboratory practice in rope-splicing, knots, belt-lacing, pulleys and shafting, soldering, pipe-fitting, electric wiring, babbitting, cement work, and work with cold metals. MR. DENT.

A18. MECHANICS AND WATER SUPPLY. An elementary course in the mechanics of solids, liquids, and gases. Special emphasis is given to water supplies, water systems, sewage diposal, weather conditions, and forecasts. Laboratory work will be a part of the course. MR. STEWART, MR. TYLER.

A19. HEAT AND ELECTRICITY. An elementary course in heat and electricity as applied to home-heating and lighting with a study of electric batteries, motors, and other appliances. Laboratory work will be given. MR. STEWART, MR. TYLER.

A21. CARPENTRY. The care and use of tools is taught by means of shop exercises. Each student is required to sharpen his own tools and is given instruction in painting, estimating building materials, and farm building construction. MR. WHITE.

A31. DRAWING AND FARM BUILDINGS. Sketching, practice in pictorial drawing, and drawing farm building plans. Set of instruments not required. MR. JACOBSON.

A32. FARM BUILDINGS. A study of the location, planning, construction, and maintenance of farm buildings. MR. WHITE.

A41. HOUSEHOLD PHYSICS. A study of household mechanics, air, and water pressure, heat, and electricity. The economics of power, heat, light, and electricity in the home are considered. MR. STEWART.

A51. DRAINAGE AND ROADS. Conditions requiring, purposes of, benefits from drainage. Legal organization for extensive drainage. Kinds of drainage; essential features of drainage system; practice ditching and tile-laying to grade. Country road administration; earth road construction and maintenance. MR. ROE.

FORESTRY

EDWARD G. CHEYNEY, Chief; GILBERT H. WIGGIN.

COURSE

A1. NURSERY SEEDS AND SEEDING. The cultural principles, operations, and methods of handling evergreens in nursery work. Seed-collecting, storing, sowing, raising seedlings, transplanting, field-planting, and packing for shipment. MR. WIGGIN.

GYMNASIUM AND PHYSICAL TRAINING

D. C. MITCHELL, Director; WINIFRED BAILEY.

Men

This department coöperates with the Military Department in that part of the drill that calls for gymnasium and athletic work.

The gymnasium with its facilities is kept open every afternoon and evening for the use of students.

Interclass games, etc., are maintained as well as the regular school teams.

A course in gymnasium giving one credit per term is required of students who are exempt from drill.

Women

The aim of this department is to maintain the health of the students; to give gymnastic exercise and deep breathing; to stimulate functional activity, and to give coördination and poise. The department offers opportunities for swimming in the gymnasium swimming pool, organized games, cross-country tramps, and skating. Every girl is required to pass a swimming test before graduating, proving that she can save her life in case of an accident on the water.

All girls entering the school for the first time are required to take a physical examination. This examination is conducted by the director of health and physical education for women, and a corps of doctors and nurses. It consists of an examination of the heart and lungs, nose and throat, spine and feet. Height and weight are measured, eyes and ears tested. Medical advice is given and recommendations for special exercises are made for students who would be benefited by them.

HOME ECONOMICS

————————, Chief; ELIZABETH L. BACON, CARLOTTA BROWN, CLARA M. BROWN, AMANDA EBERSOLE, HALLY J. FISHER, AURA KEEVER, MAUDE J. MILLER, MARTHA B. MOORHEAD.

COURSES

A1. GARMENT-MAKING I. Qualities and prices of standard muslins; construction and care of the sewing machine; reading and alteration of commercial patterns; application of hand sewing and machine stitching to the making of an apron and undergarments. MISS KEEVER.

A2. GARMENT-MAKING II. A study of design in children's garments; suitable materials for garments; processes involved in construction of undergarments and dresses for children; repair of clothing. MISS EBERSOLE, MISS KEEVER.

A3. DRESSMAKING I. A study of standard cotton and linen dress fabrics; of design in tailored dresses; of processes involved in the construction of simple dresses; designing and making a washable dress. MISS EBERSOLE, MISS KEEVER.

A4. DRESSMAKING II. The study of standard wool fabrics; design in simple tailored dresses; fitting of the dress form; the use of the dress form and the process of construction involved in making a simple wool dress of tailored design. MISS EBERSOLE, MISS KEEVER.

A5. TEXTILES AND MILLINERY. (a) Standard fabrics and textile fibers; tests for adulteration; (b) design and color harmony in hats; alteration of frames; making and trimming of simple fall hats. Renovation of used materials. MISS CLARA BROWN, MISS EBERSOLE.

A6. DRESSMAKING III. Clothing and health; the clothing budget; the study of fabrics and design adapted to lingerie dresses; simple modeling on the dress-form; design and construction of a lingerie dress. MISS CLARA BROWN, MISS EBERSOLE.

A7. ADVANCED MILLINERY. The construction of wire frames; molding of buckram frames; making and trimming of simple spring and summer hats. MISS CARLOTTA BROWN.

A8. TRADE GARMENT-MAKING. A course dealing with the planning, cutting, and making of simple cotton garments upon a commercial basis. (Permission of the division required for registration.) MISS KEEVER.

A11. FOODS AND COOKERY I. Planning, preparing, and serving meals with emphasis on the study of carbohydrate foods.

A12. FOODS AND COOKERY II. Planning, preparing, and serving meals with emphasis on quick breads and foods. A brief study of principles controlling the preparation of protein foods.

A13. FOODS AND COOKING III. Planning, preparing, and serving meals with emphasis on the study of protein, fat, and mineral foods.

A15. ELEMENTARY DIETETICS. A course dealing with simple problems of nutrition; food for adult man and woman; children of different ages; planning of family dietary; cost of dietaries; food for the sick and convalescent.

A16. HOME MANAGEMENT AND HOUSEHOLD ACCOUNTS. Distribution of family income, household accounts; purchasing of supplies; planning and serving meals; relation of cost to income; sanitary cleanliness and its application in the care of the house; importance of labor-saving devices. MISS MILLER.

A21. DRAWING AND DESIGN I. Principles of design and color harmony with special emphasis upon design as expressed in clothing; one lettering problem. MISS BACON.

A22. DRAWING AND DESIGN II. Continuation of Course A21 with special emphasis on color-harmonizing. The working out of designs for garments to be made in Course A3. MISS BACON.

A23. DRAWING AND DESIGN III. The working out of designs for dresses to be developed in Course A4; one craft problem. MISS BACON.

A26. HOUSE-PLANNING AND FURNISHING. Location of farm buildings; types of farm dwellings, sketches of floor plans for the farm home;

plumbing and heating equipment; interior finish, wall and floor coverings; furniture, curtains, pictures; labor-saving equipment. MISS BACON.

A33. HOME NURSING AND HYGIENE I. (a) Communicable diseases, means of prevention, control, disinfection. (b) Home nursing equipment and methods practicable in the household. MISS MOORHEAD, MISS FISHER.

A34. HOME NURSING AND HYGIENE II. (a) Hygienic requirements during infancy, childhood, womanhood, maternity. (b) Household emergencies; preparation for maternity; care of infants. MISS MOORHEAD, MISS FISHER.

HORTICULTURE

WILLIAM H. ALDERMAN, Chief; LEROY CADY, FRANC P. DANIELS, FRED A. KRANTZ, WILLIAM T. TAPLEY.

COURSES

A1. FARM HORTICULTURE. Growing fruits, vegetables, and ornamentals for use on the farm. Location and planning of the orchard and garden and the culture of the important crops. Propagation of common plants. Culture and use of ornamentals. Text, lectures, and references. MR. DANIELS.

A2. ORCHARD FRUIT-GROWING. Commercial orcharding with a special consideration of the profitable management of an orchard on the Minnesota farm. Location; planting; selection of varieties; cultural systems; pruning; pest control; harvesting and marketing of fruit. MR. DANIELS.

A3. COMMERCIAL VEGETABLE-GARDENING. Growing of vegetable crops for market. Locating, planting, and care of the commercial garden; consideration of the important crops; marketing methods; types of glass structures, their uses, and the production of vegetables under glass. MR. DANIELS.

A4. SMALL FRUIT-GROWING. A practical study of berry-growing as a commercial enterprise in Minnesota and the northwest, covering the establishing and management of plantations of strawberries, raspberries, blackberries, gooseberries, currants, and grapes. MR. DANIELS.

A5. PLANT PROPAGATION. Methods of propagation of plants by seeds, cuttings, layers, grafting, and budding are studied. The principles of greenhouse management, transplanting, watering, and ventilation are studied. Lectures and laboratory. MR. CADY.

A6. ADVANCED PLANT PROPAGATION. A continuation of A5. Special attention being given to handling nursery stock in nursery and nursery management. Lectures and assigned readings. MR. CADY.

A7. FLORICULTURE. The purpose of this course is to give the student a working knowledge of the culture and use of house plants, annuals, and perennials. Lectures, reference reading, laboratory, and field trips. MR. CADY.

A8. ELEMENTARY LANDSCAPE GARDENING. A general course in practice and principles of ornamental plantings as applied to the home and community. A study of common trees, shrubs, and herbaceous perennials. Lectures, reference reading, and field trips. MR. CADY.

A9. ADVANCED LANDSCAPE GARDENING. A continuation of A8, giving more attention to arrangement of trees, shrubs, and herbaceous plants on home and public grounds. Special features of construction and maintenance will be considered. Lectures and laboratory. MR. CADY.

A10. GREENHOUSE CONSTRUCTION, MANAGEMENT, AND PRACTICE. Construction and management of the greenhouse from the standpoint of the fruit, vegetable, or flower grower. Various crops in relation to types of glass construction. Practice work in crops in the greenhouse. MR. TAPLEY.

A11. NURSERY SEEDS AND SEEDING. The cultural principles, operations, and methods of handling evergreens in nursery work. Seed collecting, storing, sowing, raising seedlings, transplanting, field-planting, and packing for shipment. (Same as For. A1.) MR. WIGGEN.

A12. GREENHOUSE PRACTICE. Practice work under supervision at University Farm and other approved greenhouses. MR. CADY, MR. TAPLEY.

A13. NURSERY ORGANIZATION. Types of nurseries; specialized departments; trade policies; office organization; advertising and selling; records, field labels; field and cellar handling of stock; grading; picking; traffic problems; Federal and state regulations; relations to experimental stations. MR. DANIELS.

A14. POTATO PRODUCTION. A study of the growth, climatic requirements, regional distribution, standardization of varieties according to soil, climate, and markets. Identification, exhibiting, judging, handling of seed plots, certification, cultural methods, storage, and marketing. MR. KRANTZ.

MILITARY DRILL

(Junior Reserve Officers' Training Corps)

COLONEL GIRARD STURTEVANT, Commandant; CAPTAIN ROBERT N. FRYE, FIRST SERGEANT WILLIAM H. DEAVEY.

The Reserve Officers' Training Corps is provided for by the National Defense Act of June 3, 1916, which is essentially a peace-time measure.

The Junior R. O. T. C. is designed, through standardized physical training, the teaching of the fundamentals of military training and leadership as well as a respect for lawful authority, to offer just the kind of

training which will best enable the average educated man to perform his civic duties in time of war as well as in time of peace.

The School of Agriculture, being a duly authorized institution, receives the following support from the Federal government.

1. The services of a regular army officer to devote all his time to the military work.

2. Each student enrolled will receive annually:

1 coat wool O. D.	2 collar ornaments
1 breeches wool O. D.	1 hat cord
1 shirt wool O. D.	1 belt
1 leggings pair canvas	chevrons
1 hat service	

The following is copied from the official circular: "The R. O. T. C. in no way undertakes to assume any military control of the schools where units are authorized. Parents and school authorities lose none of their control over the students. The members are not enlisted in the army, they sign no oath, they are not subject to calls for military duty any more than are other citizens of the same age."

In accordance with the spirit of this act all male students not physically unfit are required to attend military drill.

Military instruction is intended to be so conducted as to develop a soldier-like bearing and foster a spirit of gentlemanly courtesy, soldierly honor, and obedience to lawful authority, as well as to familiarize students with battalion maneuvers, guards, and the theoretical and practical use of firearms.

The officers and non-commissioned officers are required to be good students in the other departments, soldier-like in the performance of their duties, exemplary in their general deportment, and able to pass a creditable examination in drill regulations.

In general, the officers are selected from the senior class; sergeants and corporals from the junior class.

Practice playing in the school military band will be given to such students as desire to take their military training in the band. Any desiring this work should bring band instruments with them.

The military drill includes certain time set aside for gymnasium and athletic work. It has for its object the betterment of health conditions on the campus and to make the farm boys more agile. Emphasis is laid upon free arm gymnastics, apparatus work, and competitive games. Shower baths and a swimming pool are provided.

PLANT PATHOLOGY AND BOTANY

EDWARD M. FREEMAN, Chief; JONAS J. CHRISTENSEN, HENRY C. GILBERT, ALVIN H. LARSON.

COURSES

A1. AGRICULTURAL BOTANY. A brief study is made of the parts of economic flowering plants, emphasizing their significance in relation to agricultural practice. A brief study of seeds, fungi causing diseases of plants, and decay organisms is included. MR. CHRISTENSEN, MR. GILBERT.

A2. SEED-TESTING. The seeds of the common farm weeds, with special attention to those of noxious weeds, are studied. A set of seed cases is made and practice is given in testing seeds for purity and germination. MR. LARSON.

A4. AGRICULTURAL BOTANY. A study of economic flowering plants is made. The course also contains a brief study of molds, mushrooms, rots or decays, and yeast. MR. GILBERT.

A11. PLANT DISEASES. A study of important diseases of Minnesota crop plants with special emphasis on methods of control. MR. CHRISTENSEN.

A12. WEEDS. A practical study of farm weeds with special emphasis on their identification, control, and eradication. MR. LARSON.

POULTRY HUSBANDRY

ARTHUR C. SMITH, Chief.

COURSES

A1. POULTRY. Principles of general management, house construction, important commercial breeds and types, feeding for egg production; common ailments and simple treatments. MR. SMITH.

A2. MANAGEMENT OF LAYING FLOCK. Practice in feeding and management, mixing feeds, a study of laying rations, selections for laying qualities, selections for breeding qualities, keeping accounts. MR. SMITH.

A3. INCUBATION AND BROODING. A study of the best methods of incubation and brooding, natural and artificial, includes selection of breeders, eggs for incubation, feeding and care of chicks, how to avoid losses. MR. SMITH.

RHETORIC

ROBERT C. LANSING, Chief; ELIZABETH HAUSE, KATHERINE KESTER, MONICA LANGTRY, VERNIE SWENSON.

COURSES

A1. ENGLISH I. The sentence, parts of speech, punctuation, spelling, supplementary reading. MRS. HAUSE, MISS LANGTRY, MRS. SWENSON.

A2. ENGLISH II. Paragraphs and themes in narration, description, and exposition. Supplementary reading. MRS. HAUSE, MISS KESTER, MRS. SWENSON.

A2. ENGLISH CLASSICS. Reading and analysis of the works of American and English authors. (Offered only for those who have completed the old course in Business English. Not given after 1922-23.) MRS. HAUSE, MISS KESTER, MISS LANGTRY, MRS. SWENSON.

A3. ENGLISH GRAMMAR. A study of principles and practice in them, with composition. MRS. HAUSE, MISS LANGTRY, MRS. SWENSON.

A4. COMPOSITION I. Paragraphs and themes in narration, description, and exposition. Analysis of prose models. MISS LANGTRY, MRS. SWENSON.

A5. PUBLIC SPEAKING. Voice exercise, platform deportment. Practice in delivery of memorized and extemporaneous speeches. MISS KESTER, MISS LANGTRY.

A6.* COMPOSITION II. Exposition and argument. Gathering and outlining material. Instruction in the writing of the senior thesis. Debating. MISS KESTER, MISS LANGTRY, MRS. SWENSON.

A14. ADVANCED PUBLIC SPEAKING. A continuation of Course A5. Selecting and organizing material for speeches and the presentation of speeches effectively before a given audience. MISS KESTER.

A21-22. ENGLISH LITERATURE I, II. The history of English literature with a study of selections. For students planning to enter the College of Agriculture, Forestry, and Home Economics. MISS KESTER.

A31. DRAMATICS. Students who are selected by the coach of dramatics to take major parts in a play will receive one-half point credit upon the recommendation of the coach. MISS KESTER.

A32. DEBATING. Students participating in intersociety debates under the supervision of a teacher of debating will receive a one-half point credit upon completing a required amount of work. Debaters should report to the coach as soon as they are chosen. MISS LANGTRY.

SCHOOL (GENERAL)

DEXTER D. MAYNE, Principal; HAROLD S. DIEHL, JOHANNA HOGNASON, FREDERICK B. JOHNSON, PEDER L. JOHNSRUD, GEORGINA LOMMEN, GUSTAV A. LUNDQUIST, ESTHER E. OLSON, ROSE SCHAETTGEN, GRACE W. TAPLEY, WILLIAM R. WEHREND, MABEL WILLSON, WILBERT F. WITTE.

COURSES

A1. ARITHMETIC. Training in simple mathematical processes, applications of principles to problems requiring measurements of material, extension, capacity. Practical applications to farm and home life. Assists in the mathematics of the technical school courses. MR. JOHNSRUD.

A2. ADVANCED FARM ARITHMETIC. Similar in outline to Course A1. Special emphasis on farming as a business. MR. JOHNSRUD.

* Students given advanced standing in this course will be required to write a thesis under the direction of the Rhetoric Section as one of the requirements for graduation.

A4-5. ALGEBRA I, II. The first term includes the fundamental operations and factoring. The second term covers fractions, simultaneous equations, and quadratics. Emphasis is placed in both courses on the application of equations to the solution of practical problems.

A6-7. GEOMETRY I, II. The usual theorems and problems of plane geomtery are completed, with special attention given to their applications in mechanics and surveying. MISS HOGNASON.

A8. HYGIENE. Method for promotion of health and prevention of disease will be considered with a view of acquainting the student with the fundamentals of right living and the individual and community activities against the spread of disease. MR. DIEHL.

A21. ELEMENTS OF MUSIC I. (a) Fundamental principles of musical notation, pitch, rhythm, musical terms, intervals and formation of major and minor scales. (b) Formation and progression of triads. MISS WILLSON.

A22. ELEMENTS OF MUSIC II. (a) Formation and progression of triads—seventh and ninth chords. (b) Musical history: Growth of musical composition. Lives of great musicians. (c) Origin and development of the instruments of band and orchestra. MR. WEHREND, MISS WILLSON.

A23. CHORUS. Sight-reading and ear-training. From this chorus, students with unusual ability and experience will be chosen for the school chorus, which is divided into men's glee club, girls' chorus, mixed chorus, and quartet. MRS. TAPLEY.

A24. VIOLIN. Elementary: Rosenkranz, *Kayser Etudes, Schradieck Scales, Solos in Comparison.* Intermediate: Scales in all positions, Seveik, Mazas, Dont, compositions of medium difficulty. Advanced Kreutzer, Fiorillo, Rode, Gavinie, Sonatas of Handel, Gade, David, concertos of Viotti, DeBeriot, Mendelssohn. Ten thirty-minute lessons, $10 per term. MISS R. SCHAETTGEN.

A25.* PIANO. Elementary and advanced technical training, scales, arpeggios, octaves, chords, selected technical studies. Bach: Inventions, Well-Tempered Clavicord. Sonatinas: Clementi, Kuhlan. Sonatas: Haydn, Mozart, Beethoven. Solos for all grades; classics and best modern material. Ten thirty-minute lessons, $10 per term. MISS WILLSON.

A26. INSTRUMENTAL. Instruction on band and orchestral instruments, such as cornet, clarinet, flute, saxophone, trombone, baritone, horn, bass, etc., scales and technical exercises with practical playing. Ten thirty-minute lessons, $10 per term. MR. WEHREND.

* Piano students may register for orchestra and receive training through piano quartet (two pianos), subject to the approval of the instructor.

A27.* ORCHESTRA. Standard orchestral literature and accompaniment of vocal and instrumental solos. Instruction and laboratory experience for those not sufficiently equipped technically, to improve the sense of rhythm, intonation, phrasing, and interpretation. MR. WEHREND.

A28. VOCAL MUSIC. Voice-placing, breath development, enunciation, diction, illustrated by elementary exercises by Sieber, Marchesi; songs of medium difficulty. Ten thirty-minute lessons, $10 per term. MRS. TAPLEY.

A29. BAND. Study of standard musical literature for the military band. Instruction in intonation, improvement of sense of rhythm, technique, phrasing, and interpretation. MR. WEHREND.

A41. PARLIAMENTARY LAW. Instruction in principles of parliamentary law, how to organize a society, duties of officers, how to record proceedings, and how to conduct meetings. Students will be given practice under the direction of the instructor. MR. MAYNE.

A42. CIVICS. Origin, necessity, nature, and various forms of government. The legislative, judicial, and executive departments and the functions of each. The relations of the state to the Federal government. MR. LUNDQUIST.

A43. ELEMENTARY ECONOMICS. Fundamental laws governing production, consumption, distribution, and exchange. Subjects of special interest to farmers, such as taxation, rural credit, coöperation, and the growth of tenantry. The subject is given in lectures and assigned readings. MR. WITTE.

A44. RURAL ECONOMICS. The general principles of economics as applied to the farmer's relationships, as a producer and as a consumer. Special topics considered. Marketing of farm products, coöperative societies, rural credits, taxation, farm labor, and tenancy. MR. WITTE.

A45. INDUSTRIAL HISTORY. Sanford's *Story of Agriculture,* supplemented by Moore's *Industrial History*. Recitation and written summaries from the texts, special reports, and outlines. Agricultural history is emphasized in this study of general industrial development in the United States. MR. WITTE.

A46. RURAL SOCIOLOGY. A practical course including a study of rural conditions, how to make a survey, the cause of present conditions and how they may be improved. Study of rural organizations, religions, and educational institutions. MR. LUNDQUIST.

A47. AMERICAN HISTORY. Causes and effects of great movements are emphasized, and the history of the westward migration is especially stressed. How the United States became a "world power" in 1900. Lectures, recitations, special topics, reports, and outlines. MR. LUNDQUIST.

A61. SPELLING. Students poor in spelling should elect this course and continue until able to spell words in ordinary conversation and correspondence. A spelling text is used and drills on lists of commonly misspelled words are given. MR. JOHNSON.

A62. PENMANSHIP. A standard musical movement system is taught and the Curtis tests are applied. Students who are poor in penmanship should elect this course. MR. JOHNSON.

BUSINESS COURSES FOR GIRLS

The object of these courses is to prepare students whose services are not immediately required for home work, for office work on the farm, in the village, or to take subordinate positions in regular offices.

The subject-matter of the course in home-making and agriculture fits students, with the training in business subjects, to take positions as office assistants in farm bureaus, coöperative creameries, and local elevators.

A63. TYPEWRITING I. The touch method of typewriting is taught. Following the acquirements of the command of the keyboard, repetition drills to assist in memorizing the keyboard, concentration drills, and acceleration drills are given. MISS OLSON.

A64. TYPEWRITING II. The continuous development of speed and accuracy through carefully planned speed drills. Tabulating, lessons on different machines and their care. MISS OLSON.

A65. STENOGRAPHY. Principles of phonography are taught by the Gregg system. Thoro drill is given in word forms and in combining them into phrases and sentences. MR. JOHNSON.

A66. DICTATION I. Students review carefully the principles of stenography, and take short letters by dictation, which are transcribed on the typewriter. Accuracy of transcription is the aim, rather than speed. MR. JOHNSON.

A69. LETTER-WRITING. Business correspondence from typist's viewpoint. Business letters and documents which help in gaining correct first impression are studied and copied. Construction work requiring judgment in arrangement, and developing initiative and power to solve original problems. MISS OLSON.

A70. GENERAL OFFICE PRACTICE. This course gives an insight into office routine. Letters are taken from dictation, transcribed upon the typewriter, and filed according to approved methods. The use of the mimeograph, a duplicating device, is also taught. MR. JOHNSON.

A72. COMMERCIAL LAW. (Not offered in 1922-23.)

A81. Social Training. The fundamental principles governing the individual in social contacts; with attention to the rights and responsibilities of the individual in institutional life: special emphasis upon the home as the social center. Miss Lommen.

A82. Social Problems for Boys. An open forum for the discussion of social conventions of home, school, and public life, and their relation to character as illustrated by biography. Miss Hognason.

SOILS

Frederick J. Alway, Chief; George H. Nesom.

COURSES

A1. Soils. Minnesota soils, their formation, properties, and characteristics. Treatment of lime-deficient, alkali, and peat soils. Farm manures, green manures, and commercial fertilizers. Laboratory demonstrations, examination of soils, and discussion of soil problems. Mr. Nesom.

VETERINARY MEDICINE

Clifford P. Fitch, Chief; William A. Billings, William L. Boyd, Myron H. Reynolds.

COURSES

A1. Physiology. This course consists of the study of the body, its functions and care. Mr. Reynolds.

A4. Elements of Bacteriology. Lectures and demonstrations of the fundamental principles underlying the science of bacteriology, with special reference to organisms which cause disease. Instruction will be given in the preparation and use of vaccines, bacterines, antitoxins, immune sera. Mr. Billings.

A5. Physiology and Hygiene of Breeding. A study of the gross anatomy of the reproductive organs; physiology of reproduction; the breeding season; gestation and care of the female during parturition and lactation. Mr. Boyd.

A7. Veterinary Studies. The animal body in health; causes and prevention of animal diseases in general; specially important diseases in detail including treatment; simple surgical operations, e.g., castration, dehorning, tapping for bloat, abscess drainage, etc. Mr. Reynolds.

TABULAR STATEMENT AND PROGRAM OF COURSES

EXPLANATION OF TABULAR STATEMENT

Course numbers.—All courses in the School of Agriculture are designated by the capital letter A preceding the course number to distinguish them from collegiate courses of the same number. The letter f indicates a fall term course, and the letter w, a winter term course. For example: A5f,w indicates that course A5 is offered both fall and winter terms. A5f-6w would indicate a year course continuing through two terms.

Credits and prerequisites.—The number of credits which each course counts toward graduation, the classes of students to which the course is offered and the prerequisite courses are indicated in parentheses immediately below the descriptive name of the course. For example: (2 cred.; sr. agr.; prereq., A1,A2) means that the course counts 2 credits; that it is offered to senior students in agriculture (not home economics) and that before registering for the course, courses A1 and A2 offered by the same division must have been satisfactorily completed. If neither agriculture or home economics students are designated the course may be taken by both.

ABBREVIATIONS OF BUILDINGS

Ad	Administration	HE	Home Economics
BB	Beef Barn	Ho	Home Building
Ch	Agricultural Chemistry	Hr	Horticulture
DB	Dairy Barn	MS	Meat Shop
DH	Dairy Hall	PP	Plant Pathology
En	Agricultural Engineering	SS	Soil Survey
FH	Farm House	St	Stock Pavilion
Gy	Gymnasium	Ve	Veterinary
		WH	Women's Hall

CLASS HOURS

I	8:15- 9:05	VI	1:30-2:20
II	9:15-10:05	VII	2:20-3:20
III	10:15-11:05	VIII	3:30-4:20
IV	11:15-12:05	IX	4:30-5:20

No classes are scheduled for the V hour, which is reserved for assembly (12:10-12:45) and dinner hour.

PROGRAM

AGRICULTURAL BIOCHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
A1f-2w	Chemistry of Plant and Animal Life ..... (6 cr.; jr., sr. agr.; no prereq.)	II	MWF	201Ch	Mr. Taylor
A1w	Chemistry of Plant and Animal Life ..... (3 cr.; jr., sr. agr.; no prereq.)	IV	TThS	201Ch	Mr. Taylor
A2f	Chemistry of Plant and Animal Life ..... (3 cr.; jr., sr. agr.; prereq., A1)	III	TThS	201Ch	Mr. Taylor
A3f	Household Chemistry ..... (5 cr.; jr., sr. H.E.; no prereq.)	IV	MTWFS	201Ch	Mr. Taylor

AGRONOMY AND FARM MANAGEMENT

No.	Title	Hour	Day	Bldg.	Instructor
A1f,w	Cereal Crops ..... (3 cr.; jr., sr. agr.; no prereq.)				
	Sec. 1 Lect.	I	TS	4Ad	Mr. Barker
	Lab.	I, II	Th	4Ad	Mr. Barker
	2 Lect.	II	ThS	24Ad	Mr. Barker
	Lab.	I, II	T	24Ad	Mr. Barker
A2f,w	Corn ..... (2 cr.; all agr.; no prereq)				
	Sec. 1	I	MWF	4Ad	Mr. Barker
	2	II	MWF	4Ad	Mr. Barker
	3	III	MWF	4Ad	Mr. Barker
	4	IV	MWF	4Ad	Mr. Barker
	5	VI	MWF	4Ad	Mr. Barker
	6	VII	MWF	4Ad	Mr. Barker
A3f,w	Forage Crops and Potatoes... (3 cr.; jr., sr. agr.; no prereq.)				
	Sec. 1	III	TS	4Ad	Mr. Pettigrove
		III, IV	Th	4Ad	Mr. Pettigrove
	2	IV	ThS	2Ad	Mr. Pettigrove
		III, IV	T	2Ad	Mr. Pettigrove
A4w	General Agriculture ..... (3 cr.; all H.E.; no prereq.)	I	MWF	307Ad	
A5w	Farm Crop-Breeding ..... (2 cr.; sr. agr.; prereq., A1, A2)	I	MW	4PP	Mr. Hayes
A6w	Judging and Grading Farm Crops ..... (3 cr.; sr. agr.; prereq. A1, A2)	VI, VII, VIII	TTh	4Ad	Mr. Arny
A11f	Farm Implements ..... (3 cr.; sr. agr.; no prereq.)	III, IV	MWF	BAd	Mr. Bassett
A21f,w	Farm Management I..... (3 cr.; sr. agr.; no prereq.)				
	Sec. 1	III, IV	MWF	24Ad	Mr. Engberg
	2	III, IV	TThS	24Ad	Mr. Bassett
A22f,w	Farm Management II..... (3 cr.; sr. agr.; no prereq.)	VI, VII	MWF	24Ad	Mr. Bassett, Mr. Engberg

ANIMAL HUSBANDRY

No.	Title	Hour	Day	Bldg.	Instructor
A1f,w	Types and Market Classes.... (2 cr.; all agr.; no prereq.)				
	Sec. 1	I, II	MW	ESt	Mr. Harvey, Mr. McCarty
	2	I, II	TTh	ESt	Mr. Harvey, Mr. McCarty
	3	III, IV	TTh	ESt	Mr. Harvey, Mr. McCarty
A2f,w	Breeds ..... (3 cr.; all agr.; no prereq.)				
	Sec. 1	III	MWF	WSt	Mr. Harvey, Mr. McCarty
	2	III	TThS	WSt	Mr. Harvey, Mr. McCarty
	3	IV	TThS	WSt	Mr. Harvey, Mr. McCarty
A3f,w	Stock-Judging ..... (3 cr.; jr., sr. agr.; prereq., A1, A2)				
	Sec. 1	III, IV	MWF	ESt	Mr. Harvey, Mr. McCarty
	2	VI, VII	MWF	ESt	Mr. Harvey, Mr. McCarty
A4w	Meats ..... (3 cr.; jr., sr. agr.; prereq., A3)	VI, VII, VIII	TTh	MS	Mr. Anderson, Mr. Harvey
A5f	Breeding ..... (3 cr.; sr. agr.; prereq., A3)	VI	MWF	3St	Mr. Anderson, Mr. Carnes
A5w	Breeding ..... (3 cr.; sr. agr.; prereq., A3)	III	MWF	MS	Mr. Anderson, Mr. Carnes
A6f	Livestock-Feeding and Management ..... (3 cr.; sr. agr.; prereq., A3)	IV	MWF	3St	Mr. Peters

BEE CULTURE

No.	Title	Hour	Day	Bldg.	Instructor
A1f,w	Elementary Beekeeping I..... (3 cr.; all; no prereq.)				
	Sec. 1	II	TThS	FH	Mr. Matthews
	2	III	TThS	FH	Mr. Matthews
A2f	Elementary Beekeeping II.... (3 cr.; all; prereq., A1)	II	MWF	FH	Mr. Matthews
A2w	Elementary Beekeeping II.... (3 cr.; all; prereq., A1)				
	Sec. 1	I	MWF	FH	Mr. Matthews
	2	IV	TThS	FH	Mr. Matthews

DAIRY HUSBANDRY

No.	Title	Hour	Day	Bldg.	Instructor
A1f	Feeds and Feeding..... (3 cr.; jr., sr. agr.; no prereq.)				
	(Sections limited to 45 students each) Sec. 1	II	MWF	40DH	Mr. Rayburn
	2	IV	TThS	3St	Mr. Wilbur

No.	Title		Hour	Day	Bldg.	Instructor
A1w	Feeds and Feeding.....					
	(3 cr.; jr., sr. agr.; no prereq.)					
		Sec. 1	II	MWF	40DH	Mr. Rayburn
	(Limited to	2	IV	TThS	40DH	Mr. Wilbur
	45 each)	3	IV	TThS	39DH	Mr. Gullickson
A2f	Farm Dairying					
	(3 cr.; jr., sr. agr.; no prereq.)					
	(Limited to	Sec. 1	III, IV	MWF	40DH	Mr. Dahle
	45 each)	2	VI, VII	MWF	40DH	Mr. Gullickson
A2w	Farm Dairying					
	(3 cr.; jr., sr. agr.; no prereq.)					
		Sec. 1	III, IV	MWF	40DH	Mr. Dahle
	(Limited to	2	VI, VII	MWF	39DH	Mr. Anderson
	45 each)	3	I, II	TThS	40DH	Mr. Wilbur
A3f,w	Stock-Judging		See Animal Husbandry 3, p. 28.			
A5w	Milk Production		I	MWF	39DH	Mr. Eckles
	(3 cr.; sr. agr.; no prereq.)					
A6f	Dairy Stock-Feeding		IV	TThS	40DH	Mr. Rayburn
	(3 cr.; sr. agr.; prereq., A1)					
A7w	Dairy Stock Selection.....		I, II	TThS	39DH	Mr. Rayburn
	(3 cr.; sr. agr.; prereq., A3, A5)					

ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
A1f,w	Coöperative Accounting	VI	TTh	24Ad	Mr. Miller
	(3 cr.; jr., sr. agr.; no prereq.)	VII, VIII	T	24Ad	Mr. Miller

ENTOMOLOGY AND ECONOMIC ZOOLOGY

No.	Title		Hour	Day	Bldg.	Instructor
A1f,w	Animal Biology					
	(3 cr.; all agr.; no prereq.)					
		Sec. 1	I	TThS	307Ad	Mr. Hendrickson
		2	II	MWF	307Ad	Mr. Gilmer
		3	III	MWF	307Ad	Mr. Gilmer
		4	VI	MWF	307Ad	Mr. Gilmer
A3f	Biology					
	(3 cr.; all H.E.; no prereq.)					
		Sec. 1	I	MWF	307Ad	Miss Defiel
		2	IV	MWF	307Ad	Miss Defiel
A11w	Animal Parasites		II	ThS	306Ad	Mr. Riley
	(3 cr.; sr. agr.; no prereq.)		I, II	T	306Ad	Mr. Riley
A16f	Insect Pests of Plants.....		VI, VII	MWF	317Ad	Mr. Hendrickson
	(3 cr.; jr., sr.; no prereq.)					

FARM ENGINEERING

No.	Title		Hour	Day	Bldg.	Instructor
A1f,w	Blacksmithing I					
	(3 cr.; all agr.; no prereq.)					
		Sec. 1	VI, VII, VIII	TTh	20En	Mr. Johnston
		2	VI, VII, VIII	WF	20En	Mr. Johnston

No.	Title	Hour	Day	Bldg.	Instructor
A2w	Blacksmithing II ..... (3 cr.; jr., sr. agr.; prereq., A1)	I, II	TThS	20En	Mr. Johnston
A11f,w	Farm Motors I..... (3 cr.; all agr.; no prereq.)				
	Sec. 1	VI, VII, VIII	TTh	Ar	Mr. Torrance
	2	VI, VII, VIII	WF	Ar	Mr. Torrance
A12f,w	Farm Motors II..... (3 cr.; jr., sr. agr.; prereq., C grade in A11)	III, IV	TThS	Ar	Mr. Torrance
A16f,w	Mechanical Laboratory ..... (3 cr.; all agr.; no prereq.)				
	Sec. 1	VI, VII, VIII	TTh	56En	Mr. Dent
	2	VI, VII, VIII	WF	56En	Mr. Dent
A18f	Mechanics and Water Supply.. (3 cr.; jr., sr. agr.; no prereq.)				
	Lect.	I	MW	101En	Mr. Tyler
	Lab. Sec. 1	I, II	F	102En	Mr. Tyler
	2	VII, VIII	M	102En	Mr. Tyler
A18w	Mechanics and Water Supply.. (3 cr.; jr., sr. agr.; no prereq.)	II	ThS	101En	Mr. Tyler
		I, II	T	102En	Mr. Tyler
A19w	Heat and Electricity..... (3 cr.; jr., sr. agr.; no prereq.)				
	Sec. 1	I	MW	101En	Mr. Tyler
		I, II	F	102En	Mr. Tyler
	2	IV	TTh	101En	Mr. Stewart
		III, IV	S	102En	Mr. Tyler
A21f,w	Carpentry ..... (3 cr.; all agr.; no prereq.)				
	Sec. 1	VI, VII, VIII	TTh	48En	Mr. White
	2	VI, VII, VIII	WF	48En	Mr. White
A31f,w	Drawing and Farm Buildings.. (3 cr.; all agr.; no prereq.)				
	Sec. 1	VI, VII, VIII	TTh	303En	Mr. Jacobson
	2	VI, VII, VIII	WF	303En	Mr. Jacobson
	3	II, III, IV	TTh	303En	Mr. Jacobson
A32f	Farm Buildings ..... (3 cr.; sr. agr.; prereq., A21, A31)	I	M	305En	Mr. White
		I, II	WF	305En	Mr. White
A41f	Household Physics ..... (5 cr.; jr., sr. H.E.; no prereq.)	VIII	MTThF	101En	Mr. Stewart
		VIII, IX	W	102En	Mr. Stewart
A51f	Drainage and Roads..... (3 cr.; sr. agr.; no prereq.)	I, II	TThS	215En	Mr. Roe

FORESTRY

No.	Title	Hour	Day	Bldg.	Instructor
A1w	Nursery Seeds and Seeding.. (3 cr.; jr., sr. agr.; prereq., Hort. A5)	IV	TThS	102Hr	Mr. Wiggin

GYMNASIUM

No.	Title	Hour	Day	Bldg.	Instructor
A1f,w	Gymnasium ..... (1 cr.; all agr.; no prereq.)	IX	TTh	Gy	Mr. Mitchell
A1f,w-2w,f	Freshman Physical Training.. (2 cr.; all H.E.; no prereq.)	VIII	MW	Gy	
		VIII, IX	F	Gy	
A3f,w-4w,f	Senior Physical Training..... (2 cr.; jr., sr. H.E.; prereq., A1-2)	III	TThS	Gy	
A5f,w-6w,f	Senior Physical Training.... (2 cr.; sr. H.E.; prereq., A3-4)	IV	TThS	Gy	

HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
A1f	Garment-Making I ..... (2 cr.; all H.E.; no prereq.)				
	Sec. 1	I, II	MW	114HE	Miss Keever
	2	III, IV	TTh	114HE	Miss Keever
	3	VI, VII	MW	114HE	Miss Keever
A1w	Garment-Making I ..... (2 cr.; all H.E.; no prereq.)	III, IV	ThS	114HE	
A2f	Garment-Making II ..... (2 cr.; all H.E.; prereq., A1)	III, IV	ThS	112HE	Miss Ebersole
A2w	Garment-Making II ..... (2 cr.; all H.E.; prereq., A1)				
	Sec. 1	I, II	MW	112HE	Miss Ebersole
	2	III, IV	TTh	112HE	Miss Ebersole
	3	VI, VII	MW	112HE	Miss Keever
A3f	Dressmaking I ..... (2 cr.; jr., sr. H.E.; prereq., A2)				
	Sec. 1	I, II	MF	112HE	Miss Ebersole
	2	VI, VII	MF	112HE	Miss Ebersole
A3w	Dressmaking I ..... (2 cr.; jr., sr. H.E.; prereq., A2)	I, II	ThS	112HE	Miss Keever
A4f	Dressmaking II ..... (3 cr.; jr., sr. H.E.; prereq., A3)	I, II	TThS	114HE	Miss Keever
A4w	Dressmaking II ..... (3 cr.; jr., sr. H.E.; prereq., A3)				
	Sec. 1	I, II	MWF	114HE	Miss Keever
	2	VI, VII	MWF	114HE	Miss Ebersole
A5f	Textiles and Millinery..... (3 cr.; sr. H.E.; prereq., A4)				
	Sec. 1	I, II	TThS	112HE	Miss Ebersole
	2	III, IV	MWF	112HE	Miss Clara Brown
A6w	Dressmaking III ..... (3 cr.; sr. H.E.; prereq., A5)				
	Sec. 1	I, II	TThS	114HE	Miss Ebersole
	2	III, IV	MWF	114HE	Miss Clara Brown
A7w	Advanced Millinery..... (3 cr.; sr. H.E.; prereq., A5)	VI, VII, VIII	TTh	112HE	Miss Carlotta Brown
A8f,w	Trade Garment-Making ..... (3 cr.; sr. H.E.; prereq., A4, instructor's permission)	VI, VII, VIII	TTh	114HE	Miss Keever

No.	Title	Hour	Day	Bldg.	Instructor
A11f	Foods and Cookery I..... (3 cr.; all H.E.; no prereq.)				
	Sec. 1	I, II	MWF	103HE	
	2	III, IV	TThS	103HE	
	3	VI, VII	MWF	103HE	
A11w	Foods and Cookery I..... (3 cr.; all H.E.; no prereq.)	I, II	MWF	107HE	
A12f	Foods and Cookery II..... (3 cr.; all H.E.; prereq., A11)	I, II	MWF	105HE	
A12w	Foods and Cookery II..... (3 cr.; all H.E.; prereq., A11)				
	Sec. 1	I, II	MWF	103HE	
	2	III, IV	TThS	103HE	
	3	VI, VII	MWF	103HE	
A13f	Foods and Cookery III..... (3 cr.; jr., sr. H.E.; prereq., A12)				
	Sec. 1	I, II	TThS	105HE	
	2	VI, VII, VIII	TTh	105HE	
A13w	Foods and Cookery III..... (3 cr.; jr., sr. H.E.; prereq., A12)	I, II	TThS	103HE	
A15f	Elementary Dietetics ..... (3 cr.; sr. H.E.; prereq., A13)				
	Sec. 1	I, II	TThS	103HE	
	2	III, IV	MWF	105HE	
A16w	Home Management and Household Accounts ..... (4 cr.; sr. H.E.; prereq., A15)				
	Sec. 1	I, II	MTThF	105HE	Miss Miller
	2	VI, VII	MTThF	203,207HE	Miss Miller
A21f	Drawing and Design I ..... (1 cr.; all H.E.; no prereq.)				
	Sec. 1	I, II	F	114HE	Miss Bacon
	2	III, IV	S	114HE	Miss Bacon
	3	VI, VII	F	114HE	Miss Bacon
A21w	Drawing and Design I ..... (1 cr.; all H.E.; no prereq.)	III, IV	T	114HE	Miss Bacon
A22f	Drawing and Design II..... (1 cr.; all H.E.; prereq., A21)	III, IV	T	112HE	Miss Bacon
A22w	Drawing and Design II..... (1 cr.; all H.E.; prereq., A21)				
	Sec. 1	I, II	F	112HE	Miss Bacon
	2	III, IV	S	112HE	Miss Bacon
	3	VI, VII	F	112HE	Miss Bacon
A23f	Drawing and Design III..... (1 cr.; jr., sr. H.E.; prereq., A22)				
	Sec. 1	I, II	W	112HE	Miss Bacon
	2	VI, VII	W	112HE	Miss Bacon
A23w	Drawing and Design III..... (1 cr.; jr., sr. H.E.; prereq., A22)	I, II	T	112HE	Miss Bacon
A26f	House-Planning and Furnishing ..... (4 cr.; jr., sr. H.E.; prereq., A22)	I, II	M	106HE	Miss Bacon
		VI, VII, VIII	TTh	106HE	

No.	Title	Hour	Day	Bldg.	Instructor
A26w	House-Planning and Furnishing ..... (4 cr.; jr., sr. H.E.; prereq., A22)				
	Sec. 1	I, II	W	106HE	Miss Bacon
		VI, VII, VIII	TTh	106HE	
	2	VI, VII	W	106HE	Miss Bacon
		VI, VII, VIII	MF	106HE	
A33f	Home Nursing and Hygiene I.. (2 cr.; jr., sr. H.E.; no prereq.)				
	Lect.	I	W	106HE	Miss Moorhead
	Lab. Sec. 1	I, II	F	WH	Miss Fisher
	2	VI, VII	W	WH	Miss Fisher
A34w	Home Nursing and Hygiene II.. (2 cr.; sr. H.E.; prereq., A33)				
	Lect.	I	W	203HE	Miss Moorhead
	Lab. Sec. 1	VI, VII	T	WH	Miss Fisher
	2	VI, VII	W	WH	Miss Fisher

HORTICULTURE

No.	Title	Hour	Day	Bldg.	Instructor
A1f,w	Farm Horticulture ..... (3 cr.; all; no prereq.)				
	Sec. 1	I	MWF	102Hr	Mr. Daniels
	2	IV	MWF	102Hr	Mr. Daniels
A2f	Orchard Fruit-Growing ..... (3 cr.; jr., sr.; no prereq.)	II	MWF	8aHr	Mr. Daniels
A3w	Commercial Vegetable-Gardening ..... (3 cr.; jr., sr. agr.; no prereq.)	II	MWF	102Hr	Mr. Daniels
A4w	Small Fruit-Growing ..... (3 cr.; jr., sr.; no prereq.)	II	TThS	8aHr	Mr. Daniels
A5f	Elementary Plant Propagation.. (3 cr.; all; no prereq.)	IV	TTh	8Hr	Mr. Cady
		I, II	S	8Hr	
A6w	Advanced Plant Propagation.. (3 cr.; jr., sr. agr.; prereq., A5)	II	MWF	8Hr	Mr. Cady
A7w	Floriculture ..... (3 cr.; all; no prereq.)	IV	MWF	8aHr	Mr. Cady
A8f,w	Elementary Landscape Gardening ..... (3 cr.; all; no prereq.)	III	MWF	8aHr	Mr. Cady
A9w	Advanced Landscape Gardening ..... (3 cr.; jr., sr. agr.; prereq., A8)	III	MW	8Hr	Mr. Cady
		VI, VII	M	8Hr	
A10f	Greenhouse Construction and Management ..... (3 cr.; jr., sr. agr.; prereq., A3 or A7)	III	TTh	102Hr	Mr. Tapley
		I, II	Th	8Hr	

No.	Title	Hour	Day	Bldg.	Instructor
A11w	Nursery Seeds and Seeding...	See Forestry program			
	(3 cr.; jr., sr. agr.; prereq., A5)				
A12w	Greenhouse Practice	VI, VII, VIII	W	102Hr	Mr. Cady, Mr. Tapley
	(3 cr.; jr., sr. agr.; prereq., A3, A5, A7)				
A13w	Nursery Organization	III	TThS	102Hr	Mr. Daniels
	(3 cr.; sr. agr.; prereq., A6 and A11)				
A14w	Potato Production	II	MW	8aHr	Mr. Krantz
	(3 cr.; jr., sr. agr.; prereq., Agron. A3)	VI, VII	M	8aHr	

MILITARY DRILL

No.	Title	Hour	Day	Bldg.	Instructor
	Military Drill	IX	MWF	Gy	Mr. Frye
	(2 cr.;* no prereq.)				

PLANT PATHOLOGY AND BOTANY

No.	Title		Hour	Day	Bldg.	Instructor
A1f,w	Agricultural Botany					
	(3 cr.; all agr.; no prereq.)					
		Lect. Sec. 1	VI	M	4PP	Mr. Gilbert
		Rec.	II	F	4PP	Mr. Gilbert
		Lab.	III, IV	F	3PP	Mr. Gilbert
		Lect. 2	VI	M	4PP	Mr. Gilbert
		Rec.	VI	W	4PP	Mr. Gilbert
		Lab.	VII, VIII	M	3PP	Mr. Gilbert
		Lect. 3	VI	T	4PP	Mr. Gilbert
		Rec.	VI	Th	4PP	Mr. Gilbert
		Lab.	VII, VIII	T	3PP	Mr. Gilbert
		Lect. 4	IV	M	4PP	Mr. Gilbert
		Rec.	IV	F	4PP	Mr. Gilbert
		Lab.	III, IV	W	3PP	Mr. Gilbert
A2w	Seed-Testing		VI, VII			
	(2 cr.; jr., sr. agr.; prereq., A1)		VIII	M	3, 4PP	Mr. Larson
A4w	Agricultural Botany					
	(3 cr.; all H.E.; no prereq.)					
		Lect.	I	T	4PP	Mr. Gilbert
		Rec.	I	S	4PP	Mr. Gilbert
		Lab.	VII, VIII	Th	3PP	Mr. Gilbert
A11f	Plant Diseases		IV	MWF	1PP	Mr. Christensen
	(3 cr.; sr.; prereq., A1 or A4)					
A12f	Weeds		VI	T	3PP	Mr. Larson
	(2 cr.; jr., sr. agr.; prereq., A1)		VI, VII	Th	3PP	Mr. Larson

* A maximum of 12 credits in Military Drill may be counted toward graduation.

POULTRY HUSBANDRY

No.	Title	Hour	Day	Bldg.	Instructor
A1f,w	Poultry				
	(3 cr.; all; no prereq.)				
	Sec. 1	II	TThS	104Ve	Mr. Smith
	2	IV	TThS	104Ve	Mr. Smith
	3	VII	MWF	104Ve	Mr. Smith
A2f,w	Management of Laying Flock ..	Ar	Ar	Ar	Mr. Smith
	(1 cr.; jr., sr.; prereq., A1 or parallel)				
A3w	Incubating and Brooding.....				
	(3 cr.; jr., sr.; prereq., A1)				
	Lect.	III	MF	104Ve	Mr. Smith
	Lab.	Ar	Ar	Ar	Mr. Smith

RHETORIC

No.	Title	Hour	Day	Bldg.	Instructor
A1f*	English I				
	(3 cr.; all; no prereq.)				
	Sec. 1	I	MWF	308En	Mrs. Hause
	2	I	TThS	312En	
	3	II	TThS	312En	Mrs. Swenson
	4	III	MWF	306En	Miss Langtry
	5	III	TThS	308En	Mrs. Hause
	6	VI	MWF	312En	Mrs. Swenson
A1w*	English I				
	(3 cr.; all; no prereq.)				
	Sec. 1	II	MWF	308En	Mrs. Hause
	2	IV	TThS	312En	Mrs. Swenson
A2f	English Classics				
	(3 cr.; all; prereq., Business English)				
	Sec. 1	II	MWF	308En	Mrs. Hause
	2	IV	TThS	312En	Mrs. Swenson
A2w	English II				
	(3 cr.; all; prereq., A1)				
	Sec. 1	I	MWF	308En	
	2	I	TThS	312En	
	3	III	MWF	312En	Mrs. Swenson
	4	III	TThS	308En	Mrs. Hause
	5	IV	MWF	308En	
	6	VI	MWF	307En	Miss Kester
A3f	English Grammar				
	(3 cr.; jr., sr.; prereq., English Classics)				
	Sec. 1	I	TThS	308En	Mrs. Hause
	2	III	MWF	308En	Mrs. Hause
	3	IV	MWF	306En	Miss Langtry
	4	IV	TThS	308En	

* New students register for English I followed by English II. Former students will follow the old order of courses: English Classics, English Grammar, Composition I, Public Speaking, and Composition II.

No.	Title	Hour	Day	Bldg.	Instructor
A3w	English Grammar ..... (3 cr.; jr., sr.; prereq., English Classics)				
	Sec. 1	II	MWF	312En	Mrs. Swenson
	2	III	MWF	308En	Mrs. Hause
	3	III	TThS	306En	Miss Langtry
A4f	Composition I ..... (3 cr.; jr., sr.; prereq., A3)				
	Sec. 1	III	MWF	312En	Mrs. Swenson
	2	III	TThS	312En	Mrs. Swenson
A4w	Composition I ..... (3 cr.; jr., sr.; prereq., A3)				
	Sec. 1	I	TThS	308En	Mrs. Hause
	2	III	MWF	306En	Miss Langtry
	3	IV	MWF	312En	Mrs. Swenson
	4	IV	TThS	307En	
A5f	Public Speaking ..... (3 cr.; sr.; prereq., A4)				
	Sec. 1	I	TThS	306En	Miss Langtry
	2	II	MWF	306En	Miss Langtry
	3	III	TThS	306En	Miss Langtry
	4	IV	TThS	307En	Miss Kester
A5w	Public Speaking ..... (3 cr.; sr.; prereq., A4)				
	Sec. 1	I	MWF	307En	Miss Langtry
	2	II	TThS	306En	Miss Kester
A6f	Composition II ..... (3 cr.; sr.; prereq., A4)	II	TThS	306En	Miss Kester
A6w	Composition II ..... (3 cr.; sr.; prereq., A4)				
	Sec. 1	I	TThS	306En	Miss Langtry
	2	II	MWF	306En	Miss Langtry
	3	III	TThS	312En	Mrs. Swenson
	4	IV	MWF	306En	Miss Langtry
A14f,w	Advanced Public Speaking.... (3 cr.; sr.; prereq., A5)	III	TThS	307En	Miss Kester
A21f-22w	English Literature ..... (10 cr.; sr.; prereq., A4)	VIII	MTWThF	307En	Miss Kester
A31f,w	Dramatics ..... (½ cr. under special conditions. See Faculty Regulations)	Ar	Ar	307En	Miss Kester
A32f,w	Debating ..... (½ cr. under special conditions. See Faculty Regulations)	Ar	Ar	306En	Miss Langtry

SCHOOL (GENERAL)

No.	Title	Hour	Day	Bldg.	Instructor
A1f,w	Farm Arithmetic ..... (3 cr.; all agr.; no prereq.)				
	Sec. 1	I	TThS	106En	Mr. Johnsrud
	2	II	TThS	106En	Mr. Johnsrud
	3	IV	TThS	106En	Mr. Johnsrud
	4	III	MWF	106En	Mr. Johnsrud
A1f,w	Farm Arithmetic ..... (3 cr.; all H.E.; no prereq.)				
	Sec. 5	III	TThS	106En	

No.	Title	Hour	Day	Bldg.	Instructor
A2f,w	Advanced Farm Arithmetic... (3 cr.; all; prereq., 1 or high school cr. in arith.)	I	MWF	Ar	Mr. Johnsrud
A4f,w	Algebra I ..... (7 cr.; all; no prereq.)	III	MTWThFS	217En	Mr. Johnsrud
A5f,w	Algebra II ..... (7 cr.; all; no prereq.)	IV	MTWThFS	217En	
A6f,w	Geometry I ..... (7 cr.; all; no prereq.)	I	MTWThFS	217En	Miss Hognason
A7f,w	Geometry II ..... (7 cr.; all; no prereq.)	II	MTWThFS	215En	Miss Hognason
A8f,w	Hygiene ..... (1 cr.; all agr.; no prereq.)				
	Sec. 1	II	S	9Ve	Mr. Diehl
	2	III	S	9Ve	Mr. Diehl
A21f,w	Elements of Music I..... (2 cr.; all; no prereq.)				
	Sec. 1	III	TTh	Ho	Miss Willson
	2	VII	TTh	Ho	Miss Willson
A22f,w	Elements of Music II..... (2 cr.; all; prereq., A21)	I	TTh	Ho	Miss Willson
A23f,w	Chorus ..... (½-3* cr.; all; for prereq. see course description)				
	Mixed Chorus	4:30	T	Ho	Mrs. Tapley
	Girls' Chorus	4:30	Th	Ho	Mrs. Tapley
	Men's Glee Club	6:15	F	Ho	Mrs. Tapley
A24f,w	Violin ..... (½-3* cr.; all; for prereq. see course description)	Ar	Ar	Ho	Miss Rose Schaettgen
A25f,w	Piano ..... (½-3* cr.; all; for prereq. see course description)	Ar	Ar	Ho	Miss Willson
A26f,w	Instrumental Music ..... (½-3* cr.; all; for prereq. see course description)	Ar	Ar	Ho	Mr. Wehrend
A27f,w	Orchestra ..... (½-3* cr.; all; for prereq. see course description)	6:30	T	Ho	Mr. Wehrend
A28f,w	Vocal Music ..... (½-3* cr.; all; for prereq. see course description)	Ar	Ar	Ho	Mrs. Tapley
A29f,w	Band ..... (½-3* cr.; no prereq.)	Ar	Ar	Ho	Mr. Wehrend
A41f,w	Parliamentary Law ..... (1 cr.; jr., sr.; no prereq.)	IV	Th	307Ad	Mr. Mayne
A42f,w	Civics ..... (3 cr.; sr.; no prereq.)	III	TThS	105En	Mr. Lundquist
A43f,w	Elementary Economics ..... (3 cr.; sr.; no prereq.)	II	MWF	105En	Mr. Witte
A44f,w	Rural Economics ..... (3 cr.; sr.; no prereq.)	IV	TThS	1PP	Mr. Witte
A45f,w	Industrial History ..... (3 cr.; jr., sr.; no prereq.)	III	MWF	105En	Mr. Witte
A46f,w	Rural Sociology ..... (3 cr.; sr.; no prereq.)	II	TThS	105En	Mr. Lundquist

* This course may be continued for six quarters giving a maximum of 3 credits.

No.	Title	Hour	Day	Bldg.	Instructor
A47f,w	American History ..... (3 cr.; jr., sr.; no prereq.)	IV	TThS	105En	Mr. Lundquist
A61f,w	Spelling ..... (1 cr.; all; no prereq.)				
	Sec. 1	II	S	Ar	Mr. Johnson
	2	IV	S	Ar	Mr. Johnson
	3	VII	F	Ar	Mr. Johnson
A62f,w	Penmanship ..... (1 cr.; all; no prereq.)				
	Sec. 1	II	TTh	Ar	Mr. Johnson
	2	IV	TTh	Ar	Mr. Johnson
	3	VI	TTh	Ar	Mr. Johnson
A63f,w	Typewriting I ..... (3 cr.; all H.E.; no prereq.)				
	Sec. 1	III, IV	MWF	Ar	Mr. Johnson, Miss Olson
	2	III, IV	TThS	Ar	Miss Olson
	3	VI, VII	MWF	Ar	Miss Olson
A64f,w	Typewriting II ..... (3 cr.; jr., sr. H.E.; prereq., A63)				
	Sec. 1	I, II	MWF	Ar	Miss Olson
	2	I, II	TThS	Ar	Miss Olson
	3	VI, VII, VIII	TTh	Ar	Miss Olson
A65f,w	Stenography ..... (3 cr.; all H.E.; no prereq.)	IV	MWF	Ar	Mr. Johnson
A66f,w	Dictation I ..... (3 cr.; jr. sr. H.E.; prereq., A65)	II	MWF	Ar	Mr. Johnson
A69f,w	Letter-Writing ..... (3 cr.; jr., sr. H.E.; no prereq.)	VI	MWF	Ar	Miss Olson
A70f,w	General Office Practice..... (3 cr.; jr., sr. H.E.; no prereq.)	III, IV	TThS	Ar	Mr. Johnson
A72f	Commercial Law ..... (3 cr.; sr. H.E.; no prereq.)	Not offered in 1922-23			
A81f	Social Training ..... (3 cr.; all H.E.; no prereq.)				
	Sec. 1	II	TThS	203HE	Miss Lommen
	2	III	MWF	203HE	Miss Lommen
A82f,w	Social Problems for Boys..... (1 cr.; all agr.; no prereq.)				
	Sec. 1	I	Th	4PP	Miss Hognason
	2	II	T	4PP	Miss Hognason
	3	III	S	4PP	Miss Hognason

SOILS

No.	Title	Hour	Day	Bldg.	Instructor
A1f,w	Soils ..... (3 cr.; all agr.; no prereq.)				
	Sec. 1	I	TTh	251Ch	Mr. Nesom
		I, II	S	251Ch	Mr. Nesom
	2	IV	TTh	251Ch	Mr. Nesom
		III, IV	S	251Ch	Mr. Nesom

VETERINARY MEDICINE

No.	Title	Hour	Day	Bldg.	Instructor
A1f	Physiology ..... (3 cr.; all; no prereq.)	IV	MWF	2Ve	Mr. Reynolds
A1w	Physiology ..... (3 cr.; all; no prereq.)	II	TThS	2Ve	Mr. Reynolds
A4w	Elements of Bacteriology..... (3 cr.; jr., sr.; no prereq.)	II	MWF	2Ve	Mr. Billings
A5f	Physiology and Hygiene of Breeding ..... (2 cr.; jr., sr. agr.; no prereq.)	II	WF	2Ve	Mr. Boyd
A7w	Veterinary Studies ..... (5 cr.; jr., sr. agr.; no prereq.)	I	MTWThF	9Ve	Mr. Reynolds

INDEX

NOTICE TO PROSPECTIVE STUDENTS

Please read the bulletin carefully, noting the paragraphs headed Information, How To Get to the School, Admission, Home Life on the Campus, and Expenses. If you plan to enter the school, send to the registrar, University Farm, St. Paul, for an admission blank. Please do NOT send DIPLOMAS. In case you have had any work in HIGH SCHOOL grade, be sure to have it recorded on the blank or send certificates covering the work done.

If you desire a room in the dormitory, send with your admission blank to the registrar a money-order or draft for $2 made payable to University of Minnesota, Department of Agriculture. In case your application is received after all space in the dormitories is spoken for, your money will be returned to you. In case you decide after making application that you can not enter the school, you should notify the registrar as soon as possible. If this is done prior to ten days before the opening of school, the money which you sent to reserve a room will be returned to you, otherwise it will not. ROOMS WILL NOT BE HELD AFTER THE OPENING DAY OF THE TERM FOR THOSE WHO ARE NOT PRESENT TO CLAIM THEM.

New students should not depend upon obtaining work at the institution to pay expenses. The regular work of the course takes so much time that a student should not do any outside work unless compelled to by necessity. Practically all of the work at the institution for which pay is given is spoken for a year ahead, so none is left for new students. Any able-bodied student ought to be able to earn enough during the six months of vacation to pay his way through the school year.

Students who for any reason can not enter the school on the opening day or very soon thereafter should wait until the opening of the next term before coming.