The Bulletin *of the* University *of* Minnesota

General Information for the Year 1931-1932

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

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The Bulletin comprises—

The reports of the president and of the Board of Regents, 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,
University of Minnesota,
Minneapolis, Minn.

The University Press.—The University of Minnesota Press is a department of the University devoted primarily to the publication of books, both of general and of special scholarly and scientific interest. It also issues at irregular intervals the following series of research publications: Social Science Monographs, Publications of the Bureau for Research in Government, Monographs, Studies, and Reports in Education, Child Welfare Monographs, Language and Literature Series, Biological Sciences Series (including Minnesota Studies in Plant Science), Bulletins of the Minnesota Geological Survey, Studies in Engineering, Bibliography Series, Syllabus Series.

A complete catalog of the University of Minnesota Press will be furnished by the Press upon request.

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INTRODUCTORY STATEMENT

PURPOSE

The general information bulletin contains such material as will be helpful to the high school graduate or prospective student and his parents. In it is found the necessary information about the entrance requirements, living conditions, fees, university organization, etc.

It is sent out on request, for such help as it may give young men and women who are thinking of coming to the University. It is not designed to urge a college education on any or all who may receive it. It will serve its purpose if it helps in the thoughtful consideration that should be given by parents and high school graduates when they choose a college education from among the many opportunities for further training. It presents a certain type of training which should be considered in relation to other opportunities such as vocational and trade schools of the better kind, normal schools and teachers colleges, junior and private colleges, and extension courses and correspondence schools. The controlling factor in any decision should be the best interests of the individual and his capacity to make successful use of the opportunities offered by the University or by any of the agencies suggested above. The choice is often not an easy one. Perhaps the following suggestions may be helpful.

As the boy or girl approaches the period of responsible manhood or womanhood the kind of training in final preparation for life may often be clearly indicated by the character of the individual's high school work.

The first choice which the student has to make is that between a long period of studies and some immediate employment such as a mechanical trade, buying and selling, clerical work, and many others, perhaps preceded by a shorter period of special study or training.

The wise student will make his decision after an inventory of his own real interests and abilities and will in any case avoid a choice that does not open up to him opportunities to use to the fullest his abilities as they are or as they develop.

Generally speaking, those who like their high school studies and are successful in them are more likely to succeed in college studies. Of those who stand in the lowest one fourth of their high school classes very few are successful in college work. Most of these would do well to consider other types of training for a vocation in which they may be successful. Of those who stand in the highest one fourth of their high school classes about 80 per cent make satisfactory records in college. It is very unfortunate for those young people who have shown their aptitude for studies to be drawn into employment immediately after high school when most of them are capable of preparing for and assuming positions of high responsibility and honor in industrial and social life of state and nation. Given good health and the power of application, those who like their high school studies and stand high in them ought to make every effort to secure college training.

College work is very different from high school work. It deals with a higher order of studies and demands constant advancement to more difficult studies which require intellectual growth and expansion. The college conducts its work with a view to developing initiative, independent judgment, and responsibility in its students for the two reasons that the studies require these qualities and that the students are just becoming men and women and must assume the duties and obligations of men and women.

FRESHMAN WEEK

The University recognizes the need of giving its newly entering students an introduction to their work and to university life which is new and strange to many of them. For this purpose it is requiring freshmen to come to the University for part of the week before classes begin. This Freshman Week is devoted to efforts to help the freshman get a right start.

The period of September 23 to 26, inclusive, will be used by the freshman for the following duties:

a. Making his living arrangements.
b. Registration and paying his fees.
c. Physical examinations. (Physical examinations for women are conducted by women physicians.)
d. Psychological tests.
e. Other tests or examinations which will enable the faculty to place him in the class for which he is best fitted.
f. Hearing lectures on such subjects as:
   1. The use of the library
   2. How to study.
g. Making visits to acquaint himself with the University Library, scientific laboratories, and other points of interest in connection with his choice of studies and future occupations.
h. Special exercises intended to acquaint him with the peculiar conditions or requirements of the college which he enters.
i. Musical and social entertainments in the evenings arranged with the co-operation of the Student Council and the various religious bodies.

During the process of registration faculty advisers talk with all students, helping them to make the best selection of studies.

A committee on educational guidance maintains an office for conference with freshmen regarding their general vocational and educational problems.

Administrative officers, faculty, student government councils, upper class students, and organizations for religious work all co-operate to make Freshman Week a period during which the freshmen find themselves and learn how to go about their university work and how to profit by the opportunities for recreation and other activities in addition to their studies.

NOTICE THAT ATTENDANCE FROM SEPTEMBER 23 TO 26, INCLUSIVE, IS A REQUIREMENT.

It is recommended that as many as possible present themselves for registration on Monday, September 21, in order to avoid the inconvenience and delay incident to the congestion on the last day. All who have not completed the psychological and English tests must report on Monday September 21.

NOTICE TO PROSPECTIVE STUDENTS

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1. Credentials should be submitted as soon as possible after the close of the spring term, and in no case later than July 1.

2. Students who do not observe this regulation must expect to undergo the inconvenience of delay in being notified of their status.

3. This may lead to embarrassing results in the event that the candidate in question is not qualified for admission, as the time for removing deficiencies is thereby curtailed.

4. Whenever possible, credentials should be sent in directly by the proper official at the school last attended, and should not be presented in person by the student.

UNIVERSITY CALENDAR

1931-32

Fall Quarter

1931			
September	14	Monday	Extension registration first semester begins
September	17	Thursday	Payment of fees closes, except for new students
September	21	Monday	Entrance tests
September	21-22		Registration for Freshman Week of all new students entering the freshman class
September	21-25		Examinations for removal of conditions Physical examinations
September	22-25		Registration period,[1] College of Science, Literature, and the Arts
September	23-26		Freshman Week
September	24-25		Registration days[1] for all colleges not included above except the College of Engineering and Architecture, and the School of Chemistry
September	25	Friday	Registration day[1] for the College of Engineering and Architecture, and the School of Chemistry Payment of fees for new students closes
September	26	Saturday	Last day for extension registration without penalty
September	28	Monday	Fall quarter classes begin, 8:30 a.m.[2] First semester extension classes begin[3]
October	15	Thursday	Senate meeting, 4:30 p.m.
October	31	Saturday	Homecoming Day
November	4	Wednesday	Mid-quarter grades due
November	11	Wednesday	Armistice Day Convocation
November	26	Thursday	Thanksgiving Day; a holiday
December	3	Thursday	State Day Convocation
December	14-19		Final examination period
December	17	Thursday	Commencement Convocation Senate meeting, 4:30 p.m.
December	19	Saturday	Fall quarter ends, 6:00 p.m.
December	26	Saturday	Payment of fees closes for all students in residence fall quarter[4]

See footnotes on page 10.

Winter Quarter

1932			
January	2	Saturday	Entrance tests
			Registration day for new students in all colleges
			Payment of fees for new students closes
			Registration and payment of fees close at 3:00 p.m.
January	4	Monday	Winter quarter classes begin, 8:30 a.m.[2]
January	18	Monday	Extension registration second semester begins
January	30	Saturday	First semester extension classes close
			Last day for extension registration without penalty
February	1	Monday	Second semester extension classes begin
February	9	Tuesday	Mid-quarter grades due
February	12	Friday	Lincoln's Birthday; a holiday (except for extension)
February	18	Thursday	Charter Day Convocation
			Senate meeting, 4:30 p.m.
February	22	Monday	Washington's Birthday; a holiday (except for extension)
March	14-19		Final examination period
March	17	Thursday	Commencement Convocation
			Payment of fees closes for all students[4] in residence winter quarter
March	19	Saturday	Winter quarter ends, 6:00 p.m.

No spring recess for members of the junior and senior classes in Medicine.

Spring Quarter

March	26	Saturday	Entrance tests
			Registration day for new students in all colleges
			Payment of fees for new students closes
			Registration and payment of fees close at 3:00 p.m.
March	28	Monday	Spring quarter classes begin, 8:30 a.m.[2]
May	4	Wednesday	Mid-quarter grades due
May	12	Thursday	Cap and Gown Day Convocation

[1] Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, page 49. No student will be allowed to register in the University after one week from the beginning of the quarter excepting in unusual cases wherein special circumstances shall justify the appropriate committee of the college concerned permitting registration at a later date.

[2] First hour classes begin at 8:15 a.m. at University Farm.

[3] This date does not refer to correspondence study courses, which may be started at any time during the year.

[4] New students must pay fees on dates announced for registration.

May	19	Thursday	Senate meeting, 4:30 p.m.
May	27	Friday	Second semester extension classes close
May	30	Monday	Memorial Day; a holiday
June	4 & 7-11		Final examination period
June	5	Sunday	Baccalaureate service
June	6	Monday	Sixtieth annual commencement
June	11	Saturday	Spring quarter closes, 6:00 p.m.

Summer Quarter

June	13-14		Registration, first term
June	15	Wednesday	Summer quarter classes begin, 8:00 a.m.
July	4	Monday	Independence Day; a holiday
July	21	Thursday	Commencement Convocation
July	23	Saturday	Registration and payment of fees for second term closes at 12 m.
			First term closes
July	25	Monday	Second term classes begin, 8:00 a.m.
August	27	Saturday	Second term closes

Entrance Examinations

Entrance examinations for admission to the various colleges of the University will be conducted for students whose credentials do not meet the requirements.

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

For further information concerning these examinations see under "Admission by Examination," page 30.

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, including—
- THE ENGINEERING EXPERIMENT STATION

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

THE LAW SCHOOL

THE MEDICAL SCHOOL, including—
- THE SCHOOL OF NURSING

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

THE SCHOOL OF MINES AND METALLURGY, including—
- MINNESOTA SCHOOL OF MINES AND METALLURGY 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 ADMINISTRATION

THE UNIVERSITY EXTENSION SERVICE, including—
- GENERAL EXTENSION DIVISION
- AGRICULTURAL EXTENSION DIVISION

THE BOARD OF REGENTS

The Hon. Fred B. Snyder, Minneapolis, President of the Board -	1935
The Hon. W. J. Mayo, Rochester - - - - - - - -	1935
The Hon. Bess M. Wilson, Minneapolis - - - - - - -	1933
The Hon. George H. Partridge, Minneapolis - - - - - -	1931
The Hon. John G. Williams, Duluth - - - - - - -	1935
The Hon. Egil Boeckmann, St. Paul - - - - - - -	1933
The Hon. Julius A. Coller, Shakopee - - - - - - -	1931
The Hon. J. E. G. Sundberg, Kennedy - - - - - - -	1931
The Hon. Samuel E. Lewison, Canby - - - - - - -	1933
The Hon. W. H. Gemmel, Brainerd - - - - - - -	1933
The Hon. A. J. Olson, Renville - - - - - - - -	1931

ADMINISTRATIVE OFFICERS

Lotus Delta Coffman, Ph.D., LL.D., President
James C. Lawrence, B.A., University Dean
Rodney M. West, B.A., Registrar
William T. Middlebrook, B.A., M.C.S., Comptroller
Frank K. Walter, M.A., M.L.S., Librarian
Harold S. Diehl, M.A., M.D., Director of the Health Service
John B. Johnston, Ph.D., Dean of the College of Science, Literature, and the Arts
Ora Miner Leland, B.S., C.E., Dean of the College of Engineering and Architecture and the School of Chemistry
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
William F. Lasby, B.S., D.D.S., F.A.C.D., Dean of the College of Dentistry
William R. Appleby, M.A., Dean of the School of Mines and Metallurgy
Frederick J. Wulling, Phm.D., LL.M., Dean of the College of Pharmacy
Melvin E. Haggerty, Ph.D., Dean of the College of Education
Guy Stanton Ford, Ph.D., Dean of the Graduate School
Russell A. Stevenson, Ph.D., Dean of the School of Business Administration
Richard R. Price, M.A., Ed.D., Director of University Extension
Anne D. Blitz, M.A., 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

COURSES AND DEGREES

Brief sumarized statements of the courses of study offered by the University of Minnesota, together with the degree to which each leads are listed below.

The University does not issue a complete catalog of courses in one volume but a full outline of each of these courses of study together with descriptions of the subject-matter courses which they include will be found in the announcement of the college or school in which the course of study is offered.

These anouncements may be obtained by addressing The Registrar, University of Minnesota, Minneapolis, Minnesota.

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

General 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 Diplomatic and Consular Service.—A five-year course leading to the degree of bachelor of arts 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 Hospital Library Service.—A five-year course including three years in this college, one year in an approved library school, and one year in special training in hospital library service.

Course in Training for Medical Technicians.—A four-year course including the two-year pre-medical course in this college and two years of work in the Medical School.

Course in Preventive Medicine and Public Health.—Students in this college may major in this field.

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.

A four-year course leading to the degree of bachelor of 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 Architecture.—A six-year course in Arts and Architecture leading to the degrees of bachelor of science at the end of four years, bachelor of architecture at the end of the fifth year, and the Master's degree in architecture at the end of six years.

Combined course in Arts and Interior Architecture.—A four-year course leading to the degree of bachelor of interior architecture. The third and fourth years are spent in the College of Engineering and Architecture.

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

NOTE.—Students who have met the entrance requirements but whose high school record combined with the psychological tests and other information show that they will be unable to carry a regular course, will be permitted to take certain studies of general informational, cultural, or vocational character. Any student who shows sufficient ability in these studies may continue in them or may register as a candidate for a degree. A student in a regular course who does not profit by his opportunities may be transferred to this group until he demonstrates his ability and willingness to do work of an acceptable grade.

COLLEGE OF ENGINEERING AND ARCHITECTURE AND SCHOOL OF CHEMISTRY

The College of Engineering and Architecture offers professional four-year courses of study in the following fields:

Aeronautical Engineering	Architecture
Civil Engineering	Architectural Engineering
Electrical Engineering	Landscape Architecture
Mechanical Engineering	Interior Architecture

Agricultural Engineering (in co-operation with the College of Agriculture, Forestry, and Home Economics)

The School of Chemistry offers professional four-year courses of study in

Chemistry	Chemical Engineering

Each of these courses leads to the Bachelor's degree in the corresponding field (as bachelor of aeronautical engineering or bachelor of chemistry). Optional groups of electives are available in some of the courses for students who desire to devote special attention to certain branches, such as Engineering Administration.

The four-year course in Chemistry is designed for those who wish to become professional chemists or teachers of chemistry.

The course in Chemical Engineering leads to the degree of bachelor of chemical engineering at the end of four years and to the Master's degree 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 and allied sciences and professional preparation in chemical engineering.

The Engineering Pre-business Course requires the first two years of work in the College of Engineering and Architecture. This is followed by two years in the School of Business Administration upon the completion of which the degree of bachelor of business administration is conferred.

The first two years of the course in *Interior Architecture* are taken in the College of Science, Literature, and the Arts, and the last two years in the College of Engineering and Architecture.

Work is also offered in the Graduate School leading to the Master's degree in the appropriate branch of engineering, architecture, or chemistry, or to the Doctor's degree.

The professional degree of aeronautical, agricultural, architectural, chemical, civil, electrical, or mechanical engineer will be conferred upon those who have received the Bachelor's degree in the corresponding field of engineering when they have completed the equivalent of one additional year's college work in that field, and four years of approved engineering experience in positions of responsibility, and have presented a satisfactory professional thesis. Graduates of this university may be granted permission to pursue the year of graduate study *in absentia* under the direction of the faculty. It is recommended, however, that this year be spent in residence at this or some other university and that the Master's degree be obtained in this manner. There are many advantages in taking this year of study immediately following graduation from the four-year course, thus making a five-year course leading to the Master's degree. Then after four years of approved experience and the preparation of the thesis, the professional degree may be obtained. This procedure is especially recommended to those students whose undergraduate work is of high grade and who desire additional preparation for the higher positions which require strong character and leadership. Candidates for the professional degrees register in the Graduate School.

The Engineering Experiment Station is a research organization, which provides facilities for studies, experiments, and investigations in the various fields of engineering and architecture, under the direction of members of the staff. Several research fellowships are available for part-time graduate students. Results of investigations are published in the bulletin of the

Engineering Experiment Station. Research funds are provided by industries in some cases to support special studies.

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

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 work in Agriculture includes general courses in agriculture, agricultural education, agricultural economics, agricultural engineering, agronomy, farm management, dairy husbandry, dairy products, animal husbandry, and horticulture; also a course in extension work, and special courses in such sciences as agricultural biochemistry, agricultural economics, entomology, plant pathology, dairy husbandry, and soils. A course in agricultural business is also offered in co-operation with the School of Business Administration. An engineering course leading to the degree of bachelor of agricultural engineering is offered in co-operation with the College of Engineering and Architecture. While no special course in fur farming is yet offered, courses basic to this industry and helpful to it are available.

In Forestry are included courses in general forestry, commercial lumbering, forest by-products, grazing, and forest sciences. A part of the work is given at the Cloquet Forest Experiment Station and at Itasca State Park, where well-equipped demonstration forests are available for use as laboratories.

The work in Home Economics includes a general course, courses in foods and nutrition, textiles and clothing, and a teacher's course in the general field of home economics; special teachers' courses in textiles and clothing, in foods and home management, and in related arts; a course for dietitians, a course for extension workers, and a course for institutional managers.

Graduate work is offered in special lines of agriculture, forestry, and home economics. For the most part the special problems are correlated with the investigational work of the agricultural experiment station and its branches.

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

Short courses offer opportunity for the study of a great variety of subjects related to agriculture, to industries based on agriculture, to home economics, and to rural life.

Farmers' and Homemakers' Week, in January, offers instruction in regular classes in agriculture and home economics and gives opportunity for conferences of many important agricultural organizations of the state, which hold their annual meetings at University Farm in the course of the week.

Other short courses of the year are an Advanced Creamery Operators' Course of two weeks in October; an Ice Cream Makers' Course of ten days in December; a Creamery Operators' Course of six weeks in January and February; a Horticultural Short Course of three days in March; a Beekeepers' Course of four days in December; an Editors' Short Course of three days in May; a Short Course in Veterinary Medicine in July; a Short Course in Home Nursing in the spring; a Poultry Short Course in September; a Forestry, Woodcraft, Scouting, and Camping Leadership Course in August; and a Boys' and Girls' Short Course in June.

The Experiment Station provides facilities for investigation of the numerous and varied problems involved in the agricultural industry. The results of these investigations contribute largely to the subject-matter included in the courses of instruction given in the College of Agriculture, Forestry, and Home Economics, in the Schools of Agriculture, and to that used by the extension specialists in their work among farmers. The experiment station organization also offers some research advantages to students taking advanced work in the Graduate School. The main or Central Station is located at the University Farm, St. Paul, with branch stations at Crookston, Morris, Grand Rapids, Waseca, and Duluth, and forestry experiment stations at Cloquet and Itasca.

The Agricultural Extension Service of the University Department of Agriculture carries to the farmers and homemakers of the state the information made available by the research divisions of the University and the United States Department of Agriculture, and the experience of successful farm practice. This is done through county extension workers, organized local rural leadership, demonstrations, lectures, institutes, contests, bulletins, farm papers, correspondence, and personal visits.

LAW SCHOOL

The Law School offers courses leading to the degrees of bachelor of science in law and bachelor of laws.

The degree of bachelor of science in law is conferred on students who have completed two years of work, including rhetoric, English, psychology, American government, logic, English constitutional history, and principles of economics, in the College of Science, Literature, and the Arts of this University, or equivalent work in some other accredited college, and two years of work in the Law School. Graduates of the School of Business Administration and of the College of Engineering are eligible as candidates for this degree. The law work may be chosen in accordance with the objective of the student, and may be restricted generally to commercial law. One purpose of this course is to provide a training in law for business purposes. This degree will not qualify for admission to the bar, but graduates of good standing in this course may obtain the bachelor of laws degree by two years additional study.

The degree of bachelor of laws will be conferred on students who have completed (a) two years of college work and four years of work in the Law School, or (b) three years of college work and three years

of work in the Law School. Course (a) is recommended for students looking forward to the profession of law. Students taking course (b) may qualify for the degree of bachelor of arts on completing the first year in law provided they have satisfied the requirements of the College of Science, Literature, and the Arts for that degree, the first year in law being accepted as a substitute for the fourth year in that college.

A course leading to the degree of master of laws may be taken under the direction of the Graduate School. Candidates must have completed two years of college work, and must have secured the degree of bachelor of laws from a school which is a member of the Association of American Law Schools.

MEDICAL SCHOOL

The Medical School offers a five-year course, leading to the degree of doctor of medicine. This course comprises two years in the scientific or pre-clinical department of the school, two years chiefly in its practical or clinical departments, and one year in a hospital interneship or in advanced laboratory study or research. All students are required to secure the degree of bachelor of science or of bachelor of arts before beginning the senior medical year. 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 pages 35-37), (b) four years in the Medical School, and (c) one year of interneship or advanced scientific study.

2. A combined course, leading to the degree 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 above, and (b) four years in the Medical School, and (c) one year of interneship or advanced scientific study.

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

The degree of bachelor of arts or bachelor of science from other recognized universities or colleges will be accepted as fulfilling the requirement of the bachelor of science degree before the degree of doctor of medicine is granted.

Graduate courses and research facilities are offered to qualified students. (See page 22.)

The School of Nursing is conducted as part of the Medical School. It makes use of the facilities of the University Hospital, the Minneapolis General Hospital, the Miller Hospital, St. Paul, and the Northern Pacific Hospital, St. Paul. It offers a three-year course leading to a diploma in nursing. A combined five-year course in Arts and Nursing is offered by the College of Education and the School of Nursing, leading to the degree of bachelor of science and a diploma in nursing. The first five quarters

are spent in the Arts College, the third and fourth years in hospital work, and the fifth year in both hospital and class work.

Graduates of approved three-year schools of nursing who fulfill university admission requirements may become candidates for the degree of bachelor of science in nursing education. Graduate nurses interested in nursing education should consult the director of the School of Nursing.

A Course in Public Health Nursing is conducted in the Medical School under the Department of Preventive Medicine and Public Health with the assistance of the Departments of Education and Psychology, and a number of social service organizations. These, together with the Hennepin County Model Practice Field, provide opportunities for field work. (See special circular.) The Public Health Nursing Course is open to graduate nurses.

A Course for Medical Technicians is offered by the Medical School with the co-operation of the College of Science, Literature, and the Arts. (See special circular.)

The Course in Embalming, offered by the General Extension Division with the co-operation of the Medical School, the School of Chemistry, and the State Board of Health, is a twenty-four weeks' term of study, given annually in the winter and spring quarters. On the successful completion of the work, the university certificate in embalming will be issued. Those students who desire to procure a Minnesota embalmer's license must take the State Board examination which is held annually. The university certificate in embalming is issued to successful candidates without reference to the legal requirements for the issuance of an embalmer's license by the state of Minnesota.

Short courses for physicians are offered throughout the year by the medical faculty under the administration of the General Extension Division.

COLLEGE OF DENTISTRY

The College of Dentistry offers a three-year course leading to the degree of doctor of dental surgery. The minimum requirement for admission is the completion of two years of pre-dental work in the College of Science, Literature, and the Arts at Minnesota or at some other university or college of equal rank.

The School for Dental Hygienists.—The College of Dentistry offers a two-year course leading to the degree of graduate dental hygienist. The minimum requirement for admission is the completion of a four-year high school course or its equivalent.

Graduate work is open in certain fields of dentistry to students having a baccalaureate or dental degree. (See page 22.)

Extension courses.—Courses in Crown and Bridge Work, Oral Surgery, Orthodontia, and Prosthetic Dentistry 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.

SCHOOL OF MINES AND METALLURGY

The School of Mines and Metallurgy offers four regular four-year courses, namely, Mining Engineering, Mining Engineering (specializing in geology), Petroleum Engineering, and Metallurgy, leading to the degrees of engineer of mines, engineer of mines (in geology), engineer of mines (in petroleum), 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.

COLLEGE OF PHARMACY

The regular course of the College of Pharmacy leads to the degree of bachelor of science in pharmacy and extends over four university years and includes one year of prescribed academic work of a minimum of 45 quarter credits. The 1929 Legislature passed an act reading partly as follows: "To be entitled to examination by the Board (of Pharmacy) the applicant shall be at least 21 years old and shall be a graduate of a college approved by, or a member of, the American Association of Colleges of Pharmacy." This act went into effect upon passage. The same legislative session passed a bill providing that: "After January 1, 1930, there shall be no examinations for registration or registration of any person as an 'assistant pharmacist'."

All of the colleges of pharmacy comprising the membership of the American Association of Colleges of Pharmacy will have gone upon a minimum four-year basis on January 1, 1932. The College of Pharmacy of the University of Minnesota is already on the four-year basis (Board of Regents' action April 1, 1926). The legislature has therefore established the graduating course in the College of Pharmacy as the minimum educational requirement preliminary to the state examination for license to practice pharmacy in Minnesota.

SCHOOL OF CHEMISTRY

(See p. 15 with College of Engineering and Architecture)

COLLEGE OF EDUCATION

The College of Education is organized to offer professional courses in the field of education, to promote research in the problems of education, and to provide educational guidance for prospective teachers and other educational workers in the schools. The completion of satisfactory curricula in this college entitles graduates to receive certificates for school work from the Minnesota State Department of Education. Such certificates are issued only to those graduating from this college.

Among the important curricula, offered by the college are those relating to teaching in the following fields: academic subjects in elementary and high schools, agriculture, art, business subjects, home economics, industrial arts, natural science, physical education, and public school music.

Work is also offered in the fields of educational administration and supervision, clinical psychology, educational psychology, library service, school health work, sociology, teaching of subnormal children, work of the visiting teacher, educational and vocational guidance, nursery school and kindergarten education, nursing education, and public health education.

GRADUATE SCHOOL

The Graduate School gathers into a single organization and unites for the purpose of administration all the activities of the University in all its schools and colleges in so far as they relate to advanced instruction offered for the second or higher degrees, 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 degrees of bachelor of science (or equivalent) and doctor of medicine and one year of intern service in an acceptable hospital are prerequisite for admission to the clinical departments. Properly qualified college students may be admitted to the medical laboratory departments (Anatomy, Physiology, Bacteriology, Biophysics, Pharmacology, and Pathology) without the medical degree and interneship. A number of fellowships and scholarships are provided for selected students undertaking graduate courses in chosen specialties in medicine (see page 57). 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.

SCHOOL OF BUSINESS ADMINISTRATION

The School of Business Administration offers a two-year course leading to the degree of bachelor of business administration. This course requires as a prerequisite the completion of two years of work in the College of Science, Literature, and the Arts, College of Engineering and Architecture, or the College of Agriculture, Forestry, and Home Economics in which certain pre-business courses are prescribed.

In addition to the general course in business, several specialized sequences are offered. Among them are courses in Accounting, Advertising, Agricultural Business, Finance, Insurance, Merchandising, Foreign Trade, Personnel Management, Industrial Administration, Real Estate, Traffic and Transportation, Secretarial Work, and Statistics. In each of these a sequence of courses has been arranged which enables the student to obtain the professional training essential for entrance into the specialized field.

Instruction is directed toward the broader aspects of the business professions rather than detailed drill in various technical processes. The business courses are combined with a sufficient amount of instruction in other fields to afford a well-rounded university education.

A limited number of positions are available to students in the senior year to supplement the university training. Students selected for these positions are employed by accounting firms, financial institutions, or other business concerns on a full time basis for one term. Employment under these conditions affords an excellent opportunity for laboratory experience. The positions available have been selected by the faculty with special consideration as to the educational value of the work. University credit is allowed for work which has been successfully carried under proper supervision.

Students who have completed the course of study required for the degree of bachelor of business administration at this University or the equivalent degree at any other institution of recognized standing may enroll in the Graduate School and become candidates for the degree of master of science.

ALL-UNIVERSITY CURRICULA

A student who is unable to find in any of the curricula of the colleges a program of study suited to his special intellectual interests or professional aims may, with the advice and approval of the All-University Curriculum Committee, arrange a course of study best adapted to his needs. Any course offered in the University may be drawn upon in making up such a program. The satisfactory completion of an approved curriculum entitles the student to the degree of bachelor of arts or bachelor of science.

UNIVERSITY SUMMER QUARTER

The university summer quarter is organized for two terms, one of six weeks and one of five weeks, from June to September, under the authority of the Board of Regents as a regular part of the University. Courses in the College of Science, Literature, and the Arts, Agriculture, Forestry, and Home Economics, Education, Engineering and Architecture, Chemistry, Medicine, Dentistry, Laws, and Business Administration, with special attention given to graduate work, are offered. These courses are, in the main, regular courses, the same as are offered during the academic year, but wherever necessary, are adapted to meet the needs of students in the summer quarter.

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 at 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 18.

The General Extension Division conducts late afternoon and evening extension classes and correspondence courses, in science, literature, and the arts, business, education, and engineering subjects; it provides communities with faculty lectures and lyceum courses of popular lectures, concerts, and entertainments; lends lantern slides and films for visual instruction; maintains a Municipal Reference Bureau; holds annual short courses in embalming, engineering, dentistry, merchandising, medicine, banking, citizenship, and social service; offers guidance for the development of community organizations; gives advice to schools and other organizations on the selection and production of plays; operates a radio broadcasting station for educational purposes. Bulletins of extension classes and of correspondence and lecture courses may be had upon request. Address the General Extension Division.

DEGREES

The Board of Regents will confer the degree appropriate to the course pursued under the following conditions:

1. *Curriculum requirements.*—Certification by the registrar of the completion of all requirements of the course of study as outlined in the college announcement, or its equivalent as determined by the faculty of the college offering the course.

2. *Recommendation of the faculty.*

3. *Residence requirement.*—The student must earn at least one year's credit in residence in this University. 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. In addition, special residence requirements must be met in several of the schools and colleges. See individual announcements.

4. *Payment or satisfactory arrangement of all financial obligations* due the University.

5. *Attendance at commencement.*—All candidates for degrees are required to be present at commencement exercises provided that the candidate's work is completed at the end of a quarter when such exercises are held.

A student who fails to attend shall not receive his diploma until the expiration of one year, unless in the meantime he attends commencement exercises or unless excused from such attendance by the dean of the college and the president of the University.

THE UNIVERSITY LIBRARY

The University Library comprises all the collections of books belonging to the University. It now contains about 630,000 volumes.

The University Library Building contains not only the general collec-

tion but several important college and departmental collections aggregating about 500,000 volumes.

In addition to the General Library, branches are maintained in the Department of Agriculture, the College of Engineering and Architecture, and the Schools of Chemistry, Law, and Mines and Metallurgy. Small collections of books constantly in use in departmental work are deposited in many important departments of the University.

The service of the University Library to the University is twofold: (1) to supply the books and references used in connection with the courses of instruction, for graduate and faculty research, 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. A course in the use of books and libraries, open to freshmen and sophomores, is conducted for this purpose.

The Arthur Upson room with a collection of about 4,000 volumes was given to the Library for the purpose of promoting personal cultural reading.

The Division of Library Instruction with a full year of professional training in librarianship has a separate organization but is under the direction of the university librarian and closely affiliated in its work with the University. Its course is accepted by the Colleges of Science, Literature, and the Arts and of Education as the senior year requirement for graduation. Certain courses will also be credited by the School of Business Administration.

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 her 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 STUDENTS' HEALTH SERVICE

Through the Students' Health Service the University makes available to any student physical examinations, health consultations, and medical attention. General service is provided free of charge, but for services which are specialized and individual in character, such as dentistry, X-rays, board and laundry in the student hospital, out-patient calls, minor surgery, etc., special fees are charged. No student, however, will be denied service because of inability to pay these fees. Major surgical operations or prolonged medical care ordinarily are secured through private physicians selected by the students or their families, but may be arranged for through the Students' Health Service upon the basis established for the care of such patients.

On the main campus the offices of the Health Service and the Students' Hospital and Dispensary are located in the new Health Service Building.

On the University Farm campus the hospital and dispensary also are located in a special Health Service Building. 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 for the Health Service on the main campus is University of Minnesota (Dinsmore 8720); for the one on the University Farm campus, Nestor 2881.

The facilities of the dispensary, medical and dental, are such that a large number of students can be given attention in a day. The normal capacity of the two hospitals is one hundred beds. In emergencies, this 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 the prodigious academic and economic loss due to indisposition and illness of students. Positive health is its goal.

There are four main lines to the activities of the University Health Service: (1) personal attention, (2) dental hygiene, (3) sanitation, and (4) education.

1. *Personal division.*—This division is concerned with the physical examinations of students. A complete record of the physical condition of each student is made and kept on file. From this 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; co-operation with the Department of Physical Education regarding physical exercise; education along lines of right living; safeguarding of 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 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. *Dental hygiene.*—As a part of his entrance physical examination each student is given a complete dental examination by a member of the dental

staff, and advised regarding the condition of his teeth. During the year, students at any time may receive dental consultation and, if they so desire, they may obtain expert dental treatment and care on a cost basis.

3. *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.

4. *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.

School of Nursing.—Special arrangements with the hospitals are made for students in the School of Nursing. See School of Nursing bulletin.

MILITARY SCIENCE AND TACTICS

REQUIRED WORK

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.

The University requires that every physically fit male student shall take two years of military training.

EXEMPTIONS

1. *Physical unfitness.*—If you believe you should be exempted on this ground report to Dr. Cooke of the Student Health Department for examination and petition. If the petition is approved by him, present it at the office of the dean of student affairs.

2. *Admission with sophomore or junior standing.*—If you have attended another college where drill is not required and have completed one or more full years of work, the registrar's office will give you a release from one or two years. In case of any irregularity in such cases make a petition for release and present at office of dean of student affairs.

3. *Military training elsewhere.*—In case you have had previous military training in college, high school, military school, National Guard, Naval Reserves, or United States Army, present a petition to the office of the dean of student affairs, giving full statement of facts and credentials.

a. Students who have been enrolled in senior R.O.T.C. units are given full credit for work done prior to matriculation at the University of Minnesota.

b. Students who have satisfactorily completed three years or more at essentially military schools at which R.O.T.C. units are maintained, will be credited with six quarters of drill.

c. Students who have been enrolled in military schools, in the National Guard, in the Naval Reserves, or who have completed courses in C.M.T. camp will be given credit for such service, as follows:

Where Service Was Rendered	Amount of Service	Credit
Junior R.O.T.C. units not essentially military	1 year or more	3 quarters
National Guard or Naval Reserves	1 year or more prior to matriculation in the University	3 quarters
C.M.T. Camp	3 camps totalling 12 weeks or more	3 quarters
	2 camps totalling 8 weeks	2 quarters
	1 camp totalling 4 weeks	1 quarter

d. Students who hold commissions in the National Guard, the Organized Reserves, or the Naval Reserves are exempt from military training.

e. All cases not covered by the above will be decided on their merits by the dean of student affairs.

f. In no case will students, except those coming under the provisions of paragraphs a, b, and d above, be given credit for more than three quarters, except as provided for in paragraph g below.

g. Prior military training which under paragraph c would entitle a student to credit for more than three quarters, will be handled as follows: the student will be given a test by the Military Department to determine his proficiency. If found qualified, he will receive credit for the full amount of prior service up to six quarters.

h. The preceding regulations are based on the provisions of the Land-Grant Act, and in case of conflict with R.O.T.C. instructions published by the War Department, the regulations outlined herein will govern.

4. *Substitution of athletics for military training.*—a. Any student who has satisfactorily completed the first three quarters of military work in a senior R.O.T.C. Unit, and who is designated by the director of athletics as a first string man in any recognized sport, will be given credit for the three remaining quarters of required military work, provided substitution of athletics for military work is made during the next year in which the student is registered, following the completion of three quarters of military work.

b. If at any time the director of athletics considers a student taking athletics under these regulations unfit as a first string man, such student will be reported back to the Military Department to complete such portion of the year's work as remains on the date of relief from the Athletic Department.

c. If a student of his own accord fails to substitute athletics for military work during the second year, as contemplated in these regulations, such student will be required to complete the full six quarters of military work necessary under university regulations.

d. Work done in athletics under these regulations will be considered as leading to eligibility for Advanced R.O.T.C. Course.

e. A list of students coming under these regulations will be prepared by the director of athletics prior to the opening of a new quarter. Such list will become effective upon approval by the dean of student affairs. A copy of such approved list will be filed with the Military Department.

Any student who is registered for military drill and who is reported to this office by the Military Department as failing to attend will be dropped from the University for the balance of the quarter.

5. *Postponement of military training.*—If for any good and sufficient reason you need to be allowed to postpone this training for any quarter, make the request on petition blanks, giving reasons, and present at office of the dean of student affairs.

Do not under any consideration fail to register for or attend drill unless you have attended to the matter in the registrar's office or that of the dean of student affairs.

ELECTIVE WORK

Any student 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 expenses 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.

ADMISSION

GENERAL REQUIREMENTS

Admission to the schools and colleges of the University which accept students directly from the high school is either by certificate or examination. These methods are described below.

ADMISSION BY CERTIFICATE

The applicant must present a certificate of graduation from an accredited preparatory school, or certificates showing that he has passed examinations in high school subjects as given by the Minnesota State Board, or corresponding examinations in another state provided these examinations are recognized by the state university in that state. Certificates representing examinations given by the College Entrance Board or the New York Regents are likewise accepted.

Graduates of senior high schools must present twelve units of work, at least nine of which must be from Groups A, B, C, D, E (see page 31). These nine units must include a major of three units, and two minors of two units each, or preferably two majors and one minor, of which either one major or one minor must be from Group A. In Group B or D applicants may present a maximum of one unit of work from grades below the senior high school as fulfilling one of these requirements. This unit, however, may not be counted in the twelve which are required. In addition to these requirements, applicants must fulfil such others as the particular college which they desire to enter may specify. See Requirements of Individual Colleges, pages 32-41.

Graduates of four-year high school courses, and candidates who offer state board or other examination certificates must present evidence to show that they have completed sufficient work in the last three years of their course to satisfy the requirements specified for graduates of senior high schools.

ADMISSION BY EXAMINATION

Applicants for admission to the University who are high school graduates, or who are at least nineteen years of age and are unable to meet the requirements for entrance by certificate will be admitted provisionally and subject to one year of satisfactory work at the University, upon passing the following tests:

(a) College aptitude test
(b) Test of proficiency in English
(c) Such special placement tests as the school or college to which the candidate desires admission, may prescribe.

Applicants failing to pass tests (b) or (c) may apply for a subsequent examination at any scheduled date on payment of a fee of five dollars. Those failing to pass test (a) may enter only upon satisfactorily meeting the entrance requirements by the certificate method.

LIST OF ENTRANCE SUBJECTS

Below is shown the minimum and maximum number of units in any one subject that will be accepted by the various colleges of the University. The term "unit" means not less than five recitations of forty minutes each week for a school year of 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

Composition and literature one to three units[1]

Group B: Foreign languages

French, one, two, three, or four units
German, one, two, three, or four units
Greek, one, two, three, or four units
Latin, one, two, three, or four units
Scandinavian languages, one, two, three, or four units
Spanish, one, two, three, or four units

Requirements for a major in this group, three units in one language; for a minor, two units in one language.

Group C: History and social sciences

History—

American, one-half or one unit
English, one-half or one unit
European, one or two units

Social sciences—

American government, one-half or one unit
Commercial geography, one-half or one unit
Elementary economics, one-half unit
History of commerce, one-half or one unit
Sociology, one-half unit

Requirements for a major in this group include at least two units in history; for a minor, at least one unit in history.

Group D: Mathematics

Elementary algebra, one unit
Plane geometry, one unit
Unified mathematics, two units
Higher algebra, one-half or one unit
Solid geometry, one-half unit
Trigonometry, one-half unit

Group E: Natural sciences

Astronomy, one-half unit
Biology, one unit
Botany, one-half or one unit
Chemistry, one unit
Geology, one-half unit
Physics, one unit
Physiology, one-half unit
Zoology, one-half or one unit

[1]Not to exceed one unit of public speaking or journalism may be presented in partial satisfaction of these requirements.

For a major or minor in this group not more than two half-unit courses may be included.

Group F: Vocational and miscellaneous subjects

The three units which are not required to be in Groups A, B, C, D, E, may be in work which the superintendent certifies as being of acceptable nature and as having been counted toward the applicant's graduation.

APPLICATION FOR ADMISSION

The applicant for admission should request the principal or superintendent to forward to the examiner at 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 received, and the year during which each subject was pursued. 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.

REQUIREMENTS OF INDIVIDUAL COLLEGES

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

I. Admission by Certificate

(a) Major in Group A.

(b) Minor in Group D.

(c) Major or minor in Groups B or C or E.

Note that one unit in a minor may be counted from work below the tenth grade in accordance with the regulation on page 30.

II. Admission by Examination

In accordance with the regulation printed on page 30, the tests required for admission will be (a) college aptitude test, (b) test of proficiency in English.

Adult special students.—See statement on page 41.

COLLEGE OF ENGINEERING AND ARCHITECTURE AND SCHOOL OF CHEMISTRY

Courses in Aeronautical, Agricultural, Architectural, Chemical, Civil, Electrical, and Mechanical Engineering; Architecture, Landscape Architecture, Chemistry, and Engineering Pre-business.

I. Admission by Certificate

(a) Major in Group D or A (preferably D).

(b) Minor in Group A or D (preferably A).

(c) Minor in Group E, B, or C (preferably E, in chemistry and physics).

For admission to the School of Chemistry, that is, for the courses in chemistry and chemical engineering, *one unit of chemistry* must be included.

Students who do not present a major (3 units) in mathematics, including *higher algebra and solid geometry,* will be required to take these subjects in their first quarter at the University without credit. This will usually necessitate their attending summer quarter to complete the work of the freshman year.

Recommendations.—All students entering these colleges are urged to include in their high school courses mathematics, 3 or more units; English, 3 units; chemistry; physics; Latin, 2 units; German or French, 2 units; ancient, modern, and American history; and American government or civics. French is desirable for students in architecture. German is important for students entering the School of Chemistry.

Course in Interior Architecture

Students in Interior Architecture spend the first two years in the College of Science, Literature, and the Arts and must meet the admission requirements for that college.

For admission to the College of Engineering and Architecture in the third year, the student must present the following credits: Freshman English (15 credits); Mathematics, Trigonometry (4 or 5 credits); French (0 to 20 credits); History 11-12-13 (10 credits); Architecture 21-22-23 (6 credits); Architecture 31-32-33 (15 credits); Drawing 61-62-63 (6 credits), and Chemistry 1-2-3 or 4-5 (8 to 12 credits), or Physics 3 and 4 and any of the continuations, 23 and 24, 33 and 34, 43 and 44 (8 credits).

If, including these credits, the student does not present a total of 90 credits and 90 honor points, he must secure enough credits and honor points to make this total, after admission to the College of Engineering and Architecture and in addition to the 102 credits required in the last two years of the course.

II. Admission by Examination

In accordance with the regulation printed on page 30, the tests required for admission will be (a) college aptitude test, (b) test of proficiency in English, (c) test in mathematics including arithmetic, algebra, and plane geometry.

Adult special students.—See statement on page 41.

Time of admission.—The regular time to enter the college is in September. However, students will be admitted at the beginning of the winter quarter in January; then by attending the following summer quarter it is possible to complete most of the work of the freshman year. Admission at the opening of the spring quarter is possible altho several beginning courses are not given in the spring. Unless the student can present advanced credit from some other college, he is advised to wait until fall.

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

I. Admission by Certificate

(a) Subject to the general regulations governing their selection (see page 30), majors and minors may be presented from the Groups A, B, C, D, and E.

(b) Students intending to enter any course in Forestry or the course in Agricultural Sciences must present at least a minor in Group D and one unit in Group E.

(c) For entrance to the course leading to the degree of bachelor of agricultural engineering, see requirements of the College of Engineering and Architecture.

Recommendations—

(1) For all students intending to enter any work in the college: Students entering with a unit of high school chemistry are permitted to take a two quarters' course of five credits each in general chemistry in the college instead of a three quarters' course of four credits each. Students presenting a unit of high school physics are not required to take an elementary course in college physics.

(2) For all students intending to enter any course in Agriculture: Every prospective student in Agriculture is 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 or such experience as the committee may consider equivalent will be required during the college course in accordance with the results of these examinations. It is also recommended that major and minors be taken in Groups A, D, and E.

(3) For all students intending to enter any course in Forestry: It is recommended that major and minors be taken in Groups A, D, and E.

II. Admission by Examination

In accordance with the regulation printed on page 30, the tests required for admission will be (a) college aptitude test, (b) test of proficiency in English.

Schools of Agriculture

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

LAW SCHOOL

Students desiring to enter the Law School must first complete two full years (not less than 90 quarter [60 semester] credits) of collegiate work in Science, Literature, and the Arts with an average of one 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 32.) Such candidates may be admitted upon presenting their credentials to the examiner.

A special pre-legal course is offered by the College of Science, Litera-

ture, and the Arts covering those subjects which are particularly desirable as preliminary to the study of law.

Students entering the Law School with two years of college work must devote four years to the study of law to qualify for the degree of bachelor of laws. They may qualify for the degree of bachelor of science in law on completing two years of work in the Law School, provided they have taken in their college course the subjects required of candidates for that degree. See Courses and Degrees.

Students entering with three full years (not less than 135 quarter [90 semester] credits) of college work of the required grade may qualify for the bachelor of laws degree by completing three years of work in the Law School. They may also qualify for the degree of bachelor of arts on completing the first year in law provided they have satisfied the requirements of the College of Science, Literature, and the Arts in respect to the combined six-year course in arts and law.

Excess honor points do not count as credits for admission to any course in the Law School.

MEDICAL SCHOOL

On account of the limited capacity of the school, not more than one hundred beginning freshman medical students will be accepted for the fall quarter and forty for the winter quarter. Applicants will be selected on the basis of scholarship, character, and general fitness. The entire number of fall quarter freshmen 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 is not 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. The winter quarter freshmen will be chosen as soon as possible after the close of the fall quarter.

Applicants will be selected on the basis of their record in (a) the pre-medical college studies listed below and (b) a medical students' aptitude test given each year to all prospective medical students.

Applicants for admission must present records covering the successful completion of two years of academic collegiate work[1] which years are defined as including not less than ninety quarter (sixty semester) credits which must carry a number of honor points at least equal to the total number of credits. 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. Therefore, a student's marks must average C or higher in order to admit to the Medical School. Those having a high ratio of honor points to total credits will be given preference.

An applicant must also average C or better, as determined by the honor point method, on his combined records in the required subjects, zoology, chemistry, physics, and rhetoric.

[1] For admission to the pre-medical college course see admission requirements of the College of Science, Literature, and the Arts.

The pre-medical academic college credits must include the following:

1. Rhetoric, nine quarter (six semester) credits. At Minnesota this requirement is met by English 4-5-6 or by Rhetoric A-B-C (15 credits).

2. Chemistry, twenty quarter (thirteen and one-third semester) credits, including general chemistry, qualitative analysis, quantitative analysis, and organic chemistry with laboratory work. At Minnesota, Inorganic Chemistry 4-5 or (1-2-3) 11, Analytical Chemistry 7, and Organic Chemistry 1-2 are necessary. Students are advised also to take chemistry in high school.[1]

3. Physics, twelve quarter (eight semester) credits, covering mechanics, sound, heat, light, electricity and magnetism, with the proper laboratory work. At Minnesota, Courses 3 and 4, 23 and 24, 33 and 34, 43 and 44 (a total of sixteen credits) meet the requirements. Students are advised to complete them all but, if desired, Course 35 may be substituted for 33 and 34.

See bulletin of the College of Science, Literature, and the Arts for description of these courses and statement of prerequisites.

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

5. Sufficient high school and college training to insure a reading knowledge of German medical literature. This 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 usual minimum preparation for admission to this examination is two years of German. This examination is conducted by the German Department.

6. Pre-medical students are advised to secure preparation in some or all of the following subjects: Latin (high school or college), mathematics (including calculus), psychology, sociology, drawing, and comparative anatomy. A broad general education is desirable for those who contemplate the medical profession as their life work.

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 high school and college work, showing subjects, credits, and grades.

MODIFIED ADMISSION REQUIREMENTS

The foregoing regulations governing the quality and amount of pre-medical training required for admission to the Medical School will be enforced in all cases upon those who present the minimum amount of work. In cases of mature and superior students, especially such as have taken degrees and have made special progress along some line (even tho it may not have been closely related to medicine), concessions may be made. Cases under this paragraph will be considered individually and upon petition to the dean of the Medical School.

It should be borne in mind that no student can pursue the medical course to advantage without some knowledge of biology, chemistry, and physics.

[1] While the minimum requirement in chemistry is defined as 18 credits, the arrangement of courses in many institutions is such that students are obliged to take more. An excellent preparation in chemistry is essential in modern medicine.

Bachelor's Degree

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 pages 15 and 19).

Special Students

Physicians and other graduates 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 cannot 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 Medical School.

Irregular Students

By an irregular student is meant one who is entitled to time credit toward the M.B. and M.D. degrees but who is not carrying a regular program.

Physical Condition

Physical examinations at specified intervals are required of all medical students, together with such tests and vaccinations as will protect them from avoidable communicable diseases. Students may be excluded who are deemed physically unfit for the medical course.

School of Nursing

I. Admission by Certificate

Applicants for admission to the School of Nursing should be graduates of an approved high school and must present the minimum entrance requirements of one major and two minors as described on page 30.

II. Admission by Examination

In accordance with the regulation printed on page 30, the tests required for admission will be (a) college aptitude test, (b) test of proficiency in English.

Those wishing to enter the School of Nursing should file their applications with the director, 111 Millard Hall, and their credentials with the university examiner. Applicants must be not less than eighteen nor more than thirty-five years of age. They must submit satisfactory evidence of physical and mental fitness and of good character and pass a satisfactory general physical examination by the school physician.

Because of limited facilities for clinical experience in the hospitals it is necessary to limit the number of students that may be accepted. Final

acceptance is made by the enrolment committee and selection is made on the basis of scholarship, character, and general fitness.

All applicants for the five-year combined course must meet the entrance requirements of the College of Science, Literature, and the Arts. See page 32.

Beginning with the fall quarter of 1932 applicants for both the three- and five-year courses must meet these same requirements and in addition present one unit in chemistry. See page 32.

COLLEGE OF DENTISTRY

Students desiring to enter the College of Dentistry must first complete two full years (not less than ninety quarter or sixty semester credits) of collegiate work in Science, Literature, and the Arts at this or some other university or college of equal rank.

The minimum requirements for admission include nine quarter (six semester) credits in English (rhetoric); twelve quarter (eight semester) credits in zoology; twenty quarter (thirteen and one-third semester) credits in chemistry (including general inorganic, qualitative, organic); four quarter (two and two-thirds semester) credits in mathematics; eight quarter (five and one-third semester) credits in physics; six quarter (four semester) credits each in mechanical engineering and drawing; six quarter (four semester) credits in psychology; and enough additional credits to make a total of at least ninety quarter (sixty semester) credits.

At Minnesota the pre-dental requirements are met by the following two-year course of study provided high school chemistry and higher algebra are presented for admission (if these are not presented, Chemistry 1-2-3 is required instead of Chemistry 4-5; and Mathematics 3 must be taken as a prerequisite to 4 or 6); Zoology 5-6-7 (12 credits); Inorganic Chemistry 4-5, 11, Organic Chemistry 6-7 (20 credits); Mathematics 4 (4 credits) or Mathematics 6 (5 credits); Physics 3-4 and one of 23-24, 33-34, 43-44 (8 credits); Freshman English A-B-C (15 credits) or Composition for Technical Students 4-5-6 (9 credits); Drawing 41-42-43 (6 credits); Mechanical Engineering 11-12-13 (6 credits); Psychology 1-2 (6 credits). Electives to make a total of ninety quarter credits.

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.

Students preparing for admission to the College of Dentistry are advised to follow this arrangement as closely as possible.

School for Dental Hygienists

The requirement for admission to the School for Dental Hygienists is graduation from an approved high school or other preparatory school on the accredited list, and the applicant must present the minimum requirements of one major and two minors as prescribed on page 30. Applicants must not be over 35 years of age.

All accepted applicants must pay a preliminary fee within ten days of notification of acceptance, in order to hold a place in the class. This fee is not returnable in case the student fails to enter.

SCHOOL OF MINES AND METALLURGY

I. Admission by Certificate

(a) Major or minor in Group A.

(b) Major or minor in Group D.

Recommendations—

(1) It is recommended that the major be offered either from Group D, Mathematics or Group A, English. If it be in mathematics, it should include higher algebra, one-half unit, and solid geometry, one-half unit.

It is further recommended that all work in mathematics be taken in the senior high school.

Applicants deficient in higher algebra and plane geometry will be required to take a special course in mathematics during their freshman year.

(2) It is recommended that the second minor requirement be offered from Group E, natural sciences, and include physics, one unit, and chemistry, one unit; or from Group B, foreign languages.

II. Admission by Examination

In accordance with the regulation printed on page 30, the tests required for admission will be (a) college aptitude test, (b) test of proficiency in English.

Adult special students.—See statement on page 41.

COLLEGE OF PHARMACY

I. Admission by Certificate

(a) Major in Group A.

(b) Minor in Group D.

(c) One unit in Latin, Group B.

(d) One unit in physics, Group E.

Students who have completed forty-five credits in the College of Science, Literature, and the Arts or in other accredited colleges of similar standing, including nine or ten credits in each of (1) rhetoric, (2) a modern language, (3) physics or zoology, will be admitted to the second-year class. These students must have completed the high school equivalent of one year each of Latin and physics in addition to meeting the other entrance requirements of the College of Science, Literature, and the Arts.

II. Admission by Examination

In accordance with the regulation printed on page 30, the tests required for admission will be (a) college aptitude test, (b) test of proficiency in English.

SCHOOL OF CHEMISTRY

Courses in Chemistry and Chemical Engineering

See page 15, with College of Engineering and Architecture.

COLLEGE OF EDUCATION

I. Admission by Certificate

(a) Completion of a regular senior high school course.

(b) For all courses of study excepting the special curricula to which freshmen are admitted (see page 21) the completion of two full years of college work (a minimum of 90 credits must have been earned with an average of one honor point per credit hour in all subjects pursued) in the College of Science, Literature, and the Arts at this or some other college or university of equal rank is required.

(c) For all special curricula to which freshmen are admitted (see page 21) the certificate of senior high school graduation must show the completion of the following:

(1) Major in Group A.

(2) Minor in each of two of the Groups B, C, D, and E (except for the public school music curriculum for which a minor in Group D, mathematics, is required).

II. Admission by Examination

In accordance with the regulation printed on page 30, the tests required for admission will be (a) college aptitude test, (b) test of proficiency in English, (c) for Public School Music Course: mathematics and music tests, (d) for Art Education Course: art test.

In explanation of the honor point 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 (a) and (b), 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 advanced (two-year) normal course in Minnesota teachers colleges are given full credit for additional work taken since September, 1926, which the University of Minnesota considers the equivalent of its own courses. Graduates of two- or three-year courses in out of state teachers colleges receive additional credit for work taken beyond graduation in so far as the subjects taken are of senior college grade.

SCHOOL OF BUSINESS ADMINISTRATION

Candidates for admission to the degree courses offered by this school must have completed the equivalent of the two-year pre-business course given in the College of Science, Literature, and the Arts, the College of Agriculture, or the College of Engineering and Architecture of this University. (See admission to the College of Science, Literature, and the Arts, page 32; the College of Agriculture, page 33; the College of Engineering and Architecture, page 32.)

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.

ADULT SPECIAL STUDENTS

No student will be admitted to any school or college of the University who has not fully met the entrance requirements by one of the above methods, except applicants of mature age (24 years or older) and experience who may desire to pursue a special and limited course of study. Such candidates for admission must secure the approval of the college concerned for the work which they wish to pursue.

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 list of the preparatory units presented upon entrance.

(f) A letter or statement of honorable dismissal.

Applications for advanced standing should be made, if possible, at least one month before the time when the student expects to enter the University.

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.

The following institutions in Minnesota are recognized as institutions of full collegiate grade:

Carleton College, Northfield
Concordia College, Moorhead
Gustavus Adolphus College, St. Peter
Hamline University, St. Paul
Macalester College, St. Paul
College of St. Catherine, St. Paul
St. Olaf College, Northfield
College of St. Teresa, Winona

The following are recognized for three years of college work. Under certain conditions their graduates may be admitted to the Graduate School:

Augsburg College, Minneapolis
College of St. Benedict, St. Joseph
St. Mary's College, Winona
College of St. Scholastica, Duluth

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 toward graduation.

Applicants for transfer from the third or fourth year of the degree course offered in Minnesota teachers colleges may receive credit for any part of their work in so far as such work is equivalent in subject-matter to courses in the particular college to which the student transfers.

Graduates of state teachers colleges will not be permitted to take the following course at the University for credit: Psychology 1-2.

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
Duluth Junior College, Duluth
Ely Junior College
Eveleth Junior College
Hibbing Junior College
Itasca Junior College, Coleraine
Rochester Junior College
St. John's University, Collegeville
St. Mary's Hall, Faribault (for one year's work)
St. Thomas College, St. Paul
St. Paul Luther College
Virginia Junior College

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
Alberta
Albert Lea
Alden
Alexandria
Amboy
Annandale
Anoka
Appleton
Argyle
Arlington
Atwater
Audubon
Aurora

Austin
Badger
Bagley
Balaton
Barnesville
Barnum
Battle Lake
Baudette
Becker
Belle Plaine
Bellingham
Bemidji
Benson
Big Lake
Bird Island
Biwabik
Blackduck
Blooming Prairie
Bloomington
Blue Earth
Braham
Brainerd
Breckenridge
Brewster
Bricelyn
Brooten
Browns Valley
Brownton
Buffalo
Buffalo Lake
Buhl
Butterfield
Caledonia
Cambridge
Campbell
Canby
Cannon Falls
Carlton
Cass Lake
Ceylon
Chaska
Chatfield
Chisholm
Clarissa
Clarkfield
Cleveland
Climax
Clinton
Cloquet
Cloverton
Cokato
Coleraine
Columbia Heights
Comfrey
Comstock
Cottonwood
Crookston
Crosby-Ironton
Cyrus
Dassel
Dawson
Deer River
Delano
Delavan
Detroit Lakes
Dilworth
Dodge Center
Duluth
  Central
  Denfeld
  Morgan Park
Eagle Bend
East Grand Forks
Echo
Eden Prairie
Eden Valley
Edgerton
Elbow Lake
Elk River
Elkton
Ellendale
Elmore
Ely
Eveleth
Excelsior
Eyota
Fairfax
Fairmont
Faribault
Farmington
Fergus Falls
Fertile
Finlayson
Fisher
Forest Lake
Fosston
Frazee
Fulda
Garden City
Gaylord
Gilbert
Glencoe
Glenwood
Glyndon
Gonvick
Granada
Grand Marais
Grand Meadow
Grand Rapids
Granite Falls
Greenbush
Hallock
Halstad
Hancock
Harmony
Hastings
Hawley
Hayfield
Hector
Henderson
Hendricks
Henning
Herman
Heron Lake
Hibbing
Hill City
Hills
Hinckley
Hitterdal
Hopkins
Houston
Hutchinson
International Falls
Ivanhoe
Jackson
Janesville
Jasper
Jeffers
Jordan
Karlstad
Kasota

Kasson
Keewatin
Kelliher
Kellogg
Kenyon
Kerkhoven
Lake Benton
Lake City
Lake Crystal
Lakefield
Lake Park
Lamberton
Lancaster
Lanesboro
Le Roy
Lester Prairie
Le Sueur
Le Sueur Center
Lewiston
Lindstrom-Center City
Litchfield
Little Falls
Littlefork
Long Prairie
Luverne
Lyle
McGregor
McIntosh
Mabel
Madelia
Madison
Mahnomen
Mankato
Mantorville
Maple Lake
Mapleton
Marshall
Mazeppa
Medford
Melrose
Menagha
Mentor
Milaca
Milroy
Minneapolis
  Central
  Edison
  John Marshall
  North
  Roosevelt
  South
  Washburn
  West
Minneota
Montevideo
Montgomery
Monticello
Moorhead
Moose Lake
Mora
Morgan
Morris
Morristown
Morton
Motley
Mound
Mountain Iron
Mountain Lake
Murdock
Nashwauk-Keewatin
New Prague
New Richland
New Ulm
New York Mills
Nicollet
Northfield
North St. Paul
Norwood-Young America
Okabena
Olivia
Ortonville
Osakis
Osseo
Owatonna
Park Rapids
Parkers Prairie
Paynesville
Pelican Rapids
Pemberton
Perham
Pine City
Pine Island
Pine River
Pipestone
Plainview
Plummer
Preston
Princeton
Proctor
Randolph
Rapidan
Red Lake Falls
Red Wing
Redwood Falls
Remer
Renville
Robbinsdale
Rochester
Roseau
Rosemount
Round Lake
Royalton
Rush City
Rushford
Russell
St. Charles
St. Cloud
St. Francis
St. Hilaire
St. James
St. Louis Park
St. Paul
  Central
  Humboldt
  John A. Johnson
  Mechanic Arts
  Washington
St. Peter
Sacred Heart
Sanborn
Sandstone
Sauk Center
Sauk Rapids
Sebeka
Shakopee
Sherburn
Sioux Valley, Lake Park, Ia.
Slayton
Sleepy Eye

South St. Paul
Springfield
Spring Grove
Spring Valley
Staples
Starbuck
Stephen
Stewart
Stewartville
Stillwater
Storden
Thief River Falls
Thomson
Tower-Soudan
Tracy
Twin Valley
Two Harbors
Tyler
Ulen
Upsala
Verdi
Verndale
Villard
Virginia
Wabasha
Wabasso
Waconia
Wadena
Wahkon
Waldorf
Walker
Walnut Grove
Warren
Warroad
Waseca
Watertown
Waterville
Waubun
Wayzata
Wells
West Concord
Wheaton
White Bear
Willmar
Windom
Winnebago
Winona
Winthrop
Worthington
Wrenshall
Zumbrota

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

Adrian
  St. Adrian High School
Austin
  St. Augustin High School
Caledonia
  The Loretto
Collegeville
  St. John's College
Crookston
  Mount St. Benedict's Academy
  St. Joseph's Academy
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
  Maplewood Academy
Lake City
  McCahill Institute
Little Falls
  St. Francis High School
Mankato
  Good Counsel Academy
  Loyola High School
Minneapolis
  Academy, Augsburg Seminary
  Blake School for Boys
  De La Salle High School
  Minnehaha Academy
  Minnesota College
  Northrop Collegiate Institute
  St. Anthony High School
  St. Margaret's Academy
New Ulm
  Catholic High School
Owatonna
  Pillsbury Academy
Red Wing
  Academy of the Red Wing Seminary
Rolling Stone
  Holy Trinity School
St. Cloud
  Cathedral High School
St. Joseph
  Convent of St. Benedict

St. Paul
- Academy of the St. Paul Luther College
- Bethel Academy
- Breck School
- College of St. Catherine (Derham Hall)
- Cretin High School
- Oak Hall
- St. Joseph Academy
- St. Paul Academy
- St. Paul Institute Evening School
- St. Thomas Military Academy
- Summit School
- Visitation Convent

Sleepy Eye
- St. Mary's School

Wabasha
- St. Felix High School

Waseca
- Sacred Heart High School

Winona
- Cathedral High School
- Cotter High School

Graduates of Minnesota state high school departments which are on the recommended list of the State Department of Education are accepted on the same basis as the graduates of fully accredited preparatory schools.

EXPENSES

FEES

The university year, extending from October to June, is divided into three terms called quarters. On the specified dates (see Calendar, pp. 9-11) 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 cannot be deferred. Special attention is called to the paragraph on Penalty Fees (page 49) for further instructions on late registration and late payment of fees.

TUITION FEES

School or College	Quarter Fee		Credit Hour Fee*	
	Resident	Non-resident	Resident	Non-resident
College of Science, Literature, and the Arts	$20.20	$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	40.00	50.00	3.75	4.75
Medical School	75.00	100.00	†3.25	†4.50
School of Nursing (preliminary course)	25.00	25.00	†1.00	†1.00
Public Health Nursing	20.00	20.00		
Medical Technicians	30.00	40.00	†1.25	†1.75
College of Dentistry	60.00	70.00	†2.50	†3.00
Dental Hygienists	25.00	25.00	2.00	2.00
School of Mines and Metallurgy	30.00	40.00	2.50	3.25
College of Pharmacy	35.00	45.00	1.50	2.00
School of Chemistry	30.00	40.00	2.50	3.25
College of Education	20.00	30.00	1.75	2.50
Graduate School	‡20.00	‡30.00	‡1.75	‡2.50
Clinical Medicine	75.00	100.00	†3.25	†4.50
School of Business Administration	30.00	40.00	2.75	3.75
Division of Library Instruction	40.00	45.00	3.00	3.00

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

† In these colleges the prorating 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.

Non-resident fees.—"All students under the age of twenty-one shall be considered to be domiciled where their parents or legal guardians are domiciled.

"All students who are, and for six months prior to the date of registration have been, domiciled in Minnesota shall pay resident fees, provided, however, that a student's domicile is not to be considered as alterable simply by declaration of intention or by the fact of his presence in the state while

attending an educational institution."—Board of Regents Minutes, May 9, 1928.

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.[1]

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 above.

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 FEE

An incidental fee of $6 a quarter is charged each student for which the student receives the privileges of the Minnesota Union or Shevlin Hall, the Health Service, the *Minnesota Daily* including the Official Daily Bulletin, the university post-office service, and the *University Address Book*. Students in Engineering, Architecture, and Chemistry pay $6.40 per quarter and receive the *Minnesota Techno-Log* in addition to the foregoing.

All students who are registered for five credits or more in any quarter shall be required to pay the regular incidental fee; while students who are registered for less than five credits in any quarter shall not be charged any incidental fee, nor be permitted to pay this fee in order to obtain the privileges to which the payment of this fee entitles students.

DEPOSIT FEES

General deposit.—At the student's first registration at the University a deposit fee of five dollars ($5) (Medicine, Dentistry, Dental Hygiene, and Pharmacy, ten dollars) is required of each student to cover the following charges: locker rental, locker key deposit, case book deposit (Law School), laboratory breakages, drawing board rental (Architecture), library fines, or damage to university property.

The unused balance of the deposit fee will be returned *by mail* upon cancellation or automatically after the beginning of the first quarter the student fails to return. If, at any time, the charges against a student shall warrant a renewal of the deposit, an additional fee of five dollars ($5) will be required.

Military deposit.—A military deposit of ten dollars ($10) is required of all students taking military drill or athletics or band as a substitution for drill.

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

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)

Lesson fees—

Two individual lessons per week, in one subject .....$65.00 per quarter
One individual lesson per week, in one subject ..... 35.00 per quarter
Two individual lessons per week, in two subjects .... 70.00 per quarter

Practice fees—

Organ .....$0.20 to $0.40 per hour
Piano (six hours per week) .....$5.00 per quarter
($0.50 per quarter for each additional hour per week)

Practice teaching fee— $1.00 per credit hour

Laboratory fees—for individual courses. The amounts are specified in the course announcements.

Gymnasium fee (required of all men taking exercise courses in Physical Education) .....$1.50 a quarter

Gymnasium fee (required of all 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 set time[1] $5.00

Examination on subjects taken out of class[1] $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 payment of the special fee of $5.00

Duplicate copy of record: one copy of record will be issued to each student free of charge. Each additional copy will be issued only on payment of $0.50
(Except during a registration period, when the fee is $1.00)

Graduation fee $10.00

PENALTY FEES

Registration penalties.—A penalty fee for late registration, late change of registration, or late payment of fees shall be $2 prior to the day classes begin, on and after which the penalty increases at the rate of $1 per day, provided that no student shall pay more than $10 of penalty in any given quarter.

[1] Such an examination may be taken only upon approval of the appropriate committee.

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:

After Quarter Opens	Percentage of Refund
No attendance	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.

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.

Incidental fee.—Students in any college of the University, with the exception of the College of Engineering and Architecture, and the School of Chemistry, who cancel their registration before the end of the quarter, are entitled to a refund of the incidental fee on the same basis as the refund for tuition, except that in no case will more than $5 of the incidental fee be refunded. Students in the College of Engineering and Architecture and the School of Chemistry will receive refunds of the incidental fee on the same basis, except that the extra forty cents of the incidental fee in these schools will be entirely refunded during the first two weeks of the quarter, and none of this extra forty cents will be refunded after the second week of the quarter.

LIVING EXPENSES

BOARD AND ROOM

General Regulations

1. It is understood that a room is engaged for a complete quarter, unless otherwise arranged with the householder. Only when a student withdraws from the University is such student released from financial obligations.

2. It is understood that a room is automatically released at the conclusion of each quarter, but 10 days' notice must be given.

3. A deposit of $5 is to be made to a householder when a room is engaged.

4. It is advisable to make separate arrangements for board and room.

5. Students are advised—when possible—to board where they room.

6. No rebate in room rent is allowed for absence.

7. Rebate in charges for board is made only if absence exceeds a week, or if arrangements have been made in advance with the householder. This rule applies to absence during vacations as well as to all other absences.

8. A special charge is made for meals served to guests, or for extra services to guests.

Women

Sanford Hall.—Sanford Hall, the dormitory residence for women students, is situated at 1100 University Avenue S.E., three blocks from the main entrance to the campus. Two hundred and fifty students may be accommodated. The building is fireproof and modern in every way and is very comfortable and homelike.

The charge for board and a single room is $135 per quarter. For occupants of double rooms the charge for board and room is $125 per quarter. Board and room is to be paid $60 the first month in advance, $40 the first of the second month, and the balance the first day of the last month of the quarter. Fourth floor rooms are $10 less per quarter. All applications for residence must be made for the entire school year. It is best to apply as early as possible. Applications will be considered in the order in which they are received.

Communications requesting residence or further information should be addressed to the house director, Sanford Hall.

Co-operative cottages.—Four co-operative cottages, each in charge of a chaperone, offer comfortable homes for about forty women. 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. It is understood that students engage rooms for the school year and will not be released unless their places can be filled. Application may be made to the manager of university cottages, Shevlin Hall.

Rooming houses.—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. About seventy-five houses are approved by the University as residences for 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 fifty watt is required in a student's room. No electric appliances are to be used except by permission of the householder. Room rent varies from ten ($10) to fifteen dollars ($15) a month for each student; board at the present time is from five ($5) to eight dollars ($8) a week.

Luncheon on the cafeteria plan is served at Shevlin Hall daily, with the exception of Sunday.

For further information and list of addresses, application may be made to the director of housing, Shevlin Hall.

School of Nursing Expenses

Expenses of the *Three-Year Nursing Course* are estimated as follows:

Payable at the time of registration	
Tuition and deposit	$36.00
Books	15.00
Payable at the end of first three months	
Uniform cape and cap	22.50
Payable during first year	
Books	10.00
Payable during junior year	
Books	10.00
Payable during senior year	
Books	10.00
Graduation fee	10.00
	$113.50*

* Student nurses are expected also to purchase their own initial set of uniforms.

Room and board is furnished by the associated hospitals without charge to the student during the entire three years, including the preliminary quarter. Students who are below passing in the majority of their work at the end of the first six weeks may be asked to provide their own maintenance until the quarter's work is completed. Students who are advised to leave during the preliminary quarter are under no obligation to the school, but acceptable students who voluntarily leave the school before they have given any service to the hospitals are expected to reimburse the hospital for the cost of maintenance. Students in the School of Nursing receive no salary and have no opportunity for earning money while in training. After the first year they are eligible to apply for aid from the student loan funds. The above estimate does not include clothing, railroad fare, nor provision for the vacation periods.

Students in the *Five-Year Nursing Course* are registered in the academic college during the first five and last three quarters of the course and would have the same expenses in regard to maintenance, tuition, etc., as other students in that college. During the time they are in the School of Nursing their expenses would be similar to those of the three-year students.

Men

New residence hall for men.—The new residence hall for men at the University of Minnesota was erected for the purpose of providing comfortable and attractive individual living quarters for men students. It is ideally located overlooking the Mississippi River on the East River Drive, one block east of the Medical buildings. The building is quadrangle in form and is divided into eight houses, each house having a separate entrance. Approximately 32 students are accommodated in each house. Most of the rooms are arranged in three-room suites for two students—separate bedrooms and a common study. A few single and double rooms are provided for students who prefer this arrangement. Rooms are furnished with a

combination wardrobe and dresser, bed, chair, study table, arm chair, rug, wastebasket, curtains, bed linen, and bed cover. Students are expected to furnish blankets, study lamps, towels, and other personal necessities.

The main dining hall will provide the residents of the houses three meals per day.

Rates, including board, are as follows:

Three-room suites for two men (two bedrooms and a common study) with board, per man	$145 per quarter
Single rooms with board	$140 per quarter
Double rooms with board, per man	$135 per quarter
Fourth floor rooms are $5 less per quarter	

Students interested in residence in the hall should write to the Director of the New Residence Hall for Men, University of Minnesota, for a copy of the special bulletin and an application form. Assignments will be made in the order of application.

Approved boarding and rooming houses.—A list of approved boarding and rooming houses may be secured at the Housing Bureau. 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.

Minnesota Union.—At the Minnesota Union, the men's clubhouse on the campus, three meals a day are served on the cafeteria plan.

Men's cottages.—The University operates four houses where about forty men students can be accommodated. The charge for room and board is three hundred sixty dollars ($360) for the university year, payable in nine installments. Rooms are assigned in these cottages for the year and students cannot be released until their places are filled.

The application fees are not refunded to students leaving university houses before the end of the college year. An additional charge of thirty dollars ($30) for the year must be made for single rooms.

A fifth house, accommodating ten men, is operated as a dormitory only but board can be had, if desired, at the cottage dining hall. Room rentals run from ninety dollars ($90) to one hundred thirty-five dollars ($135) for the college year.

For each cottage there is provided a house mother who looks after the comfort and welfare of the men. The students live under a few self-made regulations. For further information, communicate with the manager of university cottages, Shevlin Hall.

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. A few 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. In addition to tuition fees prospective students should have at least $150 or the equivalent; and then it will be necessary for them to live very economically. Students who are eventually able to place themselves in self-supporting positions may have to try again and again, and meanwhile their living expenses will be accumulating. An adequate reserve fund under such conditions will enable them to continue their college work.

The Twin Cities offer many opportunities to the self-supporting student. Students are employed as clerks, stenographers, bookkeepers, cashiers, store clerks, drug clerks, salesmen, solicitors, telephone and telegraph operators, teachers, tutors, mechanics, musicians, waitresses and waiters, domestic workers, laborers, janitors, and in many other capacities, some of which are highly specialized. However, it must be remembered that there are usually more applicants than positions. For this reason a student, especially one who is new and unacquainted, may not be able to exercise much preference in work at first.

Applicants for employment should bear in mind that, while every effort is made to secure work for all who need it, the positions that come to this bureau cannot 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.

Applicants should also bear in mind that during the opening week of school there are many hundred students who apply to the Employment Bureau for work. It is manifestly impossible to place all of these students as soon as they apply and some students have to wait for days or weeks before they can secure work. The amount of work available varies with employment conditions.

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 the hope that he can get a position before the other students arrive because much 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 can register in some of the evening extension classes and seek employment during the day rather than run the risk of not being able to finance themselves while carrying regular university work. By choosing extension courses for which university credit is allowed, students can make

their future university work much easier and give themselves more time for outside work. The correspondence courses offered by the Extension Division are open to all. 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 Agric. For.,H.E. Educ.	Mines & Met. Business Adm.	Law	Eng. and Arch. Chem.	Dent.	Med.	Pharmacy
Incidental fee ...	$ 18.00	$ 18.00	$ 18.00	$ 19.20	$ 18.00	$ 18.00	$ 18.00
*Deposit fee	5.00	5.00	5.00	5.00	10.00	10.00	10.00
Gym. suit (approx.)	8.00	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	36.00
Room rent	90.00	90.00	90.00	90.00	90.00	90.00	90.00
Board	260.00	260.00	260.00	260.00	260.00	260.00	260.00
†Tuition	60.00	90.00	120.00	90.00	180.00	225.00	105.00
Incidentals	200.00	200.00	200.00	200.00	200.00	200.00	200.00
Books and instr'ts.	35.00	35.00	45.00	35.00	160.00	40.00	35.00
Total	$712.00	$742.00	$782.00	$743.20	$962.00	$887.00	$762.00

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

† An additional tuition fee of ten dollars per quarter (twenty-five dollars in the Medical School) 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. 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	$502.00	$709.00	$923.00
Business Administration and Pharmacy ..	531.00	739.00	953.00
Law	542.00	749.00	968.00
Engineering and Architecture, Chemistry, Mines and Metallurgy	562.00	739.00	998.00
Dentistry	756.00	959.00	1193.00
Medicine	631.00	839.00	1068.00

GRADUATE FELLOWSHIPS, SCHOLARSHIPS, AND LOANS

Applications for these fellowships must be made on or before March 1. Blank applications can be obtained from the dean of the Graduate School. Information may be secured from the dean of the college or head of the department in which the fellowship is located.

GENERAL

ADMINISTRATION FELLOWSHIPS

The Board of Regents has recently established four graduate fellowships, one in the office of the comptroller, one in the office of the registrar, one in the office of the dean of women, and one in the office of the dean of students affairs. Each of these fellowships will require one half of the time of the student, one half of his time being given to such other work as may be deemed advisable. The fellowships will cover a period of two academic years, or eighteen continuous months. They carry a stipend of $1,200 for the two years, $600 a year. The appointments will be made by the president on the recommendation of the comptroller, the registrar, the dean of women, and the dean of student affairs, respectively.

THE CLASS OF 1890 FELLOWSHIP

As a gift of the Class of 1890 the sum of $250 a year 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 CLARA UELAND FELLOWSHIP

The income from $11,191.67 is awarded annually to a recent woman graduate of any acceptable college or university for graduate study of problems of government and citizenship. Recipient is exempt from tuition fees.

LAMBDA ALPHA PSI GRADUATE LOAN FUND

Gift of $500 from the honorary language society of Lambda Alpha Psi for the establishment of a loan fund for needy graduate students to be known as the Lambda Alpha Psi Graduate Loan Fund. Applicants must have completed successfully one quarter's work in the Graduate School of the University of Minnesota. "Successfully" is to be interpreted as meaning an average of B for all work and A in 50 per cent of the major work. Application should be made through the dean of student affairs.

THE SWEDISH HOSPITAL AND CHARLES R. DRAKE FELLOWSHIP IN PATHOLOGY

The Swedish Hospital and Charles R. Drake Fellowship in Pathology for a period of three years—$900 first year, $1,200 second year, and $1,500 the third year. It does not carry exemption from tuition.

FELLOWSHIPS AND ASSISTANTSHIPS

The following fellowships and assistantships 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 1.

Agriculture and Home Economics	45 assistants
Anthropology	2 assistants
Botany	5 teaching assistants 6 assistants
Chemistry and Chemical Engineering	31 teaching assistants
Civil Engineering	1 teaching fellow 4 research fellows
Economics	10 assistants
Education	7 assistants
Engineering, Electrical	4 teaching fellows
Engineering Experiment Station	6 research fellows
English	1 teaching fellow 2 teaching assistants 5 assistants
Geology and Mineralogy	2 assistants
German	5 teaching assistants 3 assistants
History	15 teaching assistants 1 assistant
Mathematics	1 teaching assistant 2 assistants
* Medicine and Surgery	
(1) Medical School	41 fellows 12 assistants
(2) Mayo Foundation	265 fellows
(3) Miller Hospital Clinic	4 fellows
Philosophy	1 assistant
Physics	12 teaching assistants
Pokegama Fellowship in Tuberculosis	1 fellow
Political Science	5 teaching assistants 2 assistants
Psychology	9 teaching assistants
Romance Languages	2 teaching fellows 1 teaching assistant
Scandinavian	1 assistant
Sociology	4 teaching assistants 2 assistants
Zoology	18 teaching assistants

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

AGRICULTURE, FORESTRY, AND HOME ECONOMICS

CALEB DORR RESEARCH FELLOWSHIPS

The Caleb Dorr Fellowships were founded by the bequest of the late Caleb Dorr. Their purpose is the encouragement of research in any field of agriculture. No services are required. Whole time during the academic year (9 months) must be given to graduate work. Fellowship amounts to $500. Holder is exempt from all tuition fees. Awarded on basis of scholarship and prospect and promise of productive research. There are two such fellowships maintained at the present time.

SHEVLIN FELLOWSHIP IN AGRICULTURE

A fellowship of $500 open to graduate of any acceptable college or university.

AMERICAN DRY MILK FELLOWSHIP

The Victor Chemical Works of Chicago established the above fellowship to make a study of the properties of wheat flour doughs and yeast leavened bread prepared from such doughs to which varying amounts of dry skimmilk have been added.

CLOQUET WOOD FIBRE FELLOWSHIP

On January 23, 1925, the Northwest Paper Company and the Cloquet Lumber Company established this fellowship for the purpose of investigating the fundamental chemistry of paper manufacture. This fellowship is at the present time in the amount of $1,200 per year.

FLEISCHMANN FELLOWSHIP

The Fleischmann Company on December 13, 1921, established a fellowship for a research as to the effect of yeast on wheat gluten. This fellowship has been offered several times since the original gift in 1921, and at the present time is offered.

MINNESOTA VALLEY CANNING COMPANY

On June 8, 1926, the above company established a fellowship in the amount of $1,400 a year for a period of five years, for the purpose of making a study of the ways to develop the fundamental principles of sweet corn.

SPORTING ARMS AND AMMUNITION MANUFACTURERS RESEARCH

A fellowship established in 1929 for the purpose of investigating the life history and ecology of ruffed grouse, and other birds or animals found to be involved in game population cycles.

CHEMISTRY

AMERICAN PETROLEUM INSTITUTE RESEARCH FUND IN CHEMISTRY

Through the National Research Council, the American Petroleum Institute, in 1926, provided the sum of $4,500 annually for five years, to be used for fundamental research in the chemistry, physics, or geology of the

hydrocarbons. The research is under the charge of the director of the School of Chemistry, and provides for one research fellowship and one research assistantship.

THE DUPONT FELLOWSHIP IN CHEMISTRY AND CHEMICAL ENGINEERING

This fellowship, established by E. I. du Pont 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.

SHEVLIN FELLOWSHIP IN CHEMISTRY

A fellowship of $500 open to graduates of any acceptable college or university.

EDUCATION

COFFMAN FOUNDATION SCHOLARSHIP

The Coffman Foundation for the promotion of scholarship and research in education offers the sum of $100 to a graduate of the College of Education in encouragement of graduate work in education. Application should be made to the dean of the College of Education not later than May 1.

The money becomes available at the time the winning candidate is pursuing graduate work, a period of three years being allowed in which advantage of the award may be taken.

ENGINEERING AND ARCHITECTURE

AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS LUMBER RESEARCH

A gift for the purpose of conducting a series of experiments to determine the heat insulation properties of a selected list of woods.

MEDICAL

MEDICAL SOCIAL WORK FUND

Gift from the Minnesota District of the American Association of Hospital Social Workers for a fund for the assistance of graduate students of medical social work to be known as the Medical Social Work Fund.

SHEVLIN FELLOWSHIP IN MEDICINE

A fellowship of $500 open to graduates of any acceptable college or university.

MARION L. VANNIER SCHOLARSHIP

Gift of $100 annually from the Nurses' Self-Government Association of the University of Minnesota for the establishment of the Marion L. Vannier Scholarship. The recipient of this scholarhsip must be a graduate of the School of Nursing of the University of Minnesota. The scholarship is to be used for the purpose of higher education only, within two years after her graduation.

PHARMACY

JACOBSON GRADUATE PRIZE

David L. Jacobson will offer a fifty-dollar gold medal to the student who graduates with the highest general average rating from the postgraduate course in pharmacy leading to the degree of master of science in pharmacy.

THE FAIRCHILD SCHOLARSHIP

The Fairchild Scholarship, amounting to $500, is awarded to that graduate of any of the colleges holding membership in the American Association of Colleges of Pharmacy 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 Association of Colleges of Pharmacy, and the National Association of Boards of Pharmacy and who will use the $500 for graduate work in pharmacy. Fuller particulars may be had from the dean of the college.

SCIENCE, LITERATURE, AND THE ARTS

THE CLASS OF 1889 MEMORIAL PRIZE IN HISTORY

A prize of $100 is offered biennially (odd years) for the best thesis in history written from the sources. It is open to graduate and undergraduate students. It will not be offered until 1933.

THE ALBERT HOWARD SCHOLARSHIP

This scholarship of $240 a year is awarded to graduates of the College of Science, Literature, and the Arts of the University of Minnesota.

ROCK ANALYSIS LABORATORY—ROCKEFELLER FOUNDATION

A fellowship for the purpose of rock analysis established in 1929.

SHEVLIN FELLOWSHIP IN SCIENCE, LITERATURE, AND THE ARTS

A fellowship of $500 open to graduates of any acceptable college or university.

UNDERGRADUATE SCHOLARSHIPS, LOANS, AND PRIZES

Undergraduate scholarships, loan funds, and prizes are classified as (1) general, for students in all colleges of the University, (2) those for women students only, and (3) those open only to students registered in a certain college. Information may be obtained from the dean of the college in which the student is registered, the head of the department particularly concerned, the registrar, or the dean of women. Unless otherwise stated, all applications for loans should be made to the dean of student affairs. No student is eligible to borrow from any university loan fund until he has completed two quarters' work at the University of Minnesota.

GENERAL

THE JOHNSON FOUNDATION SCHOLARSHIPS

The trustees of the Edward M. and Effie R. Johnson Foundation have donated a fund of $12,000, the income of which is available annually for undergraduate scholarships. The scholarships are open to either men or women in any college of the University. Holders of the scholarships must be in the third or fourth year of work beyond high school and must have been in residence in the University of Minnesota at least one year. The student's record in his studies, his success in other activities, his interests, and his personal qualities will be taken into account in making awards. The purpose is to encourage scholarship and thoroness of training in students who appear capable of unusual service or leadership.

Whether one or more scholarships shall be awarded each year will depend upon the qualifications of available candidates.

The awards will be made by the Board of Regents upon recommendation of a committee of the faculty appointed by the president. Nominations should be sent to the dean of the college in which the student is enrolled.

LA VERNE NOYES SCHOLARSHIPS

Under the will of Mr. La Verne Noyes there was established a number of scholarships for ex-service men or their direct dependents to assist them in obtaining a college education. The funds for these scholarships were placed in the hands of a board of trustees. Beginning with the year 1928-29 five of these scholarships were granted to Minnesota. The scholarship covers the tuition fee in the college in which the appointee is registered.

UNIVERSITY CONCERT BAND SCHOLARSHIPS

Twenty-seven scholarships of $35 each and eight scholarships of $50 each are available for members of the university concert band.

GENERAL STUDENT LOAN FUND

A loan fund open to all students in the University of Minnesota that come under the requirements established by the Board of Regents. This fund has been built up by small contributions from alumni who have been benefited in their student days and have taken this means of building up a loan fund to show their appreciation.

ARGOSY CLUB LOAN FUND

Gift of $225 from the Argosy Club of Minneapolis for a loan fund to be administered in accordance with the usual policies and regulations of the University. Both the interest and the principal may be used for loan purposes.

CLASS OF 1902 LOAN FUND

Gift from the Class of 1902 for the establishment of a loan fund for worthy students, preferably those in the junior and senior classes.

THE COSMOPOLITAN CLUB LOAN FUND

The Cosmopolitan Club of the University has established a $200 loan fund to be loaned to foreign students at the University, residing outside the territorial limits of the United States.

DAD'S DAY LOAN FUND

Due to the generosity and interest in the University of Minnesota on the part of the dads attending the annual Dad's Day dinners, money was collected and donated to the University to be used as a loan fund for needy students, subject to the regulations adopted by the Board of Regents governing the administration of loan funds.

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.

WILLIAM ARTHUR LAWHEAD SCHOLARSHIP LOAN FUND

Gift of $2,000 from the estate of Lillian Lawhead Rinderer for the establishment of a loan fund to be known as the William Arthur Lawhead Scholarship Loan Fund, for needy students.

THE JOHN LIND LOAN FUND

A fund of $7,000 has been established by John Lind, the income of which is to be used for loans to deserving crippled students.

THE LUDDEN ESTATE LOAN FUND

The annual income from this fund of approximately $15,000, 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, 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.

ARIEL MACNAUGHTON PLAY PRODUCTION FUND

A fund of $100 known as the Ariel Macnaughton Play Production Class Fund, available, all or in part, as a loan for any dramatic purpose, to an organization or individual, with condition that it must be returned to the University at the close of the school year following the loan. Decisions upon the loan are to be made upon recommendation by instructor in dramatics.

FIRST NATIONAL BANK OF ST. PAUL LOAN FUND

A gift of $400 received from the First National Bank of St. Paul, Minnesota, to be used as a loan fund for needy students.

SIGMA ALPHA MU LOAN FUND

A loan fund of $50 for students of Sigma Alpha Mu, a Jewish fraternity. If at any time there is a balance unused, and uncalled for, it may be used for other Jewish students.

F. P. KEPPEL PRIZE IN FINE ARTS

A gift of $250 to be used in promoting interest in the fine arts either in the form of a prize for the most meritorious piece of original work by a student during the year, or in any other way that commends itself to the University.

LUDDEN PRIZES

Three prizes of $50, $30, and $20 to the winners of the first three places in the Freshman-Sophomore Oratorical Contests are provided from the Ludden Real Estate Loan Fund.

THE FRANK O. LOWDEN PRIZES

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 FRANK H. PEAVEY PRIZE

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

THE JOHN S. PILLSBURY PRIZES

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.

ZETA ALPHA PSI PRIZES

Gift of $40 annually from the Zeta Alpha Psi, forensic sorority of the University of Minnesota, for the establishment of the Zeta Alpha Psi prizes of $25 and $15 for first and second places in the annual extemporaneous speaking contest.

CLASS OF 1911 MEMORIAL TRUST FUND PRIZE

A prize of $40 has been provided by the alumni of the Class of 1911 for an annual contest to encourage original dramatic writing. Plays must be submitted by March 1.

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 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 MINNESOTA QUARTERLY AWARD

The Minnesota Quarterly offers two prizes of $15 each, one for the best prose article published in the magazine during the year, and the other for the best poem. These prizes must not be awarded to members of the editorial board.

ISRAEL W. CROSLEY BEQUEST

Israel W. Crosley of St. Paul, Minnesota, bequeathed to the University of Minnesota and established the "Crosley Benevolent and Educational Fund." This is to help individuals in obtaining an education in the higher institutions of learning and especially in the University, preference to be given at all times to needy young men and women of African descent. The awards are made as follows: $17.50 on June first and $27.50 on December first of each year.

FOR WOMEN STUDENTS

DELTA PHI EPSILON SCHOLARSHIP

Gift of $100 annually from the Delta Phi Epsilon Sorority for the establishment of the Delta Phi Epsilon Scholarship, open to women students of Jewish faith. Applicants must have completed two quarters' work at time of award. The award will be given on the basis of scholarship, character, and need. Application should be made to the dean of women.

THE MRS. GEORGE C. CHRISTIAN SCHOLARSHIP

Through the generosity of Mrs. George C. Christian, a scholarship amounting to $100 annually is available for young women of high scholarship and fine character. Application may be made to the dean of women before May 1.

THE NINA MORAIS COHEN SCHOLARSHIP

The Nina Morais Cohen Scholarship of $125, given by the Council of Jewish Women, is awarded annually to a woman student of Jewish descent. Applications may be made to the dean of women before May 1.

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. Application may be made to the dean of women before May 1.

EVERYWOMAN'S PROGRESSIVE COUNCIL SCHOLARSHIP

Everywoman's Progressive Council offers annually one scholarship of $50 to a negro woman student of high scholarship and fine character. Application 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 P. E. O. SCHOLARSHIP

The P. E. O. organization gives annually a scholarship of $100 to some woman student of high scholarship and fine character. Applications may be made to the dean of women before May 1.

ST. PAUL COLLEGE CLUB SCHOLARSHIPS

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

THE W. S. G. A. SCHOLARSHIPS

The Women's Self-Government Association of the University offers annually several scholarships of $100 and $150, preference being given to women of the junior or senior class. Applications may be made to the dean of women before May 1.

EIGHTH WARD WOMAN'S CHRISTIAN TEMPERANCE UNION LOAN FUND

A gift of $100 was made by the above organization to establish a loan fund. The money is to be repaid by the borrowers within two years after graduation.

THE COSMOPOLITAN CLUB LOAN SCHOLARSHIP

The Cosmopolitan Club of Merriam Park, St. Paul, offers a loan scholarship of $100 to a woman of high scholarship and fine character. Applications may be made to the dean of women before May 1.

THE DAUGHTERS OF THE AMERICAN REVOLUTION LOAN SCHOLARSHIP

The Daughters of the American Revolution, St. Anthony Chapter, offers a loan scholarship of $100 to a woman of high scholarship and fine character. Applications may be made to the dean of women before May 1.

FACULTY WOMEN'S CLUB LOAN FUND

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.

EDWARD M. AND EFFIE R. JOHNSON FOUNDATION LOAN FUND FOR GIRLS

A gift of $5,000 from the above foundation was received, the income of which is to be used as a loan fund for girls.

JESSIE S. LADD LOAN FUND

The Minneapolis Alumnae Club has established a small loan fund known as the Jessie S. Ladd Loan Fund to be used for assisting women students. This loan fund is used as an emergency loan fund for short time loans to 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. This loan fund is used as an emergency loan fund for short time loans to students. 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 MINNEAPOLIS PATHFINDERS' CLUB LOAN FUND

The Pathfinders' Club of Minneapolis has established a small loan fund to be used for assisting women students. This loan fund is used as an emergency loan fund for short time loans to 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 the 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.

PROFESSIONAL SORORITY COUNCIL LOAN FUND

Income from sum of $200 to be used as loans to needy women students, preference given to senior girls. An advisory committee consisting of one member from each sorority together with a faculty adviser recommend the candidate for the loan.

ST. PAUL ALUMNAE LOAN FUND

The alumnae of St. Paul have established a small loan fund to be used for assisting women students. This loan fund is used as an emergency loan fund for short time loans to students. Applications may be made to the dean of women at any time.

KAPPA RHO AWARD

A cup is awarded annually to that woman member of the senior class who has been outstanding in ability and achievement in one or more of the speech arts. Recommendation of candidate is made by a committee of five, three members of which are appointed by the chairman of the Department of Speech, and two members by Kappa Rho. In the absence of a suitable candidate the committee may withhold the award.

THE W.S.G.A. AWARD

The W.S.G.A. Scholarship tablet is inscribed annually with the name of that young woman who has attained the highest average during her first college year.

AGRICULTURE, FORESTRY, AND HOME ECONOMICS

THE AGRICULTURAL FACULTY WOMEN'S CLUB SCHOLARSHIP

The Agricultural Faculty Women's Club offers several scholarships which are available to students of the Division of Home Economics. In awarding these, 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 this scholarship may be made to the chief of the Division of Home Economics.

THE ALPHA ZETA SCHOLARSHIP

The active chapter of Alpha Zeta offers a scholarship of $50. Award is made, without application, to that male student of good moral character, who shall have attained the highest average scholastic record while a student in the freshman class in the College of Agriculture, Forestry, and Home Economics. Scholarship is granted with the understanding that the recipient will continue to pursue his work in agriculture or forestry in this college. Awards made through regular channels provided by faculty.

HENRY WEBB BREWSTER SCHOLARSHIP

This scholarship of $250 is donated by Mrs. Florence A. Brewster in honor of her husband, the late Henry Webb Brewster, formerly principal of the Central School of Agriculture, University of Minnesota. It is open to students in the College of Agriculture, Forestry, and Home Economics under the following conditions as stated by the donor: "The beneficiaries must be young men or young women who are and must continue of exemplary moral character and of temperate and industrious habits. They must be such as by trial and examination shall evince and maintain a habit and aptitude for study and improvement. Any student who shall fail to come or cease to be within the above conditions shall forfeit all claims to the benefits of these scholarships. It is my preference that such scholarships be awarded to needy students who would otherwise be unable to gain educational advantages."

MARY L. BULL SCHOLARSHIP FUND

A gift of $500 from the Alpha Alumnae Chapter of Phi Upsilon Omicron for the establishment of the Mary L. Bull Scholarship fund. The income may be used for scholarships, or grants, for needy and worthy students enrolled in courses in Home Economics.

CALEB DORR COLLEGE SCHOLARSHIPS AND MEDALS

Donated by the late Caleb Dorr of Minneapolis, Minnesota. Awarded to students in the College of Agriculture, Forestry, and Home Economics on the basis of scholastic record in college. Sophomore scholarships, two of $50 each, one for men and one for women. Junior scholarships: two of $50 each, one for men and one for women. Senior scholarships: two gold medals, one for men and one for women.

Special grants: Awarded to students of the college who have maintained a creditable scholastic record in college and who have made a significant achievement in necessary self-support. Amounts and distribution determined by special faculty committee.

CALEB DORR FRESHMAN COLLEGE SCHOLARSHIPS

Open to entering freshmen in the College of Agriculture, Forestry, and Home Economics. Donated by the late Caleb Dorr, of Minneapolis, Minnesota. Awarded to graduates of high schools of Minnesota and

schools of agriculture of the University of Minnesota, on the basis of scholarship and achievement in self-support during high school course and on need for financial assistance, objectives and aims in college course, and qualifications for public service and leadership. The amount of the scholarship is $100. The number awarded depends upon funds available.

SAMUEL B. GREEN SCHOLARSHIP

Through the generosity of Mrs. Samuel B. Green the income from $1,000 will be available annually for a scholarship to be awarded to a senior in Forestry having the highest scholastic record.

HOME ECONOMICS ASSOCIATION SCHOLARSHIP

The Home Economics Association of the College of Agriculture, Forestry, and Home Economics offers a scholarship of $50 to students in the Division of Home Economics. Any student in the division is eligible. The scholarship is awarded on the following basis: spirit of service, financial need, professional attitude, character, and an honor point ratio of 1.5 or above, and ideals and standards consistent with those set up by the Division of Home Economics. The award is in the hands of a faculty committee from the Division of Home Economics. Applications may be made to the chief of the Division of Home Economics.

MINNESOTA HOME ECONOMICS ASSOCIATION FRESHMAN SCHOLARSHIP

A $200 scholarship for freshman girls in the Division of Home Economics. The award is to be made by the faculty of the College of Agriculture, Forestry, and Home Economics, on the basis of character, scholarship, achievement, need of financial help, and especially upon promise of leadership.

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 may be made to the chief of the Division of Home Economics.

PULLMAN COMPANY SCHOLARSHIPS

These are awarded to the University of Minnesota on the basis of prizes taken by stock at the International Show held annually in Chicago. They become the permanent property of the University. The scholarships are awarded in the form of loans to students. When the loans are paid back, the money becomes again available for award to other students of agricultural courses. For information consult the head of the Division of Animal Husbandry.

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.

MARY DWIGHT AKERS LOAN FUND FOR FORESTRY STUDENTS

Established by Emily Speechley Whitacre, of St. Paul, Minnesota, "in recognition of the interest and work of the Fourth District, Minnesota Federation of Women's Clubs, in conservation and reforestation, and especially of the effective work of Mrs. C. N. Akers, chairman of the Outdoor Life Committee of that organization, and with a hearty appreciation of the work which the students and faculty of the Forestry Department of the University of Minnesota are doing in the cause of forestry and conservation," and "to assist worthy and needy students in the study of Forestry and to establish a permanent memorial to the great work of the Outdoor Life Committee, Fourth District Minnesota Federation of Women's Clubs." The amount of this loan fund is $4,000.

AGRICULTURAL FACULTY WOMEN'S CLUB LOAN FUND

The Agricultural Faculty Women's Club has established a $500 loan fund for the use of undergraduate and graduate students in the home economics course. The fund will be governed by the university rules and regulations for loan funds.

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.

DR. NELLIE WELCH NELSON HOME ECONOMICS STUDENT LOAN FUND

Gift from the Fourth District of the Minnesota Federation of Women's Clubs for the establishment of the Dr. Nellie Welch Nelson Home Economics Student Loan Fund. The principal and interest are to be available for loans to girls in the Division of Home Economics under the usual conditions governing the use of university student loan funds.

JUNIATA SHEPPERD LOAN FUND

Gift of $208.74 to be known as the Juniata Shepperd Loan Fund. The principal and income to be used for loans. Women students needing financial aid in the School and College of Agriculture and graduates in the Division of Home Economics are eligible.

DOROTHY M. WINTER MEMORIAL FUND

A gift of $500 to be used as a revolving loan fund in the College of Agriculture for the benefit of daughters or sisters of World War veterans, pursuing work in home economics, or any other course within that college leading to a degree from the College of Agriculture, and fulfilling the requirements of said College of Agriculture.

A. D. WILSON PRIZE

The income from a fund of $322.30 contributed by friends of A. D. Wilson, awarded to the student in the College of Agriculture, Forestry, and Home Economics who submits the best essay on co-operation in agriculture.

GIDEON MEMORIAL PRIZE

The Gideon Memorial Fund of $500 was raised by members of the State Horticultural Society and presented to the University of Minnesota in 1908 in honor of Peter M. Gideon, Excelsior, the originator of the Wealthy apple, with the stipulation that the income from this fund be used for a prize in some annual competition open to students in horticulture. The annual income from the investment of this capital amounts to $25, payable $12.50 semiannually in May and November. This competition has taken the form of papers prepared on some horticultural subject and delivered at the annual meeting of the State Horticultural Society. In odd numbered years the competition is open to college students and in even numbered years to the students of the School of Agriculture. Arrangements for contests are in charge of the Division of Horticulture.

CHARLES LATHROP PACK FOUNDATION FORESTRY PRIZES

Gift of $2,000 from Charles Lathrop Pack of which the income is to be used for two prizes for the best essays or other evidence of accomplished work in the interests of public co-operation and public appreciation of forestry. Open to all undergraduates specializing in forestry.

FARMSTEAD, STOCK AND HOME MEDAL

Farmstead, Stock and Home, a farm journal published in Minneapolis, offers a medal in the form of a watch fob to each student standing highest in judging dairy cattle, beef cattle, horses, swine, and sheep.

DEAN E. M. FREEMAN MEDAL FOR STUDENT LEADERSHIP

An annual medal to the senior student who has made the greatest contribution to student life on the University Farm campus.

THE TOMHAVE MEDAL

Provided by W. H. Tomhave, alumnus of the College of Agriculture (Class of 1907). Awarded to the student who proves himself the most proficient in judging all classes of livestock. For conditions of competition see the head of the Division of Animal Husbandry.

BUSINESS ADMINISTRATION

THE MINNEAPOLIS ADVERTISING CLUB SCHOLARSHIP

The Minneapolis Advertising Club awards annually in June a scholarship of $100 to a senior student in the School of Business Administration on vote of a committee consisting of the dean of the School of Business Administration, two other faculty members appointed by the dean, and the president and secretary of the Minneapolis Advertising Club.

AMERICAN BANKER'S ASSOCIATION LOAN SCHOLARSHIP

The American Banker's Association has allocated two loan scholarships of $250 each to the University of Minnesota. These loan scholarships are available to students majoring in banking and finance. Applications are made to a committee on which there is representation from the Banker's Association.

F. D. LINDQUIST LOAN FUND

The sum of $500 is available as a loan to students in the School of Business Administration in need of financial assistance.

DENTISTRY

ARTHUR V. ARONSON MEMORIAL SCHOLARSHIP

Gift of $50 annually from the Young Men's Jewish Club of St. Paul for the establishment of a scholarship for a Jewish student in Dentistry to be known as the Arthur V. Aronson Memorial Scholarship.

DELTA SIGMA DELTA LOAN FUND

A loan fund of $700 for needy and eligible dental students who are members of the Delta Sigma Delta Fraternity.

MINNEAPOLIS DISTRICT DENTAL SOCIETY—WOMAN'S AUXILIARY—LOAN FUND

A loan fund of $500 to assist needy and worthy students who are registered in the College of Dentistry, and who are American citizens and residents of Minnesota.

ALPHA KAPPA GAMMA PRIZE IN DENTAL HYGIENE

The active chapter of Alpha Kappa Gamma Sorority offers an annual prize of ten dollars ($10) in gold to the girl graduating from the School for Dental Hygienists, who presents the highest scholastic average, having completed her entire course at the University of Minnesota.

ENGINEERING, ARCHITECTURE, AND CHEMISTRY

AMERICAN SOCIETY OF CIVIL ENGINEERS, NORTHWESTERN SECTION

The Northwestern Section of the American Society of Civil Engineers offers prizes to the amount of $40 annually to upper class students in the course in civil engineering on the basis of scholarship.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS PRIZE

The American Society of Mechanical Engineers offers an annual prize of $50, open to members of the University of Minnesota student chapter of the society, for the best original paper adjudged from the standpoint of applicability, value as a contribution to mechanical engineering literature, completeness, originality of manner, and conciseness. Papers must be submitted before June 30.

TAU BETA PI PRIZE

The Minnesota Chapter of Tau Beta Pi awards annually a prize of the value of $25 to a freshman in the College of Engineering and Architecture, the School of Chemistry, or the School of Mines and Metallurgy on the basis of high scholarship and merit.

PI TAU SIGMA PRIZE IN MECHANICAL ENGINEERING

The Minnesota Gamma Chapter of Pi Tau Sigma, honorary mechanical engineering fraternity, presents each year a *Mechanical Engineers' Handbook* to the sophomore in mechanical engineering who earned the highest scholastic average in his class in his freshman year.

ENGINEERS BOOKSTORE LOAN FUND

The Engineers Bookstore of the University of Minnesota has established a loan fund of $1,000, primarily for the use of students in the College of Engineering and Architecture, the School of Chemistry, and the School of Mines and Metallurgy.

MAX TOLTZ (A.S.M.E.) LOAN FUND

Through the American Society of Mechanical Engineers, members of the University of Minnesota student chapter of the society have access to a loan fund established by the gift of $15,000 from Major Max Toltz, of St. Paul. Applications should be made through the head of the Department of Mechanical Engineering.

THE ALBERT MOORMAN MEMORIAL FELLOWSHIP IN ARCHITECTURE

A. Moorman and Company, of Minneapolis, contribute an annual fellowship for excellence in senior architectural design as determined by a competition and the award of a committee of judges. The fellowship consists of a sum of money sufficient to cover the traveling expenses of the recipient on a trip after graduation to study notable examples of architecture in this country.

ALPHA ALPHA GAMMA PRIZE IN ARCHITECTURE

An annual prize of $15 in books is provided by the Alpha Alpha Gamma Sorority, to be awarded to the author of the design placed first in a designated competition consisting of one of the regular long problems in the sophomore course in design in the School of Architecture.

MINNESOTA CHAPTER, AMERICAN INSTITUTE OF ARCHITECTS

The Minnesota Chapter of the American Institute of Architects contributes annually two prizes of books to the value of $50 and $25 to the students attaining the two highest general averages in the work of the junior year of the course in architecture.

ARCHITECTURE FACULTY PRIZES

The faculty of the School of Architecture awards annual prizes of books to the value of $35 and $15, respectively, to the students attaining the first and second highest general averages in the sophomore year of the courses in architecture and architectural engineering.

MAGNEY AND TUSLER PRIZES IN ARCHITECTURE

Two annual prizes of $20 and $10, respectively, are provided by Magney and Tusler, architects, of Minneapolis. They will be awarded to the authors of the designs placed first and second in a sketch competition, the subject of which pertains to civic beautification.

WILLIAM A. FRENCH PRIZES IN INTERIOR ARCHITECTURE

Mr. William A. French, of Minneapolis, has established two annual prizes of $15 and $10, respectively, for a design competition open to seniors in the course in interior architecture.

NORTHERN STATES POWER COMPANY PRIZES IN INTERIOR ARCHITECTURE

Two prizes of $25 and $15, respectively, have been established by the Northern States Power Company of Minneapolis to be awarded each year to students in interior architecture for the best solutions of problems involving special concealed or built-in lighting features.

HORTON ART SCHOLARSHIP AND LOAN FUND

Annual income from $1,000 donated by Edith Lee Horton as a memorial to her father, Dr. William Dixon Horton, is available for loans or scholarships to junior and senior students in art classes.

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.

SCARAB MEDAL IN ARCHITECTURE

The Scarab Fraternity provides an annual silver medal, to be awarded to the student winning first place in a designated design competition in the regular work of the junior year in the course in architecture.

AMERICAN PETROLEUM INSTITUTE RESEARCH FUND IN CHEMISTRY

Through the National Research Council, the American Petroleum Institute, in 1926, provided the sum of $4,500 annually for five years, to be used for fundamental research in the chemistry, physics, or geology of the hydrocarbons. The research is in charge of the director of the School of Chemistry, and provides for one research fellowship and one research assistantship.

THE DU PONT FELLOWSHIP IN CHEMISTRY AND CHEMICAL ENGINEERING

This fellowship, established by E. I. du Pont 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.

SHEVLIN FELLOWSHIP IN CHEMISTRY

A fellowship of $500 open to graduates of any acceptable college or university.

ALPHA CHI SIGMA TWIN CITY ALUMNI PRIZE IN CHEMISTRY

The Twin City Alumni Association of Alpha Chi Sigma Fraternity offers an annual prize of books to the value of $10 to that male sophomore in the School of Chemistry having the highest scholastic average at the end of the winter quarter.

FACULTY PRIZE IN THE SCHOOL OF CHEMISTRY

Gift of $25 annually from the faculty of the School of Chemistry for the establishment of an annual prize of $25 in scientific books or journals to the senior who, while registered in the School of Chemistry, has attained the highest scholastic average in the work of the sophomore and junior years and the first two quarters of the senior year.

PHI LAMBDA UPSILON PRIZE IN CHEMISTRY

Phi Lambda Upsilon, national honorary chemical fraternity, offers an annual prize of $15 to that male sophomore student registered in the School of Chemistry, or specializing in agricultural biochemistry, who shall have the highest scholastic standing up to the beginning of the spring quarter, as certified by the registrar upon a prescribed basis.

LAW

LAW ALUMNI ASSOCIATION SCHOLARSHIP

A varying number of scholarships of $150 each are awarded to the students of the junior and senoir classes who have made the most meritorious records in their work and qualify for the Board of the *Minnesota Law Review.*

LAW FACULTY SCHOLARSHIPS

Law faculty scholarships of $150 each are awarded to students in the senior class of the Law School who have done meritorious work in their classes and on the *Minnesota Law Review* up to the date of the award.

MINNESOTA LAW REVIEW SCHOLARSHIP

A scholarship of $150 awarded to a student in the senior class who has done meritorious work in his classes and on the *Minnesota Law Review* up to the date of the award.

LAW ALUMNI LOAN FUND

A sum has been provided by the alumni of the Law School for loans to law students. Loans are made in sums not exceeding $200. Preference is given to students on the Editorial Board of the *Minnesota Law Review.* Application may be made to the dean of the Law School.

MEDICINE

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.

CHARLES LYMAN GREENE PRIZE IN PHYSIOLOGY

Certificate of merit and a prize of $100 from the Minnesota Society of Internal Medicine for the establishment of the Charles Lyman Greene Prize in Physiology. It is offered to an undergraduate medical student for the most meritorious thesis upon a subject in physiology which is closely related to clinical medicine.

RAMSEY COUNTY MEDICAL AUXILIARY LOAN FUND

Gift of $300 from the Ramsey County Medical Auxiliary for two loan funds of $150 each available for needy and worthy students in the Medical School.

MINNESOTA STATE ORGANIZATION FOR PUBLIC HEALTH NURSING LOAN FUND

The sum of $500 has been donated from the Minnesota Organization for Public Health Nursing to be available for loan fund purposes for deserving and needy students in Public Health Nursing.

LOUISE M. POWELL PRIZE

A gift of $50 annually from the Alumnae Association of the School of Nursing for the establishment of the Louise M. Powell Prize of $25 to be awarded at the March and June commencements to the student in the School of Nursing of the University of Minnesota who has attained the highest degree of efficiency in practical work.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION MEDAL

An annual gold medal and scroll to the member of the senior class of the Medical School showing the greatest degree of excellency in the clinical fields of medicine during his two last years in the Medical School.

MINES AND METALLURGY

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 and Metallurgy. 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. Application may be made to the dean of the School of Mines and Metallurgy.

TAU BETA PI PRIZE

The Minnesota Chapter of Tau Beta Pi awards annually a prize of the value of $25 to a freshman in the College of Engineering and Architecture, the School of Chemistry, or the School of Mines and Metallurgy on the basis of high scholarship and merit.

PHARMACY

MINNESOTA STATE PHARMACEUTICAL ASSOCIATION SCHOLARSHIP

A scholarship amounting to $105 in cash 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 first two years 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.

LEHN AND FINK GOLD MEDAL

Messrs. Lehn and Fink, of New York City, award annually a gold medal to that student in the College of Pharmacy who graduates with the highest general average rating.

SCIENCE, LITERATURE, AND THE ARTS

THE AMERICAN LEGION AUXILIARY SCHOLARSHIP

The American Legion Auxiliary established a scholarship of $100 a year, the award to go to some woman student majoring in sociology with special service among the foreign born.

DELTA SIGMA PSI SCHOLARSHIPS

One or more scholarships of $25 each are offered annually by Delta Sigma Psi, honorary Norwegian culture fraternity. The applicants must have at least 25 university credits or their equivalent in Norse and promise

to continue the study of Norse so as to earn nine additional credits after applying for the scholarship. Applications must be made to the seceretary not later than May 1.

CAPTAIN DeWITT JENNINGS PAYNE MEMORIAL SCHOLARSHIPS

Under the will of the late Olive Payne Stover, of Chicago, the University was given securities amounting to $15,615.24. This bequest was for the purpose of establishing one or more scholarships in the Department of English. Only the income is to be used.

HORTON ART SCHOLARSHIP AND LOAN FUND

Annual income from $1,000, donated by Edith Lee Horton as a memorial to her father, Dr. William Dixon Horton, is available for loans or scholarships to junior and senior students in art classes.

THE MOSES MARSTON SCHOLARSHIP IN ENGLISH

This scholarship of $75 is to be used to further English study, and is awarded to the English Department as a recognition of special capacity for literary and linguistic studies.

THE MINNESOTA GRAND ARMY OF THE REPUBLIC AND WOMEN'S RELIEF CORPS SCHOLARSHIP AND LOAN FUND

A gift of $100 from the Department of Minnesota Women's Relief Corps, Auxiliary to the Grand Army of the Republic, for a scholarship and loan fund for a student in the College of Science, Literature, and the Arts, preference to be given to a descendant of a member of the Grand Army of the Republic.

MU PHI EPSILON SCHOLARSHIP

Gift of $50 from the Phi Beta Chapter of Mu Phi Epsilon Sorority for the establishment of an annual scholarship for junior and senior women music students.

MUSIC SCHOLARSHIP

A gift of $250 to a music student who shall be selected by the president and the head of the Music Department, who shall be guided solely by consideration of merit.

THE '89 MEMORIAL PRIZE IN HISTORY

A prize of $100 is offered biennially (odd years) for the best thesis in history, written from the sources. It is open to undergraduate and graduate students. It will not be offered until 1933.

LAMBDA ALPHA PSI PRIZE

Lambda Alpha Psi, the honorary language society, in order to encourage independent work in languages and literature among the undergraduates of the University, offers two annual prizes of $50 and $25 for the best essays in this field.

H. P. LINNER PRIZES

Gift of $200 from Dr. H. P. Linner for three prizes—first, $100; second, $60; and third, $40, to be awarded annually upon the recommendation of the Department of Scandinavian Languages for exceptional progress in the study of the Swedish language, for general scholarship, and for character and extra-curricular activities in promoting Swedish cultural interests at the University of Minnesota.

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 10,000 words, must be handed to one of the instructors in political science by May 1. The next award will be made in 1930.

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 field 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.

CHI OMEGA PRIZE

The Chi Omega prize of $25 is awarded annually to the woman student who has excelled in social work in the Department of Sociology. All senior women following the training course for social and civic work or one of the sequences of applied sociology are eligible for consideration. The award is made on the basis of academic standing plus personality, judged not only by instructors in the courses, but by the supervisors in social agencies who direct the practical work.

HELEN DWAN PRIZE

Gift of $2,100 from Mrs. Helen R. Dwan for the establishment of the Helen Dwan Fund, with the understanding that the income from this fund will be used as a prize to be awarded each year to a student in the Department of Music, junior or senior, and with the further understanding that the principal and income, either or both, may be used as a loan fund in the Department of Music.

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 clubhouse for such purpose. All men students of the University are active members of the Union. The membership fee is included in the incidental fee paid each quarter. 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, rooms for games, private dining rooms for students and faculty luncheons, and a ballroom.

The Union gives periodical social activities in the nature of an open house. Reservations for meeting rooms are made through the manager's office.

The Women's Self-Government Association is composed of all the women students of the University. Membership is automatic on the payment of registration fees. 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. Headquarters 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 *All-University Council* is composed of representatives of the senior and junior classes. There is one senior representative from each of the twelve colleges, and one junior representative elected for a term of two years, from each of three groups of colleges—professional, technical and academic-education. Its functions are: to recognize the common purpose and responsibility of students and faculty in the development and safeguarding of the University; to build and develop a spirit of co-operation; to represent the whole student body in matters affecting student interest; to afford a suitable medium for communication and contact between the student body and the university authorities; and to exercise general supervision over student activities.

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

MISCELLANEOUS ORGANIZATIONS

There are at the University more than two hundred student organizations representing religious, ethical, literary, scientific, technical, 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 bulletin of general information, the annual announcement of individual colleges of the University, announcements of special courses of instruction, reports of officers, etc.

The University Press.—The University of Minnesota Press is a department of the University devoted primarily to the publication of books, both of general and of special scholarly and scientific interest. It also issues at irregular intervals the following series of research publications: Social Science Monographs, Publications of the Bureau for Research in Government, Monographs, Studies, and Reports in Education, Child Welfare Monographs, Language and Literature Series, Biological Sciences Series (including Minnesota Studies in Plant Science), Bulletins of the Minnesota Geological Survey, Studies in Engineering, Bibliography Series, Syllabus Series.

A complete catalog of the University of Minnesota Press will be furnished by the Press upon request.

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 Official Daily Bulletin, published in *The Minnesota Daily,* 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 Gopher, the senior annual, is a book published annually by the senior class of the University.

The Minnesota Alumni Weekly, issued each Wednesday during the university year, is published in the interests of alumni and the University.

Minnesota Chats is a monthly publication of general university character designed to carry to the Minnesota public the more interesting problems and achievements of the state's principal educational institution. It is sent without charge to those who ask to be placed on its lists.

The Minnesota Quarterly, a literary magazine, is published three times during the university year, by a student editorial board of five members. It is devoted to the publication of the best literary work done by the students of the University.

The Bulletin of the Engineering Experiment Station is devoted to reports and announcements regarding the activities of the station and the various investigations carried on under its auspices.

The Techno-Log is issued monthly during the academic year by students in the College of Engineering and Architecture, and the School of Chemistry. It is devoted to articles on engineering subjects and to student and alumni news.

The Minnesota Mentor is issued three times a year by students in the College of Education. It is devoted to matters of interest to undergraduate and graduate students in education.

The Gopher Business News is a magazine published three times during the academic year by the students of the School of Business Administration. It is devoted to articles on business and to news of general interest to the student body and alumni of the school.

Agricultural Experiment Station Bulletins give the results of experiments carried on at University Farm and at the branch stations at Crookston, Morris, Grand Rapids, Duluth, Waseca, Cloquet, and Zumbra Heights, as rapidly as such work is completed or as soon as conclusions of economic value are reached. At least four bulletins are published annually; usually the number is much larger. An *Annual Report* of the station and branch stations summarizes the work accomplished from year to year.

The Agricultural Extension Division Special Bulletins, and *Circulars,* are a series of popular pamphlets issued by the Agricultural Extension Division, designed to inform farmers and others interested as to methods tried out at the Experiment Station and its branches, or elsewhere under the direction of the station staff, and approved as good practice in Minnesota.

The News Letter is a weekly clip sheet issued by the Agricultural Extension Division, containing items of news and agricultural information for reprinting in the newspapers of the state.

The Extension Service News is a monthly publication intended as a medium for the exchange of news among those connected with the agricultural extension activities in the state.

The Visitor is a news letter issued monthly by the Division of Agricultural Education of the College of Education and the College of Agriculture, Forestry, and Home Economics, for teachers of agriculture, superintendents of schools, and students of education under the division named.

The Gopher Countryman is a monthly magazine published by the students of the College of Agriculture, Forestry, and Home Economics, for the publication of matters of interest to students and alumni and faculty.

The Gopher Peavey is a booklet published annually by the students in the Forestry course of the College of Agriculture, Forestry, and Home Economics.

The News of the School of Agriculture is a newspaper issued during the months of October, November, December, January, February, March, June, and August by the Central School of Agriculture as a means of keeping students and alumni informed of the activities of the school and its students.

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

The Northwest Monthly is a small paper published to report activities at the Northwest School and Station at Crookston.

The West Central School News is a quarterly, four-page newspaper, giving reports of the activities of the West Central School of Agriculture and the Experiment Station, Morris.

The Red River Aggie is a book published annually by the Northwest School of Agriculture.

The Moccasin is a book published annually by the West Central School of Agriculture.

Minnesota Law Review.—A legal magazine published monthly, December to June, inclusive, by the faculty and students of the Law School. It is the official journal of the Minnesota State Bar Association.

School of Mines and Metallurgy Experiment Station Bulletins contain reports 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 co-operation 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 Reports 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; Foundry Sands of Minnesota; A Contribution to the Geology of the Mesabi Range; A Guidebook to Minnesota Trunk Highway No. 1; The Geology and Magnetite Deposits of Northern St. Louis County.* These are for sale by the University Press. A complete list will be sent on request.

The Bulletin *of the* University *of* Minnesota

The College of Science, Literature, and the Arts

Part I

Announcement of Courses for the Years 1931-1933

Vol. XXXIV No. 25 April 4 1931

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THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

FACULTY

ADMINISTRATION

Lotus Delta Coffman, Ph.D., LL.D., President
William Watts Folwell,[1] 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
Joseph M. Thomas, Ph.D., Assistant Dean for the Senior College and Professor of English
William H. Bussey, Ph.D., Assistant Dean for the Junior College and Professor of Mathematics
Royal R. Shumway, B.A., Assistant Dean for Students' Work and Associate Professor of Mathematics

ANTHROPOLOGY

Albert Ernest Jenks, Ph.D., D.Sc., Professor and Chairman
Wilson D. Wallis, Ph.D., Professor

ARCHITECTURE

See the bulletin of the College of Engineering and Architecture.

ASTRONOMY

Clifford Crump,[2] Ph.D., Professor
William O. Beal, Ph.D.,[3] Assistant Professor
Willem J. Luyten, Ph.D., Assistant Professor
John S. Allen, M.A., Assistant
Christine Westgate, B.S., Assistant

BACTERIOLOGY

See the bulletin of the Medical School.

BOTANY

J. Arthur Harris, Ph.D.,[4] Professor and Head
William S. Cooper, Ph.D.,[5] Professor
Carl O. Rosendahl, Ph.D., Professor
Josephine E. Tilden, M.S., Professor

[1] Died, September 18, 1929.
[2] Resigned, June 30, 1930.
[3] Died, February 15, 1930.
[4] Died, April 27, 1930.
[5] Absent on leave, 1931-32.

George O. Burr, Ph.D., Associate Professor
Frederic K. Butters, Ph.D., Associate Professor
Rodney B. Harvey, Ph.D., Associate Professor
Ned L. Huff, M.A., Assistant Professor
Alan E. Treloar, Ph.D., Assistant Professor
Ethel Sue Horton, M.A., Instructor
Ethel M. Mygrant, M.S., Instructor
Henry Oosting, Ph.D., Instructor
Helen Foot, M.A., Assistant
Marjorie A. Forbes, M.A., Assistant
Martin L. Grant, M.A., Assistant
Borghild Gunstad, B.S., Assistant
Robert R. Humphrey, M.A., Assistant
Vera Koerper, B.A., Assistant
Elmer S. Miller, B.S., Assistant
Edwin W. Tisdale, B.S., Assistant
Fern Ward, M.A., Assistant
Esther H. Wilson, B.A., Assistant and Technician

CHEMISTRY

See the bulletin of the School of Chemistry

AGRICULTURAL BIOCHEMISTRY

See the bulletin of the College of Agriculture, Forestry, and Home Economics.

COMPARATIVE LITERATURE

Oscar W. Firkins, M.A., Professor

COMPARATIVE PHILOLOGY

Frederick Klaeber,[1] Ph.D., Litt.D., Professor and Head

DRAWING AND DESCRIPTIVE GEOMETRY

See the bulletin of the College of Engineering and Architecture.

ENGLISH

Cecil A. Moore, Ph.D., Professor and Chairman
Joseph W. Beach, Ph.D., Professor
J. Douglas Bush, Ph.D., Professor
Martin B. Ruud, Ph.D., Professor
Elmer E. Stoll, Ph.D., Professor
Joseph M. Thomas, Ph.D., Professor
G. Tremaine McDowell, Ph.D., Associate Professor
Elizabeth Atkins, Ph.D., Assistant Professor
Muriel B. Carr, Ph.D., Assistant Professor

[1] Retired, June 30, 1931.

William P. Dunn, Ph.D., Assistant Professor
L. Burton Hessler,[1] Ph.D., Assistant Professor
James T. Hillhouse, Ph.D., Assistant Professor
Elizabeth Jackson, Ph.D., Assistant Professor
Charles W. Nichols, Ph.D., Assistant Professor
Anna H. Phelan, Ph.D., Assistant Professor
Harlow C. Richardson, B.A., Assistant Professor
Amy Armstrong, M.A., Instructor
Curtis E. Avery, M.A., Instructor
Roman Becker, M.A., Instructor
Luther Becklund, B.A., Instructor
Herbert C. Behm, M.A., Instructor
Arthur L. Bradford, M.A., Instructor
Harold E. Briggs, M.A., Instructor
Frank Buckley, M.A., Instructor
Ruth Christie, M.A., Instructor
John W. Clark, M.A., Instructor
Frances K. del Plaine, M.A., Instructor
James M. Edmunds, M.A., Instructor
John T. Flanagan, M.A., Instructor
Margaret Gable, M.A., Instructor
Adah Grandy, B.L., Instructor
Ledru O. Guthrie, M.A., Instructor
Clifford Haga, B.A., Instructor
Jesse McFadyen, Ph.D., Instructor
Paul Mahon, B.A., Instructor
Edward Mallam, M.A., Instructor
Franz Montgomery, M.A., Instructor
Dorothy Poindexter, M.A., Instructor
John Rusinko, M.A., Instructor
Margaret S. Scallon, M.A., Instructor
Norman J. Sykes, M.A., Instructor
Edgar W. Weaver, B.A., Instructor
John W. Powell, B.A., S.T.D., D.D., Lecturer
William Bjornstad, M.A., Assistant
Evelyn Dickinson, B.A., Assistant
Bessie Dworsky, B.A., Assistant
Elizabeth Ebeling, B.A., Assistant
Roberta Grahame, B.A., Assistant
Lorraine Kranhold, B.A., Assistant
Mildred Lindou, B.A., Assistant
Florence Litchfield, B.A., Assistant
Ruth Norman, B.A., Assistant
G. Hubert Smith, B.A., Assistant
Gracia Torinus, B.A., B.S., Assistant

[1] Absent on leave, 1931-32.

Luella Tressman, M.A., Assistant
Donald Wandrei, B.A., Assistant

ENTOMOLOGY AND ECONOMIC ZOOLOGY

See the bulletin of the College of Agriculture, Forestry, and Home Economics.

FINE ARTS

Everard M. Upjohn, M.Arch., Assistant Professor

GEOGRAPHY

Darrell H. Davis,[1] Ph.D., Professor and Head
Ralph H. Brown, Ph.D., Assistant Professor
Richard Hartshorne,[2] Ph.D., Assistant Professor
Russell C. Carlson, B.S., Instructor
Samuel N. Dicken, Ph.D., Instructor

GEOLOGY AND MINERALOGY

William H. Emmons, Ph.D., Professor and Head
Frank F. Grout, Ph.D., Professor
Clinton R. Stauffer, Ph.D., Professor
John W. Gruner, Ph.D., Associate Professor
George M. Schwartz, Ph.D., Associate Professor
George A. Thiel, Ph.D., Associate Professor
Carl E. Dutton, M.A., Instructor
Charles A. Park, Ph.D., Instructor
Archie Mathewson, M.A., Instructor
Thomas Andrews, M.A., Assistant
Olen L. Backman, M.A., Assistant
Kenneth M. Gold, M.A., Assistant
Louis H. Powell, B.A., Assistant

GERMAN

Samuel Kroesch, Ph.D., Professor and Chairman
Oscar C. Burkhard, Ph.D., Professor
George F. Lussky, Ph.D., Associate Professor
James Davies, Ph.D., Assistant Professor
Frederick L. Pfeiffer, Ph.D., Assistant Professor
Bertha Bertsch, M.A., Instructor
Fred B. Gerstung, M.A., Instructor
Alvin E. Prottengeier, M.A., Instructor
Gina Wangsness, M.A., Instructor
Marcella Gosch, B.A., Teaching Assistant
Otto Herzog, M.A., Teaching Assistant
Ernest Howald, M.A., Teaching Assistant

[1] Absent on leave, spring quarter, 1931-32.
[2] Absent on leave, 1931-32.

Hans F. Laas, Teaching Assistant
Marie Matt, B.A., Teaching Assistant
Joseph Meidt, M.A., Teaching Assistant
Eugene H. Mueller, B.A., Teaching Assistant
Albert R. Rathert, B.A., Teaching Assistant

GREEK

Charles A. Savage, Ph.D., Professor and Chairman
John Corrin Hutchinson, B.A., Professor Emeritus
Arthur C. P. Hays, B.A., Teaching Assistant

HISTORY

Lester B. Shippee, Ph.D., Professor and Chairman
Solon J. Buck,[1] Ph.D., Professor
Alfred L. Burt, M.A., Professor
Clarence C. Crawford, Ph.D., Professor
Guy Stanton Ford, Ph.D., Professor
Herbert Heaton,[2] M.A., M.Com., Litt.D., Professor
August C. Krey, Ph.D., Professor
Albert B. White, Ph.D., Professor
Theodore Blegen, Ph.D., Associate Professor
George M. Stephenson, Ph.D., Associate Professor
Harold C. Deutsch, Ph.D., Assistant Professor
William McDonald, Ph.D., Assistant Professor
Ernest S. Osgood, Ph.D., Assistant Professor
Lawrence D. Steefel, Ph.D., Assistant Professor
Faith Thompson, Ph.D., Assistant Professor
Alice Felt Tyler, Ph.D., Assistant Professor
David H. Willson, Ph.D., Assistant Professor
John LaMont, Ph.D., Lecturer
Norma Adams, M.A., Teaching Assistant
Robert H. Bahmer, M.A., Teaching Assistant
Lewis Beeson, M.A., Teaching Assistant
Charlotte Butler, B.A., Teaching Assistant
Edna I. Coder. B.A., Teaching Assistant
Iona Fortune, B.A., Teaching Assistant
Charles M. Gates, M.A., Teaching Assistant
Olaf L. Hagen, M.A., Teaching Assistant
Margareth Jorgenson, B.A., Teaching Assistant
Robert Netherly, B.A., Teaching Assistant
George A. Palmer, B.A., Teaching Assistant
Renata Pecinovsky, M.A., Teaching Assistant
Carlton C. Qualey, M.A., Teaching Assistant
Hazel Riggs, M.A., Teaching Assistant

[1] Resigned, June 30, 1931.
[2] Absent on leave, 1931-32.

Roma Shively, M.A., Teaching Assistant
Beatrice Siedschlag, B.A., Teaching Assistant
Jean Watkins, B.A., Teaching Assistant
Hedvig Ylvisaker, M.A., Teaching Assistant
Stanley B. Newhall, B.A., Assistant

HOME ECONOMICS

See the bulletin of the College of Agriculture, Forestry, and Home Economics.

HUMAN ANATOMY

See the bulletin of the Medical School.

JOURNALISM

Ralph D. Casey, Ph.D., Professor and Chairman
Kenneth E. Olson, M.A., Professor
Thomas F. Barnhart, B.A., Assistant Professor
Robert W. Desmond, M.A., Assistant Professor
Edwin H. Ford, M.A., M.S., Assistant Professor
Thomas E. Steward, B.A., Assistant Professor
Fred L. Kildow, B.A., Instructor
George L. Peterson,[1] B.A., Instructor
Thomas E. Quillman, B.A., Teaching Assistant

LATIN

Joseph B. Pike, M.A., Professor and Head
Robert V. Cram, Ph.D., Assistant Professor
Emily A. Babcock, M.A., Instructor

LIBRARY METHODS

Frank K. Walter, M.A., M.L.S., Professor
Ina T. Firkins, B.L., Associate Professor
Lura C. Hutchinson, B.A., Assistant Professor
Harold Russell, B.A., B.L.S., Assistant Professor
Clara F. Baldwin. B.A., Instructor
Della McGregor, B.A., Instructor
Harriet A. Wood, B.A., Instructor

MATHEMATICS

Raymond W. Brink, Ph.D., Professor and Chairman
William H. Bussey, Ph.D., Professor
William L. Hart, Ph.D., Professor
Dunham Jackson, Ph.D., Professor
Royal R. Shumway, B.A., Associate Professor
Anthony L. Underhill, Ph.D., Associate Professor

[1] Resigned, March 31, 1931.

S. Elizabeth Carlson, Ph.D., Assistant Professor
Gladys E. C. Gibbens, Ph.D., Assistant Professor
Ella A. M. Thorp, B.A., Instructor
William McEwen, M.A., Teaching Assistant
Edwin Oberg, B.A., Teaching Assistant
Erling Ordal, B.A., Teaching Assistant
Marion Wilder, M.A., Teaching Assistant

MECHANICAL ENGINEERING

See the bulletin of the College of Engineering and Architecture.

MILITARY SCIENCE AND TACTICS

John H. Hester, Major, Infantry, Professor and Head
William G. Guthrie, Major, Medical Corps, Assistant Professor
Willis Shippam, Major, Coast Artillery Corps, Assistant Professor
William C. Webb, Jr., Major, Dental Corps, Assistant Professor
William A. Ellis, Captain, Infantry, Assistant Professor
Murray T. Davenport, Captain, Infantry, Assistant Professor
Emil Krause, Captain, Infantry, Assistant Professor
William G. Walker, Captain, Infantry, Assistant Professor
Porter P. Wiggins, Captain, Infantry, Assistant Professor
Vincent J. Conrad, First Lieutenant, Infantry, Assistant Professor
Richard A. Ericson, First Lieutenant, Coast Artillery Corps, Assistant Professor
Harlan N. Hartness, First Lieutenant, Infantry, Assistant Professor
Rex W. Minckler, First Lieutenant, Signal Corps, Assistant Professor
Hewitt W. Richmond, First Lieutenant, Coast Artillery Corps, Assistant Professor
Alfred Brandt, Master Sergeant, Infantry, Instructor
Harry E. Strider, Master Sergeant, Signal Corps, Instructor
Aubrey Dunkum, Technical Sergeant, Coast Artillery Corps, Instructor
Roy Cunningham, Staff Sergeant, Infantry, Instructor
John Coop, Sergeant, Infantry, Instructor
Ernest R. Mylk, Sergeant, Coast Artillery Corps, Instructor
Clayton A. Peterson, Sergeant, Infantry, Instructor

MUSIC

Carlyle M. Scott, Professor and Chairman
Donald N. Ferguson, M.A., Professor
Earle G. Killeen, M.M., Professor
Gertrude Hull, Associate Professor
William Lindsay, Associate Professor
George H. Fairclough, F.A.G.O., M.Mus., Assistant Professor
Blanche Kendall, Assistant Professor of Piano
Gertrude Reeves, Assistant Professor

Clyde Stephens, Assistant Professor of Piano
Harold Ayres, Instructor in Violin
Cecil Birder, Instructor in Voice
Henry Cunnington, Instructor in Bassoon
Christian Erck, Instructor in Cello
Roger Gauthier, Instructor in Oboe
Georges Grisez, Instructor in Clarinet
Michael Jalma, Band Master and Instructor
Paul Lemay, Instructor in Viola
Richard Lindenhahn, Instructor in French Horn
Karl Scheurer, Instructor in Violin
Jascha Schwarzman, Instructor in Cello
Miles Sery, Instructor in Trumpet
Agnes R. Snyder, Instructor in Voice
George Stump, Instructor in Voice
Kate M. Twitchell, Instructor in Piano
Frederick L. Hughart, B.A., Assistant
Mary Malcolm, B.S., Assistant
Jean Mickey, B.A., Assistant

ORIENTATION

Edward H. Sirich, Ph.D., Professor of Romance Languages
J. William Buchta, Ph.D., Associate Professor of Physics
Frederic K. Butters, Ph.D., Associate Professor of Botany
John J. Reighard, M.A., C.P.A., Associate Professor of Business Administration
Samuel N. Dicken, Ph.D., Instructor in Geography
Mary J. S. Kuypers, Ph.D., Instructor

PHILOSOPHY

Norman Wilde, Ph.D., Litt.D., Professor and Head
David F. Swenson, B.S., Professor
George P. Conger, Ph.D., Associate Professor
Alburey Castell, Ph.D., Instructor
Michael de la Bedoyere, B.A., Instructor
George Gentry, Ph.D., Instructor
Svin Nilson, Ph.D., Instructor
Rose Gero, B.A., Assistant
John C. Henry, B.A., Assistant

PHYSICAL EDUCATION FOR MEN

See the bulletin of the College of Education.

PHYSICAL EDUCATION FOR WOMEN

See the bulletin of the College of Education.

PHYSICS

Henry A. Erikson, Ph.D., Professor and Chairman
Edward U. Condon,[1] Ph.D., Professor of Theoretical Physics
J. Frenkel,[2] Ph.D., Professor of Theoretical Physics
Louallen F. Miller, Ph.D., Professor
John T. Tate, Ph.D., Professor
Anthony Zeleny, Ph.D., Professor
J. William Buchta, Ph.D., Associate Professor
Joseph Valasek, Ph.D., Associate Professor
Edward L. Hill, Ph.D., Assistant Professor
Owen W. Anderson, M.S., Teaching Assistant
Lester Borchardt, B.E.E., Teaching Assistant
Max Goodrich, B.A., Teaching Assistant
William B. Halliday, B.A., Teaching Assistant
Elmo Hanson, B.A., Teaching Assistant
John Liska, B.S., Teaching Assistant
Moaling Liu, B.S., Teaching Assistant
Leon S. Nergaard, B.S., Teaching Assistant
Philip T. Smith, B.A., Teaching Assistant
Alfred Vaughan, B.A., Teaching Assistant
Wilfred W. Wetzel, B.A., Teaching Assistant

PLANT PATHOLOGY

See the bulletin of the College of Agriculture, Forestry, and Home Economics.

POLITICAL SCIENCE

William Anderson, Ph.D., Professor and Chairman
Morris B. Lambie, Ph.D., Professor
Harold Quigley, Ph.D., Professor
Jeremiah S. Young, Ph.D., Professor
Oliver P. Field. M.A., S.J.D., Associate Professor
Lennox Mills, Ph.D., Assistant Professor
Allan F. Saunders,[2] Ph.D., Assistant Professor
Joseph R. Starr, Ph.D., Assistant Professor
Benjamin E. Lippincott,[3] Ph.D., Instructor
Edwin O. Stene, M.A., Instructor
Robert Connery, M.A., Teaching Assistant
J. Murdoch Dawley, M.A., LL.B., Teaching Assistant
Clayton D. Ford, M.A., Teaching Assistant
T. Edgar Henderson, B.S., Teaching Assistant
Elmer E. Hilpert, B.A., Teaching Assistant
Ralph A. Norem, M.A., Teaching Assistant
Harvey F. Pinney, M.A., Teaching Assistant

[1] Resigned, June 30, 1930.
[2] Resigned, June 30, 1931.
[3] Absent on leave, spring quarter, 1931-32.

William Verhage, M.A., Teaching Assistant
Doris Anderson, B.A., Assistant
Raymond Elvin, B.A., Assistant

PREVENTIVE MEDICINE AND PUBLIC HEALTH

See the bulletin of the Medical School.

PSYCHOLOGY

Richard M. Elliott. Ph.D., Professor and Chairman
Donald G. Paterson, M.A., Professor
Charles Bird, Ph.D., Associate Professor
Edna Heidbreder, Ph.D., Associate Professor
William Heron, Ph.D., Assistant Professor
Kate Hevner, Ph.D., Assistant Professor
Miles Tinker, Ph.D., Assistant Professor
Edmund G. Williamson, Ph.D., Assistant Professor
Starke R. Hathaway, M.A., Lecturer
Howard Longstaff, Ph.D., Lecturer
Fred Beers, B.A., Instructor
Egerton L. Ballachey, B.A., Teaching Assistant
Eleanor Brussel, B.A., Teaching Assistant
Alice Christian, B.A., Teaching Assistant
Milton C. Forster, M.A., Teaching Assistant
Arden Frandsen, B.A., Teaching Assistant
Grace Holmes, M.A., Teaching Assistant
Hilda Iseli, B.A., Teaching Assistant
Sara Levy, B.A., Teaching Assistant
Oscar F. Litterer, B.A., Teaching Assistant
Alice M. Michels, B.A., Teaching Assistant
Elsa Rendahl, B.A., Teaching Assistant
Isabel Rosenstein, M.A., Teaching Assistant
Cornelia Taylor, B.A., Teaching Assistant
Evelyn M. Warnke, B.A., Teaching Assistant
Bill H. Williams, B.A., Teaching Assistant
Beatrice Dvorak, M.A., Assistant
Frederick Foote, B.A., Assistant

ROMANCE LANGUAGES

Everett W. Olmsted, Ph.D., Litt.D., Professor and Head
Francis B. Barton, Docteur de l'Université de Paris, Professor
Irville C. LeCompte, Ph.D.. Professor
Colbert Searles, Ph.D., Professor
Edward H. Sirich, Ph.D., Professor
Carlos V. Arjona,[1] Ph.D., Associate Professor

[1] Leave of absence, 1931-32.

Herbert E. Clefton, M.A., Assistant Professor
Jules T. Frelin, B.A., Assistant Professor
Elizabeth Nissen, Ph.D., Assistant Professor
Jean Boyer, Licencie ès Lettres, Professorial Lecturer
Emmert Brackney, M.A., Instructor
Marguerite Guinotte, M.A., Certificat d'Aptitude Pedagogique, Instructor
Clinton C. Humiston, B.S., Instructor
Mabel C. Johnson, M.A., Instructor
Paul H. Johnstone, M.A., Instructor
Howard S. Jordan, M.A., Instructor
Emilio LeFort, M.A., Instructor
Channing MacFadon, M.A., Instructor
J. Henry Owens, Ph.D., Instructor
Robert E. Pike, B.A., Instructor
George R. Hilton, B.A., Teaching Assistant
Stanley D. Kane, M.A., Teaching Assistant
Mary B. McDonald, M.A., Teaching Assistant
Augusta Nelson, M.A., Teaching Assistant

SCANDINAVIAN

Andrew A. Stomberg, M.S., Professor and Chairman
Aage Brusendorff, Ph.D., Professor
Didrik A. Seip, Professor
Thorvald B. Madsen, M.A., Instructor
Alice Johnson, B.S., Assistant

SOCIOLOGY AND SOCIAL WORK

F. Stuart Chapin, Ph.D., Professor, Chairman, and Director of the Training Course for Social and Civic Work
Max Handman,[1] Ph.D., Professor
Robert W. Murchie, Ph.D., Professor
Pitirim A. Sorokin,[2] Doctor of Sociology, Professor
Edward A. Ross, Ph.D., Professor
Edwin H. Sutherland,[2] Ph.D., Professor
Malcolm Willey, Ph.D., Professor
Clifford Kirkpatrick, Ph.D., Associate Professor
George O. Lundberg,[2] Ph.D., Associate Professor
Gertrude Vaile, M.A., Associate Professor
Carle C. Zimmerman,[1] Ph.D., Associate Professor
Anne L. Fenlason, M.A., Assistant Professor
Ross L. Finney, LL.B., Ph.D., Assistant Professor
Elizabeth G. Gardiner, B.S., Assistant Professor
Gustav A. Lundquist, Ph.D., Assistant Professor
Mildred D. Mudgett,[2] Ph.D., Assistant Professor

[1] Resigned June 30, 1931.
[2] Resigned June 30, 1930.

Calvin F. Schmid, Ph.D., Assistant Professor
George B. Vold,[1] Ph.D., Assistant Professor
Ellinor I. Black, B.Sc.(Econ.), Lecturer
Otto F. Bradley, B.A., Lecturer
Gertrude Cammack, B.A., Lecturer
Monica K. Doyle, M.A., Lecturer
Samuel H. Jameson, Ph.D., Lecturer
Alice Leahy, M.A., Lecturer
Pearl Salsberry, B.A., Lecturer
Edwin F. Waite, B.A., LL.M., Lecturer
Raymond V. Bowers, M.A., Instructor
Walter O. Cralle, M.A., Instructor
Irene Hill, B.S., Instructor
Marion D. Iverson, B.A., Instructor
Amaretta Jones, B.A., R.N., Instructor
Paul H. Landis, M.A., Instructor
Elio Monachesi, Ph.D., Instructor
Lucille Quinlan, B.A., Instructor
Raymond F. Sletto, B.S., Instructor
A. Steven Stephan, M.A., Instructor
Nathan Whetten, M.A., Instructor
Barnett O. Williams, M.S., Instructor
Alfreda Davis, B.A., Teaching Assistant
Isaac Hoffman, B.A., Teaching Assistant
Mary McCune, B.A., B.S., Teaching Assistant
Gladys Rideout, B.A., Teaching Assistant
Mary W. Smith, B.A., Teaching Assistant
Carmen Frazee, B.S., Assistant
Dorothy Hosford, B.A., Assistant
Carl W. Masche, B.A., Assistant
Rose Seiler, B.A., Assistant

SPEECH

Frank M. Rarig, M.A., Professor and Chairman
Bryng Bryngelson, M.A., Assistant Professor
F. Lincoln D. Holmes, Ph.D., Assistant Professor
Lou Kennedy, Ph.D., Assistant Professor
Edward Staadt,[2] B.L., Assistant Professor
Howard Gilkinson, M.A., Instructor
Melba Hurd, B.A., Instructor
Franklin H. Knower, M.A., Instructor
Helen McLachlan, M.A., Instructor
Agnes T. Somer, M.A., Instructor
Luverne Ramsland, M.A., Teaching Assistant

[1] Absent on leave, 1930-31.
[2] Died, June 24, 1931.

ZOOLOGY

Dwight E. Minnich, Ph.D., Professor and Chairman
Henry F. Nachtrieb, B.S., Professor Emeritus
William A. Riley, Ph.D., D.Sc., Professor
Thomas S. Roberts, M.D., Professor
Charles P. Sigerfoos, Ph.D., Professor
Jerry Wodsedalek, Ph.D., Professor
Adolph Ringoen, Ph.D., Associate Professor
Ralph Dawson, Ph.D., Assistant Professor
Samuel Eddy, Ph.D., Assistant Professor
Clarence E. Mickel, Ph.D., Assistant Professor
John A. Cederstrom, Ph.B., Instructor
Reed O. Christenson, M.S., Instructor
Alexander C. Hodson, B.S., Instructor
Ethel Slider, B.S., Instructor
John P. Turner, Ph.D., Instructor
Almeda Anderson, B.A., Teaching Assistant
Herman C. Arneson, B.A., Teaching Assistant
Selma Crow, B.S., Teaching Assistant
Leslie Bergren, B.S., Teaching Assistant
Willis Gertsch, M.A., Teaching Assistant
Anna Harms, M.A., Teaching Assistant
Bertis L. Hawkins, B.S., Teaching Assistant
Paul Highby, B.A., Teaching Assistant
Kenneth L. Hobbs, B.A., Teaching Assistant
Isabelle Jeffrey, B.A., Teaching Assistant
Ralph W. Macy, B.A., Teaching Assistant
Earle Murdoch, B.A., Teaching Assistant
O. Wilford Olsen, B.A., Teaching Assistant
Isadore Pass, B.A., Teaching Assistant
Ruth A. Strandberg, B.S., Teaching Assistant
Gustav A. Swanson, B.S., Teaching Assistant
C. A. Swinyard, M.S., Teaching Assistant
Merlin O. Zenner, B.A., Teaching Assistant
Grace E. Friedlund, Assistant
De Forrest Olson, B.S., Assistant
Robert W. Phares, B.A., Assistant

GENERAL INFORMATION

1. *Admission to the freshman year.*—Students are admitted to this college either by certificate from an accredited secondary school or by examination. For details concerning the requirements in either case consult the bulletin of general information, pages 30 to 32.

2. *Examination in English.*—All students registering for English A-B-C or Composition 4-5-6 are required to take a series of tests in English. Any student in either course who fails to pass this examination will be required to register with the Extension Division for subfreshman composition for as many quarters as may be necessary. During this time he can be registered in this college for not more than fourteen credits.

On the basis of these tests students will be further divided into three groups: (1) those of whom no further work in English is required; (2) those who will be allowed to register for English A-B-C; (3) those who will be restricted to a three-credit course in composition.

3. *Exemption from requirement in English.*—Those students who meet certain standards of competence in the tests mentioned above will be exempted from required work in English. These students may register for any courses in English, Composition, or Speech, for which the only prerequisite is English A-B-C or Composition 4-5-6.

4. *Adult special students.*—Persons of maturity (at least 24 years of age) who desire to pursue a special and limited course of study may be admitted by the Students' Work Committee as adult special students. The registration of such students will be under the control of the committee.

Application for registration as an adult special student should be made not later than September 15, December 15, or March 15, depending upon the quarter the candidate desires to enter the college.

5. *Admission to advanced standing.*—Attention is called to the following rules governing students entering this college with advanced standing from some other institution.

a. 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.

b. 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.

c. 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.

6. *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.

7. *Examinations for credit.*—Credit for work done outside of class may be obtained by taking special examinations. Application should be made to the assistant dean for students' work.

8. No student may receive by means of such an examination, more than 12 credits in one department, or more than a total of 18 credits, toward graduation.

9. No credit in beginning language courses may be gained by special examination.

10. *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, and no student will be enrolled after the first week of the quarter. (See also section 13, Penalty Fees.)

11. No student will receive credit for work for which he is not properly registered.

12. *Fees.*—Tuition fee (per quarter)

Residents of Minnesota	$20.00
Non-residents	30.00
Credit hour tuition fee (unclassed students, auditors, and others carrying less than full work)	
Residents of Minnesota	1.75
Non-residents	2.50
Incidental fee (per quarter)	6.00
Matriculation deposit[1] (first quarter only)	
Men	15.00
Women	5.00
Special fees	
Fees for individual courses are specified in the course announcements.	
Examination for removal of condition	1.00
Examination for credit (after the first quarter in residence)	5.00
Special examination	5.00
Laboratory deposit (required of students registered for courses in chemistry)	5.00
Graduation fee	10.00
Music fees (in addition to tuition) for those electing music Courses A-B-C, 10, 11, 12, 13	
1 lesson per week, 2 credits in one subject	$35.00
2 lessons per week, 4 credits in one subject	65.00
2 lessons per week, 2 credits in each of two subjects	70.00

[1] Such charges as may be incurred for lockers, library penalties, laboratory breakage, etc., will be deducted from the amount of this deposit and the balance will be refunded by mail upon graduation or after the beginning of the first quarter the student fails to return to the University.

Courses 14 to 26 (Orchestral Instruments)

1 lesson per week, 2 credits in one subject..... 40.00

2 lessons per week, 4 credits in one subject 75.00

2 lessons per week, 2 credits in each of two subjects 80.00

Practice fees

Organ (per hour) .....0.20 to 0.40

Piano[1] (per quarter) 5.00

($.50 per quarter for each additional hour per week)

13. *Penalty fees.*—A penalty fee for late registration, late change of registration, or late payment of fees shall be $2 prior to the day classes begin, on and after which the penalty increases at the rate of $1 per day, provided that no student shall pay more than $10 of penalty in any given quarter.

14. *Auditors.*—Under certain conditions stated below students may be enrolled as auditors and may hear lectures and class discussions regularly without being required to do the work of the course. No regular student may be admitted to classes as an auditor until his senior year.

15. Any mature person not a regular student may be admitted as an auditor to any course under the following regulations:

a. He shall secure the written approval of the dean and of the instructor in charge of the course.

b. He shall present such approval to the registrar and pay the usual fee charged for regular membership in such a course. See section 12.

16. Attendance as an auditor does not entitle one to credit or to admission to regular examinations in the course.

17. Any senior whose high scholastic standing enables him to carry a small program may register as an auditor under the same regulations.

18. *Grades.*—Four grades, A, B, C, and D, are given for work of varying degrees of merit. The grade D permits a student to register for continuation or dependent courses; and work completed with this grade is counted toward graduation when combined with work of A or B grade in other courses. The grade C indicates work of a quality acceptable for graduation; the grades B and A are given for work of higher degrees of excellence.

Work of inferior grade is marked E (condition) or F (failure). Work which is of at least D grade but, because of circumstances beyond the student's control, not complete, may be marked I (incomplete).

19. *Credits and honor points* are used for convenience in indicating amount and quality of work.

Amount of work is expressed in *credits.* Each credit demands on the average three hours a week of a student's time; that is, one recitation with two hours of preparation, or three hours of laboratory work.

Quality of work is indicated by *honor points.* Honor points are assigned to the various grades on the assumption that work of a quality

[1] Six hours per week.

acceptable for graduation is graded at least C. (See section 18.) Each credit with the grade of C carries one honor point; each credit with the grade of B, two honor points; each credit with the grade of A, three honor points. The grade of D carries no honor points. The grade of F carries minus one honor point per credit. The penalty cannot be removed by repeating the course with a passing grade.

A student who maintains an average of one honor point per credit is proceeding normally to fulfill the requirements for graduation or for admission to the professional schools. By maintaining an average better than C, a student is able to reduce the amount of work which he is required to complete. (See sections 34 to 36.)

20. *The grade I (incomplete)* cannot be given when the work not completed represents more than one fourth of the quarter's work.

21. An *incomplete* not removed before the end of the first month of the student's next quarter in college becomes a *condition.* The Students' Work Committee may, in special cases, extend this time limit.

22. *The grade E (condition)* is a temporary grade, representing a deficiency which may be removed without repeating the course. A student who has received a condition in a course may register for the continuation or dependent course the following quarter.

23. *Removal of conditions.*—Conditions may be removed by additional work and an examination or, in certain cases, by satisfactory work in the next quarter of the course.

24. In English (courses in composition), Geology, Greek, History, Journalism, Latin, Music, Physical Education for Women, Physics, Scandinavian, Speech, and Zoology, conditions may sometimes be removed by passing a continuation course with a grade of C or better, in which case the grade of the first quarter will be recorded as D. A student who desires to remove a condition in this way must obtain the approval of the department, and must notify the registrar's office of his intention within the first week of the quarter. No student who has already failed in the condition examination is permitted to remove the condition by this second method.

25. In the following departments, conditions may be removed only by examination: Anthropology, Architecture, Astronomy, Botany, Chemistry, Comparative Literature, Drawing, Economics, English (courses in literature), Fine Arts, German, Geography, Library Instruction, Mathematics, Orientation, Philosophy, Physical Education for Men, Political Science, Psychology, Romance Languages, and Sociology.

26. The permanent grade resulting from the removal of a condition may in no case be higher than C.

27. Examinations for the removal of conditions incurred during the fall and winter quarters are given during the first thirty days of the succeeding quarter. Examinations for the removal of conditions incurred during the spring quarter are given the week before the opening of the fall quarter.

28. A student who desires to take a condition examination must notify the registrar in writing at least three days before the date scheduled for the examination. Any student failing to give such notice will not be allowed to take the examination.

29. A condition not made up within one quarter of residence becomes a failure subject to the rules governing failures.

30. *The grade F (failure)* represents a deficiency so serious that the student must repeat the course in order to obtain credit therein.

31. A student receiving a failure in any course shall not be allowed to pursue the continuation of that course the following quarter.

32. Any student receiving a failure in a course which is required in his curriculum must repeat the course the next time it is offered.

33. No course for which a student has received credit may be repeated by him to raise his grade.

34. *Quality credit.*—For each five honor points in excess of one honor point per credit, the required number of credits will be diminished by one.

35. This regulation applies only to the total number of credits required. It does not apply to other specific requirements of the student's curriculum. It is in force as regards (a) admission to the Senior College, the College of Education, and the School of Business Administration, (b) graduation from the general course and from the special courses leading to the degrees of bachelor of arts and bachelor of science, and (c) the work done *in this college* in the following combined arts and professional courses: Arts and Medicine and Science and Medicine.

36. This regulation is based on the well-known fact that students of high scholarship have accomplished more than those who have poorer records. Students of higher attainment are thus given the opportunity of completing the work for the B.A. degree in less than four years and entering earlier on their graduate work. Seniors with high scholastic standing are allowed the privilege of visiting classes[1] and of reading under direction; and students who are handicapped by outside work or poor health can thus carry less than full work and still make a normal advance toward graduation.

37. *Junior and Senior colleges.*—The Junior College, consisting of the first two years, offers instruction in the fundamental branches which are required in preparation for the courses leading to the degrees B.A. and B.S., and for the professional schools. It is expected also that its courses of study will offer preparation for various vocations or will provide a general education for those who do not complete a longer course.

The Senior College, consisting of the third and fourth years, is concerned primarily with the advanced instruction leading to the Bachelor's degrees.

Each college is under the general direction of an assistant dean. See directory of Administrative and Departmental Offices on page 44 of this bulletin.

38. Students who are candidates for a degree are listed as freshmen when they have less than 39 credits; as sophomores when they have 39 credits or more.

39. The college distinguishes between junior college courses, intended primarily for freshmen and sophomores, and senior college courses, intended primarily for juniors and seniors.

[1] See sections 15 and 17.

40. 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. Every such course is specifically marked in the program.)

41. 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.

42. *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.

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.

43. *Faculty advisers for students in the Junior College.*—The junior college office (106 Folwell Hall) is open daily throughout the year to students who wish information or advice. A group of special counsellors have their office in 114 Psychology Building. Any student is invited to call at this office and make an appointment to meet an adviser. The dean and other officers of the college are ready to consult with students about any matter that pertains to their college work.

The selection of studies, methods of study, the selection of a vocation and how to prepare for it, living conditions, outside activities, difficulties in adjusting themselves to the conditions and requirements of college life and work, arrangement of courses of study to meet special needs, special opportunities and facilities for those students whose superior native gifts enable them to accomplish more or to go more rapidly than the average, are some of the problems upon which students are constantly seeking advice. In general the desire of the advisers is to help the individual student to make the most of his opportunities while in college.

The faculty advisers of all the colleges will make their information and experience available for the benefit of the students of each college

44. *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.

GENERAL REGULATIONS

Note.—*Students are held individually responsible for the information contained in these pages. Failure to read and understand these regulations will not exempt a student from whatever penalties he may incur.*

1. *Number of credit hours.*—Students must elect at least 13 credits (exclusive of physical education) of work a quarter. To take less than that number, a student must secure permission from the Students' Work Committee.

2. Students ordinarily may not elect more than 17 credits (exclusive of physical education). 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.

3. *Extension and correspondence courses.*—No student enrolled in the college will be allowed to carry work in the Extension Division without permission of the Students' Work Committee. No student may enroll for an extension course if this would increase his credits beyond the maximum allowed.

4. 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.

5. *Course in practical music.*—Courses in practical music are ordinarily not open to freshmen and sophomores except those working for a major in music.

After one quarter's residence with satisfactory work, any student carrying a regular schedule in this college may, with the permission of the assistant dean for students' work, take courses in practical music in the Extension Division without credit. This privilege may be withdrawn whenever the student falls below grade in any of his work.

6. *Physical education.*—All men are required to complete Physical Education 1-2-3 or its equivalent. This work should be done in the freshman year. All women are required to complete Physical Education 1-2-3 and three quarters of work in courses open to sophomores. This work should be finished before the beginning of the junior year.

Men entering with forty-five credits of advanced standing are excused from Physical Education 1-2-3. Women entering with advanced standing should consult the head of the department.

7. *Military drill.*—All men are required to register for military drill during their first two years and to complete satisfactorily six quarters of drill.

A student must register for military drill every quarter until the requirement is completed, unless excused by the dean of student affairs. No other office has authority to permit a student to postpone drill.

Students entering with 90 credits of advanced standing are not required to drill. Students with 45 credits, or with more than 45 credits but less than 90 credits, of advanced standing must complete three quarters of drill.

8. *Afternoon work.*—All freshmen and sophomores are required to elect approximately one third of their work in the afternoon.

9. *Residence.*—To secure any degree from this college a student must earn 45 credits in residence. To secure a degree in a curriculum given entirely within this college, he must spend the last three quarters before graduation in residence in the Senior College and must earn in residence in the Senior College a minimum of 45 credits.

10. *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 composition as the chairman of the Department of English may specify.

11. *Changes in registration.*—After classes have begun, no changes in registration other than necessary changes, may be made without permission of the Students' Work Committee.

12. No student may drop out of class without permission of the Students' Work Committee. Students are warned that failure to obey the regulation in this paragraph is likely to result in their exclusion from college.

13. When a student's registration in any subject is cancelled at his own request within the first two weeks of any quarter, no standing is recorded. After that time a record of his work is obtained from his instructor. Work of the grade of D or higher will be cancelled without grade; work below the grade of D will be recorded as "dropped with the grade of F."

14. If a student is in any doubt regarding his registration or desires to make any change in it, he should consult his major adviser, the assistant dean of his college, or the chairman of the Students' Work Committee.

15. *Absences.*—No unexcused absences are to be regarded as legitimate. Both tardiness and absence are dealt with by the individual instructor on the assumption that each student is expected to do the full work of the class.

16. *Penalties for excessive absence.*—Any junior college student who has unexcused absences (in no case less than two) equal to the number of credits in the course, will be dropped from the class with a record of failure in the course.

Any senior college student whose absences in any course exceed one sixth of the scheduled recitations of the course, will not be admitted to the final examination in that course without permission of the Students' Work Committee. Any student thus excluded will receive a failure for the course.

17. A student absent for any reason whatsoever is expected to do the full work of the course. He must make up work lost through delay in registration as in the case of any other absences.

18. *Excuses.*—Absences can be excused only by the assistant dean for students' work. A student absent because of illness should secure a statement from the Health Service, if he has been under its care, or from some

responsible person who had knowledge of his illness. A student absent for any other reason should secure from some person in a position to know the facts a statement as to the need of absence. (Women may secure such statements from the dean of women.)

These statements need not be presented to the assistant dean for students' work, until the instructor notifies the student that he has accumulated sufficient absences to bring the case under the regulation.

19. *Delinquent students.*—Continued residence in the college is conditioned upon reasonable success in the student's work. Any student who does not make satisfactory progress in the course in which he is registered may be placed on probation by the Students' Work Committee.

20. No student is 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.

21. *Probation.*—A student in the Junior College will be placed on probation if at the close of any quarter or at the time of the midquarter report he is below passing grade in fifty per cent of his work. A student in the Senior College will be placed on probation if he is below passing grade in forty per cent of his work.

22. A student on probation is in serious danger of being excluded from college if his work does not show immediate and rapid improvement. Subject to the regulations hereinafter stated, the condition and length of the probation are determined by the Students' Work Committee.

23. With the exception of students who refuse to take a serious interest in their work, no student will be excluded from college until he has been on probation at least six weeks.

24. The period of probation continues not more than two quarters. It may be extended if the committee is convinced that failure to show marked improvement is due to causes (other than incapacity) over which the student has no control, and that these causes may reasonably be expected to disappear.

25. Students excluded from this college shall be recorded as (a) transferred, (b) discontinued, or (c) dropped.

a. *Transferred.*—Students whose attitude toward their work is satisfactory, but who evidently are pursuing the wrong course, may be transferred to another college at the close of any quarter with the approval of the two colleges concerned and the dean of student affairs.

b. *Discontinued.*—Students who are apparently pursuing the right course, but have been handicapped by conditions over which they have no control (ill health, necessary outside work, etc.) may be required to discontinue their registration until the committee is satisfied that the conditions under which they work are bettered. When such discontinuance takes place, at any time other than the end of the quarter, the courses for which the student is registered are recorded as cancelled without grade.

c. *Dropped.*—Students who have clearly shown by their records that they are irresponsible, and who have failed to meet the terms of their probation, shall be dropped.

26. *Readmission.*—Students excluded from college shall be allowed to return only with the permission of the Students' Work Committee.

a. Students classified as discontinued must present evidence that the conditions which hindered their work have been remedied.

b. Students who have been dropped may be required to remain out of college until the term of the next year corresponding to that in which the delinquency occurred. Such students must present satisfactory evidence that they have been employed in an occupation demanding intelligence and responsibility, or have successfully pursued subjects of an approved character. At the time when the student is dropped the Students' Work Committee will inform him what type of studies will be accepted for readmission.

27. The cancellation of a student's registration, of his own accord, will not affect his status as a delinquent student or the terms of his readmission. When a student leaves college he will be notified by the registrar's office of his status under these regulations.

28. Students who return under the provision of section 27 will be registered on probation. Such students may be dropped at any time that their work is unsatisfactory to the Students' Work Committee.

29. *Eligibility.*—A student who is ineligible because of a condition may become eligible by removing the condition.

A student who is ineligible because of failure in a course required for graduation may become eligible (a) by repeating the course with a passing grade, or (b) by earning an average of one honor point per credit on a program of at least fifteen credits during the quarter immediately preceding participation. The two terms of a Summer Session may count as a quarter for this purpose.

A student who is ineligible because of a failure in a course not required for graduation may become eligible by either of the above methods or by completing one full year of work.

30. *Senior examinations.*—The grade of a senior about to graduate will be determined by an instructor without special final examination, provided that the student's work in the course is C or above, one week previous to the date upon which senior grades are due, and provided that, at the beginning of his last quarter, the student had an average of at least one honor point per credit hour. Otherwise, the student will be given a special final examination.

31. *Petitions.*—A student who wishes exception made to any rule of the college should present his request in writing to the Students' Work Committee. Petition blanks may be obtained at 219 Administration Building or 106 Folwell Hall.

Every student who desires to be heard in regard to his petition, will be given such an opportunity by the committee.

COURSES OF STUDY

A student may, while registered in the College of Science, Literature, and the Arts, pursue one of the following courses.[1] These curricula are subject to revision by action of the faculties of the colleges concerned. For revised statements for the year 1932-33, it will be necessary to consult Part II of the bulletin for that year.

Courses given within this college:

1. A general course leading to the degree of bachelor of arts.
2. Special courses leading to the degree of bachelor of science.
   a. Course in Library Training.
   b. Course in Hospital Library Service.
   c. Course for Medical Technicians.
   d. Course in Public Health Laboratory or Sanitary Work.
   e. Course in Social and Civic Work.
3. Courses preparing for admission to the School of Business Administration, College of Dentistry, College of Education, the course in Nursing Education, the course in Interior Architecture in the College of Engineering and Architecture, the Law School, and the College of Pharmacy.
4. A four-year course leading to the degree either of bachelor of arts or of bachelor of science with special training in military science and tactics.

Combined arts and professional courses:

5. A seven-year course leading to the degrees of bachelor of science, bachelor of medicine, and doctor of medicine.
6. A five-year course leading to the degrees of bachelor of arts and bachelor of architecture.
7. A course leading to the degrees of bachelor of arts and bachelor of laws.
8. An eight-year course leading to the degrees of bachelor of arts, bachelor of medicine, and doctor of medicine.

NOTE.—For information about the University College, consult Mr. Tate, 143 Physics.

REGULATIONS APPLYING TO ALL COURSES

1. *Physical Education and Military Drill.*—During the junior college years all men must complete three quarters of physical education and six quarters of military drill. All women must complete six quarters of physical education.

2. *Freshman English.*—Unless freed from the requirement by placement tests all students must complete three quarters of English A-B-C or Composition 4-5-6. On the basis of placement tests in English, students are:

Exempt from any requirement in English,

[1] Students in Art Education, Physical Education, Public School Music, and certain other special courses, register in the College of Education in their freshman year.

Permitted to choose between English A-B-C and Composition 4-5-6,
Assigned to Composition 4-5-6,
Required to make up minimum essentials as a preliminary to Composition 4-5-6.

Students who are exempt from Freshman English may register, if they wish, for English A-B-C or Composition 4-5-6, or for any junior college courses in English, composition, or speech for which English A-B-C is the prerequisite.

3. *Classification of studies.*—The greatest care has been taken in recent years to study all available evidence regarding the ability of students to carry the usual required college courses. The results have clearly shown that the great majority of those who appear to have low aptitude for college work do not in fact succeed in their studies here. Students who enter with low aptitude ratings are not accepted as candidates for a degree until they have made a satisfactory record in two quarters of work. Those whose handicaps are greatest are placed on probation from the beginning and have the attention of special advisers.

The studies in which these persons usually have the greatest difficulty are the foreign languages, laboratory work, mathematics, and some specialized courses. It happens that these are the subjects which would be of the least value to those who do not go on to a complete college course. Accordingly, these courses are restricted to those students who have given evidence that they will be able to profit by them. Those who enter in spite of low aptitude ratings may register for many other courses which provide opportunity for a general education.

The original estimate of a student's ability is revised on the basis of his record in college. A student of low aptitude rating who shows ability in his general studies will be admitted to the restricted studies and may complete the requirements for a degree. On the other hand, a student who is accepted as a candidate for a degree but does not do satisfactory work may be reclassified and limited in his choice of studies until he shows his ability and willingness to do work of college grade.

4. *Beginning languages.*—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, except upon petition.

5. *Residence.*—To secure a degree from this college a student must earn at least 45 credits in residence at this college.

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

JUNIOR COLLEGE

1. For admission to the Senior College[1] the student must have completed the following work in the Junior College or the equivalent in another recognized institution.

[1] See also requirements for admission to the Senior College in courses leading to the degree of B.S., and section on advisers for individual students, p. 28.

A. 15 credits in English (English A-B-C) or 9 credits in composition (Composition 4-5-6), or exemption from the requirement. All students are required to take a placement test before registering for any course in English or composition. See page 5.

B. Foreign language, 0 to 20 credits, according to the following schedule:[1]

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
One year of one language	15 credits in same language
Less than a year of one language	20 credits in one language

C. 10 credits in one of the social sciences: anthropology, economics, geography, history, political science, sociology.

D. 10 credits in one of the natural sciences: astronomy, botany, chemistry, geology, physics, psychology (including laboratory), zoology.

2. Every student should plan to begin the work specified in the preceding paragraph early enough to provide for the completing of these requirements before the end of his sophomore year. Failure to do this will delay his admission to the Senior College.

3. In addition the student must secure the necessary preparation for a senior college major sequence in one subject or in liberal arts.

4. During the junior college years all men must complete three quarters of physical education and six quarters of military drill. All women must complete six quarters of physical education.

5. 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.

6. The student must earn a total of 90 credits in addition to the requirement in physical education, with an average of one honor point per credit, 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.

A student entering with advanced standing from some other institution must secure a total of 90 credits in addition to the requirement in physical education, and an average of one honor point per credit for the work done in this college. For every five honor points earned in this college, in excess of one honor point per credit, the number 90 is diminished by one.

SENIOR 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

[1] Not required in the Social and Civic Course.

sequences are offered by the following departments: Anthropology, Architecture, Astronomy, Bacteriology, Botany, Chemistry, Economics, English, Fine Arts, Geography, Geology and Mineralogy, German, Greek, History, Human Physiology, Journalism, Latin, Mathematics, Music, Philosophy, Physics, Political Science, Psychology, Romance Languages, Sociology, Speech, Zoology. The courses constituting a major sequence in any department are announced in the program. For a major in liberal arts consult Mr. Sirich, 200 Folwell Hall.

A student must maintain an average of one honor point per credit 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.

3. The student must earn 90 credits and 90 honor points in addition to the number required for admission, 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. He must spend the last three quarters before graduation in residence in the Senior College and must earn in residence in the Senior College a minimum of 45 credits.[1]

Any student who fails to complete the requirements for graduation within a normal period will, in order to complete the work, be required to continue in the Senior College for one or more university sessions. During this period he will be required to carry at least 13 credit hours of work and to secure an average of one honor point per credit.

A student entering the Senior College with advanced standing from some other institution must secure the same total, and an average of one honor point per credit for the work done in this college. For every five honor points earned in this college in excess of one honor point per credit, the number is diminished by one.

ADVISERS FOR INDIVIDUAL STUDENTS

Students who have shown unusual ability, whose peculiar interests or needs are not met by the general course, may be assigned by the dean of the college to special advisers. The adviser in such case will consult with the student regarding his individual aims and assist him in the choice of his studies.

The modification of the curriculum requirements may begin with the junior college work if necessary in view of the whole plan for the individual. This may mean substitutions and changes in time or sequence of studies but must not involve a departure from the spirit and purpose of the college or an essential lowering of standards.

The curriculum arranged for the individual must receive the approval of the adviser. The adviser will be responsible for the student throughout his course.

[1] This regulation does not apply to students in the combined courses.

HONORS COURSE PLAN

A student who has met all the requirements for admission to the Senior College may be enrolled for the Honors Course upon the approval of the department in which he wishes to pursue his major study.

Each student enrolled in the Honors Course will be put under the immediate direction of a member of his major department of professorial rank who shall be known as his tutor.

A student enrolled in the Honors Course may be a candidate for graduation honors. The tutors will co-operate with the Committee on Honors in arranging comprehensive examinations and in evaluation of theses.

A part of the student's senior college work will consist of reading or other individual studies done under the direction of his tutor. Work done in this way will be accepted as a substitute for a part or the whole of the major sequence and of the elective work of the usual curriculum.

A student electing this plan will be governed by the announcement of his major department and the direction of his tutor as to number of courses, attendance at classes, and general methods to be pursued.

The requirements for the minor study are not modified by this plan at present.

When the tutors of a department report at the end of any quarter that a student is not making satisfactory progress in the Honors Course, the student will be registered as a candidate in the regular course. In this case the tutors will report blanket credits equivalent to the work actually done. The student can then arrange to complete his major sequence either in the same department or in another.

For the year 1931-32 Honors Courses are offered by the Departments of Anthropology, Economics, English, History, Latin, Political Science, Psychology, Sociology, and Zoology.

GRADUATION HONORS[1]

The degree B.A. may be awarded *cum laude, magna cum laude,* or *summa cum laude* upon the recommendation of the Committee on Honors.

Honors are awarded only to students who have a scholastic record of two honor points per credit in all work carried. A student who has this record will be awarded the degree B.A. *cum laude.*

Students wishing to become candidates for the higher honors (*magna cum laude, summa cum laude*) must signify their intention not later than the beginning of the third quarter before graduation. Students are admitted as candidates upon the recommendation of the major department with the approval of the Committee on Honors. The committee will not admit as a candidate a student who has limited his senior college work to the minimum requirements in major and minor subjects. The purpose of granting

[1] Students who enter with advanced standing are eligible to become candidates for honors if they will have earned 75 credits of work in residence before graduation.

honors is to secure scholarly ideals and achievements, and the candidate is expected to show his interest and ideals in his election of studies.

With the approval of the Committee on Honors the candidate may pursue a course of reading in addition to the required major and minor studies and in lieu of any or all elective courses. Near the close of the senior year the candidate will take a special examination which may touch upon any part of the field of his college course. In this comprehensive examination the candidate should show (a) an acquaintance with the chief literature and sources of information in the fields studied, and (b) an ability to discuss with intelligence and clear reasoning, questions or problems upon which he has had opportunity to secure the necessary information. Such questions may be new to the student. The object is to test the student's ability to bring facts and theories to bear upon problems presented in the examination. The examination should be a test not of memory but of assimilation, of culture, and of power to command or use the knowledge which courses of study have put within the student's reach. Candidates who pass this examination will, upon recommendation of the committee, be awarded the degree B.A. *magna cum laude.*

A candidate whose standing in the comprehensive examination is satisfactory and who in addition presents an acceptable critical paper, a piece of creative work, or a thesis embodying the results of original research will, upon recommendation of the committee be awarded the degree B.A. *summa cum laude.* The preparation of the paper should be begun early in the senior year.

The degree B.S. *cum laude* will be awarded to students who have an average of two honor points per credit in all their work.

Students may be accepted as candidates for the higher honors in courses leading to the B.S. degree and in combined arts and professional courses provided they present an equivalent of the work required for graduation honors in the General Course.

CREDIT IN THE GRADUATE SCHOOL

A student lacking not more than nine credits toward graduation may, upon petition, receive graduate credit for a limited amount of work taken as an undergraduate. No graduate credit will be given unless the student has made previous arrangement with the Graduate School. Courses taken for graduate credit will not carry credit toward the Bachelor's degree.

With the permission of the assistant dean for the Senior College, undergraduates lacking not more than nine credits toward graduation may be registered also in the Graduate School. Permission will be granted only in exceptional cases.

II. COURSES LEADING TO THE DEGREE OF BACHELOR OF SCIENCE

Students in these courses who complete the work with an average of two honor points per credit will receive the degree B.S. *cum laude.* Candidates for the higher honors may be accepted if they offer an equivalent of the work required for graduation honors in the General Course. See page 29.

A. COURSE IN LIBRARY TRAINING

For a special course in library training, leading to the degree of bachelor of science, a student must first complete satisfactorily three years of academic work. During these three years the student must secure at least 135 credits in addition to the requirement in physical education, and an average of one honor point per credit for all credits earned. (For each five honor points in excess of one honor point per credit, the required number of credits will be diminished by one.) The student must complete the requirements for admission to the Senior College in the General Course, and is subject to all the regulations which govern the work of other Arts students. During his third year the student will elect work in this college, including at least 18 credits in senior college courses and subject to the approval of the assistant dean for the Senior College. During the fourth year a student will elect not less than 45 credits from courses given by the Division of Library Instruction, and must maintain an average of one honor point per credit for all the credits earned. For specific information see the bulletin of the Division of Library Instruction obtainable from the registrar.

B. COURSE IN HOSPITAL LIBRARY SERVICE

For the specific requirements of this course, see the special bulletin of the Division of Library Instruction obtainable at the office of the registrar. This special course will be given only in case there are ten advanced registrants before June 1, 1932.

C. COURSE FOR MEDICAL TECHNICIANS

A four-year course in medical technology is offered by the College of Science, Literature, and the Arts and the Medical School.

With the increase of laboratories in hospitals, clinics, and medical schools, medical technology offers an interesting field for women at the present time. Men, as a rule, are not advised to take the course.

The satisfactory completion of the prescribed course leads to the degree of bachelor of science. During the first two years, the student is registered in this college and must earn 90 credits in addition to the requirement in physical education (see page 21), with an average of one honor point per credit.[1] The required courses are listed below. High school physics is a prerequisite, but Physics 11, Survey of Physics, may be taken after admission.

1. English A-B-C, or Composition 4-5-6, or exemption from requirement
2. Zoology 5-6-7 or 1-2 and 3-4, 24[2], 25[2]
3. Inorganic Chemistry 1-2-3 or 4-5; 11
4. Analytical Chemistry 7
5. Organic Chemistry 1-2
6. A reading knowledge of French or scientific German
7. Bacteriology 41[2]
8. Human Physiology 4[2]

For the work in the Medical School consult the special bulletin obtainable at the office of the registrar.

[1] For the requirements in physical education and military drill, see p. 21.
[2] Need not be taken during the first two years.

Practical work in the various tests required in laboratory work is taken at the University Hospitals and covers four quarters, 45 to 60 credits.

Further information may be obtained by addressing Dr. W. A. O'Brien at the University Hospitals.

D. COURSE IN PUBLIC HEALTH LABORATORY OR SANITARY WORK

For major work in the field of preventive medicine and public health, students should consult with the head of the Department of Preventive Medicine and Public Health.

E. TRAINING COURSE FOR SOCIAL AND CIVIC WORK

The Training Course for Social and Civic Work is a five-year course in preparation for professional social work. The organization of the course aims to give the undergraduate the fundamentals of a broad modern education.

The first two years of work taken in the Junior College consist of the regular academic requirements, with the usual language requirement omitted, and fundamental courses in sociology, economics, psychology, and political science required.[1]

For admission to the Senior College the student must earn 90 credits in addition to the requirement in physical education, with an average of one honor point per credit. In the Senior College he must earn 90 credits and 90 honor points in addition to the number required for admission. (For each five honor points in excess of one honor point per credit the required number of credits will be diminished by one.)

In the Senior College students begin some pre-professional specialization in social work.

A student must spend the last three quarters before graduation in residence in the Senior College and must earn in residence in the Senior College a minimum of 45 credits.

Satisfactory completion of four years' work leads to a degree of bachelor of science but not graduation from the training course.

The fifth year includes additional courses in theory and emphasizes specialized field work and seminar courses. All students must meet the general requirements of the Graduate School. Upon completion of the requirements of the Graduate School, which include an approved thesis, the student will receive the degree of master of arts and a certificate of social work.

It is strongly recommended that students who register in this course consult the training course advisers in the Department of Sociology. A special bulletin is prepared for students in this course and should be consulted for a statement of required courses and recommended elective courses.

[1] For the requirements in physical education and military drill, see p. 21.

First and Second Years, Junior College

Common basic foundation

REQUIRED

English A-B-C or Composition 4-5-6 or exemption from requirement
Sociology 1, 6, 45, 49
Economics 6-7
Political Science 1-2
Psychology 1-2
Zoology 1-2 and 3-4
Human Physiology 1 and 2[1]

Third and Fourth Years, Senior College

Concentrated sociological study and field training, in which students become familiarized with social case work and social work with groups.

General requirements.—Sociology 52, 60, 70, 71, 72, 91, 92, 119, 121, 134, 136, 137; three of 100, 101, 102, 103, 120; Preventive Medicine 50 or 53, 61; Home Economics 90.

Recommended.—Sociology 53, 55, 128, 141, 152, 160; Preventive Medicine 57, 60, 73; Economics 161, 164; Political Science 131-132; Child Welfare 40, 60, 130; Agricultural Education 154; Educational Psychology 158.

Pre-professional specialization by grouped sequences.

a. *Social case work.* Required: Sociology 129, 153, 154. Elective: Sociology 130, 131, 133, 135, 138-139, 155.

b. *Group work.* Required: Physical Education for Women 16-17, 43-44-45; one of Art Education 37, 38, 41, 46; one of Theory and Practice of Teaching T. 33, T. 34, T. 122; Sociology 153-154. Elective: Sociology 126, 155; Zoology 22.

Fifth Year, Graduate

Professional specialization by grouped sequences.

All students will meet the general requirements of the Graduate School. Thesis subjects to be selected with help of the adviser.

III. COURSES PREPARING FOR ADMISSION TO THE PROFESSIONAL SCHOOLS

A. PRE-BUSINESS COURSE

To be eligible for admission to the School of Business Administration, the student must present 90 credits, in addition to the credits given for physical education, earned in a recognized college or university, with 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.

The credits for admission shall be earned in the following groups:

[1] Required of students preparing for medical social work.

A. Required Credits:[1]

1. English A-B-C or Composition 4-5-6, or exemption from requirement. See page 25.
2. Ten credits in mathematics or in *one* of the following laboratory sciences: botany, chemistry, physics, zoology.
3. Ten credits in *one* of the following social sciences: geography, history, political science, sociology.[2]
4. Ten credits in the Principles of Economics. (This requirement may be satisfied by the completion of Economics 4 with its prerequisites, or Economics 6-7 or the equivalent. The student will consult a pre-business adviser concerning an equivalent.)

B. Elective Credits:

Sufficient elective credits to complete the minimum number required for admission (normally fifty-four credits). The attention of the student is called to the two following groups of subjects to which part of the elective time should be devoted:

1. Courses required for graduation from the School of Business Administration and recommended for pre-business students. These courses are prerequisites for certain required courses in the School of Business Administration:

   Economics 3, (Mechanism of Exchange)
   Economics 14, (Elements of Statistics)[3]
   Economics 25-26 (Principles of Accounting)[4]

Students who do not elect the above courses during the freshman and sophomore years will be required to take Business Administration 57, 62, and 70, during the first quarter in residence in the School of Business Administration.

2. Courses required as prerequisites to courses in certain sequences in the School of Business Administration and recommended for all students:
   a. Psychology 1-2, (General Psychology). This course is a prerequisite for courses in Advertising, Foreign Trade, Merchandising, Personnel Management, Insurance, and Real Estate.
   b. Mathematics 8 and 20 (Commerce Algebra and Mathematics of Investment). Required of students who take the accounting, insurance, or finance sequence.
   c. Mathematics 8 and 6 (Commerce Algebra and Trigonometry). Required of students who take the statistics sequence.
   d. Students in the foreign trade sequence are required to have a reading knowledge of at least one foreign language.

B. PRE-DENTAL COURSE

The pre-dental course, required for admission to the College of Dentistry, consists of two years of prescribed work, during which the students

[1] For the requirements in physical education and military drill, see p. 21.

[2] Sociology 45, Social Statistics, is not accepted in fulfillment of this requirement.

[3] Credit may not be received for both Economics 14, (Elements of Statistics), and Sociology 45, (Social Statistics).

[4] Students who have had a high school course or experience in bookkeeping will be admitted to Economics 25 upon passing a placement test. For other students Economics 20 is prerequisite to Economics 25.

are registered in this college and subject to its regulations.[1] The required courses are listed below. It is desirable that students should have had chemistry and higher algebra in high school.

1. Zoology 5-6-7
2. Inorganic Chemistry 1-2-3 or 4-5, and 11
3. Organic Chemistry 1-2
4. Mathematics 4 or 3-4 or 6
5. Physics 3 and 4, and one of the combinations 23 and 24, 33 and 34, 43 and 44
6. Drawing 41-42-43[2]
7. Mechanical Engineering 11-12-13[2]
8. English A-B-C or Composition 4-5-6 or exemption from requirement
9. Psychology 1-2[2]
10. Electives to make a total of 90, in addition to the requirement in physical education

NOTE.—Students who have had no chemistry in high school are advised to take Inorganic Chemistry 11 in the summer of their first year.

C. GENERAL COURSE PRELIMINARY TO THE COLLEGE OF EDUCATION

All students who desire to receive a state teacher's certificate upon graduation from the University of Minnesota must be graduates of the College of Education. If not enrolled in one of the special four-year curricula, they should register in the College of Education beginning with the junior year. They should enroll as pre-education students in the Junior College as early in their course as possible. Entrance to the college will be conditioned upon a student's meeting the general and specific requirements outlined below:

1. A minimum of ninety credits, exclusive of credit for physical education, carried with an average of one honor point per credit. The ninety credits thus indicated must be earned in the following groups of college courses:

Group A English

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

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

Group D Natural sciences: Astronomy, Botany, Chemistry, Geology and Mineralogy, Human Physiology, Physics, Psychology, Zoology

Group E Mathematics

Group F Journalism, Philosophy, Fine Arts, Speech, or such courses in other colleges or departments of the University as are approved by the College of Education

2. Within the general requirements listed above the student during his high school and junior college years must have completed the required work indicated under A, B, C, and D below. At least 20 credits in groups B, C, and D must be completed in college.

[1] For the requirements in physical education and military drill, see page 21.

[2] The faculty of the College of Dentistry may accept electives for these courses. Consult the dean of that college.

When Taken	In High School	In College
A. English	3 years	and 9 credits in composition
B. Language	3 years in one language	or 20 credits in one language
	or	
	2 years in one language	and 10 credits in same language
	or	
	1 year in one language	and 15 credits in same language
C. Social sciences	2 years	or 10 credits in one department
D. Natural sciences	2 years	or 10 credits in one department

NOTE.—In lieu of the specific course requirements indicated in the language group a student may take a comprehensive examination in an elected language to be conducted by a committee appointed by the dean of the College of Education.

3. Within the total credits stipulated under Section 1 a student must meet, in fields of study which are represented in prevailing high school curricula, the following requirement: at least 15 credits in a major field and at least 10 credits in each of two minor fields. The purpose of this requirement is to prepare the student for the study of the advanced courses necessary to the completion of satisfactory teaching majors and minors.

4. The student must have completed six credits in general psychology.

5. In the cases of certain specialized curricula described in the bulletin of the College of Education, Part I, the above requirements may be modified in details.

Apart from the specialized curricula, majors and minors are offered separately in the following fields: English, speech; German, Latin, French, Scandinavian; geography, history, political science, sociology; botany, chemistry, physics, zoology; mathematics.

6. At the time of entrance a student must present a certificate from the Students' Health Service indicating that he is free from physical defects that would prevent him from the successful pursuit of educational work.

7. At the time of entrance to the College of Education the student will be given a general examination designed to show his capacities to pursue professional curricula in education.

8. For the requirement in physical education and military drill, see page 21, or the bulletin of the College of Education, Part I.

9. Students preparing to qualify in one of the specialized curricula or in the independent study course should consult the College of Education bulletin.

D. COURSE PRELIMINARY TO NURSING EDUCATION AND PUBLIC HEALTH NURSING IN THE COLLEGE OF EDUCATION[1]

For the first five quarters of the five-year course in Nursing Education or Public Health Nursing, the student is registered in the Junior College. She must complete the requirements listed below, and must earn an average of one honor point per credit.

[1] Certain changes in this course will be made in the fall quarter of 1931. Such changes will be announced later.

English A-B-C or Composition 4-5-6 or exemption from the requirement. See page 25
Zoology, 10 credits
History, 10 credits
Human Physiology 1 and 2 (or 4)
Psychology 1-2
Home Economics 70
Sociology, 5 credits
Botany, 10 credits
Electives to make a total of 75 credits exclusive of Physical Education
Physical Education, see page 21. One quarter of this requirement may be completed after registering in the School of Nursing.

Upon completion of the above requirement the student registers in the School of Nursing for two and a half years, followed by three quarters in the College of Education, with a major in Public Health Nursing or Nursing Education.

E. COURSE PRELIMINARY TO TRAINING IN INTERIOR ARCHITECTURE IN THE COLLEGE OF ENGINEERING AND ARCHITECTURE

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 architecture and decoration without taking the full technical course in Architecture.

During the first two years, the student is registered in this college. He must complete the requirements stated below and must earn 90 credits and 90 honor points,[1] with the required work in physical education. (See page 21.) At the beginning of his course, he should consult the School of Architecture regarding electives.

During the third and fourth years, the student registers in the College of Engineering and Architecture and upon the satisfactory completion of the prescribed work, amounting to 102 additional credits, receives the degree of bachelor of interior architecture. (See bulletin of the College of Engineering and Architecture.)

Courses Required in the First Two Years	Credits
English A-B-C or Composition 4-5-6 or exemption from requirement (see page 25)	0 to 15
Mathematics 4 or 6 (with prerequisite)	4 to 10
French (see Junior College Requirements, page 27)	0 to 20
History 11-12-13	10
Physics 3 and 4 and either 23 and 24 or 33 and 34 or 43 and 44	8
or	
Inorganic Chemistry 1-2-3 or 4-5 or 6-7-8 or 9-10	8 to 15
Architecture 21-22-23	6
Architecture 31-32-33	9
Drawing 61-62-63	6

Students who enter without either French, higher algebra, or high school chemistry, should register in their freshman year for Freshman English (see page 25), French, chemistry, and, if possible, Architecture

[1] For the requirements in physical education and military drill, see page 21.

21-22-23. Students who enter with one or more years of French should register for Freshman English, French, and mathematics to complete the requirements, and, if possible, Architecture 21-22-23.

F. GENERAL COURSE PRELIMINARY TO THE LAW SCHOOL

Students in the University preparing to enter the Law School register in this college. Ninety quarter credits of academic work are required for admission to the Law School, and 135 credits for admission to the three-year law course.[1] An average of one honor point for each credit earned up to the time of admission is also required. Excess honor points do not reduce the number of credits required.

No specific subjects are required for admission to the Law School as a candidate for the degree of bachelor of laws, but a student seeking the degree of bachelor of arts in the combined course must satisfy the requirements of the College of Science, Literature, and the Arts for that degree. Likewise, a student seeking the degree of bachelor of science in law should have English A-B-C or Composition 4-5-6 (unless exempted), Political Science 1-2, American Government and Politics, Philosophy 2, Logic, Psychology 1-2, General Psychology, History 70-71-72, English Constitutional History, and Economics 6-7, Principles of Economics. No foreign language is required for this degree.

The following course is recommended by the faculty of the Law School. It satisfies the requirements for admission to the Law School and also, so far as it goes, the requirements for the degree of bachelor of arts or bachelor of science in law.

1. Latin, 20 credits, minus 5 credits for each year of Latin in high school.
2. English A-B-C or Composition 4-5-6 or exemption from requirement
3. Natural Science, 10 credits
4. Political Science 1-2
5. Philosophy 2 and 1, 3 or 50, 51, 52
6. Psychology 1-2
7. History, 10 credits, and 70-71-72
8. Economics 6-7
9. Sociology 1

Additional courses should be elected in Economics, History, Philosophy, Political Science, Sociology, and Speech.

G. PRE-PHARMACY COURSE

For recommendations for one year's work preliminary to the College of Pharmacy, consult the bulletin of that college.

IV. MILITARY SCIENCE AND TACTICS

Credit for advanced military science.—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 War Department regulations.

For admission to the Senior College, a student must complete 90 credits, in addition to the requirement in physical education, with an average of one honor point per credit. The faculty will recommend for graduation, in any course of study (given entirely in this college), leading to the degree of bachelor of arts or bachelor of science, any student who has completed in addition to this requirement 84 credits, 84 honor points, and the work of the Advanced Course of the R.O.T.C.

A student must spend the last three quarters before graduation in residence in the Senior College and must earn in residence in the Senior College a minimum of 45 credits.

Students enrolled in the Advanced Course, R.O.T.C., are furnished with a special uniform 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 the seventh grade in the army.

All students who complete the Advanced Course, R.O.T.C., 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.

Special course for students of military science.—The degree of bachelor of science will be given to students who complete the following course.

JUNIOR COLLEGE

1. A total of 90 credits, in addition to the requirement in physical education, with an average of one honor point per credit.[1]
   a. English A-B-C or Composition 4-5-6 or exemption from requirement.
   b. History 1-2.
   c. Zoology 1-2 and 3-4, Psychology 1-2, Chemistry, 10 credits.
2. Preparation for a major sequence in history, political science, or mathematics.

SENIOR COLLEGE

1. For the completion of the Advanced R.O.T.C. Course as now given, a total of ..... 12 credits
2. Bacteriology 41 ..... 5 credits
3. Preventive Medicine 50, 53 ..... 6 credits
4. One of the following (in senior college courses)
   a. History, including 59-60-61 and 93-94-95 ..... 18 credits
   b. Political Science, including 101-102, 181-182 ..... 21 credits
   c. Mathematics, including 50, 51, 52 ..... 21 credits
   d. Electives to make a total of 90 credits and 90 honor points, in addition to the requirement for admission.

The quality credit rule applies to this course in so far as the number of elective credits is concerned.

[1] For the requirements in physical education and military drill, see page 21.

V. SEVEN-YEAR COURSE IN SCIENCE AND MEDICINE, LEADING TO THE DEGREES OF BACHELOR OF SCIENCE, BACHELOR OF MEDICINE, AND DOCTOR OF MEDICINE[1]

During the first two years the student is registered in the College of Science, Literature, and the Arts. He is expected to complete the courses listed below and must secure 90 credits, in addition to the requirement in physical education, with an average of one honor point per credit.[2] (For each five honor points in excess of one honor point per credit, the required number of credits will be diminished by one.)

Composition 4-5-6, English A-B-C, or exemption from requirement. See page 25.
Zoology 5-6-7 (1-2 and 3-4, 10 credits, will be accepted).
Inorganic Chemistry 11, Analytical Chemistry 7, and Organic Chemistry 1-2, with the elementary courses prerequisite to them.
Physics 3, (with prerequisite mathematics) 13, 23, 33, and 43. Laboratory courses 4, 24, 34, and 44 are optional.
German sufficient to secure a reading knowledge. Students may meet this requirement by passing two quarters' work in Medical German (German 31-32), or by taking a special examination after completing two college years of German. This examination is conducted by the German Department.

The following subjects are recommended as electives: advanced zoology, (such as comparative anatomy), genetics and eugenics, parasitology, physics, chemistry, freehand drawing, Latin, French, higher mathematics and statistics, psychology, and sociology. General Bacteriology, a Medical School subject, may not be presented for admission to the Medical School. With the approval of the Students' Work Committee of the Medical School and the assistant dean for students' work in the College of Science, Literature, and the Arts, a pre-medical student may take one subject in the Medical School in any quarter.

For admission to the Medical School, a candidate's record must show a number of honor points equal to the total number of credits in the required subjects of zoology, chemistry, physics, and composition; also a number of honor points equal to the total number of credits in all subjects; and the student must be accepted by the Medical School under the limited registration regulation of that school. He must take a medical students' aptitude test, the scores of such tests being considered by the Students' Work Committee in advising students and determining admission. A student applying for admission to the Medical School in the fall quarter must have satisfied all requirements before July 1.

[1] Only students who have completed the required work in the College of Science, Literature, and the Arts or some similar school before entering the professional school will be permitted to avail themselves of the privilege of securing the B.S. degree in a combined course.

[2] For the requirements in physical education and military drill, see page 21.

PROGRAM FOR THOSE WHO ENTER IN THE FALL WITHOUT LANGUAGE AND WITHOUT HIGHER ALGEBRA

First Year

Inorganic Chemistry 1-2-3, or 4-5 and 11
German 1-2-3
Mathematics 3 and 4, and Physics 3
Zoology 5-6-7 (or 1-2 and 3-4)

Second Year

Inorganic Chemistry 11, if not already completed
Analytical Chemistry 7
Organic Chemistry 1-2
German 30-31-32
Physics 13, 23, 33, and 43
Composition 4-5-6, English A-B-C, or elective for those exempted from requirement

NOTE.—Students who have had no chemistry in high school are advised to take Inorganic Chemistry 11 in the summer of their first year.

PROGRAM FOR THOSE WHO ENTER IN THE FALL WITH TWO YEARS OF GERMAN

First Year

Inorganic Chemistry 1-2-3 or 4-5 and 11
German 30-31-32
Mathematics 3 and 4, and Physics 3
or
Mathematics 4 and Physics 3 and 43
Zoology 5-6-7 (or 1-2 and 3-4)

Second Year

Inorganic Chemistry 11, if not already completed
Analytical Chemistry 7
Organic Chemistry 1-2
Physics to complete the requirement of five quarters. See above.
Composition 4-5-6, English A-B-C, or elective for those exempted from requirement

The work during the third and fourth years is taken in the Medical School and is credited toward the degree of bachelor of science. To secure this degree, a student must have 90 credits and 90 honor points in addition to the requirement for admission, and must have completed the first two years of the medical course in accordance with the standards of the Medical School.

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 this seven-year combined course, will be awarded the degree of bachelor of science on recommendation of the faculty of the Medical School, provided they meet the scholarship requirements stated above. The credit value of work done elsewhere will be determined by the Students' Work Committee of the College of Science, Literature, and the Arts, but such credits will not become effective until the student has

completed, with the required standing, two full years of work in the Medical School of the University of Minnesota.

The foregoing regulations governing the quality and amount of premedical training required for admission to the Medical School will be enforced for those who present the minimum amount of work. In cases of mature and superior students, especially such as have taken degrees and have made special progress along some line (even tho it may not have been closely related to medicine), concessions may be made. Cases under this paragraph will be considered individually and upon petition.

It should be borne in mind that no student can pursue the medical course to advantage without knowledge of biology, chemistry, and physics.

VI. FIVE-YEAR COURSE IN ARTS AND ARCHITECTURE[1]

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 leads to the degrees of bachelor of arts at the end of four years and bachelor of architecture at the end of five years. The degree of master of architecture may be taken at the end of six years.

Students wishing to elect this course should consult the School of Architecture. For the first two years the requirements are the same as those laid down in the course in Interior Architecture, page 37 of this bulletin, except that the student will register in Mathematics 11, 12, and 13 (College of Engineering and Architecture) and complete these courses by the end of his sophomore year.

During the first four years of this course the student is registered in the College of Science, Literature, and the Arts. He must complete the requirements for admission to the Senior College, and is subject to the regulations governing other students in this college. At the beginning of the fifth year he registers in the College of Engineering and Architcture.

VII. COMBINED COURSE IN ARTS AND LAW, LEADING TO THE DEGREES OF BACHELOR OF ARTS AND BACHELOR OF LAWS[1]

The work of the first three years of this course is done in the College of Science, Literature, and the Arts. The student must complete the requirements for admission to the Senior College in the General Course, and is subject to all the regulations which govern the work of other Arts students. During these three years the student must secure at least 135 credits in addition to the requirement in physical education, and an average of one honor point per credit for all credits earned.[2] For a student who has 135

[1] Only students who have completed the required work in the College of Science, Literature, and the Arts before entering the professional school will be permitted to avail themselves of the privilege of securing the B.A. degree in a combined course.

[2] For the requirements in physical education and military drill, see page 21.

credits, *exclusive of quality credits,* when he enters the Law School, the course for the degree of bachelor of laws is three years; for a student who has less than 135 credits, *exclusive of quality credits,* when he enters the Law School, the course for the degree of bachelor of laws is four years.

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. This work must include eighteen credits in senior college courses. The first year of the course in the Law School, when completed with the standing required by that college for graduation, counts as the equivalent of the fourth year (45 credits) of the Arts course.

VIII. EIGHT-YEAR COURSE IN ARTS AND MEDICINE, LEADING TO THE DEGREES OF BACHELOR OF ARTS, BACHELOR OF MEDICINE, AND DOCTOR OF MEDICINE[1]

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 the other students of the college, and must secure at least 135 credits in addition to the requirement in physical education, with an average of one honor point per credit for all credits earned.[2] (For each five honor points in excess of one honor point per credit, the required number of credits will be diminished by one.) He must complete the requirements for admission to the Senior College in the General Course and also the work in zoology, chemistry, physics, and foreign language, prescribed for the seven-year course in Science and Medicine (p. 40).[3]

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. This work must include eighteen credits in senior college courses. The first year of the course in the Medical School, when completed with the standards required by that school, counts as the equivalent of the fourth year (45 credits) of the Arts course.

For admission to the Medical School, a student's record must show a number of honor points equal to the number of credits in the required subjects of English or composition, chemistry, physics, and zoology; and also a number of honor points equal to the total number of credits; and the student must be accepted by the Medical School under the limited registration regulations of that school.

[1] Only students who have completed the required work in the College of Science, Literature, and the Arts before entering the professional school will be permitted to avail themselves of the privilege of securing the B.A. degree in a combined course.

[2] For the requirements in physical education and military drill, see page 21.

[3] For recommended electives and the restrictions governing them, see page 40.

DIRECTORY OF ADMINISTRATIVE AND DEPARTMENTAL OFFICES

J. B. Johnston, Dean of the College of Science, Literature, and the Arts	219Adm
J. M. Thomas, Assistant Dean for the Senior College	219F
W. H. Bussey, Assistant Dean for the Junior College	106F
R. R. Shumway, Assistant Dean for Students' Work	219Adm

Anthropology	11F	Latin	118F
Architecture	315E	Library Methods	107Lib
Astronomy	337Ph	Mathematics	119F
Bacteriology	228MH	Mechanical Engineering	103ME
Botany	209Bot	Military Science and Tactics	105A
Chemistry	127C	Music	107Mu
Child Welfare	204OLa	Orientation	228F
Comparative Literature	111F	Philosophy	323F
Drawing and Descriptive Geometry	208E	Physical Education for Men	108A
Economics	113B	Physical Education for Women	101WGm
English	219F	Physics	148Ph
Fine Arts	101OPh	Political Science	205OL
Geography	101OL	Preventive Medicine and Public Health	HS
Geology and Mineralogy	108P	Psychology	112Psy
German	208F	Romance Languages	200F
Greek	112F	Scandinavian	122F
History	102OL	Sociology	108OPh
Home Economics	215HE	Speech	309F
How To Study	108Psy	Zoology	308Z
Human Anatomy	204IA		
Human Physiology	318MH		
Journalism	11P		

DESCRIPTION OF COURSES

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.

ANTHROPOLOGY

41. Introduction to Anthropology. The early history of man.
53. Cultural Anthropology. Technology and industry.
54. Cultural Anthropology. Social organization of primitive peoples.
56. Primitive Science. Concepts of man and nature in primitive culture.
62. Ethnology. Racial and cultural groups and contacts.
80. American Indian. Ethnology of the New World.
106. Types of Prehistoric Men and Cultures. Problems of human types, chronology, and distribution.
107. American Archeology. Vanished peoples and cultures of the New World.
108. Philippine Peoples. Ethnology of the Philippines.
110. Physical Anthropology. The physical types of man, prehistoric and contemporary.
112. The American Negro. The physical types. Problems and methods of interracial adjustments.
113. Peoples of Europe. Racial and cultural characteristics.
114. The American People. Distinguishing physical and mental characteristics of the old-line American.
121. Advanced Physical Anthropology. A critical study of problems in physical anthropology. Based on 110.
122, 123, 124. Problems in Anthropology. Advanced work with individual guidance. Also, honors course—Anthropological Backgrounds of the Social Sciences, on recommendation of major advisers. Credits to be arranged.
150. Field Trip in Archeology. Investigation under the personal supervision of Mr. Jenks of the remains of primitive civilizations.
161. Primitive Religion. Religious concepts and practices of primitive peoples. Theories of the evolution of religion. Primitive eschatology.
204, 205, 206. Consult Graduate School bulletin.

ARCHITECTURE

COLLEGE OF ENGINEERING AND ARCHITECTURE

JUNIOR COLLEGE COURSES

21-22†-23. Freehand Drawing.
24-25-26. Freehand Drawing.
31-32†-33. Elements of Architecture.
74-75-76. Freehand Drawing. For students in Interior Architecture
81. Stage Design.
84-85-86. Modeling. An elementary course in clay modeling. Ornament, heads, and animals from casts and from life.
90-91-92. Illustration. Design of illustration as applied to the printed page. Magazine illustration, posters, and books.
93-94-95. Hand Print Processes. Making and printing wood engravings, etchings, dry-points, and lithographs.

SENIOR COLLEGE COURSES

14-15-16. Architectural History (Ancient and Renaissance).
17-18-19. Architectural History (Medieval and Modern).
27-28-29. Freehand Drawing.
34-35-36. Architectural Design.
37-38-39. Architectural Design.
51-52-53. Building Construction.
70. Pictorial Composition.
87-88-89. Advanced Modeling.
121-122-123. Freehand Drawing.
134-135-136. Interior Architectural Design.
163. History of Sculpture and Painting.
182-183-184. Furniture and Decoration.

For additional courses, see bulletin of the College of Engineering and Architecture.

ASTRONOMY

11.[1] 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. Laboratory work.
51. General Astronomy. A survey course covering the fundamental facts and principles of astronomy. Similar to Course 11 but intended for senior college students.
52. Astrophysics. A descriptive study of the principles of spectroscopy and their applications to astronomy.
53. Stellar Astronomy. Special emphasis upon the distribution, organization, and evolution of the heavenly bodies.

[1] This course does not satisfy the junior college requirement for science.

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.

BACTERIOLOGY AND IMMUNOLOGY

MEDICAL SCHOOL

41. General Bacteriology.
101. Special Bacteriology for Medical Students.
103. Special Bacteriology for Students of Agriculture.
114. Molds, Yeasts, and Actinomycetes.
116. Immunity.
117. Pathogenic Protozoa.
119. Bacteriological Chemistry.
120. Bacterial and Virus Diseases Common to Man and Animals.
121. Industrial Bacteriology.
122. Industrial Bacteriology (continued).
150-151. Advanced Bacteriology.
201. Research in Bacteriology. Consult Graduate School bulletin.
203. Seminar in Bacteriology. Consult Graduate School bulletin.

BOTANY

1. General Botany. Lectures and quizzes.
2. Elementary General Morphology of Plants. A survey of the plant kingdom; structure, life histories, and evolution of plants.
5. Elementary Plant Histology.
7. Taxonomy of Flowering Plants. A general study of the classification and relationships of flowering plants.
12. General Morphology of Algae. Structure, evolution, and classification of the algae.
13. General Morphology of Fungi.
21. Elementary Ecology. An introductory course in the study of plants in relation to their environment.
22. Elementary Plant Physiology. An introductory course giving a general survey of plant functions.
23. General Morphology of Bryophytes and Pteridophytes. Structure, evolution, and classification of liverworts, mosses, and ferns.
51. Histological Methods. Training in the technique of preparing plant material for microscopic study.
63. General Morphology of Gymnosperms and Angiosperms. Structure, evolution, and classification of seed plants.
101. Biometric Principles. An introduction to the mathematical analysis of biological data.
108. Morphology and Taxonomy of Pteridophytes. An intensive study of lycopods, ferns, and their allies; their structure, history, and classification.

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

113-114-115. Advanced Taxonomy of Flowering Plants. 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.

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

124, 125, 126. Morphology and Taxonomy of Algae: Algal Types. Advanced studies in selected groups. Any course may be taken separately.

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.

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.

132. Ecological Anatomy. The individual plant and its parts as related to environment; special plant forms and structures, their causes and significance.

133. Plant Geography of North America. Preliminary discussion of the principles of plant distribution followed by a detailed study of the vegetation regions of North America.

134. Research Methods in Ecology. Theory and practice of instrumental study of the habitat and of precise investigation of community and succession.

140. General Plant Physiology. Advance survey of the whole field of plant physiology.

141. Physical Phases of Plant Physiology. Elements of biophysics applied to plants and their environment.

142. Plant Metabolism. The synthesis of plant food, its transformation and utilization by the plant.

143. Plant Metabolism and Growth. A continuation of Course 142 dealing with respiration, growth, and movement.

145,146. Advanced Biometry. Theory and practical exercises in the statistical analysis of biological data.

149,150,151. Advanced Phycology. A general survey based on studies in field and laboratory. Designed for teachers and research workers who wish to acquire a practical knowledge of the algae. Problems and reports. Any course may be taken separately.

153. Biometric Methods. A study of special methods in biometric analysis, with particular reference to the trustworthiness of statistics.

PLANT PATHOLOGY AND BOTANY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

1. Plant Pathology.

7-8. Weeds and Grasses.

9. Weeds and Seed Testing.
10. Forest Pathology.
12. Seed Problems.
105-106-107. Mycology.
110. Principles of Pathology.
111. Diseases of Cereal Crops.
112. Diseases of Fruit Crops.
113. Diseases of Vegetable Crops.
114. Advanced Forest Pathology
116. Pathologic Histology
117. Diseases of Forage and Fiber Crops.
118. Bacterial Diseases of Plants
119. Principles of Plant Disease Control.
160. Plant Microchemistry.
161. Transport, Storage, and Ripening of Fruits and Vegetables.

INORGANIC CHEMISTRY

SCHOOL OF CHEMISTRY

1-2†-3. General Inorganic Chemistry.
4-5.† General Inorganic Chemistry.
6-7†-8. General Inorganic Chemistry.
9-10.† General Inorganic Chemistry.
11. Qualitative Chemical Analysis.
12-13.† Qualitative Chemical Analysis.
101. History of Chemistry.
102. Advanced Qualitative Chemical Analysis.
103-104-105. Advanced Inorganic Chemistry.
106-107-108. Inorganic Chemistry of the Rare Elements.

ANALYTIC CHEMISTRY

SCHOOL OF CHEMISTRY

1-2. Quantitative Analysis.
7. Quantitative Analysis.
123-124-125. Advanced Analytical Chemistry.
131. Application of Indicators.
132, 133. Electrometric Measurements and Titrations.
134. Seminar: Modern Problems in Analytical Chemistry.

ORGANIC CHEMISTRY

SCHOOL OF CHEMISTRY

1-2.† Elementary Organic Chemistry.
51-52-53. Organic Chemistry.
101-102-103. Advanced Organic Chemistry.
111. Reagents in Organic Chemistry.

113. The Aliphatic Compounds.
115. The Heterocyclic Compounds.
116. The Terpenes.
122. The Aromatic Compounds.
123. Dyes.
137. Advanced Organic Chemistry Laboratory.
139. Advanced Organic Chemistry Laboratory.

PHYSICAL CHEMISTRY

SCHOOL OF CHEMISTRY

101-102-103. Physical Chemistry.
110. Physical Chemistry.
116-117-118. Advanced Physical Chemistry.
129. Principles of Colloidal Chemistry.
130. Application of Colloidal Chemistry.
131-132-133. Colloid Chemistry Laboratory.
144. Magnetochemistry.
161-162. Radioactivity.
164. Radioactivity Laboratory.

TECHNOLOGICAL CHEMISTRY

SCHOOL OF CHEMISTRY

100-101-102. Food Analysis.

AGRICULTURAL BIOCHEMISTRY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Introductory Courses

3-4. Introduction to Organic Chemistry and Biochemistry.
7-8. General Agricultural Biochemistry.
15. Principles of Animal Nutrition.

Advanced Courses

101-102. Agricultural Quantitative Analysis.
103. Dairy Chemistry.
108. Chemistry of Wheat and Wheat Products.
110. Flour Laboratory Methods.
111-112. Biochemistry.
113-114-115. Biochemical Laboratory Methods.
116. Advanced Animal Nutrition.
118. Laboratory Problems in Biochemistry.

CHILD WELFARE

40. Child Training. Emphasis on the pre-school child.

60. Modern Aspects of Child Study. A survey of the nursery school, parental education, kindergarten and Montessori movements, child health and mental hygiene, and the development of research organizations.

80. Child Psychology. A survey of child development with special reference to the young child.

90. Physical Development of the Young Child. The physical growth and development of the young child in its anatomical, physiological, and functional aspects.

120. Health Care of the Young Child. A course in the physical care, illnesses, prevention of disease, and health problems of the young child.

130. The Development of the Young Child. An advanced course dealing with the development of the pre-school child from the anatomical, physiological, psychological, educational, and social aspects.

133-134†-135. Observational and Experimental Methods in the Study of the Development of Young Children. A study of the various methods and techniques such as growth records, mental tests, ratings, controlled observations, etc., used in the experimental study of the young child. Practical exercises and problems on institute records and data.

170. Parental Education in Child Care and Training. A consideration of the content and methods used in courses and study groups for parents in the care and training of young children. Lectures, discussions, and reports.

173-174.† Technique and Practice of Parental Education. Field work in the technique of organizing and conducting parental study groups and courses for the study of the young child.

190-191.† Mental Examination of Pre-School Children. A study of the methods used in testing young children together with practice in such testing.

230-231-232. Seminar in the Development of the Young Child. Consult Graduate School bulletin.

233-234-235. Research in the Development of the Young Child. Consult Graduate School bulletin.

250. Nursery School Education. Consult Graduate School bulletin.

COMPARATIVE LITERATURE

101-102-103.† Drama. An outline of the history of drama, including the drama of today. Lectures and readings.

105-106-107.† Principles of Criticism. Lectures and readings.

110. The International Romantic Movement in Europe (1775-1825).

111. The Novel in Europe, 1875-1925. Authors such as Dostoievski, Thomas Mann, Björnson, Undset, D'Annunzio, Valdès, Bourget, Loti, Proust, Barbusse, Hardy, Bennett, Galsworthy, Conrad, Lewis, will be studied.

203. The Arthurian Legend. Consult Graduate School bulletin.
206. French and English Literary Criticism: from the sixteenth century to the present time. Consult Graduate School bulletin.

DRAWING AND DESCRIPTIVE GEOMETRY

COLLEGE OF ENGINEERING AND ARCHITECTURE

41-42-43. Technical Drawing.
44. Lettering.
45. Alphabets.
64. The Graphic Arts: Introduction.
65. The Graphic Arts: Printing and Layouts.
66. The Graphic Arts: Processes.

ECONOMICS

SCHOOL OF BUSINESS ADMINISTRATION

1A. Business Organization: Production. Description of Industrial Organization. An elementary treatment of the economic principles involved in production.

1B. Business Organization: Marketing. An introduction to the economics of marketing, including descriptions of (1) the marketing processes, (2) produce exchanges and speculation on these exchanges, (3) cooperative marketing institutions, (4) market areas. The operation of supply and demand in marketing.

3. The Mechanism of Exchange. An elementary course in money and banking. The basic principles of money and a description of each of the various types of financial institutions, its functions and its relation to the whole economic organization.

4. Principles of Economics. A course in the fundamental principles of economics which is intended to serve as a foundation for advanced courses in business administration.

6-7.† Principles of Economics—General Course. For students beginning economics, who have not taken Economics 1 and 2. An intensive study of a standard text on the principles of economics, supplemented by lectures, and followed by readings on current economic problems.

14. Elements of Statistics. Elementary concepts in statistical methods; averages, ratios, errors, sampling, index numbers, graphic representation, collection of material.

20. Elements of Accounting. The fundamental principles underlying bookkeeping and accounting. Sufficient practice in technical processes will be given to serve as a background for more advanced work. Preparation and analysis of statements.

25-26. Principles of Accounting. A course following Economics 20 presenting the principles underlying the accounting statements, the accounts, principles of valuation, depreciation, preparation, and analysis of statements.

32-33-34.[1, 2] Secretarial Training: Typewriting, Keyboard technique, letter-writing, secretarial procedure, Ediphone transcription.

37-38-39.[1, 2] Secretarial Training: Shorthand. Economics 32, or equivalent is required as prerequisite. An elementary course in Gregg shorthand. A large vocabulary of high-frequency words is developed with emphasis placed upon dictation and transcription.

40-41-42.[1, 2] Secretarial Procedure, Economics 33 and 39, or equivalent, required as prerequisites. A vocabulary of frequent words and technical terms is developed for use in dictation and transcription. Students are trained in the secretarial procedure characteristic of various lines of business.

54. Accounting Survey I. One-quarter course covering the fundamental principles of accounting without making a study of the technical processes involved. Statement construction and analysis, income determination, valuation of assets, depreciation, intangibles, the corporate balance sheet, capital stock, bonds.

55. Accounting Survey II. The applications of accounting to social and public problems such as: statement analysis and auditing from the investor's viewpoint, cost problems, accounting as an instrument of social control over public utilities and governmental operations.

85. Economics of Marketing. A general course dealing with (1) the market functions, (2) the organization of marketing enterprises, (3) measures of efficiency in marketing, (4) the manager's administration of marketing.

103-104.† Value and Distribution. An advanced course in economic theory, prices and costs; the value theory. The distribution of wealth; causes and effects of inequality. The distribution of income; inequality; rent, wages, interest, and profits.

105. History of Economic Ideas—The Classical Economists. The development of the doctrines of classical economics by English and French writers from 1750 to 1850. Economic and political influences giving rise to doctrines of population, distribution, governmental interference.

106. History of Economic Ideas.—The Critics of the Classical Economists. Leading critics of the classical school of economics are studied, especially such critics as (1) Karl Marx and Henry George who emphasized the dynamic aspects of economic life, (2) the nationalistic school, (3) the historical school, and (4) the modern institutionalists.

113-114. Theory of Statistics. An advanced course in statistical analysis, covering averages, dispersion, simple and multiple correlation, and the theory of sampling. A brief consideration of the theory of index numbers.

124. Comparative Banking—British Systems. A study of the existing financial institutions of the various members of the British Empire

[1] A fee of $2.50 per quarter is charged for the use of typewriters in one or more of these courses.

[2] Does not carry credit except for admission to the secretarial course and the course in commercial education.

with regard to development, functions, methods, and problems. Constant comparison is made with the American system.

125. Comparative Banking—European Systems. Similar to Course 124, except that five of the continental systems will be studied instead of the British systems.

127. Comparative Banking—South American Systems.

141. Monetary and Banking Policy. An advanced course in money and banking. Banking policy viewed from the social viewpoint, with primary reference to the problems of the Federal Reserve system. Selected problems in monetary policy; monetary reconstruction and monetary reform.

149. Business Cycles. Analysis of factors involved in business fluctuations. Comparison of theories of the causes of prosperity and depression. Introduction to the statistical data and methods of business forecasting.

154. Public Utilities. A general survey of the economic characteristics and the legal position of public utilities. Special emphasis on methods of public regulation, valuation, and control of finances.

160. The Modern Corporation. A survey of the simpler financial activities and of the social problems of the corporate form of business organization.

161. Labor Problems and Trade Unionism. A discussion of employment; hours; wages; extent and strongholds of unionism; open and closed shops; collective bargaining; industrial unrest; government regulation of labor disputes.

162. Labor Movements. An interpretation of leading labor movements in Europe and the United States during the last century.

163. Economic Aspects of Population and Immigration. Population and immigration trends, economic interpretations of these trends with probable forecasts. Various population theories are studied.

164. Labor Legislation and Social Insurance. A course dealing with the economic aspects of labor legislation, including minimum wage laws; hours legislation; factory acts; accident, health, old age, and employment insurance; mothers' pensions.

166. Contemporary Economic Problems. A survey of current problems including monetary stabilization, reparations, international debts and the Dawes Plan, foreign investments and economic imperialism, international cartels and tariff barriers, international wage levels, population and immigration movements.

172. Economics of Transportation.

176. Commercial Policies. Theory of international commerce; protective tariffs, free trade, reciprocity, subsidies, preferential treatment, the open door, international finance, commercial treaties, foreign politics, and other governmental and organized efforts to affect trade. American problems emphasized.

187,188,189. Honors Course in Economics. This course is arranged for those students whose scholastic records are of such a character as to warrant encouraging them to carry on independent study in economics.

Admission will be granted only by special permission of the faculty. Application should be made to one of the major advisers.

191-192. Public Finance. Public expenditures, revenues, and debts. Special attention is given to tax principles, practices, and burdens.

193. State and Local Taxation. Main problems of state and local finance and proposed solutions thereof.

ENGLISH

COURSES IN ENGLISH

A-B-C. Freshman English. The study of the fundamental principles of composition; training in the art of writing; classics of English literature.

21-22-23.[1] Introduction to English Literature.

31-32.† Development of the English Novel. Principles and personalities in the evolution of the English novel. Written reports on selected novels.

33. The Later English Novel.

40-41. The Bible as Literature. Special attention to literary forms.

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.*

53. Seventeenth-Century Lyrists. The tradition of the Elizabethan lyric traced in the work of the metaphysical and cavalier schools of poetry.

55-56.† Shakespeare.

58-59.† Nineteenth-Century Prose. The more important prose of the nineteenth century, not including fiction.

61. American Pronunciation. A study of the sounds of present day English, with particular reference to American usage.

62. Milton, with some consideration of his contemporaries.

63. American Usage. A study of the forms and syntax of present day English, with particular reference to American English.

69. Browning and Tennyson. Most of the time will be spent on Browning.

73-74.† American Literature.

75. Chaucer. Reading of tales from the Canterbury collection, with introduction dealing with the grammar and literary forms of fourteenth-century English.

77-78.† Classic Myths and the Classic Tradition in English Poetry. Some ancient literature (in translation), and representative poets from Chaucer to the present.

81-82.† Survey of Middle English.

86.† Forms of English Verse.

100. Old English. Old English prose and poetry. The relation to modern English is particularly emphasized.

102. Old English Poetry.

[1] Students must take two consecutive quarters to receive credit.

103. Beowulf. An introduction to the Old English poem, with reading of considerable portions of the text.

105-106.† Eighteenth-Century Poetry. From Pope to Burns, with special reference to the rise and growth of romanticism.

107-108.† Eighteenth-Century Prose. Special study of fiction and the essay.

109-110.† The Romantic Poets of the Nineteenth Century. From Wordsworth to Keats.

111-112.† Seventeenth-Century Prose. General survey of the prose of the century to 1660.

123-124-125.† The Technique of the Novel. Special studies in novels of the late nineteenth and twentieth centuries with particular regard to structure.

126-127.† Drama, 1660 to 1880.

129. Modern Drama. Contemporary drama from 1870 to the present.

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.

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.

140. Advanced Chaucer. The more important poems (except those read in Course 75.) The treatment will be primarily literary and historical, linguistic proficiency being presumed.

141-142-143.† Historical Grammar of the English Language.

146-147.† The Metrical Romances. The more important Middle English romances of the non-Arthurian cycles.

148-149.† The Arthurian Romances. An introduction to the great stories of love and chivalry connected with King Arthur and the Round Table.

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.

151. Recent Poetry. Poetry in England and America since the death of Queen Victoria. The main tradition and tendencies now prevailing.

152.† Pre-Elizabethan Drama. The late Medieval and the Renaissance drama, moralities, interludes, and farces up through the earlier years of the Elizabethan period.

154-155. The American Novel. The history of the American novel from the beginning to the present.

156. The American Drama.

157-158.† Elizabethan Non-Dramatic Literature. Renaissance background; lyric and narrative poetry, prose fiction, pamphlets, translations, critical essays.

159. Colonial Literature in America. A study of early American literature (1608 to 1785).

160. History of the English Language.

162. Restoration Literature.

165. A Historical Study of Modern English.

168. Literary Criticism. A historical speech, with special reference to Aristotle, Sir Philip Sidney, Dryden, Dr. Johnson, Coleridge, Arnold, T. S. Eliot.

170. 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.

171-172-173. Honors Course.

GRADUATE COURSES. CONSULT GRADUATE SCHOOL BULLETIN

201. Old English.

202-203. Old English Poetry.

208. Piers the Plowman.

209-210-211. Seminary in Middle English Lyric.

213-214-215. Seminary in Eighteenth-Century Drama.

217-218-219. Seminary in Restoration Drama.

220-221-222. Seminary in Medieval Drama.

225-226-227. Seminary in Elizabethan Drama.

228-229-230. Seminary in Eighteenth-Century Novel.

231-232-233. Shakespeare's Tragic and Comic Art.

234-235-236. Seminary in Middle English Alliterative Poetry.

237-238-239. Seminary in Chaucer.

240-241-242. Seminary in *The Canterbury Tales.*

COURSES IN COMPOSITION

A-B-C. Freshman English. The study of the fundamental principles of composition; training in the art of writing; the classics of English literature.

4-5-6. Freshman Composition. Practical training in the art of writing; the principles of structure, and analysis of specimens of good prose.

11-12.† Description and Narration.

18-19.† Types of Writing. Advanced exposition, first quarter; description and narration, second quarter. Intended for students who do not plan to take advanced work in narrative writing.

20. Informal Exposition. Description and narration as methods of exposition; the informal essay.

31. Technical Writing. (See bulletin of the College of Engineering.)

65. Source Materials: Shakespeare's England (or similar field).

67-68.† 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. Number of students limited to twenty-five.

69-70-71.† Short-Story Writing. The technique of the short story accompanied by constructive work in story writing. Number of students limited to twenty-five.

81-82-83. Essay Writing. Practice in writing didactic, biographical, critical, and informal essays. Analysis of a considerable body of modern essays.

91-92-93. Seminary in Writing. Open to advanced students who write with facility and who desire personal direction. Criticism of manuscripts submitted.

THE FINE ARTS

In the courses in the history of art the lectures will be illustrated by lantern slides and the student will prepare his work by means of reference reading and the study of photographs.

1. History of Classic Art. Illustrated lectures and reading on the development of the major arts from the earliest times to the fall of Rome.
2. History of Architecture and Sculpture. Development of these two major branches of art from the rise of Christianity to modern times.
3. History of Painting. An introductory historical survey of painting from the late middle ages to the present time.
5. Appreciation of the Fine Arts. Discussion of the elements of the fine arts.
40. European Study. Observations in museums during the summer supplemented by reading. Consent of the instructor and directions for this work must be secured before going abroad.
51. Medieval Art. Chiefly architecture and sculpture of Gothic cathedrals.
52. Art of the Italian Renaissance.
53. Art of the Seventeenth Century.
54. Art of the Eighteenth Century.
55. Art of the Nineteenth Century.
56. American Art.

GEOGRAPHY

1-2.† Introduction to Human Geography. An introductory study of man's distribution and economic activities.

11. Human Geography. A study of the factors of the physical environment and their limiting effect on human activities.
41. Geography of Commercial Production. The principal commodities of world trade, with reference to areas of production and consumption and the geographic elements in their production.
43. Political Geography. The natural environment in its relation to man's political activities and organizations.
53. Historical Geography. The geography of selected districts of the United States during past periods of history, the successive adjustments of man to the pre-existent natural environment being presented in chronological order.
71. Geography of North America. A systematic study of the United States, Canada, and Mexico, with special reference to industrial and commercial opportunities and the distribution of activities of the population.
101. Geography of Europe. A study of the various European countries and their development as influenced by the physical setting.
102. Trade Routes and Trade Centers. Major land and ocean routes, the nature of the traffic, ports and interior trade centers, their location and significance.

110. Geography of South America. A study of the major geographic regions of South America with emphasis upon the economic activities and their geographic basis.

111. Cartography. The construction and use of maps and graphs.

120. Geography of Asia. Areal differentiation in the major geographic regions of Asia. Special consideration of China, Japan, and India.

133. Climatology. Weather and climate in their relation to man and his activities.

235. Geography of Minnesota. A regional economic study of the state. The basis for the existing development and the problems of the idle lands will receive special consideration. The principal cities will be studied as sites for industry and commerce.

241. Field Course in Geography. A consideration of the problems of field work, illustrated by field trips.

251-252-253. Seminar in Geography. A survey of current literature with reports and discussions on assigned topics.

301. Research Problems in Geography. Consult Graduate School bulletin.

GEOLOGY

1-2.† General Geology (Dynamic and Historical). A synoptical treatment of the materials of the earth and of geologic processes, together with a study of the history of the earth and its inhabitants as recorded in the rocks.

1-3.† General Geology (Dynamic and Economic). A synoptical treatment of the materials of the earth and the origin, distribution, and occurrence of metals, non-metals, coal, and petroleum.

4. Geology of Minnesota. The physical geography and geologic history of Minnesota. The relations of industrial development to geologic features.

8. Introductory Geology. A course designed especially for students who want a short introductory course as an elective. Principles of earth sculpture; topographic changes and their causative agents; dynamic, structural, and historical geology.

11. Elements of Paleontology. An introduction to the study of fossil organisms. Lectures supplemented by laboratory work and field excursions.

15. Minerals and Rocks. An outline study of general principles of petrography; classification of minerals and rocks and practice in their identification.

23-24.† Elements of Mineralogy. The crystal systems; morphological, physical, and chemical characters of minerals; occurrence, genesis, and use of minerals; classification and description of common minerals. rock minerals, and common rocks. Determinative work in laboratory, blowpipe analysis, sight identification.

27. Outlines of Mineralogy. A course designed especially for teachers. Methods of identification of minerals, laboratory practice, conferences, reference reading.

61. Blowpipe Analysis. The determination of minerals by systematic blowpipe analysis.

73. Economic Geology. Study of non-metallic minerals of economic value, and discussion of geologic guides to prospecting for these deposits.

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.

91-92-93. Index Fossils of North America. A study of fossils and their uses in correlation. A course intended primarily for mining geologists.

101. Sedimentation. The origin of sedimentary rocks and their primary structures; interpretation of sediments in relation to paleogeography. Lectures and assigned readings.

102-103. Micropaleontology. A study and classification of Foraminifera, diatoms, and other small fossil organisms, and their use for purposes of correlation.

105. Rock Study. The occurrence and genesis of rocks; their mineral and chemical composition and classification; their structure, texture, and alteration.

106. Petrography. The study of rocks by optical methods.

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. Three credit hours of laboratory work.

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.

112. Geology of Petroleum. The nature, origin, and distribution of petroleum. Discussion of the oil fields of the world.

113. Problems in Ore Deposits. Field excursions, map work, lectures on field and laboratory methods.

119. Physiography of the United States. The development of the surface features of the United States as affected by the rock structure and geologic history. Description and genetic analysis.

121. Crystallography. Study of crystal models and space groups. Crystal drawings and measurements. Projections and mathematical calculations.

124-125. Structural and Metamorphic Geology. A study of the principles and application of structural geology. The conditions, processes, and results of metamorphism.

127. Geology of the Lake Superior Region. Structure and correlation of districts. Interpretation of field notes and survey reports. Practical problems.

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.

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.

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.

144-145. Interpretation of Geologic Maps. Study and problems in construction and interpretation of geologic maps; recognition of structural and stratigraphic relations. Geology 124 should precede or accompany this course.

149. Methods of Field Geology. General methods of field work necessary for Course 150.

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 1930, Black Hills, South Dakota. May 1 to June 15.

151-152-153. Advanced General Geology. Geologic processes and their results; development of the North American continent.

161. Crystal Structure. Study of point groups and space groups. Diffraction of X-rays by crystals. Interpretation of powder and Laue diagrams.

166-167. Mineralography. Methods of studying opaque minerals and the application of the methods to problems in ore genesis and history.

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.
251-252. Original Problems.
253-254. Research Course in Ore Deposits.
263-264. Research Course in Petrology.

GERMAN

1. Beginning A.
2. Beginning B. Continuation of Course A.
3. Beginning C. Selected texts from modern writers.
3A. Beginning C for Pre-Medics.
4. Intermediate German. Modern narrative prose.
4A. Intermediate German for Pre-Medics.

24-25-26.† Beginning German for Chemists.

30-31-32.† Medical German. Reading 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.

53-54-55. Conversation.

56-57.† Essay Writing. Syntax, structure, and style; criticism of essays on assigned subjects.

61. Epics and Ballads. Epics and ballads from classical and modern authors.

62. Nineteenth-Century Prose. Readings from modern novelists.

63. Modern Drama.

64. Classic Drama.

65. Survey of German Literature through the Reformation Period.

66. Survey of German Literature of the Eighteenth Century.

67. Survey of German Literature of the Nineteenth Century.

77. Goethe's *Faust,* Part I. Reading and interpretation of the text; genesis of the work; the Faust legends, Faust books, puppet plays, Marlowe's *Faustus.*

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.

115-116-117.† Middle High German Literature: The Nibelungenlied, the Court Epic, the Minnesong.

143-144-145.† The Classical Period. The literary period from the birth of Gottsched (1700) to the death of Goethe (1832).

153-154-155.† Studies in German Literature of the Nineteenth Century. Subject for 1931-32: Realism.

160-161-162.† Lyric Poetry of the Eighteenth and Nineteenth Centuries.

163-164-165.† German and English Literary Relations in the Sixteenth, Seventeenth, and Eighteenth Centuries.

170-171-172. Young Germany (Gutzkow, Immerman, Heine).

173-174-175. The Modern Novel, 1890-1930.

215-216-217.† Middle High German. Consult Graduate School bulletin.

GREEK

1-2†-3. Beginning Greek. Grammar, composition, word formation, oral exercises, and selected readings in simple prose and verse.

14. History: Xenophon or Herodotus. Selected readings; syntax, irregular verbs, collateral work.

15. History: Herodotus. Selected readings; syntax, irregular verbs, dialectical forms.

16. Epic Poetry: Homer. Selections from the *Iliad* or *Odyssey;* scansion, mythology, dialectical forms.

17. Greek Sources of English (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 dialogs of Plato; collateral work.

52. Oratory. Selections from Lysias and Demosthenes; study of the principles of Greek rhetoric and Greek oratory.

53. Dramatic Poetry. One play of Euripides; introductory course in the drama.

61-62-63. Advanced Greek Composition. Translation into Greek of selected passages of English prose, with review of important principles of syntax.

105. Lyric Poetry. Selections from the elegiac, iambic, lyric, and bucolic poets.

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.

107. Advanced Prose. Selections from Plutarch or Lucian. Alternates with Course 106.

108. Advanced Epic Poetry. A course of rapid readings in the *Iliad* or the *Odyssey.*

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.

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.

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.

44. Greek Literature and Life. Lectures, textbook work, illustrative and assigned readings; stereopticon views. Recommended to those who intend to teach Greek, Latin, English, or ancient history.

45. Greek Mythology. Lectures, textbook work, and illustrative readings, supplemented by occasional stereopticon views. Recommended to those specializing in languages, literature, or philosophy.

HISTORY

JUNIOR COLLEGE COURSES

1-2.† The Modern World.

3. Social and Economic History of Modern Europe.

4-5.† Survey of English History.

7-8-9.† American History. National period introduced by a brief survey of the situation preceding the Revolution.

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.

17. Europe in the Middle Ages.

SENIOR COLLEGE COURSES

Survey Courses Open to Juniors and Seniors

50-51-52.† Survey of Ancient European History.

53-54-55.† Survey of Medieval European History.

56-57-58.† Survey of Early Modern European History. From the sixteenth century to 1815.

59-60-61.† Survey of Later Modern European History. After 1815.

62-63-64.† Survey of European Expansion. Exploration, colonization in the New World, Africa, and elsewhere.

70-71-72.† Survey of English Constitutional History.

73-74-75.† England since 1485.

76-77-78.† Survey of Canadian History.

80-81-82.† Introduction to Economic History.

83-84-85.† American Economic History.

86-87.† English Backgrounds and American Colonies.

88-89.† American Colonies in the Seventeenth Century.

90-91-92.† The West in American History.

93-94-95.† American Diplomatic History.

Intensive Reading Courses Open to Seniors and Graduates

150-151-152.† Topics in Ancient European History.

153-154-155.† Topics in Medieval European History. Small groups will study and read intensively on such topics as the Crusades, Empire and Papacy, Rise of Feudalism, Feudal Institutions, European Migrations, Rise of National States, Intellectual Development, the Renaissance, the Reformation, Rise of Towns.

156-157-158.† Topics in Modern European History. Small groups will study and read intensively on such topics as Age of Louis XIV, the Eighteenth Century, French Revolution and Empire, Restoration and Revolution, Second French Empire, Making of Italy and Germany, International Relations, 1871-1914, European since 1914, the Eastern Question, Modern Russia.

170-171-172.† Topics in English History. Small groups will study and read intensively on such topics as Beginnings of Parliament, Legal Reforms of Henry II, Local Self-Government in Medieval England, Parliament and Administration in the Fourteenth Century, Antiquarianism and Political Theorists, English Backgrounds and American Colonies, the Tudors and Stuarts, England in the Nineteenth Century, British India.

180-181-182.† Topics in Economic History. Topics studied will include subjects as the Industrial, Agricultural, and Commercial Revolutions,

Organization of Modern Industry and Finance, Commercial Policy, Labor Movement, Industrial Legislation.

190-191-192.† Topics in American History. Small groups will study and read intensively on such topics as the Colonies, the Revolution and Making of the Constitution, Political Parties, Civil War and Reconstruction, Immigration, the West, History of Minnesota, American Agriculture and Rural Life, American Diplomacy, Recent American Development.

HOME ECONOMICS

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

3. Textiles.
4. Textiles.
11. Clothing Planning and Construction A.
13. Clothing Planning and Construction B.
15. Clothing Problems.
17. Advanced Clothing.
50. Color and Design I.
51. Color and Design II.
53. Related Art Problems.
56. Applications of Color and Design.
70. Nutrition Survey.
80. Foods and Cookery.
83. Food Management.
90. Home Management Problems for Social Workers. The management of the home in relation to the economic and social status of the family, special consideration being given to the dependent family.
115. Clothing Economics.
131. Home Management: House Planning and Equipment.
150. Art History and Appreciation.

HOW TO STUDY

1. How To Study. Intensive study of principles underlying academic work, such as budgeting time, efficient reading, recitation methods, and organization of knowledge. Practice in the skills involved.

HUMAN ANATOMY

MEDICAL SCHOOL

For Course 3, Elementary Anatomy, primarily for nurses, see Nursing School program.

Students in this college may elect other courses in human anatomy (see Medical School program) only by arrangement with the head of the Department of Anatomy.

HUMAN PHYSIOLOGY

MEDICAL SCHOOL

1. Elementary Physiological Chemistry. Primarily for nursing students. Open to others.
2. Elementary Physiology. Primarily for nursing students. Open to others.
4. Human Physiology. A brief course for academic and home economic students. Lectures and laboratory work.

57.[1] Physiologic Chemistry. Intermediate course.

59.[1] Human Physiology. Intermediate course.

60. Physiology of Exercise.

100-101. Physiologic Chemistry. Inorganic, carbohydrate, fat, protein and heat metabolism.

103. Physiology of Muscle, Nerve, Blood, Circulation, Respiration, Digestion.

104. Physiology of the Nervous System and Special Senses, Metabolism, Nutrition, and Excretion.

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.

114. Applied Physiology. The interpretation in physiologic terms of symptoms and signs of abnormal cardiac and circulatory function.

116. Theory of Tissue Culture. A lecture course with assigned readings.

117. Laboratory Course in Tissue Culture. Practical work under direction.

118. Internal Secretions. Consideration of pathologic physiology on the basis of recent clinical observations.

131. Advanced Physiology of Muscle, Blood, Circulation, and Digestion. Alterations due to physiologic conditions. Special laboratory work.

153. Problems in Physiologic Chemistry. Course arranged by instructors with qualified students for special work. May be taken one or more quarters.

155,156,157. Pathological Chemistry. Blood chemistry of diabetes and nephritis. Basal metabolism, deficiency diseases.

162,163,164. Physical Chemistry and Biophysics in Biology and Medicine.

162x,163x,164x. Laboratory course related to Course 162,163,164.

NOTE.—For other courses, see Medical School bulletin.

JOURNALISM

NOTE.—A typewriter fee of $1 is charged each quarter to all students registered for journalism courses, with the exception of Journalism 5, regardless of the number of courses pursued.

5. The American Newspaper. A survey of the history, organization, and methods of contemporary journalism, followed by an analysis of the relations of newspapers to their readers.

[1] Courses 57, 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 cannot receive credit for both of these sequences.

13. Introduction to Reporting. Intensive practice in forms of newspaper writing, together with exercises to promote familiarity with modern journalistic writing. Section I undertakes a more intensive and less general study of reporting problems than Section II.

14-15.† Newspaper Reporting. Detailed study of the reporter's problems and how he meets them. Students cover at least one news assignment each week, in addition to doing exercises to encourage an analytical attitude toward newspapers and their contents.

17.[1] Newspaper Reference Methods. A course intended to acquaint prospective journalists with sources of information and reference, which will enable them to write and edit with more appreciation of the significance of their subjects. Newspaper library and filing methods.

41.[2] Editing for Non-Majors. A one-quarter course in copy reading, proofreading, and make-up for journalism minors and those having a professional or vocational major in colleges other than Science, Literature, and the Arts.

51-52.†[3] News Editing. Instruction and practice in editing news copy, proofreading, headline writing, and news evaluation. Students will edit timely wire news received over telegraph printer machines. Practice in news judgment in determining the display of the news.

55.[4, 5] Advertising Typography. How to use type to create more effective advertisements, how to identify and use the better type faces, how to handle typographic elements of advertising layouts. Laboratory instruction in type setting and make-up of advertisements.

56.[4, 5] Newspaper Typography and Make-Up. How to identify and use type faces, how to handle headlines and type devices for interesting newspaper make-up. Instruction in type setting, make-up of page forms, study of printing machinery, and engraving processes.

58. Advanced Typography.

60-61-62.† The Weekly Newspaper. A comprehensive analysis of publishing problems of the weekly newspaper. The first quarter is devoted to editorial management; the second to local, national, and classified advertising; the third to circulation problems, cost accounting, business management.

65. Women's Departments. Study of departmental work on newspapers and magazines and an analysis of the editorial positions usually occupied by women.

69. Newspaper and Magazine Articles. A course intended for students enrolled as journalism minors. Practice in writing articles for newspapers and for magazines of varied types. Markets for such articles are studied, and emphasis is placed upon writing for publication.

[1] No student may receive credit for both Journalism 17 and Library Methods 1.
[2] A laboratory fee of $1 is charged for this course.
[3] A laboratory fee of $2 per quarter is charged for this course.
[4] Credit will be allowed for only one quarter of Courses 55 and 56.
[5] A laboratory fee of $1 per credit is charged for this course.

70-71.† Business and Specialized Journalism. A study of the specialized journalism of the leading industries, professions, and vocations. Practice in writing news and feature articles for trade and class magazines. Some attention is given to the general publication problems.

73-74.† Newspaper and Magazine Articles. The special article considered with reference to newspapers and magazines of various types. It is primarily a writing course, but attention is given to the theory of popular writing, selection of subjects, gathering of material.

75. Law of the Press. A study of the rights and obligations of newspapers, magazines, and journalists, including the laws affecting libel, contempt of court, literary property, rights of privacy, and federal regulations.

76. Critical Writing. A study of critical standards. Reviews of books, plays, and motion pictures are written and discussed.

78. Press Relations. A course designed to give specialized instruction to those who may have occasion to deal with newspapers and editors from the outside. The study of press contacts.

82. Supervision of School Publications. A practical consideration of problems which face the high school teacher who supervises the newspaper, magazine, or yearbook. The course includes editorial content, staff organization, editing, headlines, typography, make-up, business management, publication costs, engraving, photography.

94-95.† Newspaper Administration. The principles and problems of circulation advertising, business, and editorial management of the newspaper with particular reference to the small daily newspaper.

96. The Journalism of Finance and Commerce. An examination of the sources, values, and procedures in gathering and writing news and special articles based on business and financial subjects, including the specialty subjects of the business page.

101. Reporting of Public Affairs. A review of city, county, state, and national government as a background for reporting. Advanced practice in the writing of news stories.

103. Literary Aspects of Journalism. Study of journalistic works of a literary character. The course will include the study of examples of a high order of journalistic writing—American, British, and Continental.

110. History of Journalism. A survey of main trends in the history of journalism. The preprinting era, the first printed newspapers, the Old World origins of American journalism, colonial press, political party press, popular newspapers, the period of contemporary journalism.

111. Foreign News Sources. An examination of foreign news and the methods by which it is obtained and prepared for American readers. The importance of foreign news, the methods of correspondents in various countries, the newspapers in those countries.

112. Current Newspaper Problems. A study of contemporary matters of importance in journalistic fields, such as the growth of chain newspapers, the radio in its relation to newspapers, changing news values, ethics of journalism, and the professionalization of journalism.

130-131-132.† The Press and Public Opinion. A study of the newspaper and public opinion; a survey of theories of what constitutes public opinion; the influence of the newspaper in the field of political and social relations; publicity, propaganda, and their techniques.

140-141-142.† Contemporary Affairs. A study of important state, national, and world problems about which the journalist must be informed and concerning which he serves as interpreter. The course aims to unify separate social studies bearing on contemporary problems.

210. Research in Newspaper Problems. Individual research in either historical or contemporary phases of newspaper, magazine, or advertising fields.

LATIN

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. Virgil: Book I of the *Aeneid.* The first month is spent in grammatical review and practice in Latin composition. A continuation of Course 3. Students entering the first quarter with two years' preparation in Latin may select Course 11.

12. Selections from Virgil: Books II to VI of the *Aeneid.* Students entering the second quarter with two years of Latin may select Course 12.

21. Selections from Latin Authors.

22. Selections and Survey of Roman Literature.

23. Plautus and Terence. One play each of Plautus and Terence with a study of the beginnings of Roman drama. Students entering the third quarter with four years' preparation in Latin may select Course 23.

SENIOR COLLEGE COURSES

51. Pliny's Letters. Selected letters of Pliny the Younger with a study of Roman society in his time.

52. Horace's Satires and Epistles.

53. Suetonius. Selected Lives of the Caesars, including that of Nero.

62. Horace's Odes and Epodes. Alternates with Course 52.

63. Apuleius. Selected stories including that of Cupid and Psyche. Alternates with Course 53.

71. Cicero's *De Amicitia* and *De Senectute.* Alternates with Course 51.

73. Advanced Grammar and Composition.

121. Advanced Virgil. Selections from the Eclogues and Georgics and from Books VIII to XII of the *Aeneid.* Alternates with Course 131.

122. Cicero's Letters.

123. Medieval Latin. Selections from Beeson's *Primer of Medieval Latin.*

131. Juvenal. Selected satires. Alternates with Course 121.

132. Seneca's Epistles. Alternates with Course 122.

133. Vulgar Latin. Lectures on vulgar Latin; selections from Petronius and Gregory of Tours. Alternates with Course 123.

145.[1] Roman Tragedy.

146.[1] Roman Comedy.

147.[1] The Histories of Tacitus

154.[1] The Elegiac Poets.

201-202-203. Tacitus. Graduate seminar.

211-212-213. Lucretius. Graduate seminar.

221-222-223. Cicero's Philosophical Works. Graduate seminar.

231-232-233. Cicero's Rhetorical Works. Graduate seminar.

241-242-243. Graduate Seminar. Introduction to classical philology with special attention to the principles of textual criticism, epigraphy, and historical Latin grammar.

LIBRARY METHODS

1. Use of Books and Libraries. General introduction. No professional credit.

NOTE.—For professional courses in Library Instruction, consult the bulletin of the Division of Library Instruction.

MATHEMATICS

3.[2] Higher Algebra, Short Course. 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.

4.[2] College Algebra and Trigonometry. Selected topics in algebra and trigonometry with special reference to preparation for the first course in physics.

5. 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.[3] Trigonometry. Logarithms and plane trigonometry.

7.[3] 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.

8.[3] Commerce Algebra. Logarithms and selected topics in college algebra. A preparatory course for Mathematics of Investment, designed primarily for pre-business students.

[1] Courses 145, 146, 147, and 154 are offered in successive summers.

[2] For pre-medical and pre-dental students, and others who desire only the mathematics necessary in the first course in physics.

[3] Courses 6 and 8 involve some duplication; any student who has taken one of them may take the other for 4 credits. No student may receive credit for both Courses 7 and 8. Students who elect mathematics to meet the requirements of 10 credits in mathematics or laboratory science in the pre-business course should take Courses 5 and 8 if they have not had high school higher algebra and Courses 8 and 20 if they have had high school higher algebra.

20. The Mathematics of Investment. First principles of the mathematical theory of interest, annuities, amortization, valuation of bonds, sinking funds and depreciation.
21. Elements of the Mathematics of Life Insurance.
30. Analytic Geometry. The elements of plane analytic geometry including the geometry of the conic sections, with a brief introduction to solid analytic geometry.
50. Calculus I. Differential calculus.
51. Calculus II. Integral calculus.
52. Calculus III. Selected topics in differential and integral calculus with special reference to infinite series, partial differentiation, multiple integrals, and applications of the calculus.
60. Synthetic Metric Geometry. The modern developments of Euclidean geometry, with a detailed study of some of the more modern geometry of the triangle and the circle.
62. Theory of Equations I.
63. Theory of Equations II.
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.
102. Advanced Analytical Geometry.
106. Differential Equations.
107-108. Advanced Calculus. Selected topics in advanced differential and integral calculus.
116. Differential Geometry.
118. Vector Analysis.
121-122-123. The Mathematical Theory of Statistics. Frequency curves, averages, measures of dispersion, ordinary and partial correlation, theory of probability and the method of least squares, theory of sampling, construction and smoothing of tables, curve fitting, analysis of time series.
131. Advanced Algebraic Theory. A study of the fundamental properties of polynomials, determinants, matrices, linear transformations, and quadratic forms, based on Bôcher's *Introduction to Higher Algebra.*
141. Projective Geometry.
142. Theory of Invariants. Algebraic properties of invariants and covariants of binary and ternary forms; applications; symbolic notation.
143. Integral Equations.
144-145-146. Topics in Mathematical Analysis. A study of mathematical questions arising in connection with certain problems of mathematical physics; developments in series; the properties of solutions of Laplace's equation.

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.

MECHANICAL ENGINEERING

COLLEGE OF ENGINEERING AND ARCHITECTURE

11.[1] Pattern Practice.
12.[1] Foundry Practice.
13.[1] Forge Practice.

MILITARY SCIENCE AND TACTICS

1-2-3. First Year Basic Course R.O.T.C. Infantry. Practical and theoretical instruction in school of soldier, squad, and company; rifle marksmanship, military hygiene, and first aid; military courtesy; physical drill; equipment; ceremonies, National Defense Act.

4-5-6. Second Year Basic Course R.O.T.C. Infantry. Practical instruction in school of the platoon and company; command and leadership; scouting and patrolling; automatic rifle; musketry.

51-52-53. First Year Advanced Course R.O.T.C. Infantry. Combat principles; military sketching and map reading; machine gun, 37 mm gun, 3-inch trench mortar; drill and command.

54-55-56. Second Year Advanced Course R.O.T.C. Infantry. Administration; military history and policy; combat principles; drill and command; military law and Officers Reserve Corps regulations, field engineering.

MUSIC

1-2-3.† Harmony. The study of chords, their construction, relations, and progressions. Written exercises on bases, the harmonization of given melodies.

4-5-6.† Counterpoint. Strict counterpoint up to eight parts; free contrapuntal harmonization of chorales and composition of smaller contrapuntal forms as inventions.

7-8-9. Ear Training.
10.[2] Organ.
11.[2] Piano.
12.[2] Voice.
13.[2] Violin.
14.[3] Viola.
15.[3] Cello.
16.[3] Double Bass.
17.[3] Flute.
18.[3] Oboe.
19.[3] Clarinet.
20.[3] Bassoon.
21.[3] Trumpet.
22.[3] French Horn.
23.[3] Trombone.
24.[3] Tuba.
25.[3] Percussion.
26.[3] Harp.
40-41-42. Orchestra.
43-44-45. University Chorus.

86-87-88. Normal Piano.
89-90-91. Advanced Normal Piano.

[1] For description, see bulletin of the College of Engineering and Architecture.

[2] Fees as follows are charged for these courses:
1 lesson per week, 2 credits in 1 subject, fee $35 per quarter.
2 lessons per week, 4 credits in 1 subject, fee $65 per quarter
2 lessons per week, 2 credits in each of 2 subjects, fee $70 per quarter.

[3] Fees as follows are charged for these courses:
1 lesson per week, 2 credits in 1 subject, fee $40 per quarter.
2 lessons per week, 4 credits in 1 subject, fee $75 per quarter.
2 lessons per week, 2 credits in each of 2 subjects, fee $80 per quarter.

100-101-102. Composition-Orchestration. For those specializing in theory. May be taken only with the consent of the instructor.

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.

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.

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.

112-113-114. Ensemble. Section 1. (For students of piano, violin, organ, etc.) Chamber music, duos, trios, and quartets and other larger combinations for strings and wind instruments. Section 2. (For voice students.) Oratorio and opera.

115-116-117. Advanced Ensemble. Section 1. (For students of piano, organ, violin, etc.) Chamber music continued. Section 2. (For voice students.) Offers to groups made up of students from all voice ensemble classes, practical experience in scenes from opera.

121-122-123. Romantic Movement. An analytical course covering the romantic movement, with illustrations by the instructor. Papers assigned during the year.

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.

127-128-129. Advanced Composition.

201-202-203. Basis of Musical Expression. Consult Graduate School bulletin.

ORIENTATION

1-2.† Man in Nature and Society. A course intended to orient the student in the world of nature, of man, and of organized society; to stimulate intellectual curiosity and to develop habits of scientific thinking in these fields.

PHILOSOPHY

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.

2. Logic. The nature of knowledge, the laws of reasoning, the principles and methods of scientific proof.

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.

10. Science and Religion. Religious problems as affected by the results of modern science.

50. Ancient Philosophy. An introduction to philosophy through a study of typical world views: Greek, Roman, early Christian.
51. Medieval and Renaissance Philosophy. The beginning of the modern scientific view of the world.
52. Modern Philosophy. Sketch of the development of philosophy from the Renaissance to the present.
100. History of Religions. A comparative survey of primitive, national, and personal religions. Readings in sacred scriptures and in oriental philosophies and literatures.
101. Psychology of Religion. The organization of mental life in emotions, sentiments, and values. Studies in the psychology of conversion, faith, healing, mysticism, etc.
102. Philosophy of Religion. A critical discussion of esthetic, ethical, and religious attiudes toward life.
103. Esthetics. An introduction to the history and theory of esthetics, psychological analysis of beauty, and a discussion of the arts.
104. History of Esthetic Theory. A survey of the chief esthetic theories of ancient and modern thinkers.
108-109-110. History of Ethics. A survey of the chief ideals of conduct and theories of life from Socrates to the present day.
115. Contemporary Philosophy. Critical discussion of the various forms of present day idealism, naturalism, pragmatism, and realism.
120. Scandinavian Philosophy. The philosophical thought of the nineteenth century in Scandinavian countries, including a comparative study of Boström and Kierkegaard.
124. Political and Social Ethics. The fundamental aspects of society and the state, considered from the point of view of ethics.
129. The Development of Political Thought. The state in modern political philosophy; its nature, basis, and authority. Individualism and socialism in the eighteenth and nineteenth centuries.
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.
141. Metaphysics. A study of the problem of the unity of the sciences.
147-148. 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.
151-152. Modern Idealism. Discussions of the place of mind in the world, based upon the works of philosophers from Kant to Royce.
161-162-163. Seminar in Philosophy.

PHYSICAL EDUCATION FOR MEN

1, 2, 3. Freshman Physical Education. Mass activities, corrective exercise, swimming, athletics, and games.
7, 8, 9. Advanced Leaders. One hour of instruction; three hours leading squads in Physical Education 1, 2, 3 or 16, 17, 18 under supervision.

13, 14, 15. Corrective Work. By petition in place of Physical Education 1, 2, 3.

16, 17, 18. Drill Substitution. By petition as substitution for military science.

NOTE.—All students carrying one or more "exercise" courses in this department pay a fee of $1.50 per quarter.

PHYSICAL EDUCATION FOR WOMEN

1-2-3. Freshman Physical Education. Apparatus and floor work, orthopedic exercise, folk dancing, sports. Individual health consultations.

4. Preliminary Hygiene. One lecture a week. The most essential aspects of the care of personal health.

7-8. Sophomore Gymnastics. Fundamental gymnastics based on the German, Swedish, and Danish systems. The exercises include work for flexibility, strength, and co-ordination, apparatus work.

9. Sophomore Archery. Suitable in strength for girls in Individual Gymnastics.

10-11-12. Sophomore Orthopedic and Individual Gymnastics. For those who need more individual supervision than is possible in other classes.

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.

16-17. Sophomore Games and Folk Dancing. Suitable in strength for C-D girls. Conducted outdoors when weather permits.

18. Tennis.

19. Sophomore Hockey.

20. Sophomore Basket-Ball.

21. Sophomore Baseball.

22-23. Sophomore Elementary Swimming. Course 22, elementary; 23, low intermediate.

24. Sophomore Horseback Riding. Lessons for beginning and advanced classes under competent instruction, supervised by a member of the Department of Physical Education for Women.

25-26. Sophomore Intermediate Swimming. Wide range of strokes, elementary diving.

27. Sophomore Golf. The fall quarter is open to students who know the rudiments of golf, and the spring quarter is open only to beginners in golf.

28-29. Sophomore Advanced Swimming. Advanced strokes and diving, life saving.

30. Sophomore Life Saving and Water Sports.

31. Sophomore Skating. Practice and technique of fundamental strokes.

41, 42. Individual Projects in Physical Activity. Two periods of exercise in a course chosen by the student; one period of conference; individual study of a problem of health.

43-44.[1] Elementary Games and Folk Dancing. Graded games, and folk dances for school and playground, two hours.

45. Theory and Function of Play. A consideration of the nature and function of play.

66-67-68.[1] Interpretive Dancing. Similar to 13-14-15. Three hours.

69-70-71.[1, 2] Advanced Interpretive Dancing. Two hours of dancing. Written work and prescribed reading.

ACTIVITIES FOR WHICH NO REGISTRATION IS REQUIRED

Elective Sports. Hockey and volley ball in the fall, basket-ball and ice hockey in the winter, baseball, track, and swimming in the spring.

General Swimming. For beginners and advanced swimmers and divers.

NOTE.—A fee of $2 per quarter is charged for all 2-hour "exercise" courses. A fee of $2.50 per quarter is charged for all 3-hour "exercise" courses.

PHYSICS

INTRODUCTORY COURSES

3. Elements of Mechanics. First part of general course, 3, 13, 23, 33, 43. Course 4 should be taken in conjunction with this course. Three lectures, one quiz hour a week.

4.[3] Elements of Mechanics Laboratory. The laboratory part supplementing Course 3. One two-hour session in the laboratory a week.

11. Survey of Physics. The field of general physics from the standpoint of general rather than technical interest. The fundamental principles of physics presented in non-mathematical terms. Consequences and applications of these principles illustrated by experiment.

13. Acoustics. A study of the principles of sound. Three lectures a week.

23. Heat. Course 24 should be taken in conjunction with this course. Three lectures, one quiz hour a week.

24.[3] Heat Laboratory. The laboratory part supplementing Course 23. One two-hour session in the laboratory a week.

33. Optics. Course 34 should be taken in conjunction with this course. Three lectures, one quiz hour a week. Course 33 will satisfy the pre-medical requirement in optics.

34.[3] Optics Laboratory. The laboratory part supplementing Course 33. One two-hour session in the laboratory a week.

43. Electricity. Course 44 should be taken in conjunction with this course. Three lectures, one quiz hour a week.

44.[3] Electricity Laboratory. The laboratory part supplementing Course 43. One two-hour session in the laboratory a week.

INTERMEDIATE COURSES

52.[3] Laboratory Arts. Designed to acquaint students with the methods used in glass blowing, silvering, etching metal to glass seals, making quartz

[1] If taken for no credit no reading or written work will be required.
[2] A fee of $1 per credit is charged for this course.
[3] A fee of $2 per quarter is charged for this course.

fibers, soldering, spinning, spot welding, etc., as a preparation for general experimental work.

101-103-105. Theoretical Physics. An 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. Five lectures a week.

104. Precision Mechanics. Standard methods of precise measurements of length, mass, and time.

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.

115-117-119. Problem Course. A study of the fundamental principles and standard methods involved in the mathematical analysis of physical problems. Three lectures a week.

124.[1] Pyrometry. An experimental and theoretical study of high temperature measurements. One lecture, two three-hour sessions in the laboratory a week.

134.[1] Experimental Optics. Special experimental work in spectrometry, optical instruments, photometry, absorption, polarized light. Two three-hour laboratory periods a week.

136.[1] Spectrum Analysis. An experimental course dealing with the measurement of wave lengths, intensities, and absorption coefficients in the infra-red, visible, and ultra-violet regions of the spectrum. Two three-hour laboratory periods each week.

144.[1] Electricity Measurements. Devoted mainly to the study of potentiometer methods, capacity, inductance, magnetic flux. Three two-hour laboratory periods a week.

146.[1] Advanced Electricity Measurements. Standard measurements of the various electrical quantities including the use of precision instruments. A continuation of Course 44. Three two-hour periods a week.

148.[1] Radioactivity. An analytical study of the theories and methods of investigation supplemented by laboratory technique. Those pursuing this course should continue with Chemistry 151, Radiochemistry.

150.[1] Conduction through Gases. An analytical study of the theories and methods of investigation, supplemented by laboratory technique.

152. X-Rays. A study of the production and nature of X-rays. Three lectures a week.

154. X-Ray Spectroscopy. Theory of diffraction of X-rays by crystals. Emission and absorption spectra. Theory and systemization of X-ray spectra. Satellities of diagram lines and effects of chemical combination. Lectures and laboratory, six hours per week.

POLITICAL SCIENCE

1-2.† American Government and Politics. A survey of the American political system, with some consideration of the basic principles and problems of government in the modern industrial age.

[1] A fee of $2 per quarter is charged for this course.

2. American State Government. Discontinued after the fall of 1931.
3. Comparative European Government. A study of government and politics in Great Britain, France, Germany, Russia, and Italy.
15. Elements of Political Science. The state and the individual, the forms and functions of government, and the nature of political processes.
25. World Politics. A study of the foreign policies and international relations of the leading European powers today.
51-52-53.† Business Law. See announcement of the School of Business Administration.
81-82-83. Readings in Political Science. Reading and discussion of selected classics of politics, from Plato to the present.
91-92-93. Readings and Theses for Honors. Individual guidance of senior students preparing papers for honors.
101-102.† Constitutional Law. I. Constitutional amendment; national-state relations; national judiciary; powers of Congress; taxation; interstate commerce. II. The executive; foreign relations; military affairs; territories; interstate relations.
103. Constitutional Law. III. Government and the individual; freedom of speech; ex post facto laws; obligation of contracts; due process of law; equal protection of laws.
104. American Constitutional Development. I. To 1800. Colonial origins; first state constitutions; formation of the federal constitution; organization of the new government.
105. American Constitutional Development. II. 1800 to 1865. Political revolution of 1800; national sovereignty and state rights; slavery and the constitution; Civil War problems.
106. American Constitutional Development. III. 1865 to the Present. Reconstruction of the Union; extension of national authority over commerce, transportation, labor; national subsidies to states; structural and functional changes in government; government of dependencies; extension of democracy; recent amendments, including prohibition of liquor traffic.
107. Recent Social Legislation. Governmental powers and methods used for social legislation, both state and federal; peace and security; safety and health; public morals; semi-social economic relations, social insurance, minimum wage, city planning, police power restrictions on use of private property.
108. Legislative Power and Methods. Source and scope of the legislative power; methods used by legislative bodies; current legislative problems; formulation and defense of legislative bills.
109. Government and Business. Governmental powers; 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 resources; vested rights; confiscatory legislation.
111. Law of Public Utilities. See bulletin of Law School.

113-114.† Administrative Law. I. Election, appointment, status, compensation, and discharge of civil officers and employees of government. II. Official powers; construction of powers; discretion; enforcement of administrative orders; judicial remedies against abuse of official authority.

115. Topics in Constitutional and Administrative Law. Intensive study of a few related topics in these fields each year.

116. Municipal Powers and Functions. A study of the constitutional status, the common law attributes, creation, alteration, and dissolution of cities, villages, and other municipal corporations; municipal officers, organization, and procedure; changing scope of the powers and functions of municipalities.

117. Municipal Administration. Administrative organization, personnel, and financial problems of cities; city planning, public works, parks, police and fire departments; administration and regulation of local public utilities.

119. Jurisprudence. See bulletin of Law School.

131-132.† Principles of Public Administration. Source of the administrative power; administrative areas; the budget; purchasing; organization; public service as a career.

133. Problems of Public Administration. Special problems relating to education, finance, safety, health, welfare, commerce, labor, and conservation of natural resources.

145-146.† Comparative Government and Politics. Intensive study of parties, politics, and governmental processes in Great Britain, France, and other leading states.

149-150.† Government and Politics of the British Empire. The Imperial relationship; status and government of the self-governing dominions, the crown colonies, and India.

151. Topics in British Empire. Intensive study of some phase of British Imperial affairs.

153-154.† Far Eastern Government and Politics. The constitutional development of Japan and China; government, parties, and political problems. The first quarter is devoted to Japan, the second to China.

161-162.† Current Political Thought. A study of present-day schools of political thought; ideas concerning sovereignty and liberty, state functions, representative government, and democracy; analysis of socialism, communism, syndicalism, and fascism.

163. Topics in Current Political Thought. Stress to be laid on current American political ideas.

165. Development of Political Thought. See Philosophy 129.

169. Problems of Democracy. Problems of individual and class differences, opinion, dictatorships, expert knowledge, and leadership.

171. Political Psychology. See Psychology 141.

175. Political Parties. The nature, function, organization, and methods of political parties and other groups active in politics; legal control of parties and elections; public opinion as a factor in popular government.

176-177.† Scope and Methods of Political Science. The field of political science; relation to other studies; types of approach; research methods and technique; bibliography. Problems of teaching at the college level.

181-182.† International Law. Nature, sources, and sanction of international law. The laws of peace, war, and neutrality.

183. International Organization. The structure of the older international community and of the League of Nations; procedure in the formation of international policy; international legislation and administration; the settlement of international disputes; sanctions.

184. Problems in International Law. Intensive study of the solution of selected international controversies by national and international courts, arbitration tribunals, and diplomatic conferences.

191-192.† Far Eastern Diplomacy. The international relations of China from the earliest period; early contacts between Japan and China; the policy of exclusion gradually overcome by western powers; the opening of the Far East in the nineteenth century; the "open door" policy; the Great War and the revision of treaties; the present situation.

193. Problems of the Pacific. Intensive study of selected problems in the political and constitutional developments, or in the foreign relations, of Far Eastern countries.

195-196.† Colonial Government and Administration. The economic and political factors in colonization; forms of government; administrative organization, personnel, and problems; commercial policies; mandates under the League of Nations.

197. Problems in Colonial Administration.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

MEDICAL SCHOOL

3. Personal Hygiene and Elementary Sanitation. Elementary principles of normal body function; predisposing and actual causes of disease; ways in which disease may be avoided.

50. Public and Personal Health. Discusses the causes of diseases and of physical defects and presents the fundamental principles and working methods of health conservation and disease prevention. Lectures, demonstrations, discussions, inspection trips, and directed readings.

52. Health Care of the Family.

53. Elements of Preventive Medicine. Susceptibility, resistance, and immunity to disease; methods of spread and prevention of communicable and degenerative diseases; protection of food, water, and milk; school health work; vital statistics.

57. Health of Infant and Pre-School Child. Growth and development of baby and young child. Care and feeding of normal child. Prevention and correction of physical defects. Demonstration of infant clinics.

58. Maternal and Child Hygiene. (For public health nurses only.)

59. Social Hygiene. Relation to public health; normal physiological development through adolescence; educational measures; responsibility of the public health nurse; prevention and control of venereal diseases.

60. Tuberculosis and Its Control. History of tuberculosis movement and campaign in the United States. 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.
61. Mental Hygiene. History of movement; social importance. Factors underlying emotional maladjustments and mental diseases. Relations to social work and social agencies. The importance of psychiatric nursing.
62. Principles of Public Health Nursing.
64. Field Practice in Infant Welfare Nursing.
65. Field Practice in School Nursing.
66. Field Practice in County Nursing.
67. Field Practice in a Tuberculosis Sanatorium.
68. Field Practice in Visiting Nursing.
73. Occupational Hygiene and Disease. For non-medical students. Working hours and conditions as related to health; specific occupational diseases, their causes and prevention; importance of temperature; light and dust; wages and disease; industrial medical and nursing services.
80. Health Supervision of the School Child.
102. Sanitation.
103. Public Health Bacteriology.
106. Public Health Administration.
107. Sanitary Surveys.
200. Research. Consult Graduate School bulletin.
210. Seminar.

PSYCHOLOGY

1-2.† General Psychology. An introductory survey of psychology; its material, fundamental laws, applications, and relations to other sciences.
3. Psychology Applied to Daily Life. The applications of psychology to selected problems in medicine, law, education, sociology, and daily life.
4-5.[1] † 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.
7.[2] Introductory Laboratory Psychology. Identical with 4-5 combined. Eight laboratory hours per week.
9. Introduction to Animal Psychology. 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.
15. Psychology of Sensation. Vision, audition, taste and smell, and sensations arising from the skin and internal organs. Sensory acuity and defects. The dependence of sensory qualities upon sense organs and conditions of stimulation.

[1] A fee of $1 per quarter is charged for this course.
[2] A fee of $2 is charged for this course.

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. Experimental techniques for investigating advertising problems are stressed and opportunity for research is provided.

72. Psychological Esthetics. The psychology of esthetic experience. An analysis of the capacity for enjoying and originating beauty. Emphasis upon experimental studies.

84. Psychology of Learning. A study of the literature and experiments of memory and habit formation. Lectures, readings, and reports.

90, 91, 92. Readings in Psychology. Independent reading and reports in any field or on any topic which meets the approval of one of the listed instructors. The chairman of the department will, if requested, assist the student in selecting the most appropriate instructor to guide reading in a particular field.

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 second and third quarters. One lecture, four laboratory hours per week.

108. Systems of Psychology. A comparative study of the problems, methods, and viewpoints of modern systems of psychology.

114-115.† Human Behavior. Analysis of the development and organization of human behavior. Consciousness or mind, as a property of the living body, is discussed in its dependence upon response.

125-126†-127. Psychology of Individual Differences. Experimental and statistical study. Influence of sex, race, immediate ancestry, environment, maturity in causation of individual differences. Investigation of definite problems and analysis of results. Individual minor research problems in third quarter.

130. Vocational Psychology. Psychology of individual differences in intelligence, aptitudes, interests, and training, with special reference to vocational guidance.

140. Social Psychology. A critical study of the experimental investigations of group behavior including the social significance of instinct, habit, imitation, suggestibility, and personality traits.

141. Political Psychology. A biological and psychological approach to political theories and problems. The political significance of individual differences in intellect and temperament in relation to belief, propaganda, and public opinion.

144-145.† Abnormal Psychology. Normal and abnormal behavior contrasted. Varieties of maladjustment as illustrated in criminality, deficiency, fanaticism, and insanity. Stress will be laid on the inadequacies of personality as shown in everyday life.

151-152†-153. Animal Psychology. Vertebrate behavior is emphasized. A critical study of the literature and the relationship between animal and human psychology. Individual investigation of special problem in second and third quarters.

160. Psychology in Personnel Work. 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.

GRADUATE COURSES. CONSULT GRADUATE SCHOOL BULLETIN

200-201-202.† History of Psychology I. Origin and Development of Scientific Psychology.

203-204-205.† History of Psychology II. Psychology in America.

206-207-208. Research in Animal Behavior.

210-211-212. Research Problems.

215-216-217.† Seminar in Psychology.

220-221-222.† Journal Club in Contemporary Trends in Psychology.

230. Advanced Differential Psychology.

250-251-252. Topics in Psychology. Independent reading and reports.

ROMANCE LANGUAGES

FRENCH

1-2.† Beginning French.

3-4. Intermediate French.

8-9-10. Scientific French. (Pre-medical students.)

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.

24-25.† Survey of French Literature. Same as 21-22-23.

49. French Pronunciation. The essentials of French pronunciation and diction. A rapid survey and intensive drill designed as an introduction to the French conversation courses.

53. French Composition.

54-55. French Conversation.

62. Practical French Phonetics. Organs of speech. Alphabet of the International Phonetic Association. Articulation of sounds. Ear training. (With the aid of sound charts and phonographic records.)

63. Advanced French Composition.

64-65. Advanced French Conversation.

80-81-82. French Literature: Nineteenth Century. First quarter: romantic poetry and novel; second quarter: romantic drama and realistic novel; third quarter: drama and poetry after 1850. The course is conducted entirely in French.

100. French Oral Diction. Practical and theoretical study of spoken French.

103-104-105.† French Syntax and Composition. Studies in characteristic problems of French syntax especially for prospective teachers.

115. French Literature: Seventeenth Century. Formation of the classic ideal; the salons, the Academy, Descartes; Malherbe, Pascal, Corneille.

116. French Literature: Seventeenth Century. Molière, Racine, and LaFontaine.

117. French Literature: Seventeenth Century. Moral and didactic literature: Boileau, La Rochefoucauld, Bossuet, Mme. de Sévigné, the quarrel of the Ancients and the Moderns.

118-119-120. French Literature: Eighteenth Century. First quarter: beginnings of the philosophic movement, Bayle, Montesquieu, Diderot; second quarter: Voltaire; third quarter: Rousseau, the theater, the novel.

121-122-123. French Literature: Sixteenth Century. First quarter: the Rhetoriqueurs, Marot, Rabelais; second quarter, the Pleiade; third quarter: Montaigne, Amyot.

145-146. Explication de Textes. An intensive, critical study of selected French masterpieces. The course is conducted in French.

150-151-152. French Dramatic Literature. A study of the development of dramatic literature in France from the classical period to the present time.

153. Contemporary French Lyric Poetry.

157. Contemporary French Novel. Bourget, Loti, France, etc.

171-172-173.† History of the French Language. Lectures and illustrative texts giving the development of the French language from its origins to the nineteenth century. Especially intended for those who are going to teach French.

174-175-176. Contemporary French Novel and Drama. Lectures in French.

190-191-192. Honors Course.

ITALIAN

1-2.† Beginning Italian.

3-4. Intermediate Italian.

70. Survey of Italian Literature.

71. Modern Poetry (Leopardi, Carducci). Alternates with 72.

72. Modern Drama (Giacosa, Bracco, Pirandello). Alternates with 71.

73. Boccaccio. Alternates with 74.

74. Petrarch. Alternates with 73.

159-160. Dante: the *Divina Comedia.* Alternates with 161-162.

161-162. The Sixteenth Century. Reading of texts and study of literary influences. Alternates with 159-160.

164. Dante in English. Lectures, reading and discussion of the *New Life* and parts of the *Divine Comedy.*

SPANISH

1-2.† Beginning Spanish.

3-4. Intermediate Spanish.

20. Oral and Written Spanish.

30. Spanish Commercial Correspondence.

53. Spanish Composition.

54-55. Spanish Conversation.

60. Advanced Spanish Composition.

61-62. Advanced Spanish Conversation.

65-66-67.† Survey of Spanish Literature. An outline of the history of Spanish literature from 1500 to the present day.

68-69.† Survey of Spanish Literature. Same as 65-66-67.

70-71. Latin American Culture and Development. Contemporary conditions as seen in the newspapers and other periodical literature of Latin America.

110-111-112. Spanish Literature: Nineteenth Century. First quarter: drama; second quarter: the novel; third quarter: poetry.

115-116-117. Spanish Literature: Seventeenth Century. First quarter: drama; second quarter: the novel; third quarter: lyric and epic poetry. Alternates with 156-157-158.

141. The Modern Spanish Novel.

150. Modern Spanish Drama. Contemporary dramatists.

156-157-158. Spanish Literature: Sixteenth Century. First quarter: drama; second quarter: Cervantes and the novel; third quarter: poetry and the mystics. Alternates with 115-116-117.

174-175-176. Lectures in Spanish: Twentieth-Century Literature. First quarter: drama; second quarter: the novel; third quarter: poetry.

GRADUATE COURSES. CONSULT GRADUATE SCHOOL BULLETIN

201-202-203. Old French Phonology and Morphology.

204-205-206. Readings in Old French Literature.

207-208-209. Old Provençal.

222-223-224. Seminar in Modern French Literature.

230-231-232. Research Methods and Material.

241-242-243. Old Spanish Philology.

244-245-246. Old Spanish Literature.

250-251-252. Spanish Seminar.

259-260-261. Research in Romance Languages.

SCANDINAVIAN

1-2. Beginning Norwegian. Grammar, composition, selected readings in easy prose and poetry.

3. Intermediate Norwegian. Grammar, composition, conversation, elementary history of literature, and selected works of modern authors.

4-5. Advanced Norwegian (Survey). Prose and poetry.

7-8. Beginning Swedish. Grammar, composition, conversation, reading of selected prose texts.

9. Intermediate Swedish. Reading selected works in prose and verse.

10-11. Advanced Swedish (Survey). Reading of Tegner's *Frithiofs Saga,* Runeberg's *Fänrik Ståls Sägner,* and Grimberg's *Sveriges historia.*

12. Ancient and Medieval Scandinavian History. The antiquities of Scandinavia, formation of states, the viking expeditions, medieval culture. Knowledge of Scandinavian not required.

45. Scandinavian Mythology. Lectures, textbooks, and reading the principal songs of the poetic Edda. Knowledge of Scandinavian not required.

101-102-103. Modern Norwegian Literature. Norwegian literature from 1814 to the present day.

104-105. Modern Scandinavian History. Religious, political, and economic changes in the north, military enterprises, growth of liberalism, material progress. Knowledge of Scandinavian not required.

107-108-109. Modern Swedish Literature. The Swedish novel. Book reports and discussions.

110. Ibsen. Lectures, reading, and interpretation.

111-112-113. Old Norse (Icelandic). Grammar and reading. Gunnlaug's *Saga Ormstungu.*

114. Strindberg. Lectures, reading, interpretation.

117. Earlier Norwegian Literature. History of literature. Saga period. Norwegian and Danish folk songs Holberg. Oplysningstiden.

130-131-132. Danish Literature of the Nineteenth Century.

136. Björnson. A study of his activity as a central figure in modern Norway.

140. History of the Norwegian Language and Literature. Lectures and reports.

GRADUATE COURSES. CONSULT GRADUATE SCHOOL BULLETIN

201-202-203. Seminar in History of Scandinavian Languages.

209-210-211. Seminar in Modern Swedish Literature.

215-216-217. Seminar in Modern Norwegian Literature.

SOCIOLOGY

1. Introduction to Sociology. A study of the culture of the group. An objective analysis of culture with special attention to social change. Survey of culture patterns, cultural processes, and social interaction.

6. Social Interaction. An examination into the basis and forms of social interaction and social relationships, with detailed attention to some of the fundamental behavior patterns of contemporary society.

14. Rural Sociology. A study of rural and urban relationships. The principles of sociology applied to the position of an agricultural class in an industrial society; the contributions and obligations of farmers to the larger society and vice versa.

45. Social Statistics. Statistical methods applied to the quantitative study of population and problems of group living. Especially designed to give social workers and public health officers the training necessary to carry on their work successfully.

49. 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. An introduction to the problems and methods of social case work.

53. Elements of Criminology. The causes and treatment of crime from the point of view of processes of social interaction.

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.

60. Social Protection of the Child. 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.

70. Group Work in the Community. Activities and problems of social work with groups, especially in settlements and in boys' and girls' organizations.

71-72.[1] Elementary Field Training in Group Work.

90.[1] Field Survey of Social Case Work. Gives a general perspective of the field of social case work as seen in a variety of social work agencies.

91.[1] Elementary Social Case Work. Begins individual training for the practice of social case work.

92.[1] Continuation of 91.

93. The Social Heritage and the Individual. An analysis of the mental interdependence of individuals in their common utilization of the social heritage. Stresses the implications of this not only for sociology but for the other social sciences as well, including education.

100. Social Psychology. The social attitudes; their development and modification under social pressure; the interactions of individuals and groups.

101. Social Organization. The organization and structure of social groups; the basic social processes of differentiation, stratification, and mobility. Integration and disintegration of social groups and institutions. Essentials of social dynamics.

102. Social Control and Criminal Behavior. A consideration of criminal behavior and of the relation between criminal behavior and the breakdown of social control.

103. Sociology of Conflict. Types of social conflict and their rôle in social life.

110. Rural Organization. A study of social organization as it affects living conditions in small towns and rural districts. Especially designed for rural social workers and specialists in rural sociology or agricultural economics.

112. The Rural Social Survey. A course dealing with the methods and content of rural social research. All methods of investigation are analyzed. Especially designed for those interested in social research under Purnell or similar funds.

114. Rural Social Institutions. A detailed study of the problems of organization and efficiency of selected rural institutions, especially religious, educational, civic, and recreational. Lectures, discussions, reports.

115. Religion as a Social Institution. The origin and function of religion viewed as a culture pattern in relation to social processes and social organization.

[1] A fee of $3.50 per quarter is charged for this course.

116. The Newspaper As a Social Institution. A study of the social rôle of the newspaper in the United States, with special reference to the social changes that have influenced the press, and the corresponding influences of the press upon social life.

119. The Family. The evolution of the family; development of family unity or disunity; the rôles of the several members of the family; methods of investigation of the family.

120. Social Progress. A history of the theories of progress and a critique of the idea of progress.

121-122. Statistical Methods. The analysis and interpretation of social data by application of the theory of errors, the theory of probability, the theory of sampling, partial correlation, and the analysis of time series.

123. Methods of Social Investigation. The nature of scientific method; the problems of sociology; specific methods of investigation of social phenomena.

126. The Technique of Leadership in Group Work. An advanced course for prospective executives in settlements and program agencies.

128. Principles of Administration Applied to Social Work. 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.

129. Selected Problems in Social Case Work. A study of social case work practices as applied to selected problems.

130. Advanced Case Work. A study of some of the wider aspects of social case work. A consideration of the adaptations of other scientific knowledge to social case work and an analysis of processes and techniques of interviewing.

131. Rural Social Case Work. Primarily a course for students wishing to specialize in social work in the rural field.

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 courts and probation.

133. Social Case Work in Health Problems. A course open only to students who are properly grounded in case work.

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.

135.[1] 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.

136. Essentials of Medicine for Social Workers. A discussion of diseases most often encountered in social work, with a consideration of their social implications. Open only to training course majors.

137. The History and Theory of Social Work. A consideration of the historical backgrounds of the modern social work movement and the evolution of the theory underlying it.

[1] A fee of $3.50 per quarter is charged for this course.

138-139. Mental Case Work. A study of the intellectual and emotional factors in human adjustment and their significance in case work.

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.

141. Contemporary Social Theory. An intensive study of developments in the social theory of the late nineteenth and twentieth centuries.

152. Public Welfare Administration. Deals with the history of public welfare administration and special problems of state and county administration of public welfare activities.

153-154-155.[1] Advanced Field Training in Group or Case Work. May be taken in specialized fields of child welfare and medical, as well as family, work.

160. Population Problems.

GRADUATE COURSES. CONSULT GRADUATE SCHOOL BULLETIN

200-201-202. Seminar in Applied Sociology.

203-204-205. Seminar in Social Theory.

206-207-208. Seminar: Statistical Theory in Relation to Social Theory and Practice.

209-210-211. Seminar: Social Evolution: The Cultural Approach to Sociology.

218-219-220. Graduate Seminar in Social Work.

221-222-223. Graduate Field Work.

224-225-226. Medical Social Work.

227-228-229. Advanced Graduate Field Work.

SPEECH

41-42†-43.[2] Fundamentals of Speech. A study of speech as applied in social adaptation of the individual and in his control of his environment. Emotional problems. Technique of body and voice. Mechanisms of thought. Oral reading and original speeches.

45-46.[2] Fundamentals of Speech. A 10-credit course identical in subject-matter with 41-42-43.

51.[2] Advanced Public Speaking. Speeches on public questions. Analysis and outlining. Methods of reasoning. Adaptation of material to audience.

55-56-57.† Argumentation and Debating. Analysis, gathering of evidence, briefing. Critical study of models, including Lincoln-Douglas debates.

61. Speech Correction. An introduction to the correction of speech disorders. Speech defects as symptoms of maladjustment and organic malformations. Case histories. The vocal mechanism. Examination of the literature of the field.

[1] A fee of $3.50 per quarter is charged for this course.

[2] A fee of $1 per quarter is charged for this course.

67.[1] Phonetics. The study of English speech sounds, as they occur separately and in connected speech. Strong and weak forms, stress, assimilation. Practice in ear training.

71-72-73.[1] Elements of Play Production. Elementary principles of make-up and acting. History of the theater. Reading of plays. Knowledge and use of stage equipment. Organization and management of the production staff.

81-82-83.[1] Interpretative Reading. Literature as an art form. Esthetic theory of interpretation and oral reading. Critical appreciation of authors. Action and voice. Practice in reading essays, prose narratives, lyric and narrative poems, and plays as vehicles of distinct modes of experience.

91-92-93. Stagecraft and Direction. The translation of the writer's meanings into the symbols of the acted drama. Atmosphere, tempo, contrast, climax. The connotation of selected properties. Management of a production from the selection of the play to the presentation.

97. Intercollegiate Oratory and Debate. The question for intercollegiate debate studied and briefed, and frequent practice debates held.

101-102.† Advanced Speech Composition. Structure and oral style. Psychology of persuasion. Briefing. Critical study of models. Written speeches. Reports.

105. Theory of Reading and Acting. The forms of literature; literature regarded as an art; psychology of creative imagination; speech elements in literature; technique governing use of auditory and visual symbols. Collateral readings, speech problems, reports, term papers.

121-122.†[1] Advanced Speech Problems. Factors determining the behavior of speakers and audiences.

141-142-143.[1] Voice Science. The study of vocal sound, methods of analysis and synthesis. The study of hearing. Experimental methods applied in individual research projects. Readings, reports, experiments.

162-163.[1] Advanced Speech Pathology. The physiological and psychological aspects of organic and functional speech problems. Theories of stuttering. Diagnoses, case histories, and treatment of speech cases. Observation of clinical diagnosis and treatment.

207-208-209. Seminar in Orators. A critical study of great English and American orators.

261-262-263. Seminar in Speech Correction. A study and critical analysis of current literature in the field of speech pathology. Each student works out a short thesis problem in connection with his studies in speech correction. Studies in new theories and clinical procedures. Specific cases presented for group study.

291-292-293. Research and Thesis. (For graduate students engaged in thesis projects.)

ZOOLOGY

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

[1] A fee of $1 per quarter is charged for this course.

INTRODUCTORY COURSES

1-2.† General Zoology. Structure, physiology, embryology, classification, and evolution of animals. Textbook, lectures, and quizzes.

3-4.[1]† General Zoology. Laboratory.

5-6-7.[1]† General Zoology. Similar to 1-2, 3-4, for pre-medical and pre-dental students.

14-15-16.[1]† General Zoology. Similar to 1-2, 3-4, with the spring quarter devoted to the Arthropoda, principally the Insecta. (For students of Agriculture and Forestry.)

17-18.[1]† General Zoology. A brief course for students in Home Economics.

21. Introduction to General Physiology.

22. General Ecology. Distribution of local fauna with special emphasis on life histories, habits, and identification. Lectures, assigned reading, laboratory and field work.

23. Introductory Entomology. General characters, classification, and habits of insects.

24. Introductory Animal Parasitology. An elementary course, dealing with the parasitic Protozoa, worms, and arthropods, and their relation to diseases of man and animals.

25. Introductory Histology. A brief course on the structure of the cell, tissues, and organs. Lectures, laboratory.

26.[2] Comparative Anatomy. A comparative study of the gross anatomy of vertebrates.

27. Technique. Elements of microscopical technique.

INTERMEDIATE AND ADVANCED COURSES

46-47.† Ornithology. Lectures, laboratory, and field work. Field glasses and handbook required.

75. Nature Study. Especially for the fitting of teachers for the secondary schools.

107-108. Protozoology. Lectures, references, and laboratory work on the structure and life histories of Protozoa.

109-110-111. Experimental Zoology. A survey of animal behavior from the physiological viewpoint. Lectures, laboratory, reading.

117-118-119. Animal Ecology. Ecology of animals with special reference to insects. Lectures, assigned reading, laboratory, and field work.

125-126-127. Advanced Entomology. Morphology and classification of insects, and lectures on the history of entomology.

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.

148-149-150. Histology and Organology. Comparative study of the microscopic structure of tissues and organs. Textbook, lectures, laboratory.

[1] A laboratory fee of $1 per quarter is charged for this course.
[2] A laboratory fee of $2 per quarter is charged for this course.

160-161. Cytology. A survey of cell structure and behavior with special reference to genetic cytology. Lectures, reading, and laboratory work.
181-182. Embryology. A survey of the principles of animal development dealing with fundamental invertebrate and vertebrate types. Lectures, reference, and laboratory work.
183. Genetics and Eugenics. Facts and theories of heredity and application to man. Textbook, lectures, and demonstrations.
197-198-199. Problems. Advanced work in some special line.

GRADUATE COURSES. CONSULT GRADUATE SCHOOL BULLETIN

201-203. Research in Entomology.
211-213. Research in Ecology.
217-219. Experimental Zoology.
229-232. Research in Animal Histology.
233-235. Research in Embryology.
237-239. Research in Animal Cytology.
261-263. Animal Parasitology.
205-208, 209-212, 265-268. See Entomology and Economic Zoology.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

The courses in this department are closely correlated with those of the Department of Zoology. Courses 37-38-39, 117-118-119, 125-126-127, 139-140, 144-145-146, and 197 are offered under these numbers in both departments. In addition the following courses in entomology and economic zoology are available:

3. Economic Entomology.
4. Economic Vertebrate Zoology.
5. Economic Entomology.
8. Methods in Field Zoology.
141,142. Insects in Relation to Plant Diseases.
175. Insecticides and Their Action.
176,177. Advanced Economic Entomology.

GRADUATE COURSES. CONSULT GRADUATE SCHOOL BULLETIN

200. Seminar.
201-204. Research in Entomology.
205-208. Research in Economic Entomology.
209-212. Research in Economic Vertebrate Zoology.
265-268. Research in Insecticides.
269-272. Research in Apiculture.

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The Bulletin *of the* University *of* Minnesota

The College of Science, Literature, and the Arts

Part II

Announcement of Program for the Year 1931-1932

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1931

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UNIVERSITY CALENDAR

1931-32

Fall Quarter

1931			
September	17	Thursday	Payment of fees closes, except for new students
September	21	Monday	Entrance tests
September	21-22		Registration for Freshman Week of all new students entering the freshman class
September	21-25		Examinations for removal of conditions Physical examinations
September	22-25		Registration and change of registration[1]
September	23-26		Freshman Week
September	25	Friday	Payment of fees for new students closes
September	28	Monday	Fall quarter classes begin, 8:30 a.m.[2]
October	15	Thursday	Senate meeting, 4:30 p.m.
October	31	Saturday	Homecoming Day
November	4	Wednesday	Mid-quarter grades due
November	11	Wednesday	Armistice Day Convocation
November	26	Thursday	Thanksgiving Day; a holiday
December	3	Thursday	State Day Convocation
December	14-19		Final examination period
December	17	Thursday	Commencement Convocation Senate meeting, 4:30 p.m.
December	19	Saturday	Fall quarter ends, 6:00 p.m.
December	26	Saturday	Payment of fees closes for all students in residence fall quarter[3]

Winter Quarter

1932			
January	2	Saturday	Entrance tests Registration and change of registration[1] Payment of fees for new students closes Registration and payment of fees close at 3:00 p.m.
January	4	Monday	Winter quarter classes begin, 8:30 a.m.[2]
February	9	Tuesday	Mid-quarter grades due
February	12	Friday	Lincoln's Birthday; a holiday
February	18	Thursday	Charter Day Convocation Senate meeting, 4:30 p.m.
February	22	Monday	Washington's Birthday; a holiday
March	14-19		Final examination period
March	17	Thursday	Commencement Convocation Payment of fees closes for all students[3] in residence winter quarter
March	19	Saturday	Winter quarter ends, 6:00 p.m.

See footnotes on page 4.

Spring Quarter

March	26	Saturday	Entrance tests Registration and change of registration[1] Payment of fees for new students closes Registration and payment of fees close at 3:00 p.m.
March	28	Monday	Spring quarter classes begin, 8:30 a.m.[2]
May	4	Wednesday	Mid-quarter grades due
May	12	Thursday	Cap and Gown Day Convocation
May	19	Thursday	Senate meeting, 4:30 p.m.
May	30	Monday	Memorial Day; a holiday
June	4 & 7-11		Final examination period
June	5	Sunday	Baccalaureate service
June	6	Monday	Sixtieth annual commencement
June	11	Saturday	Spring quarter closes, 6:00 p.m.

Summer Quarter

June	13-14		Registration, first term
June	15	Wednesday	Summer quarter classes begin, 8:00 a.m.
July	4	Monday	Independence Day; a holiday
July	21	Thursday	Commencement Convocation
July	23	Saturday	Registration and payment of fees for second term closes at 12 m. First term closes
July	25	Monday	Second term classes begin, 8:00 a.m.
August	27	Saturday	Second term closes

Entrance Examinations

Entrance examinations for admission to the various colleges of the University will be conducted for students whose credentials do not meet the requirements.

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

For further information concerning these examinations see under "Admission by Examination," page 30, bulletin of general information.

[1] Registration subsequent to the date specified will necessitate the approval of the assistant dean for students' work. See also penalty fees for late registration, page 49, general information bulletin. No student will be allowed to register in the University after one week from the beginning of the quarter excepting in unusual cases wherein special circumstances shall justify registration at a later date.

[2] First hour classes begin at 8:15 a.m. at University Farm.

[3] New students must pay fees on dates announced for registration.

COURSES OF STUDY

A student may, while registered in the College of Science, Literature, and the Arts, pursue one of the following courses.[1] These curricula are subject to revision by action of the faculties of the colleges concerned.

Courses given within this college:

1. A general course leading to the degree of bachelor of arts.
2. Special courses leading to the degree of bachelor of science.
   a. Course in Library Training.
   b. Course in Hospital Library Service.
   c. Course for Medical Technicians.
   d. Course in Public Health Laboratory or Sanitary Work.
   e. Course in Social and Civic Work.
3. Courses preparing for admission to the School of Business Administration, College of Dentistry, College of Education, the course in Nursing Education, the course in Interior Architecture in the College of Engineering and Architecture, the Law School, and the College of Pharmacy.
4. A four-year course leading to the degree either of bachelor of arts or of bachelor of science with special training in military science and tactics.

Combined arts and professional courses:

5. A seven-year course leading to the degrees of bachelor of science, bachelor of medicine, and doctor of medicine.
6. A five-year course leading to the degrees of bachelor of arts and bachelor of architecture.
7. A course leading to the degrees of bachelor of arts and bachelor of laws.
8. An eight-year course leading to the degrees of bachelor of arts, bachelor of medicine, and doctor of medicine.

NOTE.—For information about the University College, consult Mr. Tate, 143 Physics.

REGULATIONS APPLYING TO ALL COURSES

1. *Physical Education and Military Drill.*—During the junior college years all men must complete three quarters of physical education and six quarters of military drill. All women must complete six quarters of physical education.

2. *Freshman English.*—Unless freed from the requirement by placement tests all students must complete three quarters of English A-B-C or Composition 4-5-6. On the basis of placement tests in English, students are:

Exempt from any requirement in English,

Permitted to choose between English A-B-C and Composition 4-5-6,

Assigned to Composition 4-5-6,

[1] Students in Art Education, Physical Education, Public School Music, and certain other special courses, register in the College of Education in their freshman year.

Required to make up minimum essentials as a preliminary to Composition 4-5-6.

Students who are exempt from Freshman English may register, if they wish, for English A-B-C or Composition 4-5-6, or for any junior college courses in English, composition, or speech for which English A-B-C is the prerequisite.

3. *Classification of studies.*—The greatest care has been taken in recent years to study all available evidence regarding the ability of students to carry the usual required college courses. The results have clearly shown that the great majority of those who appear to have low aptitude for college work do not in fact succeed in their studies here. Students who enter with low aptitude ratings are not accepted as candidates for a degree until they have made a satisfactory record in two quarters of work. Those whose handicaps are greatest are placed on probation from the beginning and have the attention of special advisers.

The studies in which these persons usually have the greatest difficulty are the foreign languages, laboratory work, mathematics, and some specialized courses. It happens that these are the subjects which would be of the least value to those who do not go on to a complete college course. Accordingly, these courses are restricted to those students who have given evidence that they will be able to profit by them. Those who enter in spite of low aptitude ratings may register for many other courses which provide opportunity for a general education.

The original estimate of a student's ability is revised on the basis of his record in college. A student of low aptitude rating who shows ability in his general studies will be admitted to the restricted studies and may complete the requirements for a degree. On the other hand, a student who is accepted as a candidate for a degree but does not do satisfactory work may be reclassified and limited in his choice of studies until he shows his ability and willingness to do work of college grade.

4. *Beginning languages.*—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, except upon petition.

5. *Residence.*—To secure a degree from this college a student must earn at least 45 credits in residence at this college.

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

JUNIOR COLLEGE

1. For admission to the Senior College[1] the student must have completed the following work in the Junior College or the equivalent in another recognized institution.

A. 15 credits in English (English A-B-C) or 9 credits in composition (Composition 4-5-6), or exemption from the requirement. All stu-

[1] See also requirements for admission to the Senior College in courses leading to the degree of B.S., and section on advisers for individual students, p. 7.

dents are required to take a placement test before registering for any course in English or composition. See page 5.

B. Foreign language, 0 to 20 credits, according to the following schedule:[1]

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
One year of one language	15 credits in same language
Less than a year of one language	20 credits in one language

C. 10 credits in one of the social sciences: anthropology, economics, geography, history, political science, sociology.

D. 10 credits in one of the natural sciences: astronomy, botany, chemistry, geology, physics, psychology (including laboratory), zoology.

2. Every student should plan to begin the work specified in the preceding paragraph early enough to provide for the completing of these requirements before the end of his sophomore year. Failure to do this will delay his admission to the Senior College.

3. In addition the student must secure the necessary preparation for a senior college major sequence in one subject or in liberal arts.

4. During the junior college years all men must complete three quarters of physical education and six quarters of military drill. All women must complete six quarters of physical education.

5. 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.

6. The student must earn a total of 90 credits in addition to the requirement in physical education, with an average of one honor point per credit, 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.

A student entering with advanced standing from some other institution must secure a total of 90 credits in addition to the requirement in physical education, and an average of one honor point per credit for the work done in this college. For every five honor points earned in this college, in excess of one honor point per credit, the number 90 is diminished by one.

SENIOR 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: Anthropology, Architecture, Astronomy, Bacteriology, Botany, Chemistry, Economics, English,

[1] Not required in the Social and Civic Course.

Fine Arts, Geography, Geology and Mineralogy, German, Greek, History, Human Physiology, Journalism, Latin, Mathematics, Music, Philosophy, Physics, Political Science, Psychology, Romance Languages, Sociology, Speech, Zoology. The courses constituting a major sequence in any department are announced in the program. For a major in liberal arts consult Mr. Sirich, 200 Folwell Hall.

A student must maintain an average of one honor point per credit 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.

3. The student must earn 90 credits and 90 honor points in addition to the number required for admission, 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. He must spend the last three quarters before graduation in residence in the Senior College and must earn in residence in the Senior College a minimum of 45 credits.[1]

Any student who fails to complete the requirements for graduation within a normal period will, in order to complete the work, be required to continue in the Senior College for one or more university sessions. During this period he will be required to carry at least 13 credit hours of work and to secure an average of one honor point per credit.

A student entering the Senior College with advanced standing from some other institution must secure the same total, and an average of one honor point per credit for the work done in this college. For every five honor points earned in this college in excess of one honor point per credit, the number is diminished by one.

ADVISERS FOR INDIVIDUAL STUDENTS

Students who have shown unusual ability, whose peculiar interests or needs are not met by the general course, may be assigned by the dean of the college to special advisers. The adviser in such case will consult with the student regarding his individual aims and assist him in the choice of his studies.

The modification of the curriculum requirements may begin with the junior college work if necessary in view of the whole plan for the individual. This may mean substitutions and changes in time or sequence of studies but must not involve a departure from the spirit and purpose of the college or an essential lowering of standards.

The curriculum arranged for the individual must receive the approval of the adviser. The adviser will be responsible for the student throughout his course.

HONORS COURSE PLAN

A student who has met all the requirements for admission to the Senior College may be enrolled for the Honors Course upon the approval of the department in which he wishes to pursue his major study.

[1] This regulation does not apply to students in the combined courses.

Each student enrolled in the Honors Course will be put under the immediate direction of a member of his major department of professorial rank who shall be known as his tutor.

A student enrolled in the Honors Course may be a candidate for graduation honors. The tutors will co-operate with the Committee on Honors in arranging comprehensive examinations and in evaluation of theses.

A part of the student's senior college work will consist of reading or other individual studies done under the direction of his tutor. Work done in this way will be accepted as a substitute for a part or the whole of the major sequence and of the elective work of the usual curriculum.

A student electing this plan will be governed by the announcement of his major department and the direction of his tutor as to number of courses, attendance at classes, and general methods to be pursued.

The requirements for the minor study are not modified by this plan at present.

When the tutors of a department report at the end of any quarter that a student is not making satisfactory progress in the Honors Course, the student will be registered as a candidate in the regular course. In this case the tutors will report blanket credits equivalent to the work actually done. The student can then arrange to complete his major sequence either in the same department or in another.

For the year 1931-32 Honors Courses are offered by the Departments of Anthropology, Economics, English, History, Latin, Political Science, Psychology, Sociology, and Zoology.

GRADUATION HONORS[1]

The degree B.A. may be awarded *cum laude, magna cum laude,* or *summa cum laude* upon the recommendation of the Committee on Honors.

Honors are awarded only to students who have a scholastic record of two honor points per credit in all work carried. A student who has this record will be awarded the degree B.A. *cum laude.*

Students wishing to become candidates for the higher honors (*magna cum laude, summa cum laude*) must signify their intention not later than the beginning of the third quarter before graduation. Students are admitted as candidates upon the recommendation of the major department with the approval of the Committee on Honors. The committee will not admit as a candidate a student who has limited his senior college work to the minimum requirements in major and minor subjects. The purpose of granting honors is to secure scholarly ideals and achievements, and the candidate is expected to show his interest and ideals in his election of studies.

With the approval of the Committee on Honors the candidate may pursue a course of reading in addition to the required major and minor studies and in lieu of any or all elective courses. Near the close of the senior year the candidate will take a special examination which may touch

[1] Students who enter with advanced standing are eligible to become candidates for honors if they will have earned 75 credits of work in residence before graduation.

upon any part of the field of his college course. In this comprehensive examination the candidate should show (a) an acquaintance with the chief literature and sources of information in the fields studied, and (b) an ability to discuss with intelligence and clear reasoning, questions or problems upon which he has had opportunity to secure the necessary information. Such questions may be new to the student. The object is to test the student's ability to bring facts and theories to bear upon problems presented in the examination. The examination should be a test not of memory but of assimilation, of culture, and of power to command or use the knowledge which courses of study have put within the student's reach. Candidates who pass this examination will, upon recommendation of the committee, be awarded the degree B.A. *magna cum laude.*

A candidate whose standing in the comprehensive examination is satisfactory and who in addition presents an acceptable critical paper, a piece of creative work, or a thesis embodying the results of original research will, upon recommendation of the committee be awarded the degree B.A. *summa cum laude.* The preparation of the paper should be begun early in the senior year.

The degree B.S. *cum laude* will be awarded to students who have an average of two honor points per credit in all their work.

Students may be accepted as candidates for the higher honors in courses leading to the B.S. degree and in combined arts and professional courses provided they present an equivalent of the work required for graduation honors in the General Course.

CREDIT IN THE GRADUATE SCHOOL

A student lacking not more than nine credits toward graduation may, upon petition, receive graduate credit for a limited amount of work taken as an undergraduate. No graduate credit will be given unless the student has made previous arrangement with the Graduate School. Courses taken for graduate credit will not carry credit toward the Bachelor's degree.

With the permission of the assistant dean for the Senior College, undergraduates lacking not more than nine credits toward graduation may be registered also in the Graduate School. Permission will be granted only in exceptional cases.

II. COURSES LEADING TO THE DEGREE OF BACHELOR OF SCIENCE

Students in these courses who complete the work with an average of two honor points per credit will receive the degree B.S. *cum laude.* Candidates for the higher honors may be accepted if they offer an equivalent of the work required for graduation honors in the General Course. See page 9.

A. COURSE IN LIBRARY TRAINING

For a special course in library training, leading to the degree of bachelor of science, a student must first complete satisfactorily three years of academic work. During these three years the student must secure at least 135 credits in addition to the requirement in physical education, and an average of one honor point per credit for all credits earned. (For each

five honor points in excess of one honor point per credit, the required number of credits will be diminished by one.) The student must complete the requirements for admission to the Senior College in the General Course, and is subject to all the regulations which govern the work of other Arts students. During his third year the student will elect work in this college, including at least 18 credits in senior college courses and subject to the approval of the assistant dean for the Senior College. During the fourth year a student will elect not less than 45 credits from courses given by the Division of Library Instruction, and must maintain an average of one honor point per credit for all the credits earned. For specific information see the bulletin of the Division of Library Instruction obtainable from the registrar.

B. COURSE IN HOSPITAL LIBRARY SERVICE

For the specific requirements of this courses, see the special bulletin of the Division of Library Instruction obtainable at the office of the registrar. This special course will be given only in case there are ten advance registrants before June 1, 1931.

C. COURSE FOR MEDICAL TECHNICIANS

A four-year course in medical technology is offered by the College of Science, Literature, and the Arts and the Medical School.

With the rapid increase of laboratories in hospitals, clinics, and medical schools, medical technology offers a splendid field for women at the present time. Men, as a rule, are not advised to take the course.

The satisfactory completion of the prescribed course leads to the degree of bachelor of science. During the first two years, the student is registered in this college and must earn 90 credits in addition to the requirement in physical education (see page 5), with an average of one honor point per credit.[1] The required courses are listed below. High school physics is a prerequisite, but Physics 11, Survey of Physics, may be taken after admission.

1. English A-B-C, or Composition 4-5-6, or exemption from requirement
2. Zoology 5-6-7 or 1-2 and 3-4, 24[2], 25[2]
3. Inorganic Chemistry 1-2-3 or 4-5; 11
4. Analytical Chemistry 7
5. Organic Chemistry 1-2
6. A reading knowledge of French or scientific German
7. Bacteriology 41[2]
8. Human Physiology 4[2]

For the work in the Medical School consult the special bulletin obtainable at the office of the registrar.

Practical work in the various tests required in laboratory work is taken at the University Hospital and covers four quarters, 45 to 60 credits.

Further information may be obtained by addressing Dr. W. A. O'Brien at the University Hospital.

D. COURSE IN PUBLIC HEALTH LABORATORY OR SANITARY WORK

For major work in the field of preventive medicine and public health, students should consult with the head of the Department of Preventive Medicine and Public Health.

[1] For the requirements in physical education and military drill, see p. 5.

[2] Need not be taken during the first two years.

E. TRAINING COURSE FOR SOCIAL AND CIVIC WORK

The Training Course for Social and Civic Work is a five-year course in preparation for professional social work. The organization of the course aims to give the undergraduate the fundamentals of a broad modern education.

The first two years of work taken in the Junior College consist of the regular academic requirements, with the usual language requirement omitted, and fundamental courses in sociology, economics, psychology, and political science required.[1]

For admission to the Senior College the student must earn 90 credits in addition to the requirement in physical education, with an average of one honor point per credit. In the Senior College he must earn 90 credits and 90 honor points in addition to the number required for admission. (For each five honor points in excess of one honor point per credit the required number of credits will be diminished by one.)

In the Senior College students begin some pre-professional specialization in social work.

A student must spend the last three quarters before graduation in residence in the Senior College and must earn in residence in the Senior College a minimum of 45 credits.

Satisfactory completion of four years' work leads to a degree of bachelor of science but not graduation from the training course.

The fifth year includes additional courses in theory and emphasizes specialized field work and seminar courses. All students must meet the general requirements of the Graduate School. Upon completion of the requirements of the Graduate School, which include an approved thesis, the student will receive the degree of master of arts and a certificate of social work.

It is strongly recommended that students who register in this course consult the training course advisers in the Department of Sociology. A special bulletin is prepared for students in this course and should be consulted for a statement of required courses and recommended elective courses.

First and Second Years, Junior College

Common basic foundation

REQUIRED

English A-B-C or Composition 4-5-6 or exemption from requirement
Sociology 1, 6, 45, 49
Economics 6-7
Political Science 1-2
Psychology 1-2
Zoology 1-2 and 3-4
Human Physiology 1 and 2[2] or 4[2]

[1] For the requirements in physical education and military drill, see p. 5.
[2] Required of students preparing for medical social work.

Third and Fourth Years, Senior College

Concentrated sociological study and field training, in which students become familiarized with social case work and social work with groups.

General requirements.—Sociology 52, 60, 70, 71, 72, 91, 92, 119, 123, 134, 136, 137; three of 100, 101, 102, 103, 120; Preventive Medicine 50 or 53, 61; Home Economics 90.

Recommended.—Sociology 53, 55, 128, 141, 152; Preventive Medicine 57, 60, 73; Economics 161, 164; Political Science 107; Child Welfare 40, 60, 130; Agricultural Education 154; Educational Psychology 158.

Pre-professional specialization by grouped sequences.

a. *Social case work.* Required: Sociology 129, 130, 153, 154. Elective: Sociology 131, 133, 135, 138-139, 155.

b. *Group work.* Required: Physical Education for Women 16-17, 43-44-45; one of Art Education 37, 38, 41, 46; one of Theory and Practice of Teaching T. 33, T. 34, T. 122; Sociology 153-154. Elective: Sociology 126, 155; Zoology 22.

Fifth Year, Graduate

Professional specialization by grouped sequences.

All students will meet the general requirements of the Graduate School. Thesis subjects to be selected with help of the adviser.

III. COURSES PREPARING FOR ADMISSION TO THE PROFESSIONAL SCHOOLS

A. PRE-BUSINESS COURSE

To be eligible for admission to the School of Business Administration, the student must present 90 credits, in addition to the requirement in physical education, earned in a recognized college or university, with 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.

The credits for admission shall be earned in the following groups:

A. Required Credits:[1]

1. English A-B-C or Composition 4-5-6, or exemption from requirement. See page 5.
2. Ten credits in mathematics or in *one* of the following laboratory sciences: botany, chemistry, physics, zoology.
3. Ten credits in *one* of the following social sciences: geography, history, political science, sociology.[2]
4. Ten credits in the Principles of Economics. (This requirement may be satisfied by the completion of Economics 4 with its prerequisites, or Economics 6-7 or the equivalent. The student will consult a pre-business adviser concerning an equivalent.)

B. Elective Credits:

Sufficient elective credits to complete the minimum number required for admission (normally fifty-four credits). The attention of the student is called

[1] For the requirements in physical education and military drill, see p. 5.

[2] Sociology 45, Social Statistics, is not accepted in fulfillment of this requirement.

to the two following groups of subjects to which part of the elective time should be devoted:

1. Courses required for graduation from the School of Business Administration and recommended for pre-business students. These courses are prerequisites for certain required courses in the School of Business Administration:

   Economics 3, (Mechanism of Exchange)
   Economics 14, (Elements of Statistics)[1]
   Economics 25-26 (Principles of Accounting)[2]

Students who do not elect the above courses during the freshman and sophomore years will be required to take Business Administration 57, 63, and 70, during the first quarter in residence in the School of Business Administration.

2. Courses required as prerequisites to courses in certain sequences in the School of Business Administration and recommended for all students:
   a. Psychology 1-2, (General Psychology). This course is a prerequisite for courses in Advertising, Foreign Trade, Merchandising, Personnel Management, Insurance, and Real Estate.
   b. Mathematics 8 and 20 (Commerce Algebra and Mathematics of Investment). Required of students who take the accounting, insurance, or finance sequence.
   c. Mathematics 8 and 6 (Commerce Algebra and Trigonometry). Required of students who take the statistics sequence.
   d. Students in the foreign trade sequence are required to have a reading knowledge of at least one foreign language.

B. PRE-DENTAL COURSE

The pre-dental course, required for admission to the College of Dentistry, consists of two years of prescribed work, during which the students are registered in this college and subject to its regulations.[3] The required courses are listed below. It is desirable that students should have had chemistry and higher algebra in high school.

1. Zoology 5-6-7
2. Inorganic Chemistry 1-2-3 or 4-5, and 11
3. Organic Chemistry 1-2
4. Mathematics 4 or 3-4 or 6
5. Physics 3 and 4, and one of the combinations 23 and 24, 33 and 34, 43 and 44
6. Drawing 41-42-43[4]
7. Mechanical Engineering 11-12-13[4]
8. English A-B-C or Composition 4-5-6 or exemption from requirement
9. Psychology 1-2[4]
10. Electives to make a total of 90, in addition to the requirement in physical education

NOTE.—Students who have had no chemistry in high school are advised to take Inorganic Chemistry 11 in the summer of their first year.

[1] Credit may not be received for both Economics 14, (Elements of Statistics), and Sociology 45, (Social Statistics).

[2] Students who have had a high school course or experience in bookkeeping will be admitted to Economics 25 upon passing a placement test. For other students Economics 20 is prerequisite to Economics 25.

[3] For the requirements in physical education and military drill, see page 5.

[4] The faculty of the College of Dentistry may accept electives for these courses. Consult the dean of that college.

C. GENERAL COURSE PRELIMINARY TO THE COLLEGE OF EDUCATION

All students who desire to receive a state teacher's certificate upon graduation from the University of Minnesota must be graduates of the College of Education. If not enrolled in one of the special four-year curricula, they should register in the College of Education beginning with the junior year. They should enroll as pre-education students in the Junior College as early in their course as possible. Entrance to the college will be conditioned upon a student's meeting the general and specific requirements outlined below:

1. A minimum of ninety credits, exclusive of credit for physical education, carried with an average of one honor point per credit. The ninety credits thus indicated must be earned in the following groups of college courses:

Group A English
Group B Foreign languages: German, Greek, Latin, Romance Languages, Scandinavian
Group C Social sciences: Anthropology, Economics, Geography, History, Political Science, Sociology
Group D Natural sciences: Astronomy, Botany, Chemistry, Geology and Mineralogy, Human Physiology, Physics, Psychology, Zoology
Group E Mathematics
Group F Journalism, Philosophy, Fine Arts, Speech, or such courses in other colleges or departments of the University as are approved by the College of Education

2. Within the general requirements listed above the student during his high school and junior college years must have completed the required work indicated under A, B, C, and D below. At least 20 credits in groups B, C, and D must be completed in college.

When Taken	In High School	In College
A. English	3 years	and 9 credits in composition
B. Language	3 years in one language	or 20 credits in one language
	or	
	2 years in one language	and 10 credits in same language
	or	
	1 year in one language	and 15 credits in same language
C. Social sciences	2 years	or 10 credits in one department
D. Natural sciences	2 years	or 10 credits in one department

NOTE.—In lieu of the specific course requirements indicated in the language group a student may take a comprehensive examination in an elected language to be conducted by a committee appointed by the dean of the College of Education.

3. Within the total credits stipulated under Section 1 a student must meet, in fields of study which are represented in prevailing high school curricula, the following requirement: at least 15 credits in a major field and at least 10 credits in each of two minor fields. The purpose of this requirement is to prepare the student for the study of the advanced courses necessary to the completion of satisfactory teaching majors and minors.

4. The student must have completed six credits in general psychology.

5. In the cases of certain specialized curricula described in the bulletin of the College of Education, Part I, the above requirements may be modified in details.

Apart from the specialized curricula, majors and minors are offered separately in the following fields: English, speech; German, Latin, French, Scandinavian; geography, history, political science, sociology; botany, chemistry, physics, zoology; mathematics.

6. At the time of entrance a student must present a certificate from the Students' Health Service indicating that he is free from physical defects that would prevent him from the successful pursuit of educational work.

7. At the time of entrance to the College of Education the student will be given a general examination designed to show his capacities to pursue professional curricula in education.

8. For the requirement in physical education and military drill, see page 5, or the bulletin of the College of Education, Part I.

9. Students preparing to qualify in one of the specialized curricula or in the limited honors course should consult the College of Education bulletin.

D. COURSE PRELIMINARY TO NURSING EDUCATION IN THE COLLEGE OF EDUCATION[1]

For the first five quarters of the five-year course in Nursing Education, the student is registered in the Junior College. She must complete the requirements listed below, and must earn an average of one honor point per credit.

English A-B-C or Composition 4-5-6 or exemption from the requirement. See page 5
Zoology, 10 credits
History, 10 credits
Human Physiology 1 and 2
Psychology 1-2
Home Economics 70
Sociology, 5 credits
Botany, 10 credits
Electives to make a total of 75 credits exclusive of Physical Education
Physical Education, see page 5. One quarter of this requirement may be completed after registering in the School of Nursing.

Upon completion of the above requirement the student registers in the School of Nursing for two and a half years, followed by three quarters in the College of Education, with a major in Public Health Nursing or Nursing Education.

E. COURSE PRELIMINARY TO TRAINING IN INTERIOR ARCHITECTURE IN THE COLLEGE OF ENGINEERING AND ARCHITECTURE

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 architecture and decoration without taking the full technical course in Architecture.

During the first two years, the student is registered in this college. He must complete the requirements stated below and must earn 90 credits and

[1] Certain changes in this course will be made in the fall quarter of 1931. Such changes will be announced later.

90 honor points,[1] with the required work in physical education. (See page 5.) At the beginning of his course, he should consult the School of Architecture regarding electives.

During the third and fourth years, the student registers in the College of Engineering and Architecture and upon the satisfactory completion of the prescribed work, amounting to 102 additional credits, receives the degree of bachelor of interior architecture. (See bulletin of the College of Engineering and Architecture.)

Courses Required in the First Two Years	Credits
English A-B-C or Composition 4-5-6 or exemption from requirement (see page 5)	0 to 15
Mathematics 4 or 6 (with prerequisite)	4 to 10
French (see Junior College Requirements, page 7)	0 to 20
History 11-12-13	10
Physics 3 and 4 and 23 and 24, 33 and 34, or 43 and 44	8
or	
Inorganic Chemistry 1-2-3 or 4-5 or 6-7-8 or 9-10	8 to 15
Architecture 21-22-23	6
Architecture 31-32-33	15
Drawing 61-62-63	6

Students who enter without either French, higher algebra, or high school chemistry, should register in their freshman year for Freshman English (see page 5), French, chemistry, and, if possible, Architecture 21-22-23. Students who enter with one or more years of French should register for Freshman English, French, and mathematics to complete the requirements, and, if possible, Architecture 21-22-23.

F. GENERAL COURSE PRELIMINARY TO THE LAW SCHOOL

Students in the University preparing to enter the Law School register in this college. Ninety quarter credits of academic work are required for admission to the Law School, and 135 credits for admission to the three-year law course.[1] An average of one honor point for each credit earned up to the time of admission is also required. Excess honor points do not reduce the number of credits required.

No specific subjects are required for admission to the Law School as a candidate for the degree of bachelor of laws, but a student seeking the degree of bachelor of arts in the combined course must satisfy the requirements of the College of Science, Literature, and the Arts for that degree. Likewise, a student seeking the degree of bachelor of science in law should have English A-B-C or Composition 4-5-6 (unless exempted), Political Science 1-2, American Government and Politics, Philosophy 2, Logic, Psychology 1-2, General Psychology, History 70-71-72, English Constitutional History, and Economics 6-7, Principles of Economics. No foreign language is required for this degree.

The following course is recommended by the faculty of the Law School. It satisfies the requirements for admission to the Law School and also, so far as it goes, the requirements for the degree of bachelor of arts or bachelor of science in law.

[1] For the requirements in physical education and military drill, see page 5.

1. Latin, 20 credits, minus 5 credits for each year of Latin in high school.
2. English A-B-C or Composition 4-5-6 or exemption from requirement
3. Natural Science, 10 credits
4. Political Science 1-2
5. Philosophy 2 and 1, 3 or 50, 51, 52
6. Psychology 1-2
7. History, 10 credits, and 70-71-72
8. Economics 6-7
9. Sociology 1

Additional courses should be elected in Economics, History, Philosophy, Political Science, Sociology, and Speech.

G. PRE-PHARMACY COURSE

For recommendations for one year's work preliminary to the College of Pharmacy, consult the bulletin of that college.

IV. MILITARY SCIENCE AND TACTICS

Credit for advanced military science.—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 War Department regulations.

For admission to the Senior College, a student must complete 90 credits, in addition to the requirement in physical education, with an average of one honor point per credit. The faculty will recommend for graduation, in any course of study (given entirely in this college), leading to the degree of bachelor of arts or bachelor of science, any student who has completed in addition to this requirement 84 credits, 84 honor points, and the work of the Advanced Course of the R.O.T.C.

A student must spend the last three quarters before graduation in residence in the Senior College and must earn in residence in the Senior College a minimum of 45 credits.

Students enrolled in the Advanced Course, R.O.T.C., are furnished with a special uniform 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 the seventh grade in the army.

All students who complete the Advanced Course, R.O.T.C., 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.

Special course for students of military science.—The degree of bachelor of science will be given to students who complete the following course.

JUNIOR COLLEGE

1. A total of 90 credits, in addition to the requirement in physical education, with an average of one honor point per credit.[1]

[1] For the requirements in physical education and military drill, see p. 5.

a. English A-B-C or Composition 4-5-6 or exemption from requirement.
b. History 1-2.
c. Zoology 1-2 and 3-4, Psychology 1-2, Chemistry, 10 credits.

2. Preparation for a major sequence in history, political science, or mathematics.

SENIOR COLLEGE

1. For the completion of the Advanced R.O.T.C. Course as now given, a total of ..... 12 credits
2. Bacteriology 41 ..... 5 credits
3. Preventive Medicine 50, 53..... 6 credits
4. One of the following (in senior college courses)
   a. History, including 59-60-61 and 93-94-95 ..... 18 credits
   b. Political Science, including 101-102, 181-182..... 21 credits
   c. Mathematics, including 50, 51, 52..... 21 credits
   d. Electives to make a total of 90 credits and 90 honor points, in addition to the requirement for admission.

The quality credit rule applies to this course in so far as the number of elective credits is concerned.

V. SEVEN-YEAR COURSE IN SCIENCE AND MEDICINE, LEADING TO THE DEGREES OF BACHELOR OF SCIENCE, BACHELOR OF MEDICINE, AND DOCTOR OF MEDICINE[1]

During the first two years the student is registered in the College of Science, Literature, and the Arts. He is expected to complete the courses listed below and must secure 90 credits, in addition to the requirement in physical education, with an average of one honor point per credit.[2] (For each five honor points in excess of one honor point per credit, the required number of credits will be diminished by one.)

Composition 4-5-6, English A-B-C, or exemption from requirement. See page 5.
Zoology 5-6-7 (1-2 and 3-4, 10 credits, will be accepted).
Inorganic Chemistry 11, Analytical Chemistry 7, and Organic Chemistry 1-2, with the elementary courses prerequisite to them.
Physics 3 and 4 (with prerequisite mathematics) 23 and 24, 33, 43 and 44. Course 34 optional.
German sufficient to secure a reading knowledge. Students may meet this requirement by passing two quarters' work in Medical German (German 31-32), or by taking a special examination after completing two college years of German. This examination is conducted by the German Department.[3]

The following subjects are recommended as electives: advanced zoology, (such as comparative anatomy), physics, chemistry, freehand drawing,

[1] Only students who have completed the required work in the College of Science, Literature, and the Arts or some similar school before entering the professional school will be permitted to avail themselves of the privilege of securing the B.S. degree in a combined course.

[2] For the requirements in physical education and military drill, see page 5.

[3] A student who enters the Medical School before September, 1932, may substitute French for German. He may meet the requirement by passing two quarters of French 8-9-10 or by taking a special examination after completing 15 credits of French.

Latin, French, higher mathematics and statistics, psychology, and sociology. General Bacteriology, a Medical School subject, may not be presented for admission to the Medical School. With the approval of the Students' Work Committee of the Medical School and the assistant dean for students' work in the College of Science, Literature, and the Arts, a pre-medical student may take one subject in the Medical School in any quarter.

For admission to the Medical School, a candidate's record must show a number of honor points equal to the total number of credits in the required subjects of zoology, chemistry, physics, and composition; also a number of honor points equal to the total number of credits in all subjects; and the student must be accepted by the Medical School under the limited registration regulation of that school. He must take a medical students' aptitude test, the scores of such tests being considered by the Students' Work Committee in advising students and determining admission. A student applying for admission must have satisfied all requirements before July 1.

PROGRAM FOR THOSE WHO ENTER IN THE FALL WITHOUT LANGUAGE AND WITHOUT HIGHER ALGEBRA

First Year

Inorganic Chemistry 1-2-3, or 4-5 and 11
German 1-2-3
Mathematics 3 and 4, and Physics 3 and 4
Zoology 5-6-7 (or 1-2 and 3-4)

Second Year

Inorganic Chemistry 11, if not already completed
Analytical Chemistry 7
Organic Chemistry 1-2
German 30-31-32
Physics 23 and 24, 33, 34 (optional), 43 and 44
Composition 4-5-6, English A-B-C, or elective for those exempted from requirement

NOTE.—Students who have had no chemistry in high school are advised to take Inorganic Chemistry 11 in the summer of their first year.

PROGRAM FOR THOSE WHO ENTER IN THE FALL WITH TWO YEARS OF GERMAN

First Year

Inorganic Chemistry 1-2-3 or 4-5 and 11
German 30-31-32
Mathematics 3 and 4, and Physics 3 and 4
or
Mathematics 4 and Physics 3, 4, 43, and 44
Zoology 5-6-7 (or 1-2 and 3-4)

Second Year

Inorganic Chemistry 11, if not already completed
Analytical Chemistry 7
Organic Chemistry 1-2
Physics to complete the requirement of four quarters. See above.
Composition 4-5-6, English A-B-C, or elective for those exempted from requirement

The work during the third and fourth years is taken in the Medical School and is credited toward the degree of bachelor of science. To secure this degree, a student must have 90 credits and 90 honor points in addition to the requirement for admission, and must have completed the first two years of the medical course in accordance with the standards of the Medical School.

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 this seven-year combined course, will be awarded the degree of bachelor of science on recommendation of the faculty of the Medical School, provided they meet the scholarship requirements stated above. The credit value of work done elsewhere will be determined by the Students' Work Committee of the College of Science, Literature, and the Arts, but such credits will not become effective until the student has completed, with the required standing, two full years of work in the Medical School of the University of Minnesota.

The foregoing regulations governing the quality and amount of premedical training required for admission to the Medical School will be enforced for those who present the minimum amount of work. In cases of mature and superior students, especially such as have taken degrees and have made special progress along some line (even tho it may not have been closely related to medicine), concessions may be made. Cases under this paragraph will be considered individually and upon petition.

It should be borne in mind that no student can pursue the medical course to advantage without knowledge of biology, chemistry, and physics.

VI. FIVE-YEAR COURSE IN ARTS AND ARCHITECTURE[1]

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 leads to the degrees of bachelor of arts at the end of four years and bachelor of architecture at the end of five years. The degree of master of architecture may be taken at the end of six years.

Students wishing to elect this course should consult the School of Architecture. For the first two years the requirements are the same as those laid down in the course in Interior Architecture, page 16 of this bulletin, except that the student will register in Mathematics 11, 12, and 13 (College of Engineering and Architecture) and complete these courses by the end of his sophomore year.

During the first four years of this course the student is registered in the College of Science, Literature, and the Arts. He must complete the requirements for admission to the Senior College, and is subject to the regulations governing other students in this college.

[1] Only students who have completed the required work in the College of Science, Literature, and the Arts before entering the professional school will be permitted to avail themselves of the privilege of securing the B.A. degree in a combined course.

VII. COMBINED COURSE IN ARTS AND LAW, LEADING TO THE DEGREES OF BACHELOR OF ARTS AND BACHELOR OF LAWS[1]

The work of the first three years of this course is done in the College of Science, Literature, and the Arts. The student must complete the requirements for admission to the Senior College in the General Course, and is subject to all the regulations which govern the work of other Arts students. During these three years the student must secure at least 135 credits in addition to the requirement in physical education, and an average of one honor point per credit for all credits earned.[2] For a student who has 135 credits, *exclusive of quality credits,* when he enters the Law School, the course for the degree of bachelor of laws is three years; for a student who has less than 135 credits, *exclusive of quality credits,* when he enters the Law School, the course for the degree of bachelor of laws is four years.

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. This work must include eighteen credits in senior college courses. The first year of the course in the Law School, when completed with the standing required by that college for graduation, counts as the equivalent of the fourth year (45 credits) of the Arts course.

VIII. EIGHT-YEAR COURSE IN ARTS AND MEDICINE, LEADING TO THE DEGREES OF BACHELOR OF ARTS, BACHELOR OF MEDICINE, AND DOCTOR OF MEDICINE[1]

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 the other students of the college, and must secure at least 135 credits in addition to the requirement in physical education, with an average of one honor point per credit for all credits earned.[2] (For each five honor points in excess of one honor point per credit, the required number of credits will be diminished by one.) He must complete the requirements for admission to the Senior College in the General Course and also the work in zoology, chemistry, physics, and foreign language, prescribed for the seven-year course in Science and Medicine (p. 19).[3]

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. This work must include eighteen credits in senior college courses. The first year of the course in the Medical School, when completed with the standards required by that school, counts as the equivalent of the fourth year (45 credits) of the Arts course.

[1] Only students who have completed the required work in the College of Science, Literature, and the Arts before entering the professional school will be permitted to avail themselves of the privilege of securing the B.A. degree in a combined course.

[2] For the requirements in physical education and military drill, see page 5.

[3] For recommended electives and the restrictions governing them, see p. 19.

For admission to the Medical School, a student's record must show a number of honor points equal to the number of credits in the required subjects of English or composition, chemistry, physics, and zoology; and also a number of honor points equal to the total number of credits; and the student must be accepted by the Medical School under the limited registration regulations of that school.

DIRECTORY OF ADMINISTRATIVE AND DEPARTMENTAL OFFICES

J. B. Johnston, Dean of the College of Science, Literature, and the Arts	219Adm
J. M. Thomas, Assistant Dean for the Senior College	219F
W. H. Bussey, Assistant Dean for the Junior College	106F
R. R. Shumway, Assistant Dean for Students' Work	219Adm

Anthropology	11F	Latin	118F
Architecture	315E	Library Methods	107Lib
Astronomy	337Ph	Mathematics	119F
Bacteriology	228MH	Mechanical Engineering	103ME
Botany	209Bot	Military Science and Tactics	105A
Chemistry	127C	Music	107Mu
Child Welfare	204OLa	Orientation	228F
Comparative Literature	111F	Philosophy	323F
Drawing and Descriptive Geometry	208E	Physical Education for Men	108A
Economics	113B	Physical Education for Women	101WGm
English	219F	Physics	148Ph
Fine Arts	101OPh	Political Science	205OL
Geography	101OL	Preventive Medicine and Public Health	HS
Geology and Mineralogy	108P	Psychology	112Psy
German	208F	Romance Languages	200F
Greek	112F	Scandinavian	122F
History	102OL	Sociology	108OPh
Home Economics	215HE	Speech	309F
How To Study	108Psy	Zoology	308Z
Human Anatomy	204IA		
Human Physiology	318MH		
Journalism	11P		

PROGRAM

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.

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.

Certain courses numbered under 50 are restricted to juniors and seniors. They are not technically senior college courses and cannot be used in major or minor sequences.

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; Adm, Administration; Ad(F), Administration, University Farm; B, Business; Bot, Botany; C, Chemistry; CWI, Child Welfare Institute; D, Dentistry; E, Engineering; EE, Electrical Engineering; F, Folwell; G, Greenhouse; HE, Home Economics, University Farm; HH, Haecker Hall, University Farm; HS, Health Service; Lib, Library; ME, Mechanical Engineering; MH, Millard Hall; Mu, Music; OLa, Old Law; OL, Old Library; OPh, Old Physics; P, Pillsbury; Ph, Physics; Psy, Psychology; S, Stadium; SBH, State Board of Health; WGm, Women's Gymnasium; Z, Zoology.

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., to 1:05; sixth hour, 1:30 to 2:20, etc.)
Ar.	To be arranged or assigned.
Aud.	Auditorium.
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.

ANTHROPOLOGY

Major Advisers

Professors Jenks and Wallis.

Major Sequence

Prerequisites: Course 41, with fifteen additional credits from the social sciences and fifteen credits from the biological sciences.

At least twenty-four credits selected from the following courses: 80, 106, 108, 110, 112, 113, 114, 121, 161; History 86-87. In addition, Psychology 114-115 is required.

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
41f	Introd. to Anthropology ..... (5 cred.; soph., jr., sr.; prereq., 10 cred. sci. or soc. sci.)	VII	MTWThF	OPhAud	Mr. Wallis
41w	Introd. to Anthropology ..... (See 41f)	VII	MTWThF	OPhAud	Mr. Jenks
41s	Introd. to Anthropology ..... (See 41f)	I	MWThFS	OPhAud	Mr. Wallis
53s	Cultural Anthropology: Technology ..... (3 cred.; jr., sr.; prereq., 41)	II	TThS	9F	Mr. Wallis
54w	Cultural Anthropology: Social Organization ..... (3 cred.; jr., sr.; prereq., 41)	VIII	MWF	9F	Mr. Wallis
56	*Primitive Science* ..... (3 cred.; jr., sr.; prereq., 41)	*Not offered*			
62w	Ethnology ..... (3 cred.; jr., sr.; prereq., 41)	IV	MWF	6F	Mr. Wallis
80s	The American Indian ..... (3 cred.; jr., sr.; prereq., 41)	III	TThS	25F	Mr. Wallis
106w	Prehistoric Man ..... (3 cred.; jr., sr.; prereq., 41)	III	MWF	12F	Mr. Jenks
107s	American Archeology ..... (3 cred.; jr., sr.; prereq., 41)	III	MWF	12F	Mr. Jenks
108	*Philippine Peoples* ..... (3 cred.; jr., sr.; prereq., 41)	*Not offered*			
110f	Physical Anthropology ..... (3 cred.; jr., sr.; prereq., 41)	III	TThS	12F	Mr. Wallis
112s	The American Negro ..... (3 cred.; jr., sr.; prereq., 41)	II	MWF	9F	Mr. Jenks
113s	Peoples of Europe ..... (3 cred.; jr., sr.; prereq., 41)	IV	MWF	6F	Mr. Jenks
114w	The American People ..... (3 cred.; jr., sr.; prereq., 41)	VII	MWF	25F	Mr. Jenks
121w	Advanced Phys. Anthropology .. (3 cred.; jr., sr.; prereq., 110)	Ar	Ar	12F	Mr. Wallis
122f-123w-124s	Problems in Anthropology ..... (Cred. ar.; jr., sr., grad.; prereq., three courses. For honors course students, permission of instructor)	Ar	Ar	12F	Mr. Jenks, Mr. Wallis

No.	Title	Hour	Day	Bldg.	Instructor
150*	Field Trip in Archeology ..... (1 to 8 cred.; sen. coll. stud. only; prereq., one sen. coll. course)	Ar	Ar	Ar	Mr. Jenks
161f	Primitive Religion ..... (3 cred.; jr., sr.; prereq., 41)	I	MWF	12F	Mr. Wallis
204f-205w-206s	Seminar in Anthropology ..... (3 cred. per qtr.; grad.)	Ar	Ar	12F	Mr. Jenks, Mr. Wallis

ARCHITECTURE

COLLEGE OF ENGINEERING AND ARCHITECTURE

Major Adviser

Professor Mann.

Major Sequence

Courses 34-35-36, 14-15-16, 17-18-19, 163, Architecture 182-183-184 or Architecture 37-38 or ten credits in senior college courses in philosophy, history, or French. (Prerequisites: Courses 21-22-23, 31-32-33, Drawing 61-62-63, and 10 credits in philosophy, history, or French.)

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
21f,w-22w,s†-23s	Freehand Drawing ..... (6 cred.; all; no prereq.)				
24f,w-25f.w,s-26f,w,s	Freehand Drawing ..... (6 cred.; soph., jr., sr.; prereq., 23)				
31f-32w†-33s	Elements of Architecture ..... (15 cred.; soph., jr.; prereq., soph. standing and regist. in Draw. 61, 62, or 63)				
31w-32s†-33su	Elements of Architecture ..... (See 31f-32w-33s)				
74f,w-75f,w,s-76f,w,s	Freehand Drawing ..... (9 cred.; soph., jr., sr.; prereq., 23)				
81f	Stage Design ..... (2 cred.; soph., jr., sr.; no prereq.)				
84-85-86f,w,s	Modeling ..... (6 cred.; soph., jr., sr.; prereq., 23 or equiv.)				
90-91-92f,w,s	Illustration ..... (3 cred.; soph., jr., sr.; prereq., 23 or equiv.)				
93-94-95f,w,s	Hand Print Process ..... (3 cred.; soph., jr., sr.; prereq., 23 or equiv.)				

NOTE.—Consult the bulletin of the College of Engineering and Architecture for program of hours, days, buildings, and instructors.

* This course may be taken for credit only once.

† The entire course must be completed before credit is received for any quarter.

Senior College Courses

No.	Title	Hour	Day	Bldg.	Instructor
14f-15w-16s	History of Architecture ..... (6 cred.; jr., sr.; prereq., 22, 32)				
17f-18w	History of Architecture ..... (4 cred.; jr., sr.; prereq., 15)				
19s	History of Architecture ..... (2 cred.; jr., sr.; prereq., 16)				
27-28-29f,w,s	Freehand Drawing ..... (6 cred.; jr., sr.; prereq., 76 or 26)				
34-35-36f,w,s	Architectural Design ..... (12 cred.; jr., sr.; prereq., 33, 23, 62)				
37-38-39f,w,s	Architectural Design ..... (21 cred.; sr.; prereq., 36)				
51f-52w-53s	Building Construction ..... (6 cred.; jr., sr.; prereq., 32)				
70f,w,s	Pictorial Composition ..... (1 cred.; jr., sr.; prereq., 26 or equiv.)				
87-88-89f,w,s	Advanced Modeling ..... (6 cred.; jr., sr.; prereq., 86)				
121-122-123f,w,s	Freehand Drawing ..... (6 cred.; jr., sr.; prereq., 29)				
134-135-136f,w,s	Interior Design (Interior Architecture) ..... (21 cred.; sr.; prereq., 36)				
163s	History of Sculpture and Painting ..... (2 cred.; jr., sr.; prereq., 16)				
182f-183w-184s	Furniture and Decoration ..... (9 cred.; sr.; prereq., 16, 23)				

NOTE.—Consult the bulletin of the College of Engineering and Architecture for program of hours, days, buildings, and instructors, and for additional courses.

ASTRONOMY

Major Sequence

Courses 51-52-53, 101-102-103, and Mathematics 50, 51, 52. (Prerequisites: Mathematics 5-6-7 or physical science and Mathematics 6.)

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
11f,s	Descriptive Astronomy ..... (5 cred.; fr., soph., jr., sr.; no prereq.)	IV	MTWFS	150Ph(f) 133(s)	Mr. Luyten
51w	Astronomy ..... (3 cred.; jr., sr.; prereq., Math. 6 and 50 or equiv.)	IV	MWF	133Ph	
52w	Astrophysics ..... (4 cred.; prereq., 51 or 11 and Math. 6)	II	MTWF	Ph	
53s	Stellar Astronomy ..... (4 cred.; prereq., 51 or 11 and Math. 6)	II	MTWF	Ph	
140f	Least Squares ..... (4 cred.; prereq., 51 or 11 and Math. 6)	II	MTWF	Ph	

BACTERIOLOGY

MEDICAL SCHOOL

Major Advisers

Professors Larson, Halvorson, Henrici, and Green.

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, Zoology 144-145-146 and Human Physiology 100-101 or Agricultural Biochemistry 111-112.)

Sequences B. For work in industrial bacteriology. Courses 103, 114, 118, 119-120, 121-122, 150-151. (Prerequisites: besides the necessary courses in this department, Human Physiology 100-101 or Agricultural 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
41f	General Bacteriology ..... (5 cred.; soph., jr., sr.; prereq., chem. 10 cred. and zool. 8 cred.)				
	Sec. 1	VII, VIII, IX	MWF	MH	Ar
	2	VI, VII, VIII, IX	TTh	MH	Ar
41w	General Bacteriology ..... (See 41f)				
	Sec. 1	VII, VIII, IX	MWF	MH	Ar
	2	I, II, III	MWF	MH	Ar
41s	General Bacteriology ..... (See 41f)	VII, VIII, IX	MWF	MH	Ar
101f	Special Bacteriology for Medical Students ..... (4 cred.; jr., sr.; prereq., 41)	I, II Substitute hrs.	TThS Ar	MH	Dr. Larson
103w	Soil Microbiology ..... (5 cred.; jr., sr.; prereq., 41, and 15 cred. chem.)	I, II, III I, II	TS Th	MH	Dr. Skinner
114s	Molds, Yeasts, and Actinomycetes (4 cred.; jr., sr.; prereq., 41)	II, III	MWF	MH	Dr. Henrici
116w	Immunity ..... (3 cred.; jr., sr.; prereq., 101 or 103)	VII, VIII	TTh	MH	Dr. Larson
117s	Pathogenic Protozoa ..... (3 cred.; jr., sr.; prereq., 101 or 103)	VII, VIII	TTh	MH	Dr. Larson
119w	Bacteriological Chemistry ..... (2 cred.; jr., sr.; prereq., 101 or 103; Hum. Physiol. 100-101, or Agr. Biochem. 111-112)	VI	TTh	MH	Dr. Green
120s	Bacterial and Virus Diseases Common to Man and Animals (3 cred.; jr., sr., grad.; prereq., 101)	VI, VII VI	T Th	MH	Dr. Green

No.	Title	Hour	Day	Bldg.	Instructor
121w	Industrial Bacteriology ..... (3 cred.; jr., sr., grad.; prereq., 41)	I, II	TTh	MH	Dr. Halvorson
122s	Industrial Bacteriology continued (3 cred.; jr., sr., grad.; prereq., 41)	I, II	TTh	MH	Dr Halvorson
150f-151w or 150w-151s	Advanced Bacteriology ..... (Cred. ar.; jr., sr., grad.; prereq., see instructor)	VII, VIII	TTh	MH	Ar

BOTANY

Major Advisers

Professors Rosendahl and Tilden; Associate Professors Burr and Butters; Assistant Professors Huff and Treloar.

Major Sequences

A. In Morphology. (Prerequisite: 1, 2, 5, 7, 12, 21, 22, 23.) Courses 51, 63, 118, either 149, 150, or 151, and 15 credits from Courses 108, 110, 124, 125, 126, 127, or Plant Pathology 105-106-107.

B. In Taxonomy. (Prerequisite: 1, 2, 7, 12, 21, 23, and Geology 2 or 8.) Courses 101, 113, 114, 115, 127, 133, and 10 credits from 63, 108, 110, 124, 125, 126, 149, 150, 151, or Plant Pathology 105-106-107.

C. In Physiology. (Prerequisite: 1, 5, 21, 22, and elementary inorganic chemistry.) Courses 140, 141, 142, 143, and 10 credits from 144 or biochemistry or organic chemistry.

D. In Ecology. (Prerequisite: 1, 2, 5, 7, 21, 22, and Geology 2 or 8.) Courses 131, 132, 133, 134, and 10 credits from 101, 113, 114, 115, 124, 125, 126, 127.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

For the requirements for the teacher's certificate consult the bulletin of the College of Education.

No.	Title	Hour	Day	Bldg.	Instructor
1f*	General Botany ..... (4 cred.; all; no prereq.)				
	Lect. Sec. 1	III	TThS	BotAud	Mr. Huff
	2	VI VI, VII	T Th		
	Quiz Sec. 1	I	M		
	2	II	T		
	3	III	M		
	4	III	W		
	5	IV	T		
	6	V	T		
	7	VI	M		
	8	VII	M		
1w,s*	General Botany ..... (See 1f)				
	Lect.	III	TThS	BotAud	Mr. Huff
	Quiz Sec. 1	I	T		
	2	II	T		
	3	III	W		

* To complete the science requirement a student may elect any two of Courses 2, 5, 7, 12, 13, 21, 22.

No.	Title	Hour	Day	Bldg.	Instructor
2w,s	Elem. Gen. Morph. of Plants .. (3 cred.; all; prereq., 1)	III, IV	MWF	1,4,5,8Bot	Mr. Huff
5w	Elem. Plant Histology ..... (3 cred.; all; prereq., 1)	VI, VII, VIII	WF	1,4,5,8Bot	Mr. Butters
7f	Taxonomy of Flowering Plants .. (3 cred.; all; prereq., 1)	I, II	MWF	1,4,5,8Bot	Mr. Rosendahl
7s	Taxonomy of Flowering Plants .. (See 7f)				
	Sec. 1	I, II	MWF	1,4,5,8Bot	Mr. Rosendahl
	2	VI, VII, VIII	TTh		
12f,w,s	Morphology of Algae ..... (3 cred.; all; prereq., 1)	I, II	TThS	1,4,5,8Bot	Miss Tilden
13	*Morphology of Fungi* ..... (3 cred.; all; prereq., 1)	*Not offered*			
21f	Elementary Ecology ..... (3 cred.; all; prereq., 1)	III, IV	MWF	1,4,5,8Bot	Mr. Oosting
21w	Elementary Ecology ..... (See 21f)				
	Lect.	VI	TTh	BotAud	Mr. Oosting
	Lab.	I, II	ThS	1,4,5,8Bot	
21s	Elementary Ecology ..... (See 21f)	VI, VII, VIII	TTh	1,4,5,8Bot	Mr. Oosting
22f,w,s	Elem. Plant Physiology ..... (3 cred.; all; prereq., 1)				
	Lect.	VI	TTh	1,4,5,8Bot	Mr. Burr
	Lab.	VII, VIII	TTh		
23w	Bryophytes and Pteridophytes .. (3 cred.; all; prereq., 2 or 12)	VI, VII	MWF	1,4,5,8Bot	Mr. Huff
51f	Histological Methods ..... (5 cred.; jr., sr.; prereq., 15 cred.)	I, II	MTWThF	01Bot	Miss Wilson
63s	Gymnosperms and Angiosperms (3 cred.; jr., sr.; prereq., 15 cred. incl. 7 and 2 or 23)	III, IV	MWF	215Bot	Mr. Butters
101f	Biometric Principles ..... (3 cred.; jr., sr., grad.; prereq., 18 cred. biol. sci. or permission of instructor)				
	Lect.	III	TThS	214Bot	Mr. Treloar
	Lab.	Ar	Ar	202Bot	
101s	Biometric Principles ..... (See 101f)				
	Lect.	I	TThS	BotAud	Mr. Treloar
	Lab.	Ar	Ar	Ar	
108w	Pteridophytes ..... (5 cred.; sr.; grad.; prereq., 18 cred. incl. 7 and 23)	Ar	Ar	Ar	Mr. Butters
110	*Gymnosperms* ..... (5 cred.; sr., grad.; prereq., 18 cred. incl. 7 and 63)	*Not offered*			
113f-114w-115s*	Adv. Taxonomy of Flowering Plants ..... (9 cred.; jr., sr., grad.; prereq., 15 cred. incl. 7)	VI, VII, VIII	MF	215Bot	Mr. Rosendahl
118w	Cytology ..... (5 cred.; jr., sr., grad.; prereq., 18 cred.)	I, II	MTWThF	215Bot	Mr. Rosendahl

* Any quarter may be taken separately.

No.	Title	Hour	Day	Bldg.	Instructor
124s-125su-126f*	Morphology and Taxonomy of Algae: Algal Types ..... (3 to 5 cred.; jr., sr., grad.; prereq., 15 cred. incl. 12, or consent of instructor)				
	Lect.	III	Th	110Bot	Miss Tilden
	Lab.	III, IV	TS		
127s	Anatomy of Vascular Plants .... (5 cred.; jr., sr., grad.; prereq., 18 cred. incl. 5)				
	Lect.	I	MWF	215Bot	Mr. Butters
	Lab.	Ar	Ar		
131f	Field Ecology ..... (5 cred.; jr., sr., grad.; prereq., 15 cred. incl. 21)	VI, VII, VIII	MWF	214Bot	Mr. Oosting
132	*Ecological Anatomy* ..... (5 cred.; jr., sr., grad.; prereq., 15 cred. incl. 21)	*Not offered*			
133	*Plant Geography of North America* ..... (5 cred.; jr., sr., grad.; prereq., 15 cred. incl. 21)	*Not offered*			
134	*Research Methods in Ecology* .. (5 cred.; jr., sr., grad.; prereq:, 15 cred. incl. 21)	*Not offered*			
140w	General Plant Physiology ..... (3 cred.; jr., sr., grad.; prereq., 22, elem. inorg. chem.)	II	MWF	8Bot	Mr. Burr
141f	Physico-chemical Principles in Plant Physiology ..... (5 cred.; jr., sr.; prereq., qual., quant., org., and phys. chem.)				
	Lect.	7:55	MWF	101Bot	Mr. Burr
	Lab.	II, III, IV	MF		
142w	Photosynthesis ..... (5 cred.; sr., grad.; prereq., as for 141)				
	Lect.	7:55	MWF	101Bot	Mr. Burr
	Lab.	II, III, IV	MF		
143s	Plant Metabolism ..... (5 cred.; sr., grad.; prereq., as for 141)				
	Lect.	7:55	MWF	101Bot	Mr. Burr
	Lab.	II, III, IV	MF		
145w	Advanced Biometry ..... (3 cred.; sr., grad.; prereq., 101)				
	Lect.	III	TThS	214Bot	Mr. Treloar
	Lab.	Ar	Ar	202Bot	
146s	Advanced Biometry ..... (3 cred.; sr., grad.; prereq., 145)				
	Lect.	III	TThS	214Bot	Mr. Treloar
	Lab.	Ar	Ar	202Bot	
149s,150su,151f*	Advanced Phycology ..... (3 to 10 cred. per qtr.; jr., sr., grad.; prereq., 12, 124, 125, or 126)	VI, VII, VIII	TTh	110Bot	Miss Tilden

* Any quarter may be taken separately.

No.	Title		Hour	Day	Bldg.	Instructor
153f	Biometric Methods ..... (3 cred.; sr., grad.; prereq., 101 or consent of instr.)					
		Lect.	I	TThS	214Bot	Mr. Treloar
		Lab.	Ar	Ar	202Bot	
153w	Biometric Methods ..... (See 153f)					
		Lect.	I	MWF	214Bot	Mr. Treloar
		Lab.	Ar	Ar	202Bot	

For graduate courses given during 1931-32, consult the department.

PLANT PATHOLOGY AND BOTANY

Students in this college may elect courses in Plant Pathology and Botany by arrangement with the department. See program of the College of Agriculture, Forestry, and Home Economics.

CHEMISTRY

SCHOOL OF CHEMISTRY

Major Advisers

Professors Hunter and Sneed.

Major Sequence

Analytical Chemistry 1-2; Organic Chemistry 51-52-53; Physical Chemistry 101-102-103. (Prerequisite: Inorganic Chemistry 12-13.)

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

NOTE.—Analytical Chemistry 1-2, and all courses numbered above 50 count as senior college courses.

INORGANIC CHEMISTRY

No.	Title		Hour	Day	Bldg.	Instructor
1f-2w†-3s	Gen. Inorg. Chemistry (pre-med. and pre-dent.) ..... (12 cred.; pre-dent.. pre-med.; no prereq.)					
		Lect.	VI	MWF	225C	Mr. Glockler
		Lab. Sec. 1	VII, VIII, IX	T	290C	Mr. Glockler and assts.
		Quiz Sec. 1	VI	T	ArC	Mr. Glockler and assts.
		Lab. Sec. 2	VII, VIII, IX	Th	290C	Mr. Glockler and assts.
		Quiz Sec. 2	VI	Th	ArC	Mr. Glockler and assts.

† Two quarters must be completed before credit is received for either quarter.

No.	Title		Hour	Day	Bldg.	Instructor
4f-5w†	Gen. Inorg. Chemistry (pre-med. and pre-dent.) ..... (8 cred.; pre-dent., pre-med. only; prereq., entrance cred. in chem.)					
	Lect.		VI	MWF	100C	Mr. Stephens
	Lab.	Sec. 1	VII, VIII, IX	T	210C	Mr. Stephens and assts.
	Quiz	Sec. 1	VI	T	ArC	
	Lab.	Sec. 2	VII, VIII, IX	Th	210C	Mr. Stephens and assts.
	Quiz	Sec. 2	VI	Th	ArC	
6f-7w†-8s	Gen. Inorg. Chemistry ..... (15 cred.; those entering without chem., fr., soph., jr., sr.; no prereq.)					
	Lect.		II	MWF	225C	Miss Cohen
	Lab.		I, II, III	ThS	210C	Miss Cohen and assts.
9f-10w†	Gen. Inorg. Chemistry ..... (10 cred.; fr., soph., jr., sr.; prereq., entr. cred. in chem.)					
	Lect.		II	MWF	100C	Mr. Sneed
	Lab.		I, II, III	ThS	290C	Mr. Sneed and assts.
9w-10s†*	Gen. Inorg. Chemistry ..... (See 9f-10w)					
	Lect.	Sec. 1	III	MWF	225C	Miss Cohen,
		2	III	MWF	100C	Mr. Maynard
	Lab.		VI, VII	MWF	290C	Ar
11f	Qual. Chemical Anal. (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, VIII, IX	F	210C	Miss Cohen and assts.
11s	Qual. Chemical Anal. (pre-med. and pre-dent.) ..... (See 11f)					
	Lect.		VI	MWF	100C	Mr. Stephens
	Lab.	Sec. 1	VI, VII, VIII, IX	T	210C	Mr. Stephens and assts.
	Lab.	Sec. 2	VI,VII, VIII, IX	Th	210C	Mr. Stephens and assts.
12f-13w†	Qual. Chemical Analysis ..... (10 cred.; all; prereq., 8 or 10)					
	Fall	Lect.	I	TThS	325C	Mr. Maynard
		Lab.	I, II, III	MW	290C	
	Winter	Lect.	VI	WF	410C	
		Lab.	VII, VIII, IX	MWF	290C	
12s†	Qual. Chemical Anal. ..... (See 12f-13w†)					
	Lect.		II	MWF	100C	Mr. Sneed
	Lab.		I, II, III	ThS	290C	Mr. Sneed and assts.

* Students who have failed in 1f or 6f may register in section 2 for this course without further prerequisite.

† Two quarters must be completed before credit is received for either quarter.

No.	Title		Hour	Day	Bldg.	Instructor
13f†	Qual. Chemical Anal. ..... (See 12f-13w†)					
		Lect.	VI	WF	490C	Mr. Heisig
		Lab.	VII, VIII, IX	WF	290C	
			VI, VII, VIII	M		
101s	History of Chemistry ..... (2 cred.; sr., grad.; prereq., Org. Chem. 52)		Ar	Ar	Ar	Miss Cohen
102w	Adv. Qual. Chemical Anal. .... (2 or 3 cred.; jr., sr., grad.; prereq., Anal. Chem. 1, 2, Org. Chem. 52)		Ar	Ar	290C	Mr. Sneed
103f-104w-105s	Adv. Inorg. Chemistry ..... (3 to 9 cred.; jr., sr., grad.; prereq., Anal. Chem. 1, 2, Org. Chem. 52)		I	MWF	111C	Mr. Sneed
106f-107w-108s	Chemistry of the Rare Elements (3 cred.; jr., sr., grad.; prereq., quant. anal. or permission of instructor)		Ar	Ar	Ar	Mr. Glockler

Analytical Chemistry

1w-2s*	Quant. Analysis ..... (10 cred.; soph., jr., sr.; prereq., Inorg. Chem. 12-13)					
		Lect.	VI	M	325C	Mr. Geiger
		Quiz	VI	W	490C	
		Rec.	VI	F	315C	
		Lab.	VII, VIII, IX	MWF	310C	
7f	Quantitative Analysis (pre-med.) (4 cred.; pre-med. only; prereq., Inorg. Chem. 11 or 13)					
	Lect. (Secs. 1, 2)		VI	M	325C	Mr. Geiger
	Rec. (limit 35)	Sec. 1	VI	W	315C	
	Lab.		VII, VIII, IX	MW	310C	
			VI, VII	F	310C	
	Rec. (limit 35)	Sec. 2	VI	F	315C	
	Lab.		VII, VIII, IX	MF	310C	
			VI, VII	W	310C	
	Lect.	Sec. 3	VII	Th	325C	Mr. Sarver
	Rec.		VI	Th	325C	
	Lab.		VII, VIII, IX	T	310C	
			VIII, IX	Th	310C	
			I, II, III	S	310C	
			or			
			II, III, IV	S	310C	
7s	Quantitative Analysis		For hours, see 7f, Sec. 3			Mr. Sarver
123f-124w-125s	Advanced Analytical Chemistry (3 cred. per qtr.; prereq., 1, 2, or 7)					
		Lect.	VI	T	315C	Mr. Sarver
		Lab.	VII, VIII, IX	T	310C	
			VI-IX	Th	310C	

* Course 2s may precede 1w, if desired.

† Two quarters must be completed before credit is received for either quarter.

No.	Title		Hour	Day	Bldg.	Instructor
131f	Application of Indicators ..... (3 cred.; prereq., Anal. Chem. 1 and 2 and Phys. Chem. 101, 102, 103)					
		Lect.	Ar	Ar	ArC	Mr. Kolthoff
		Lab.	Ar	Ar	ArC	Mr. Kolthoff
132w,s	Electrometric Titrations ..... (3 cred.; prereq., Anal. Chem. 1 and 2 and Phys. Chem. 101, 102, 103)					
		Lect.	Ar	Ar	ArC	Mr. Kolthoff
		Lab.	Ar	Ar	ArC	

Organic Chemistry

1f-2w†	Elem. Organic Chemistry ..... (8 cred.; pre-dent., pre-med., prereq., Inorg. Chem. 11)					
	Lect. (all secs.)		I	MWF	100C	Mr. Lauer
	Lab. conference (all secs.)		II	Th	225C	Mr. Lauer
	Quiz (all secs.)		I	Th	Ar	Ar
	Lab.	Sec. 1	I-IV	T	390C	
		2	VI-IX	T	390C	
		3	VI-IX	W	390C	
1w-2s†	Elem. Organic Chemistry ..... (See 1f-2w)					
	Lect.		IV	MWF	100C	Mr. Smith
	Lab. conference		IV	T	100C	Mr. Smith
	Quiz		V	T	Ar	
	Lab.	Sec. 1	VI-IX	W	390C*	
		2	VI-IX	Th	390C*	
		3	I-IV	S	390C	
1s†	Elem. Organic Chemistry ..... (See 1f-2w)		For hours, see 1f-2w.			Mr. Lauer
2f†	Elem. Organic Chemistry ..... (See 1f-2w)		For hours, see 1w-2s			Mr. Smith
51f-52w†-53s	Organic Chemistry ..... (10 or 15 cred.; jr., sr.; prereq., 15 cred. in college chem.)					
		Lect.	III	MWF	325C	Mr. Hunter
	Rec. (f,w)		III	S	111C	Mr. Lauer
	(s)		IV T and	III S	111C	
	Lab. (f)	Sec. 1	II, III, IV	T	390C	
			I, II, III	Th		
		2	VI, VII, VIII	TTh		
		3	II, III, IV	T		
			VI, VII, VIII	F		
	Lab. (w)	Sec. 1	II, III, IV	T	390C	
			I, II, III	Th		
		2	VII, VIII, IX	T		
			VI, VII, VIII	Th		
		3	VI, VII, VIII	M		
			I, II, III	Th		
	Lab. (s)	Sec. 1	II, III, IV	T	390C	
			VI, VII, VIII	F		
		2	VI, VII, VIII	TTh		
101f-102w-103s	Advanced Organic Chemistry .. (3 cred. per qtr.; prereq., 53)		III	TThS	325C	Mr. Hunter

For advanced courses in Organic Chemistry, see bulletin of the School of Chemistry.

* Limited to 40 students.

† Two quarters must be completed before credit is received for either quarter.

Physical Chemistry

No.	Title	Hour	Day	Bldg.	Instructor
101f-102w-103s	Physical Chemistry ..... (9, 12, or 15 cred.; jr., sr., grad.; prereq., 2 yrs. coll. chem., 1 yr. coll. phys.)				Mr. MacDougall
	Lect.	IV	MWF	325C	
	Lab.	VI, VII, VIII	F	190C	
	Rec.	IV	S	115C	
110f,w	Physical Chemistry (medic) .... (4 cred.; pre-med. and biol. students; prereq., Org. Chem. 2)				
	Lect.	VI	TTh	225C	Mr. Taylor
			F	325C	
	Lab. Sec. 1	I, II, III	MW	190C	
	2	VII, VIII, IX	TTh	190C	
116f-117w-118s	Adv. Physical Chem. ..... (9 or 12 cred.; jr., sr., grad.; prereq., 103 and calculus)	Ar	Ar	Ar	Ar
129	*Prin. of Colloidal Chemistry* .. (2 cred.; sr., grad.; prereq., 102)	*Not offered*			
130s	Appl. of Colloidal Chemistry ... (2 cred.; sr., grad.; prereq., 102)	Ar	Ar	ArC	Mr. Reyerson
131f-132w-133s	Colloid Chemistry Lab. ..... (Cred. ar.; sr., grad.; prereq., 129 or 130)	Ar	Ar	Ar	Mr. Reyerson
144s	Magnetochemistry ..... (3 cred.; jr., sr., grad.; prereq., 103)	Ar	Ar	Ar	Mr. Taylor
161f-162w	Radioactivity ..... (2 cred. per qtr.; jr., sr., grad.; prereq., Phys. Chem. 103)	Ar	Ar	Ar	Mr. Lind
164f,w,s	Radioactivity Laboratory ..... (Must be preceded or accompanied by 161)	Ar	Ar	Ar	Mr. Lind

Technological Chemistry

100f-101w-102s	Food Analysis ..... (9 cred.; jr., sr., grad.; prereq., Anal. Chem. 1-2)				
	Lect.	Ar	Ar	Ar	Mr. Stoppel
	Lab.	VI, VII, VIII	TF	217C	Mr. Stoppel

AGRICULTURAL BIOCHEMISTRY

Students in this college may elect courses in Agricultural Biochemistry by arrangement with the department. See program of the College of Agriculture, Forestry, and Home Economics.

CHILD WELFARE

No.	Title	Hour	Day	Bldg.	Instructor
40w*	Child Training ..... (3 cred.; jr., sr.; prereq., Psy. 1-2)	IV and one hour ar	MW	202OLa	Mrs. Foster

* Offered fall and spring as Home Economics Education 40. Consult bulletin of the College of Agriculture, Forestry, and Home Economics.

No.	Title	Hour	Day	Bldg.	Instructor
60f	Modern Aspects of Child Study (2 cred.; jr., sr.; prereq., 6 cred. in psy. and 5 cred. in soc. sci.)	VI	TTh	202OLa	Miss McGinnis
80f	Child Psychology ..... (3 cred.; jr., sr.; prereq., Psy. 1-2)	V	MWF	202OLa	Miss Shirley
90w	Physical Development of the Young Child ..... (2 cred.; jr., sr.; prereq., Zool. 1-2, Psy. 1-2)	V	T and ar	202OLa	Ar
120s	Health Care of the Young Child (2 cred.; sr., grad.; prereq., 40 and 90 and permission of the instructor)	V	T and ar	202OLa	Ar
130s	The Development of the Young Child ..... (3 cred.; sr., grad.; prereq., 12 cred. in psy. or equivalent, and permission of instructor)	I	MWF	202OLa	Mr. Anderson
133f-134w*-135s	Methods in Study of Development of Young Children ..... (6 or 9 cred.; sr., grad.; prereq., 10 cred. in psy. or ed. psy. incl. 4-5 or 7 and permission of instructor)	VI VI, VII	M WF	202OLa	Ar
170f	Parental Education in Child Care and Training ..... (3 cred.; sr., grad.; prereq., 40, 60, 80, or 15 cred. in ed. or psy., or soc., or prev. med.)	III	MWF	202OLa	Miss McGinnis
173w-174s†	Technique and Practice of Parental Education ..... (6 cred.; sr., grad.; prereq., 170, and permission of instructor)	Ar	Ar	204OLa	Miss McGinnis
190-191†	*Mental Examination of Pre-School Children* ..... (4 cred.; sr., grad.; prereq., Ed. Psy. 143-144-145 or 134-135-136 or equivalent, and permission of instructor)	*Not offered*			

COMPARATIVE LITERATURE

No.	Title	Hour	Day	Bldg.	Instructor
101f-102w-103s†	Drama ..... (9 cred.; jr., sr., grad.; prereq., jr. coll. requirement in Eng. and foreign lang.)	III	TThS	113F	Mr. Firkins
105f-106w-107s†	Criticism ..... (9 cred.; jr., sr., grad.; prereq., jr. coll. requirement in Eng. and foreign lang.)	VI	MWF	113F	Mr. Firkins
110w	Romantic Movement ..... (3 cred.; jr., sr., grad.; prereq., permission of instructor)	II	TThS	113F	Mr. Firkins

* Two quarters must be completed before credit is received for either quarter.
† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
111s	The Novel in Europe, 1875-1925 (3 cred.; jr., sr., grad.; prereq., jr. coll. requirement in Eng. and foreign lang.)	II	MWF	113F	Mr. Firkins

DRAWING AND DESCRIPTIVE GEOMETRY

COLLEGE OF ENGINEERING AND ARCHITECTURE

No.	Title	Hour	Day	Bldg.	Instructor
41-42-43f,w,s	Technical Drawing ..... (6 cred.; all; no prereq.)			411C	Mr. Brainard
	Sec. 1	I, II	MWF		
	2	III, IV	MWF		
	3	VIII, IX	MWF		
44f,w,s	Lettering ..... (1 cred.; all; no prereq.)				
	Sec. 1	IV	T	36EE	Mr. Schuck,
	2	II	Th	237EE	Mr. Levens
45f,w,s	Alphabets ..... (2 cred.; soph., jr., sr.; no prereq.)	II	TTh	205E	Mr. Kirchner
61f,w	Projections ..... (2 cred.; soph.; prereq., Math. 3 or 5)				
	Lect.	III(f)	Th	335EE	Mr. Kirchner,
	Lab.‡	VI(w)	T	205E	Mr. Myers
62w	Shades and Shadows ..... (2 cred.; prereq., 61)				
	Lect.	III	Th	335EE	Mr. Kirchner,
	Lab.‡				Mr. Myers
63s	Perspective ..... (2 cred.; prereq., 61)				
	Lect.	III	Th	335EE	Mr. Kirchner,
	Lab.‡				Mr. Myers
64f	The Graphic Arts: Introduction . (2 cred.; jr., sr.; prereq., 15 cred. of econ.)	IV	MW	5E	Mr. Kirchner
65w	The Graphic Arts: Printing and Layouts ..... (2 cred.; jr., sr.; prereq., 15 cred. of econ.)	IV	MW	5E	Mr. Kirchner
66s	The Graphic Arts: Processes .. (2 cred.; jr., sr.; prereq., 15 cred. of econ.)	IV	MW	5E	Mr. Kirchner

ECONOMICS

SCHOOL OF BUSINESS ADMINISTRATION

Major Advisers

Professor Garver; Assistant Professor Myers.

Major Sequence

Prerequisites: 3, 6-7; or 1A, 1B, 3, 4. In addition the student is urged to earn at least 10 credits in History, Political Science, or Sociology.

‡ Consult bulletin of the College of Engineering and Architecture.

The student majoring in Economics will take Courses 103-104, 141, 161; at least 12 credits from Group A (below); and additional credits elected from Groups A and B to make a total of 33 credits.

Group A: 54, 55, 85, 149, 154, 160, 163, 172, 191-192.

Group B: 105, 106, 108, 113-114, 124, 125, 127, 162, 164, 166, 170, 176, 193.

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

NOTE.—The following courses in other departments may carry credit also in this department:

Agricultural Economics 126, Economics of Consumption; 130, Prices of Farm Products; 131, Market Prices; 135, Methods of Forecasting Prices; 171, Land Tenure; History 80-81-82, Introduction to Economic History; 83-84-85, American Economic History; 113-114-115, Economic History of Europe since 1750; 180-181-182, Topics in Economic History; Political Science 107, Recent Social Legislation; 109, Government and Business; 111, Law of Public Utilities; 195-196, Colonial Government and Administration.

Honors Course

An Honors Course will be offered for the first time in 1931-32. This course will be open to seniors. Admission will be granted only to a student whose previous record demonstrates his ability to carry on independent study in the field of economics. Application for this course should be made to one of the major advisers.

No.	Title		Hour	Day	Bldg.	Instructor
1Af	Business Organization: Production ..... (5 cred.; fr. only; no prereq.)					
		Lect.	IV	T	OLAud	Mr. Stevenson,
		Sec. 1	I	MWFS	3F	Mr. Borak,
		2	I	MWFS	209OL	and others
		3	II	MWFS	110P	
		4	II	MWFS	108F	
		5	II	MWFS	5F	
		6	III	MWFS	209½F	
		7	III	MWFS	3F	
		8	IV	MWFS	6B	
		9	IV	MWFS	2OPh	
		10	V	MTWF	102B	
		11	V	MTWF	202B	
		12	VI	MWThF	206OLa	
		13	VI	MWThF	2OPh	
		14	VII	MWThF	6B	
		15	VII	MWThF	303B	
		16	VIII	MWThF	6B	
1Aw	Business Organization: Production ..... (See 1Af)					
		Lect.	IV	T	301F	Mr. Stevenson,
		Sec. 1	II	MWFS	210P	Mr. Borak,
		2	III	MWFS	3F	and others
		3	V	MTWF	303B	
		4	VII	MWThF	6B	

No.	Title		Hour	Day	Bldg.	Instructor
1Bw	Business Organization: Marketing (5 cred.; fr. only*; no prereq.)					
		Lect.	IV	TS	OLAud	Mr. Vaile and others
		Sec. 1	I	MWF	109F	
		2	I	TThS	104OPh	
		3	II	MWF	6B	
		4	II	MWF	301B	
		5	II	TThS	303B	
		6	III	MWF	211OL	
		7	III	TThS	104OPh	
		8	IV	MWF	302B	
		9	IV	MWF	321F	
		10	V	MWF	6B	
		11	VI	MWF	206OLa	
		12	VI	MWF	210P	
		13	VII	MWF	209B	
		14	VIII	MWF	6B	
1Bs	Business Organization: Marketing (See 1Bf)					
		Lect.	IV	TS	301F	Mr. Vaile and others
		Sec. 1	I	TThS	6B	
		2	IV	MWF	6B	
		3	V	MWF	102B	
		4	VI	MWF	102B	
3w	The Mechanism of Exchange ... (5 cred.; 3rd qtr. fr., soph., jr., sr.; no prereq.)					Mr. Stehman and others
		Lect.	III	TTh	OLAud	
		Sec. 1	I	TThS	211OL	
		2	II	MWF	3F	
		3	III	MWF	204F	
		4	IV	MWF	209B	
		5	V	MWF	202B	
		6	VI	MWF	125F	
		7	VII	MWF	301B	
3s	The Mechanism of Exchange ... (See 3w)					Mr. Stehman and others
		Lect.	III	TTh	OLAud	
		Sec. 1	I	MWF	303B	
		2	I	TThS	301B	
		3	II	MWF	6B	
		4	II	TThS	110F	
		5	III	MWF	209B	
		6	IV	MWF	112OL	
		7	IV	MWF	2F	
		8	V	MWF	202B	
		9	V	MWF	6B	
		10	VI	MWF	2OPh	
		11	VI	MWF	112OL	
		12	VII	MWF	202B	
		13	VII	MWF	6B	
		14	VIII	MWF	202B	

* Sophomores who have credit for 1A and wish to continue Economics may elect courses 1B, 3, and 4.

No.	Title	Hour	Day	Bldg.	Instructor
4f	Principles of Economics ..... (5 cred.; soph.; prereq., 1A, 1B and 3)				Mr. Hansen and others
	Lect.	II	Th	OPhAud	
	Sec. 1	I	TThFS	5F	
	2	II	MWFS	6F	
	3	III	TThFS	6F	
	4	IV	MWFS	9F	
	5	V	MTWF	6B	
	6	VII	MWThF	206OLa	
4s	Principles of Economics ..... (See 4f)				Mr. Hansen and others
	Lect.	II	Th	206OLa	
	Sec. 1	II	MWFS	101F	
	2	IV	MWFS	202B	
	3	V	MTWF	303B	
	4	VI	MWThF	209OL	
6f-7w†§	Principles of Economics—General Course ..... (10 cred.; soph., jr., sr.; no prereq. Not open to students who have received credit in Econ. 4 or in Econ. 1A)				Mr. Hansen and others
	Lect.	III	W	OPhAud	
	Sec. 1	I	TThFS	6F	
	2	II	MWFS	9F	
	3	III	TThFS	5F	
	4	IV	MWFS	104F	
	5	V	MTWF	301B	
	6	VI	MWThF	9F	
	7	VII	MWThF	9F	
6w-7s†	Principles of Economics—General Course ..... (See 6f-7w)				Mr. Hansen and others
	Lect.	II	T	OPhAud	
	Sec. 1	I	TThFS	5F	
	2	II	MWFS	5F	
	3	IV	MWFS	9F	
	4	V	MTWF	302B	
	5	VI	MWThF	124F	
14f‡	Elements of Statistics ..... (5 cred.; soph.; jr., sr.; prereq., 4 or 6-7)				Mr. Mudgett and others
	Sec. 1	I	MWThFS	125F	
	2	III	MTWFS	9F	
	3	IV	MTWFS	301B	
	4	VI	MTWThF	202B	
14w‡	Elements of Statistics ..... (See 14f)				Mr. Mudgett and others
	Sec. 1	III	MTWFS	9F	
	2	IV	MTWFS	124F	
	3	VI	MTWThF	102B	
	4	VII	MTWThF	303B	

† The entire course must be completed before credit is received for any quarter.

‡ No student may receive credit for both Economics 14 and Sociology 45.

§ Students entering with advanced standing in Economics 6 must consult department adviser as to a continuation course.

No.	Title	Hour	Day	Bldg.	Instructor
14s‡	Elements of Statistics ..... (See 14f)				Mr. Mudgett and others
	Sec. 1	I	MWThFS	210P	
	2	II	MWThFS	3F	
	3	III	MTWFS	206OLa	
	4	III	MTWFS	2F	
	5	IV	MTWFS	102B	
	6	VI	MTWThF	303B	
20f*	Elements of Accounting ..... (3 cred.; 3rd qtr. fr., soph.; no prereq.)				Mr. Heilman and others
	Sec. 1	I	MWF	303B	
	2	I	TThS	302B	
	3	II	MWF	302B	
	4	II	TThS	202B	
	5	III	TThS	302B	
	6	III	TThS	301B	
	7	IV	MWF	302B	
	8	V	MWF	302B	
	9	VI	MWF	303B	
20w*	Elements of Accounting ..... (See 20f)				Mr. Heilman and others
	Sec. 1	I	TThS	303B	
	2	III	TThS	301B	
	3	III	MWF	302B	
	4	VI	MWF	6B	
20s*	Elements of Accounting ..... (See 20f)				Mr. Heilman and others
	Sec. 1	I	MWF	301B	
	2	II	MWF	301B	
	3	III	TThS	301B	
	4	VI	MWF	302B	
25f-26w†¶	Principles of Accounting ..... (6 cred.; soph., jr., sr.; prereq., 20)				Mr. Heilman and others
	Sec. 1	I	MWF	301B	
	2	I	TThS	301B	
	3	VI	MWF	302B	
25w-26s†¶	Principles of Accounting ..... (See 25f-26w)				Mr. Heilman and others
	Sec. 1	I	MWF	302B	
	2	I	TThS	302B	
	3	II	MWF	302B	
	4	II	TThS	301B	
	5	III	MWF	303B	
	6	IV	MWF	301B	
	7	VI	MWF	301B	
25s†¶	Principles of Accounting ..... (1st qtr. of 25-26. See 25f-26w)				Mr. Heilman and others
	Sec. 1	II	MWF	303B	
	2	III	TThS	303B	
26f†¶	Principles of Accounting ..... (2nd qtr. of 25-26. See 25f-26w)	II	TThS	302B	Mr. Heilman and others

* Students who have had high school training or other experience in bookkeeping and who pass the placement test may be exempted from this course and admitted to Economics 25.

† The entire course must be completed before credit is received for any quarter.

‡ No student may receive credit for both Economics 14 and Sociology 45.

¶ Open to pre-business students only.

No.	Title	Hour	Day	Bldg.	Instructor
32f-33w-34s*†§	Secretarial Training: Typewriting (3 cred.; 3rd qtr. fresh., soph., jr.; prereq., consent of instructor)	III V	TThS MW	1B 1B	Miss Donaldson and others
32s*§	Secretarial Training: Typewriting (1st qtr. of 32-33-34. See 32f-33w-34s)	IV	MTWFS	1B	Miss Donaldson and others
33f*§	Secretarial Training: Typewriting (2nd qtr. of 32-33-34. See 32f-33w-34s)	VI	MTWThF	1B	Miss Donaldson and others
34w*§	Secretarial Training: Typewriting (3rd qtr. of 32-33-34. See 32f-33w-34s)	VI	MTWThF	1B	Miss Donaldson and others
37f-38w-39s*†§	Secretarial Training: Shorthand (9 cred.; soph., jr.; prereq., 32; consent of instructor)				
	Rec.	II	TThS	311F	Miss Donaldson and others
	Lab. Sec. 1	I	MWF	1B	
	2	II	MWF	1B	
40f-41w-42s*†§	Secretarial Procedure ..... (9 cred.; soph., jr., sr.; prereq., 33, 39; consent of instructor)				
	Rec.	I	MWF	301F	Miss Donaldson
	Lab. Sec. 1 Sec. Tr.	V	TThF	1B	
	2 Com'l Ed.	VII	TThF	1B	
54f¶	Accounting Survey I ..... (3 cred.; jr., sr.; prereq., 4 or 6-7)	III	TThS	209B	Mr. Heilman and others
55w¶	Accounting Survey II ..... (3 cred.; jr., sr.; prereq., 54)	III	TThS	6B	Mr. Heilman and others
85w¶	Economics of Marketing ..... (3 cred.; jr., sr.; prereq., 4 or 6-7)	I	TThS	209B	Mr. Vaile
103f-104w†¶	Value and Distribution ..... (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including 4 or 6-7)	II	MWF	204F	Mr. Garver
105s	History of Economic Ideas (The Classical Economists) ..... (3 cred.; jr., sr., grad.; prereq., 101-102 or 103-104 or consent of instructor)	VII	MWF	102B	Mr. Garver
106	*History of Economic Ideas (The Critics of the Classical Economists)* ..... (3 cred.; jr., sr., grad.; prereq., 101-102 or 103-104 or consent of instructor)	*Not offered*			
113w-114s	Theory of Statistics ..... (6 cred.; jr., sr., grad.; prereq., 14)	I	MWF	102B	Mr. Mudgett

* Open for credit to pre-secretarial and pre-commercial education students only.

† The entire course must be completed before credit is received for any quarter.

§ A laboratory fee of $2.50 will be required of students who register for one or more of the courses in secretarial training.

¶ Not open to School of Business Administration students.

No.	Title	Hour	Day	Bldg.	Instructor
124f	Comparative Banking, British Systems ..... (3 cred.; jr., sr., grad.; prereq., 141)	III	MWF	302B	Mr. Myers
125w	Comparative Banking, European Systems ..... (3 cred.; jr., sr., grad.; prereq., 141)	III	MWF	6B	Mr. Myers
127s	Comparative Banking, South American Systems ..... (3 cred.; jr., sr., grad.; prereq., 141)	II	MWF	209B	Mr. Myers
141f‡	Monetary and Banking Policy .. (3 cred.; jr., sr., grad.; prereq., 3, and 4 or 6-7)	I	MWF	102B	Mr. Marget, Mr. Myers
141w‡	Monetary and Banking Policy .. (See 141f)	I	MWF	6B	Mr. Marget, Mr. Myers
141s‡	Monetary and Banking Policy .. (See 141f)	VI	MWF	6B	Mr. Marget, Mr. Myers
149f	Business Cycles ..... (3 cred.; sr., grad.; prereq., 141)	I	TThS	202B	Mr. Marget
149w	Business Cycles ..... (See 149f)				
	Sec. 1	I	MWF	209B	Mr. Marget,
	2	VII	MWF	102B	Mr. Myers
149s	Business Cycles ..... (See 149f)	III	MWF	102B	Mr. Myers
154s‡	Public Utilities ..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. Econ. 4 or 6-7)	II	TThS	202B	Mr. Garver
160w‡	The Modern Corporation ..... (3 cred.; jr., sr., grad.; prereq., 3, and 4 or 6-7)	IV	MWF	6B	Mr. Stehman
161f	Labor Problems and Trade Unionism ..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. Econ. 4 or 6-7)	IV	MWF	202B	Mr. Hansen
161w	Labor Problems and Trade Unionism ..... (See 161f)	III	TThS	209B	Mr Stead
161s	Labor Problems and Trade Unionism ..... (See 161f)	III	TThS	102B	Mr. Hansen
162w	Labor Movements ..... (3 cred.; jr., sr., grad.; prereq., 161)	IV	MWF	202B	Mr. Hansen
163w	Economic Aspects of Population and Immigration ..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. Econ. 4 or 6-7)	III	TThS	202B	Mr. Hansen
164s	Labor Legislation and Social Insurance ..... (3 cred.; jr., sr., grad.; prereq., 161)	III	TThS	209B	Mr. Stead

‡ Not open to School of Business Administration students.

No.	Title	Hour	Day	Bldg.	Instructor
166f	Contemporary Economic Problems (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7)	VII	MWF	102B	Mr. Hansen
172f*	Economics of Transportation .... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7)	VIII	MWF	102B	Mr. Butterbaugh
176f	Commercial Policies ..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 4 or 6-7)	I	MWF	202B	Mr. Blakey
176s	Commercial Policies ..... (See 176f)	I	MWF	202B	Mr. Blakey
187f,188w,189s	Honors Course in Economics ... (Cred. ar.; jr., sr.; prereq., consent of major adviser)	Ar	Ar	Ar	Ar
191f-192w†	Public Finance ..... (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. including Econ. 3, and 4 or 6-7)	III	MWF	209B	Mr. Blakey
193s	State and Local Taxation ..... (3 cred.; jr., sr., grad.; prereq., 191-192)	III	MWF	6B	Mr. Blakey

ENGLISH

Major Advisers

Professors Beach, Moore, and Ruud; Assistant Professors Atkins, Carr, Dunn, and Hillhouse.

Major Sequences

Prerequisites: Courses 21-22 or 22-23.‡

Courses 55-56 and 75 and 21 additional credits, 9 of which are to be chosen from one of the groups below and 6 from each of two other groups. The Honors Course, 171-172-173, may be substituted for a part of the above requirement of 21 credits in these groups.

Group A. Courses 61, 63, 81-82, 100, 141-142-143, 160, 165.
Group B. Courses 81-82, 100, 102, 103, 133, 140, 146-147, 148-149, 152.
Group C. Courses 51, 53, 62, 77-78, 111-112, 133, 136, 152, 157-158, 170.
Group D. Courses 105-106, 107-108, 126-127, 162, 168.
Group E. Courses 58-59, 69, 86, 109-110, 123-124-125, 126-127, 129, 150, 151.
Group F. Courses 61, 63, 73-74, 154-155, 156, 159.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

* Not open to School of Business Administration students.
† The entire course must be completed before credit is received for any quarter.
‡ For a teacher's certificate, Course 22-23 is required.

No.	Title	Hour	Day	Bldg.	Instructor
Af-Bw-Cs	Freshman English	See Composition			
21f-22w-23s*	Introduction to Literature ..... (15 cred.; all; prereq.§)				
	Sec. 1	III	MTWFS	150Ph(f), 133Ph(w), 166Ph(s)	Mr. Thomas
	2	VI	MTWThF	301F	Miss Jackson
31f-32w†	The English Novel ..... (6 cred.; all; prereq.§)	VII	MWF	301F	Mr. Hillhouse
33s	The Later English Novel ..... (3 cred.; soph., jr., sr.; prereq.§)	VII	MWF	OPhAud	Mr. Beach
40w-41s	The Bible as Literature ..... (6 cred.; soph., jr., sr.; prereq.§)	II	MWF	226F	Mr. Powell
51	*Spenser* ..... (3 cred.; jr., sr.; prereq., 21-22 or 55-56)	*Not offered*			
53	*Seventeenth-Century Lyrists* .... (4 cred.; jr., sr.; prereq., 21-22 or 55-56)	*Not offered*			
55f-56w†	Shakespeare ..... (6 cred.; jr., sr.; prereq.‡)				
	Sec. 1	I	TThS	205F	Miss Atkins
	2	VI	MWF	305F	Mr. Hillhouse (f), Mr. Dunn (w)
	3	VII	MWF	305F	Mr. Dunn (f), Miss Jackson (w)
55w-56s†	Shakespeare ..... (See 55f-56w)				
	Sec. 1	VI	MWF	303F	Mr. Bush (w), Mr. Hillhouse (s)
	2	IV	MWF	205F	Miss Carr
55s†	Shakespeare ..... (First qtr. of 55-56. See 55f-56w)	II	MWF	205F	Mr. Bush
58f-59w†	Nineteenth-Century Prose ..... (6 cred.; jr., sr.; prereq., C or 23, or 31-32)	II	TThS	204F	Mr. Beach
61	*American Pronunciation* ..... (3 cred.; jr., sr.; prereq.‡)	*Not offered*			
62f	Milton ..... (4 cred.; jr., sr.; prereq., 21-22 or 55-56)	VII	MTWF	204F	Mr. Stoll
63	*American Usage* ..... (3 cred.; jr., sr.; prereq.‡)	*Not offered*			
69f	Browning and Tennyson ..... (4 cred.; jr., sr.; prereq.‡)	VI	MTWF	204F	Mr. Stoll

* Students may enter any quarter. Students must take two consecutive quarters to receive credit. Two quarters are required as prerequisite for a major sequence; the second and third quarters are required for a teacher's certificate. Three quarters recommended. Limited to students with an average of ⅔ honor point per credit in their previous work, and to students exempt from English A-B-C.

† The entire course must be completed before credit is received for any quarter.

‡ English A-B-C, or Composition 4-5-6 and 6 additional credits, or 10 credits in 21-22-23.

§ English A-B-C, or Composition 4-5-6, or exemption from requirement.

No.	Title	Hour	Day	Bldg.	Instructor
73f-74w†	American Literature ..... (6 cred.; jr., sr.; prereq.‡)	IV	MWF	301F	Mr. McDowell, Mr. Nichols
75f	Chaucer ..... (4 cred.; jr., sr.; prereq.‡)	III	MTWF	205F	Miss Armstrong
75s	Chaucer ..... (See 75f)				
	Sec. 1	III	MTWF	206F	Mr. Dunn
	2	V	MTWF	204F	Miss Carr
77-78	*Classic Myths and the Classic Tradition in English Poetry* .. (6 cred.; jr., sr.; prereq.‡)	*Not offered*			
81-82†	*Survey of Middle English* ..... (6 cred.; jr., sr.; prereq.‡)	*Not offered*			
86f	Forms of English Verse ..... (3 cred.; jr., sr.; prereq.‡)	III	MWF	207F	Miss Jackson
100f	Old English ..... (4 cred.; jr., sr., grad.; prereq., 8 cred. above 50)	II	MTWF	205F	Mr. Ruud
102w	Old English Poetry ..... (3 cred.; jr., sr., grad.; prereq., 100 and 4 add. cred. above 50)	II	MWF	302F	Mr. Ruud
103s	Beowulf ..... (3 cred.; jr., sr., grad.; prereq., 100 and 4 add. cred. above 50)	II	MWF	302F	Mr. Ruud
105w-106s†	Eighteenth-Century Poetry ..... (6 cred.; jr., sr., grad.; prereq., 8 credits above 50)	VII	MWF	204F	Mr. Moore
107-108†	*Eighteenth-Century Prose* ..... (6 cred.; jr., sr., grad.; prereq., 8 credits above 50)	*Not offered*			
109f-110w†	Romantic Poets ..... (6 cred.; jr., sr., grad.; prereq., 8 credits above 50)	III	TThS	204F	Mr. Beach
111f-112w†	Seventeenth-Century Prose ..... (6 cred.; jr., sr., grad.; prereq., 8 credits above 50)	III	MWF	306F	Mr. Bush
123f-124w-125s†	Technique of the Novel ..... (9 cred.; sr., grad.; prereq., 8 credits above 50 and permission of instructor)	4:00 to 6:00	T	205F	Mr. Beach
126w-127s†	Drama, 1660-1880 ..... (6 cred.; jr., sr., grad.; prereq., 8 credits above 50)	III	TThS	205F	Mr. Hillhouse, Mr. Nichols
129s	Modern Drama ..... (4 cred.; jr., sr., grad.; prereq., 55-56)	II	MTWF	204F	Mr. Stoll
133f	Ballads ..... (3 cred.; jr., sr., grad.; prereq., 8 credits above 50)	III	MWF	204F	Mr. Ruud
136s	Advanced Shakespeare ..... (4 cred.; jr., sr., grad.; prereq., 55-56)	I	MTWF	204F	Mr. Stoll
140s	Advanced Chaucer ..... (4 cred.; jr., sr., grad.; prereq., 8 credits above 50, including 75)	III	MTWF	209½F	Mr. Ruud

† The entire course must be completed before credit is received for any quarter.
‡ English A-B-C, or Composition 4-5-6 and 6 additional credits, or 10 credits in 21-22-23.

No.	Title	Hour	Day	Bldg.	Instructor
141-142-143	*Historical Grammar* ..... (6 cred.; jr., sr., grad.; prereq., 8 cred. above 50, including 75 or 81-82)	*Not offered*			
146f-147w†	Metrical Romances ..... (6 cred.; jr., sr., grad.; prereq., 8 cred. above 50, including 75 or 81-82)	VI	MWF	306F	Miss Carr
148-149†	*Arthurian Romances* ..... (6 cred.; jr., sr., grad.; prereq., 8 cred. above 50, including 75 or 81-82)	*Not offered*			
150	*Victorian Poetry* ..... (4 cred.; jr., sr., grad.; prereq., 8 credits above 50)	*Not offered*			
151s	Recent Poetry ..... (4 cred.; jr., sr., grad.; prereq., 8 credits above 50)	III	TWThF	204F	Mr. Beach
152f	Pre-Elizabethan Drama ..... (3 cred.; jr., sr., grad.; prereq., 55-56)	IV	MWF	205F	Mr. Bush
154w-155s†	American Novel ..... (6 cred.; jr., sr., grad.; prereq., 73-74)	VI	MWF	205F	Mr. McDowell
156	*The American Drama* ..... (3 cred.; jr., sr., grad.; prereq., 8 cred. above 50, including 73-74)	*Not offered*			
157-158†	*Elizabethan Non-Dramatic Literature* ..... (6 cred.; jr., sr., grad.; prereq., 8 credits above 50, including 51 or 55-56 or 170)	*Not offered*			
159f	Colonial Literature in America .. (3 cred.; jr., sr., grad.; prereq., 8 cred. above 50, including 73-74)	VI	MWF	205F	Mr. Nichols
160	*History of the English Language* (2 cred.; jr., sr., grad.; prereq., 100)	*Not offered*			
162f	Restoration Literature ..... (4 cred.; jr., sr., grad.; prereq., 8 credits above 50)	IV	MTWF	204F	Mr. Moore
165w	The Historical Study of Modern English ..... (3 cred.; jr., sr., grad.; prereq., 8 credits above 50)	III	MWF	205F	Mr. Ruud
168s	English Literary Criticism ..... (3 cred.; jr., sr., grad.; prereq., 8 credits above 50)	IV	MWF	204F	Mr. Bush
170w	Elizabethan Drama ..... (4 cred.; jr., sr., grad.; prereq., 8 cred. above 50, incl. 55-56)	IV	MTWF	204F	Mr. Stoll

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
171f-172w-173s*	Honors Course ..... (9 cred.; jr., sr.; prereq., permission of the department)				
	Sec. 1 Masterpieces of English Literature				Miss Carr
	2 Elizabethan Literature				Mr. Dunn
	3 The Romantic Movement				Mr. Nichols
	4 American Literature				Mr. McDowell

Seminars

217f-218w-219s	Restoration Drama	4 to 6	M	312Lib	Mr. Stoll
220f-221w-222s	Medieval Drama	4 to 6	W	312Lib	Mr. Ruud
228f-229w-230s	Eighteenth-Century Novel	4 to 6	Th	312Lib	Mr. Moore
253f-254w-255s	Studies in Hawthorne, Poe, and Emerson	4 to 6	F	314Lib	Mr. McDowell
256f-257w-258s	Spenser and Milton	4 to 6	F	312Lib	Mr. Bush
259f-260w-261s	The Romantic Period of the English Novel	4 to 6	T	312Lib	Mr. Hillhouse

COMPOSITION

Major Advisers

Professor Thomas; Assistant Professors Nichols and Phelan; Mrs. del Plaine.

Major Sequence

Prerequisites: Courses 11-12 or 18-19 and either 65 or 20; English 21-22 or 22-23.

Courses 67-68 and 69-70-71, or 81-82-83, and 91-92-93, and 15 credits in English, 9 of which are to be chosen from Group E (p. 45) and 6 from some other group.

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

IMPORTANT NOTE.—No student may register for any course in Freshman English without having taken a placement test.

For details of classification as based on this test see page 5.

Freshman English is a 15-credit course consisting of 9 credits of literature and 6 credits of composition. Composition 4-5-6 is a 9-credit course in composition. Either course satisfies the requirement in English for graduation or for admission to the Senior College. Students who have already completed one or more quarters of Freshman English in another college should consult the director of the course before registering.

Any student who receives an A in composition in Course A-B-C is exempted from any further requirement in English.

Any student who receives an A or B in any quarter of Course 4-5-6 may at his option elect the following quarter of A-B-C.

No.	Title	Hour	Day	Bldg.	Instructor
Af-Bw-Cs	Freshman English ..... (15 cred.; all; prereq., placement test)	I	MWThFS	Ar	Ar
		II	MWThFS		
		III	MTWFS		
		IV	MTWFS		
		V	MTWF		
		III	Th		
		VI	MTWThF		
		VII	MTWThF		

* Required of candidates for graduation honors in 1933.

No.	Title	Hour	Day	Bldg.	Instructor
Aw-Bs	Freshman English ..... (2 qtrs. of A-B-C. See Af-Bw-Cs)	VI	MTWThF	Ar	Ar
Cf	Freshman English ..... (3rd qtr. of A-B-C. See Af-Bw-Cs)	II VI	MWThFS MTWThF	Ar	Ar
4f-5w-6s	Freshman Composition ..... (9 cred.; all; prereq., placement test)				
	Sec. 1	I	MWF	Ar	Ar
	2	II	MWF		
	3	II	TThS		
	4	III	MWF		
	5	III	TThS		
	6	IV	MWF		
	7	V	MWF		
	8	VI	MWF		
	9	VII	MWF		
4w-5s	Freshman Composition ..... (2 qtrs. of 4-5-6. See 4f-5w-6s)				
	Sec. 1	II	TThS	Ar	Ar
	2	V	MWF		
	3	V	MWF		
4s	Freshman Composition ..... (First qtr. of 4-5-6. See 4f-5w-6s. For those only who have passed subfresh.)				
	Sec. 1	III	TThS	Ar	Ar
	2	V	MWF		
6f	Freshman Composition ..... (3rd qtr. of 4-5-6. See 4f-5w-6s)	II	MWF	311F	Ar
11f-12w†‡	Description; Narration ..... (6 cred.; soph., jr., sr.; prereq., A-B-C or 4-5-6 or exemption from requirement)				
	Sec. 1	I	MWF	305F	Mrs. del Plaine
	2	II	MWF	303F	Miss Armstrong, Mrs. del Plaine
	3	III	MWF	302F	Miss Gable, Miss Christie
	4	IV	MWF	305F	Miss Atkins, Miss Christie
11w-12s†‡	Description; Narration ..... (See 11f-12w)				
	Sec. 1	I	MWF	303F	Mr. Mallam
	2	IV	MWF	303F	Mr. Hursley
11s	Description; Narration ..... (First qtr. of 11-12. See 11f-12w)				
	Sec. 1	II	MWF	305F	Mrs. del Plaine
	2	III	MWF	302F	Miss Christie
	3	IV	MWF	108F	Mr. Mallam

† The entire course must be completed before credit is received for any quarter.

‡ A student registering for either 11-12 or 18-19 must bring with him a written memorandum from his instructor in Freshman English specifying which course in sophomore composition he should elect. No student may receive credit for both 11-12 and 18-19.

No.	Title	Hour	Day	Bldg.	Instructor
18f-19w†‡	Types of Writing ..... (6 cred.; soph., jr., sr.; prereq., A-B-C or 4-5-6 or exemption from requirement)				
	Sec. 1	I	MWF	304F	Mr. Briggs
	2	III	MWF	305F	Mr. Mallam
	3	V	MWF	303F	Mr. Edmunds
18s	Types of Writing ..... (First qtr. of 18-19. See 18f-19w)				
	Sec. 1	I	MWF	304F	Mr. Briggs
	2	II	MWF	316F	Miss Armstrong
20f	Informal Exposition ..... (3 cred.; soph., jr., sr.; prereq., 11-12 or 18-19)	II	MWF	302F	Miss Gable
20s	Informal Exposition ..... (See 20f)				
	Sec. 1	I	MWF	305F	Mrs. del Plaine
	2	II	MWF	303F	Miss Atkins
	3	III	MWF	305F	Mrs. Phelan
	4	IV	MWF	304F	Miss Gable
31w	Technical Writing	Consult College of Engineering bulletin			
65s¶	Source Materials: Shakespeare's England (or similar field) .... (3 cred.; jr., sr.; prereq., A-B-C, or 4-5-6 and 6 additional credits, or 10 credits in Eng. 21-22-23)	III	MWF	306F	Mr. Hillhouse
67f-68w†¶	Imitative Writing ..... (6 cred.; jr., sr., not open to sophomores; prereq., average of B in two quarters of either 11-12 or 18-19 and 20 or 65)	IV	MWF	304F	Mrs. Phelan
69f-70w-71s†¶	Short-Story Writing ..... (6 cred.; jr., sr., not open to sophomores; prereq., average of B in two quarters of either 11-12 or 18-19 and 20 or 65)	VIII, IX	W	304F	Mrs. Phelan
81f-82w-83s¶	Essay Writing ..... (9 cred.; jr., sr.; prereq., 11-12, or 18-19, and 20 or 65)	III	MWF	304F	Mr. Nichols
91f-92w-93s¶	Seminar in Writing ..... (9 cred.; sr.; prereq., 9 cred., sr. coll. courses, and permission of instructor)	VI, VII	Th	304F	Mrs. Phelan

THE FINE ARTS

Major Adviser

Assistant Professor Upjohn.

Major Sequence

Prerequisites: Courses 1, 2, 3, 5, Architecture 21-22-23, 24-25-26, and either History 1-2 or History 11-12-13.

† The entire course must be completed before credit is received for any quarter.

‡ A student registering for either 11-12 or 18-19 must bring with him a written memorandum from his instructor in Freshman English specifying which course in sophomore composition he should elect. No student may receive credit for both 11-12 and 18-19.

¶ Students may not elect for credit two senior college courses to be taken simultaneously. This rule does not apply to Course 69-70-71.

A. History of Fine Arts. Courses 51 to 56; twelve credits of tutorial work; and a comprehensive examination in the history of art.

B. Drawing and Painting. Architecture 27-28-29, 70, and 87-88-89 or 121-122-123; 9 credits from Courses 51 to 55, and 5 credits in Philosophy 103, Music 106-107-108, and History 50-51-52, 53-54-55.

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	History of Ancient Art ..... (3 cred.; all; no prereq.)	III	TThS	OPhAud	Mr. Upjohn
2w	History of Architecture and Sculpture ..... (3 cred.; all; no prereq.)	III	TThS	OPhAud	Mr. Upjohn
3s	History of Painting ..... (3 cred.; all; no prereq.)	III IV	TThS S*	OPhAud	Mr. Upjohn
5f	Principles of the Fine Arts ..... (3 cred.; all; no prereq.)	VI	MWF	OPhAud	Mr. Upjohn
40	European Study ..... (3 cred.; all; prereq., permission of chairman)	Consult department			
51	*Medieval Art* ..... (3 cred.; jr., sr.; prereq., 1 and 2 and 10 cred. in approved courses in hist. or lit., or permission of instructor)	*Not offered*			
52	*The Art of the Italian Renaissance* ..... (3 cred.; jr., sr.; prereq., 2 and 3 and 10 cred. in approved courses in hist. or lit., or by permission of instructor)	*Not offered*			
53f	The Art of the Seventeenth Century ..... (3 cred.; jr., sr.; prereq., as for 52)	III	MWF	124F	Mr. Upjohn
54w	The Art of the Eighteenth Century ..... (3 cred.; jr., sr.; prereq., as for 52)	III	MWF	124F	Mr. Upjohn
55s	The Art of the Nineteenth Century ..... (3 cred.; jr., sr.; prereq., as for 52)	III	MWF	124F	Mr. Upjohn
56	*American Art* ..... (3 cred.; jr., sr.; prereq., as for 51)	*Not offered*			
60f-61w-62s	Tutorial Work ..... (Permission of instructor)	Ar	Ar	Ar	Mr. Upjohn

* The fourth hour Saturday should be reserved for field trips.

GEOGRAPHY

Major Adviser

Professor Davis.

Major Sequence

Prerequisites: Courses 11 and 41, Geology 1-2 or 1-3 or 8 and Economics 6-7.

Twenty-seven credits from Geography 53, 71, 101, 102, 110, 111, 120, 133, 235, 241, 251-252-253; Economics 85, 108, 172; Geology 73; History 80-81-82, Botany 131. At least 20 credits must be in Geography.

Modifications of this sequence will be permitted upon petition approved by the major adviser and assistant dean for the Senior College.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	Introduction to Human Geography ..... (10 cred.; fr.; no prereq.)				
	Lect.	II	MWF	OLAud	Mr. Davis
	Sec. 1	VI	TTh	103OL	
	2	VII	TTh	103OL	
11f	Human Geography ..... (5 cred.; 3rd qtr. fr., soph., jr., sr.; no prereq.)				
	Sec. 1	II	MWThFS	103OL	Mr. Dicken
	2	III	MTWFS	103OL	Mr. Brown
11w	Human Geography ..... (See 11f)				
	Sec. 1	II	MWThFS	103OL	Mr. Dicken
	2	III	MTWFS	103OL	Mr. Brown
11s	Human Geography ..... (See 11f)				
	Sec. 1	I	MWThFS	103OL	Mr. Dicken
	2	II	MWThFS	103OL	Mr. Brown
	3	IV	MTWFS	103OL	Ar
41f	Geography of Commercial Production ..... (5 cred.; soph., jr., sr.; prereq., 5 cred. in geog., or 10 cred. in econ. or soc. or 15 cred. in hist.)	IV	MTWFS	206OLa	Ar
41w	Geography of Commercial Production ..... (See 41f)	IV	MTWFS	150Ph	Ar
41s	Geography of Commercial Production ..... (See 41f)	III	MTWFS	150Ph	Ar
43	*Political Geography* ..... (5 cred.; soph., jr., sr.; prereq., 1-2, or 11, or 41, or 10 cred. in hist. or pol. sci.)	*Not offered*			
53f	Historical Geography ..... (3 cred.; jr., sr.; prereq., 11, or 15 cred. in hist.)	I	MWF	103OL	Mr. Brown

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
71f	Geography of North America ... (3 cred.; jr., sr.; prereq., 11 or 41, or 20 cred. in soc. sci. incl. at least one course in geog.)	I	TThS	103OL	Mr. Dicken
101s	Geography of Europe ..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 cred. in geog.)	VII	MWF	103OL	Mr. Dicken
102w	Trade Routes and Trade Centers (3 cred.; jr., sr., grad.; prereq., 41)	I	TThS	103OL	Ar
110s	Geography of South America ... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. to incl. 11 or 41)	VI	MWF	103OL	Mr. Brown
111	*Cartography* ..... (3 cred.; jr., sr., grad.; prereq., 10 cred. in sen. coll. work in geog., geol., hist., or other subject in which the use of maps is necessary)	*Not offered*			
120w	Geography of Asia ..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. to incl. 11 or 41)	III	MWF	105OL	Mr. Davis
133w	Climatology ..... (3 cred.; jr., sr., grad.; prereq., 11)	I	MWF	103OL	Mr. Brown

NOTE.—The Courses 235, 241, 251, 252, 253, and 301, listed in the Graduate School bulletin, are open to properly qualified juniors and seniors. For further information consult the chairman of the department.

GEOLOGY AND MINERALOGY

Major Advisers

Professors Emmons (economic geology), Stauffer (general geology and paleontology), and Grout (mineralogy and petrography).

Major Sequences

No major sequence in geology should be undertaken without at least two quarters of chemistry. Civil Engineering 9 and 10 are also required. (See College of Engineering bulletin.) Course 23 should be taken as early as possible. One field trip is required of all students majoring in geology.¶

Sequence A.* For general geology, federal and state surveys, etc. Courses 91-92-93, 101, 111, 112, 121, 144-145 or 124-125, 151-152-153.

Sequence B.‡ For petroleum geologist. Courses 91-92-93, 101, 105, 112, 137, 144-145 or 124-125, 151-152-153.

Sequence C.* For mining geologist and mineralographer. Courses 111, 112, 113, 121, 137, 124-125, 144-145, 166-167.

* Physics 3 required.

‡ Trigonometry required.

¶ Girls may take trip only when there are enough for a separate section. They should consult a major adviser.

Sequence D.‖ For paleontologist. Courses 91-92-93, 101, 105-106, 107-108-109, 151-152-153.

Sequence E.§ For mineralogist. Courses 61, 105, 106, 111, 121, 131-132-133, 137, 166-167.

Sequence F.‡ For petrographer. Courses 105, 106, 111 and 112 or 124-125, 131-132-133, 140-141.

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*†	General Geology (Dynamic and Historical) ..... (10 cred.; fr., soph., jr., sr.; no prereq.)					
		Lect.	I	WThFS	210P	Mr. Thiel
		Lab. Sec. 1	I, II	M	220P	
			II	WF		
		Lab. Sec. 2	VI, VII	MW	220P	
1f-3w*†	General Geology (Dynamic and Economic) ..... (10 cred.; fr., soph., jr., sr.; no prereq.)					
		Lect.	III	TThFS	110P	Mr. Emmons
		Lab.	III, IV	MW	216P	
			or			
			VI, VII	TTh		
1w-2s*†	General Geology (Dynamic and Historical) ..... (See 1f-2w)					
		Lect.	IV	MTWF	110P	Mr. Dutton
		Lab.	VI, VII	WF	220P	
1w-3s*†	General Geology (Dynamic and Economic) ..... (See 1f-3w)					
		Lect.	II	MWFS	110P	Mr. Emmons
		Lab.	I, II	TTh	216P	Mr. Matheson
1s*†	General Geology (Dynamic and Historical or Economic) ..... (First qtr. of 1-2 or 1-3. See 1f-2w)					
		Lect.	III	MWThF	110P	Mr. Park
		Lab.	III, IV	TS	220P	
2f*†	General Geology (Dynamic and Historical) ..... (2nd qtr. of 1-2. See 1f-2w)					
		Lect.	III	MWThF	206P	Mr. Matheson
		Lab.	III, IV	TS	216P	

* For a three-quarter sequence, Course 2 may be followed by Course 3 or 4 or 11, and Course 3 by Course 2.

† The entire course must be completed before credit is received for any quarter.

‡ Trigonometry required.

§ Physics 3 required.

‖ Should include General Zoology.

No.	Title	Hour	Day	Bldg.	Instructor
4s	Geology of Minnesota ..... (5 cred.; all; prereq., 2)	IV	MTWFS	210P	Mr. Thiel
8f‡§	Introductory Geology..... (5 cred.; all; no prereq.)	II	MWThFS	210P	Mr. Thiel
8w‡§	Introductory Geology ..... (See 8f)	IV	MTWFS	210P	Mr. Thiel
8s‡§	Introductory Geology ..... (See 8f)	II	MWThFS	210P	Mr. Thiel
11f	Elements of Paleontology ..... (5 cred.; all; prereq., 1 and Zool. 1-2)				
	Lect.	II	MWF	208P	Mr. Stauffer
	Lab.	I, II	ThS	105P	
15f¶	Minerals and Rocks ..... (1 cred.; jr., sr.; prereq., 1 or 29)	Ar	Ar	100P	Mr. Gruner
23w-24s†	Elements of Mineralogy ..... (8 cred.; soph., jr., sr.; prereq., course in chem.)				
	(Winter) Lect.	II	WF	206P	Mr. Gruner
	Rec.	VII	T	210P	
	Lab. Sec. 1	VII, VIII	WF	100P	
	2	III, IV	TS	100P	
	(For other sections, see Mines bulletin)				
	(Spring) Lect.	II	MWF	206P	Mr. Gruner
	Rec.	IX	T		
	Lab. Sec. 1	VII, VIII	M	100P	
		VI, VII	T		
	2	III, IV	M		
		VII, VIII	F		
27s¶	Outlines of Mineralogy ..... (1 cred.; jr., sr.; no prereq.)	Ar	Ar	100P	Mr. Gruner
61f	Blowpipe Analysis ..... (3 cred.; jr., sr.; prereq., 24)	Consult Mines program			Mr. Gruner
73f	Economic Geology ..... (3 cred.; jr., sr.; prereq., 24)	VI	MWF	110P	Mr. Schwartz
85s	Field Work in Northern Minnesota ..... (4 cred.; jr., sr.; prereq., 2, 3, or 11)	Ar	Ar	Ar	Mr. Gruner, Mr. Thiel
91f-92w-93s	Index Fossils of North America (9 cred.; jr., sr.; prereq., 2, 3, or 11)				
	Lect.	I	F	208P	Mr. Stauffer
	Lab.	VI, VII	MW	105P	
101f	Sedimentation ..... (3 cred.; jr., sr., grad.; prereq., 24)	IV	MWF	210P	Mr. Thiel
102w-103s	Micropaleontology ..... (6 cred.; jr., sr., grad.; prereq., 11 or 91)	II, III	TThS	103P	Mr. Stauffer

† The entire course must be completed before credit is received for any quarter.

‡ Does not satisfy the junior college requirement for science. Cannot be followed by Course 1 for credit. May be followed by Course 2 with instructor's permission.

§ Not open to students who have had 1.

¶ Does not count for a senior college course. Not open to sophomores. See Course Numbering, page 24. Course 15 cannot be substituted for Course 23.

No.	Title	Hour	Day	Bldg.	Instructor
105f	Rock Study ..... (3 cred.; jr., sr., grad.; prereq., 24)				
	Lect.	VI	TTh	110P	Mr. Grout
	Lab. Sec. 1	VII, VIII	T	200P	
	2	VI, VII	M	200P	
106w	Petrography ..... (3 cred.; jr., sr., grad.; prereq., 105)	VII, VIII	TTh	200P	Mr. Grout
107f-108w-109s	Paleontologic Practice ..... (9 cred.; jr., sr., grad.; prereq., 91-92-93)	Ar	Ar	105P	Mr. Stauffer
111f	Ore Deposits ..... (3 cred.; sr., grad.; prereq., 2, 3, or 11, and 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	Ar	Mr. Emmons
119f	Physiography of the United States ..... (3 cred.; jr., sr., grad.; prereq., 2 or 3)				
	Lect.	II	TThS	206P	Ar
	Lab.	Ar	Ar	Ar	
121f	Crystallography ..... (3 cred.; jr., sr.; prereq., Math. 7 and Inorg. Chem. 6-7-8 or 9-10)	Ar	Ar	100P	Mr. Gruner
124w-125s	Struct. and Metamorphic Geol. .. (6 cred.; jr., sr., grad.; prereq., 2, 3, or 11, and 105)	VI	MWF	110P	Mr. Schwartz
		(II	MTWThFS, spring, to May 1)	208P	
127f	Geol. of Lake Superior Region .. (3 cred.; jr., sr., grad.; prereq., 124-125)	Ar	Ar	Ar	Mr. Thiel
131f-132w-133s	Adv. Petrology ..... (9 cred.; jr., sr., grad.; prereq., 106)				
	Lect.	III	TThS	200P	Mr. Grout
	Lab.	Ar	F	200P	
137f	Testing Econ. Minerals ..... (3 cred.; jr., sr., grad.; prereq., 2, 3, or 11, and 105)				
	Lect.	I	W	200P	
	Lab.	VI, VII, VIII, IX	T	200P	Ar
140w-141s	Applied Petrography ..... (6 cred.; jr., sr., grad.; prereq., 131)				
	Lect.	II	F	200P	Mr. Grout
	Lab.	I, II	MW	Ar	
144w-145s	Interp. of Geologic Maps ..... (6 cred.; jr., sr., grad.; prereq., 2, 3, or 11, and 124)	VII, VIII, IX	MTh	Ar	Mr. Dutton
149s	Methods of Field Geology ..... (No cred.; jr., sr., grad.; to be taken with 150; prereq., 2, 23-24, 106, 124-125)	Ar	Ar	Ar	Mr. Schwartz

No.	Title	Hour	Day	Bldg.	Instructor
150s*	Field Geol. (Black Hills) ..... (Jr., sr., grad.)	Ar	Ar	Ar	Mr. Emmons, Mr. Schwartz
151f-152w-153s	Adv. General Geology ..... (9 cred.; jr., sr., grad.; prereq., 2, 3, or 11)	III	MWF	210P	Mr. Stauffer
161w	Crystal Structure ..... (3 cred.; jr., sr., grad.; prereq., 121, elem. phys., and anal. geom.)	Ar	Ar	Ar	Mr. Gruner
166f-167w	Mineralography ..... (6 cred.; sr., grad.; prereq., 111, 131)	Ar	Ar	207P	Mr. Schwartz

GERMAN

Major Advisers

Professors Burkhard and Kroesch.

Major Sequence

Courses 50-51-52; 65, 66, and 67; 21 additional credits from courses numbered above 50.

Modification of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

Sequence of Courses

For academic students.—Without entrance German, 1, 2, 3, 4, other courses numbered 50 or above. With one year entrance German, 2, 3, 4, other courses numbered 50 or above. With two years entrance German, 3, 4, other courses numbered 50 or above. With four years entrance German, courses numbered 50 or above.

For pre-medical students.—The regular sequence for students without entrance German is 1, 2, 3A, 30-31-32. An alternate sequence, 1, 2, 3, 4A, 31-32 is intended for students who are unable to take 3A. Students with one year entrance German will take 2, 3A, 30-31-32 or 2, 3, 4A, 31-32; with two years entrance German, 3A, 30-31-32 or 3, 4A, 31-32; with three years entrance German, 4A, 31-32; with four years entrance German or 20 quarter credits, 30-31-32. In the last sequence 30 may be omitted with the consent of the department.

For chemists.—Without entrance German, 24-25-26. With two years entrance German, 25 or 26.

No.	Title	Hour	Day	Bldg.	Instructor
1f‡	Beginning A ..... (5 cred.; fr., soph., jr., sr.; no prereq.)				
	Sec. 1	I	MWThFS	207F	Ar
	2	I	MWThFS	209F	Ar
	3	I	MWThFS	209½F	Ar
	4	II	MWThFS	209½F	Ar
	5	III	MTWFS	212F	Ar
	6	IV	MTWFS	207F	Ar
	7	VI	MTWThF	207F	Ar
	8	VII	MTWThF	209½F	Ar

* A maximum of 8 credits will be granted after field report is completed.

‡ Credit is usually not given for more than one beginning language. See page 6.

No.	Title		Hour	Day	Bldg.	Instructor
1w*	Beginning A ..... (See 1f)					
		Sec. 1	I	MWThFS	125F	Ar
		2	II	MWThFS	209F	Ar
		3	VII	MTWThF	212F	Ar
1s*	Beginning A ..... (See 1f)					
		Sec. 1	II	MWThFS	213F	Ar
		2	III	MTWFS	102F	Ar
		3	VI	MTWThF	209½F	Ar
2f*	Beginning B ..... (5 cred.; fr., soph., jr., sr.; prereq., 1 or one yr. prep. German)					
		Sec. 1	II	MWThFS	207F	Ar
		2	VI	MTWThF	110F	Ar
2w*	Beginning B ..... (See 2f)					
		Sec. 1	I	MWThFS	207F	Ar
		2	I	MWThFS	209F	Ar
		3	I	MWThFS	209½F	Ar
		4	II	MWThFS	209½F	Ar
		5	III	MTWFS	212F	Ar
		6	IV	MTWFS	207F	Ar
		7	VI	MTWThF	207F	Ar
		8	VII	MTWThF	209½F	Ar
2s*	Beginning B ..... (See 2f)					
		Sec. 1	I	MWThFS	125F	Ar
		2	II	MWThFS	209F	Ar
		3	VII	MTWThF	212F	Ar
3f	Beginning C ..... (5 cred.; fr., soph., jr., sr.; prereq., 2)					
		Sec. 1	II	MWThFS	213F	Ar
		2	III	MTWFS	209F	Ar
		3	VII	MTWThF	209F	Ar
3Af	Beginning C ..... (For pre-medics. See 3f)					
		Sec. 1	I	MWThFS	102F	Ar
		2	IV	MTWFS	102F	Ar
3w	Beginning C ..... (See 3f)					
		Sec. 1	II	MWThFS	207F	Ar
		2	VI	MTWThF	110F	Ar
3s	Beginning C ..... (See 3f)					
		Sec. 1	I	MWThFS	209½F	Ar
		2	II	MWThFS	209½F	Ar
		3	III	MTWFS	212F	Ar
		4	IV	MTWFS	207F	Ar
		5	VI	MTWThF	207F	Ar
3As	Beginning C ..... (For pre-medics. See 3f)					
		Sec. 1	I	MWThFS	207F	Ar
		2	I	MWThFS	209F	Ar
		3	IV	MTWFS	104F	Ar

* Credit is usually not given for more than one beginning language. See page 6.

No.	Title	Hour	Day	Bldg.	Instructor
4f	Intermediate German ..... (5 cred.; fr., soph., jr., sr.; prereq., 3)				
	Sec. 1	II	MWThFS	209F	Ar
	2	III	MTWFS	213F	Ar
	3	IV	MTWFS	212F	Ar
	4	VII	MTWThF	102F	Ar
4Af	Intermediate German ..... (For pre-medics. See 4f)	II	MWThFS	212F	Ar
4w	Intermediate German ..... (See 4f)				
	Sec. 1	II	MWThFS	213F	Ar
	2	III	MTWFS	209F	Ar
	3	VII	MTWThF	209F	Ar
4s	Intermediate German ..... (See 4f)				
	Sec. 1	II	MWThFS	207F	Ar
	2	VI	MTWThF	110F	Ar
24f-25w-26s†	Chemical German ..... (12 cred.; chemists, miners; no prereq.)				
	Sec. 1	IV	MTWF	209½F	Ar
	2	IV	MTWF	101F	Ar
	3	V	MTWF	207F	Ar
30f-31w-32s	Medical German ..... (9 cred.; pre-med.; prereq., 3A)				
	Sec. 1	I	MWF	212F	Ar
	2	IV	MWF	113F	Ar
	3	IV	MWF	213F	Ar
30w	Medical German ..... (3 cred.; see 30f)				
	Sec. 1	I	MWF	217F	Ar
	2	IV	MWF	212F	Ar
31f-32w	Medical German ..... (6 cred.; pre-med.; prereq., 4A or 30)	I	MWF	205F	Ar
31s	Medical German ..... (1st qtr. of 31-32. See 31f-32w)				
	Sec. 1	I	MWF	217F	Ar
	2	IV	MWF	212F	Ar
32f	Medical German ..... (2nd qtr. of 31-32. See 31f-32w)	I	MWF	109F	Ar
50f-51w-52s†	Composition ..... (6 cred.; jr., sr.; prereq., 4 or 4 yrs. prep. German)	IV	TS	213F	Mr. Lussky
53f-54w-55s†	Conversation ..... (6 cred.; jr., sr.; prereq., 4 or 4 yrs. prep. German)	II	ThS	205F	Mr. Lussky
56f-57w†	Essay Writing ..... (6 cred.; jr., sr.; prereq., 52)	I	TThS	114F	Mr. Pfeiffer
61s	Epics and Ballads ..... (3 cred.; jr., sr.; prereq., 4 or 4 yrs. prep. German)	III	MWF	209F	Mr. Lussky
62w	Nineteenth-Century Prose ..... (5 cred.; jr., sr.; prereq., 4 or 4 yrs. prep. German)	III	MTWFS	209½F	Mr. Lussky

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
63f	Modern Drama ..... (3 cred.; jr., sr.; prereq., 4 or 4 yrs. prep. German)	IV	MWF	209F	Mr. Davies
64w	Classic Drama ..... (3 cred.; jr., sr.; prereq., 4 or 63)	IV	MWF	209F	Mr. Davies
65f	Survey through Reformation .... (3 cred.; jr., sr.; prereq., 3 cred. above 60)	III	TThS	207F	Mr. Kroesch
66w	Eighteenth-Century Survey ..... (3 cred.; jr., sr.; prereq., 3 cred. above 60)	III	TThS	207F	Mr. Burkhard
67s	Nineteenth-Century Survey ..... (3 cred.; jr., sr.; prereq., 3 cred. above 60)	III	TThS	207F	Mr. Pfeiffer
77s	Faust I ..... (3 cred.; jr., sr.; prereq., 64 and 3 additional cred. above 60)	IV	MWF	209F	Mr. Burkhard
108s	Phonetics ..... (3 cred.; sr., grad.; prereq., 9 senior college cred. in mod. lang.)	III	MWF	207F	Mr. Kroesch
115-116-117†	*Middle High German Literature* (9 cred.; sr., grad.; prereq., 65 and 11 credits above 60)	*Not offered*			
143f-144w-145s†	The Classical Period: Goethe .. (9 cred.; sr., grad.; prereq., 66 and 11 cred. above 60)	VIII, IX, X	W	301Lib	Mr. Lussky
153f-154w-155s†	Studies in German Literature of the Nineteenth Century: Realism ..... (9 cred.; sr., grad.; prereq., 67 and 11 cred. above 60)	VIII, IX, X	T	301Lib	Mr. Burkhard
160f-161w-162s†	Lyric Poetry ..... (9 cred.; sr., grad.; prereq., 66 or 67 and 11 cred. above 60)	Ar	Ar	Ar	Mr. Davies
163-164-165†	*German and English Literary Relations, 16th, 17th, 18th Centuries* ..... (9 cred.; sr., grad.; prereq., 66 and 11 cred. above 60)	*Not offered*			
170-171-172	*Young Germany* ..... (9 cred.; sr., grad.; prereq., 67 and 11 cred. above 60)	*Not offered*			
173f-174w-175s	The Modern Novel, 1890-1930 ..	VIII, IX, X	F	301Lib	Mr. Pfeiffer
215f-216w-217s	Middle High German ..... (9 cred.; grad., sr. with completed major sequence)	VIII	MWF	207F	Mr. Kroesch

† The entire course must be completed before credit is received for any quarter.

GREEK

Major Adviser

Professor Savage.

Major Sequence

Prerequisite: Courses 14, 15, and 16 or their equivalent.

Courses 51, 52, 53, 105, 106 or 107, 108 or 109, and Latin 51, 52, 53, or History 50-51-52.

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†-3s	Beginning Greek ..... (15 cred.; fr., soph., jr., sr.; no prereq.)	IV	MTWFS	114F	Mr. Savage, Mr. Hays
14f	History: Xenophon or Herodotus (3 cred.; all; prereq., 1-2-3)	III	TThS	108F	Mr. Hays
15w	History: Herodotus ..... (3 cred.; all; prereq., 1-2-3)	III	TThS	108F	Mr. Savage
16s	Epic Poetry: Homer ..... (3 cred.; all; prereq., 14 or 15)	III	TThS	108F	Mr. Hays
17f,w	Greek Sources (Everyday Greek) (2 cred.; soph., jr., sr.; prereq., 1 yr. of any foreign language)	VIII	TTh	114F	Mr. Savage, Mr. Hays
17s	Greek Sources (Everyday Greek) (See 17f,w)	I	TTh	114F	Mr. Hays
51f	Philosophy ..... (3 cred.; jr., sr.; prereq., any two of 14, 15, and 16)	Ar	Ar	112F	Mr. Savage
52w	Oratory ..... (3 cred.; jr., sr.; prereq., any two of 14, 15, and 16)	Ar	Ar	112F	Mr. Savage
53s	Dramatic Poetry ..... (3 cred.; jr., sr.; prereq., 51 or 52)	Ar	Ar	112F	Mr. Savage
61-62†-63	*Advanced Greek Composition* ... (2 or 3 cred.; jr., sr.; prereq., 2 years of Greek)	*Not offered*			
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
107w*	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. Hays

* Courses 106 and 107 are offered alternately.

† Two quarters must be completed before credit is received for either quarter.

§ Courses 108 and 109 are offered alternately.

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	WF	114F	Mr. Savage
45w¶	Greek Mythology ..... (See 45f)	I	WF	114F	Mr. Savage

HISTORY

Major Advisers

Professors Buck, Heaton, Krey, Shippee, and White; Assistant Professor Steefel.

Major Sequences

Prerequisites: Either of Courses 1-2 or 4-5 and 7-8-9. For students who have had an acceptable course in American history in high school or normal school, the requirement of 7-8-9 may be waived upon recommendation of the major adviser.

Students will take at least two of the courses numbered from 50 to 100. These will normally come in the junior year. In the final year students should take at least one special field or period and may take two. Those taking but one of the courses numbered from 150 to 199 should, in the final year, take another course from those numbered from 50 to 100.

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

For the requirements for the teacher's certificate, consult Education bulletin.

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	Modern World ..... (10 cred.; all; no prereq.)				
	Lect.	II	TThS	OLAud	Mr. Ford
	Rec. Secs.	I	MTh	2F	
		I	MW	5F	
		I	WF	2F	
		II	MW	2F	
		II	MW	301F	
		II	MW	112OL(f), 113F(w)	
		III	MTh	2F	
		III	MW	113F	
		III	TF	2F	
		III	WS	2F	
		IV	MW	2F	
		IV	MW	112OL	
		IV	TF	2F	
		IV	TS	112OL	
		V	MW	2F	
		V	TTh	2F	
		VI	MW	2F	
		VI	TTh	2F	
		VII	MW	2F	
		VII	TTh	2F	

† The entire course must be completed before credit is received for any quarter.

‡ Students may not get credit for both Courses 43 and 44 except by special permission.

¶ Does not count in a major or minor sequence. Not open to sophomores. See Course Numbering, page 24.

No.	Title	Hour	Day	Bldg.	Instructor
1w-2s†	Modern World ..... (See 1f-2w)				
	Lect.	I	TThS	OPhAud(w), 150Ph(s)	Mr. Burt
	Rec. Secs.	I	MW	221OL(w), 5F(s)	
		I	MW	3F	
		II	TTh	2F	
		II	TTh	25F	
		III	ThS	305F	
		VI	WF	3F	
		VI	TTh	3F	
4f-5w†	English History ..... (10 cred.; all; no prereq.)				
	Lect.	VII	MWF	OLAud	Mr. Burt
	Rec. Secs.	I	MTh	25F	
		I	WF	25F	
		II	MW	25F	
		III	MW	25F	
		III	TTh	25F	
		IV	MW	25F	
		IV	TF	25F	
		IV	TS	111OL	
		V	MW	25F	
		V	TF	25F	
		VI	MW	25F	
		VI	TTh	25F	
		VII	TTh	25F	
		VII	TTh	111OL	
7f-8w-9s†	American History ..... (10 cred.; soph., jr., sr.; no prereq.; 3 meetings with group confs.)				
	Sec. 1	I	MWF	211OL	Mrs. Tyler
	2	VII	MWF	211OL	Mr. Stephenson
	3	VII	MWF	111OL	Mr. Osgood
11f-12w-13s†	Medieval History ..... (10 cred.; mu. and int. arch. only; no prereq.)				
	Lect.	IV	MF	221OL	Miss Thompson
	Sec. 1	IV*	W	221OL	
	2	IV*	T	221OL	
17s	Europe in the Middle Ages ..... (5 cred.; all; prereq., 10 cred. if taken by fr.)				
	Lect.	II	TThS	166Ph	Mr. Krey
	Secs.	Ar	Ar		

Senior College Courses

Except where otherwise stated, prerequisites for all courses numbered 50 to 100 are 15 credits in social science. The examination at the end of the course will cover the work of the three terms, and no final grade will be assigned until the whole course is completed. In exceptional cases students may enter the winter quarter but in that event must read to cover the work of the first quarter.

No.	Title	Hour	Day	Bldg.	Instructor
50f-51w-52s†	Survey of Ancient European History ..... (9 cred.; jr., sr.)	I	TThS	112OL	Mr. Deutsch

* In the spring quarter, an additional hour to be arranged.

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
53f-54w-55s†	Survey of Medieval European History ..... (9 cred.; jr., sr.)	III	MWF	112OL	Mr. Krey
56-57-58†	*Survey of Early Modern European History*	*Not offered*			
59f-60w-61s†	Survey of Later Modern European History ..... (9 cred.; jr., sr.)	IV	MWF	111OL	Mr. Steefel
62f-63w-64s†	Survey of European Expansion (9 cred.; jr., sr.)	II	TThS	211OL	Mr. Buck, Mr. Willson
70f-71w-72s†	English Constitutional History .. (9 cred.; pre-legal soph. with C average, jr., sr.)	I	MWF	112OL	Mr. White
73f-74w-75s†	England Since 1485 ..... (9 cred.; jr., sr.)	II	MWF	211OL	Mr. Willson
76f-77w-78s†	Canadian History ..... (9 cred.; jr., sr.)	III	TThS	221OL	Mr. Burt
80f-81w-82s†	Introduction to Economic History (9 cred.; jr., sr.)	II	TThS	111OL	Ar
83-84-85†	*American Economic History*	*Not offered*			
86-87†	*English Backgrounds and American Colonies*	*Not offered*			
88w-89s	American Colonies in the Seventeenth Century ..... (9 cred.; jr., sr.)	II	MWF	112OL	Mr. White
90f-91w-92s†	West in American History ..... (9 cred.; jr., sr.)	III	TThS	211OL	Mr. Buck, Mr. Osgood, Mr. Shippee
93f-94w-95s†	American Diplomatic History .. (9 cred.; jr., sr.)	III	MWF	221OL	Mr. Shippee

Courses numbered 150 and over are open to seniors and graduates; prerequisites are the appropriate survey courses (numbered 50 to 100) and the consent of the department.

For the year 1931-32 seniors will consult with advisers to ascertain what topics their preparation fits them for.

150 151-152†	*Topics in Ancient European History*	*Not offered*			
153f-154w-155s†	Topics in Medieval European History ..... (9 cred.; sr., grad.)	*	Ar	Ar	Mr. Krey
156f-157w-158s†	Topics in Modern European History	‡	Ar	Ar	Mr. Deutsch, Mr. Steefel
170f-171w-172s†	Topics in English History ..... (9 cred.; sr., grad.)	§	Ar	Ar	Mr. White, Mr. Willson, Miss Thompson

† The entire course must be completed before credit is received for any quarter.

* One or more of such topics as the following will be studied by small groups of students: Break-up of the Roman Empire; The Crusades; Empire and Papacy; Rise of Feudalism; Feudal Institutions; European Migrations; Rise of National States; Intellectual Development; The Renaissance; The Reformation; Rise of Towns.

‡ One or more of such topics as the following will be studied by small groups of students: Age of Louis XIV; The Eighteenth Century; French Revolution and Empire; Restoration and Revolution; Second French Empire; Making of Italy and Germany; International Relations, 1871-1914; Europe Since 1914; The Eastern Question; Modern Russia.

§ One or more of such topics as the following will be studied by small groups of students: Beginnings of Parliament; Legal History (Anglo-Saxon Law, the Age of Glanvill, of Bracton, or of Edward I, etc.); Local Self-Government in Medieval England; Parliament and Administration in the Fourteenth Century; Antiquarianism and Political Theorists; The Tudors and Stuarts; England in the Nineteenth Century; British India.

No.	Title	Hour	Day	Bldg.	Instructor
176-177-178†	*Topics in Canadian History*	*Not offered*			
180-181-182†	*Topics in Economic History*	*Not offered*			
190f-191w-192s†	Topics in American History .. (9 cred.; sr., grad.)	¶	Ar	Ar	Mr. Blegen, Mr. Buck, Mr. Osgood, Mr. Shippee, Mr. Stephenson, Mrs. Tyler

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
3s	Textiles ..... (5 cred.; all; no prereq.) (Limited to 24)		I, II	MTWThF	311, 307HE	Miss Willigar
4f	Textiles (Ed., S., L., & A.) .... (3 cred.; not open to students in H.E.; no prereq.) (Limited to 24)		VI, VII	MWF	311, 307HE	Miss Weller, Miss Willigar
4s	Textiles (Ed., S., L., & A.) .... (See 4f) (Limited to 24)	Sec. 1	VI, VII	MWF	307, 311HE	Miss Weller
		2	VI, VII	MWF	305HE	Miss Willigar
11f,s	Clothing Planning and Construction A ..... (3 cred.; all; no prereq.)	Sec. 1	I, II	MWF	304HE	Miss Willigar, Miss Gorham, Miss Anderson
	(Limited to 24)	2	I, II, III	ThS	304HE	Miss Willigar, Miss Gorham
		3	VI, VII, VIII	TTh	304HE	Miss Keller
11w	Clothing Planning and Construction A ..... (See 11f)	Sec. 1	I, II	MWF	304HE	Miss Gorham
	(Limited to 24)	2	VI, VII, VIII	TTh	304HE	Miss Gorham
13f,s	Clothing Planning and Construction B ..... (3 cred.; all; prereq., 3, 11, 50)	Sec. 1	III, IV	MWF	304HE	Miss Willigar
	(Limited to 24)	2	I, II	MWF	305HE	Miss Gorham
15f,w,s	Clothing Problems ..... (3 cred.; 3rd qtr. fr., soph., jr.; prereq., 3, 51 or parallel)	Lect.	VI, VII	Th	313HE	Miss Weller, Miss Gorham
	(Limited to 30)	Field Trips	VI, VII, VIII, IX	T		

† The entire course must be completed before credit is received for any quarter.

¶ Such topics as The Colonies; The Revolution and Making of the Constitution; Political Parties; Civil War and Reconstruction; Immigration; The West; History of Minnesota; American Agriculture and Rural Life; American Diplomacy; Recent American Development; will be studied by small groups of students.

No.	Title		Hour	Day	Bldg.	Instructor
50f	Color and Design I ..... (3 cred.; no prereq.)					
		Sec. 1	I, II	MWF	402HE	Miss Segolson
	(Limited to 24)	2	I, II, III	ThS	402HE	Miss Guttman
		3	III, IV	MWF	402HE	Miss Fowler
50w	Color and Design I ..... (See 50f)					
		Sec. 1	III, IV	MWF	402HE	Miss Guttman
		2	I, II	TThS	402HE	Miss Guttman
50s	Color and Design I ..... (See 50f)					
		Sec. 1	I, II	MWF	402HE	Miss Guttman
		2	VI, VII	MWF	402HE	Miss Guttman
51f	Color and Design II ..... (3 cred.; prereq., 50)					
	(Limited to 24 each)	Sec. 1	I, II	MWF	401HE	Miss V. Goldstein
		2	I, II	TThS	401HE	Miss V. Goldstein
51w	Color and Design II ..... (See 51f)					
	(Limited to 24 each)	Sec. 1	III, IV	MWF	401HE	Miss V. Goldstein
		2	I, II	TThS	401HE	Miss Fowler
51s	Color and Design II ..... (See 51f)					
	(Limited to 24 each)	Sec. 1	VI, VII, VIII	TTh	402HE	Miss Segolson
		2	I, II	MWF	402HE	Miss Fowler
53f	Related Art Problems ..... (3 cred.; soph., jr., sr.; prereq., 51 or 56) (Limited to 24)		VI, VII	MWF	402HE	Miss Fowler
53w	Related Art Problems ..... (See 53f)					
	(Limited to 24 each)	Sec. 1	VI, VII	MWF	402HE	Miss Fowler
		2	I, II	MWF	402HE	Miss Fowler
53s	Related Art Problems ..... (See 53f)					
		Sec. 1	I, II	TThS	402HE	Miss Segolson
		2	III, IV	MWF	402HE	Miss Segolson
56f	Applications of Color and Design (3 cred.; no prereq.)		VI, VII, VIII	TTh	402HE	Miss H. Goldstein
70f	Nutrition Survey ..... (2 cred.; all; no prereq.)					
	(Limited to 45 each)	Sec. 1	IV	WF	203HE	Mrs. Furnas,
		2	I	ThS		Miss Dinsmore
70w	Nutrition Survey ..... (See 70f) (Limited to 45)		III	TTh	203HE	Miss Dinsmore
70s	Nutrition Survey ..... (See 70f) (Limited to 45)		VI	TTh	OPhAud	Miss Biester
80f	Food Preparation ..... (5 cred.; prereq., Agr. Biochem. 3 and 4* or permission of Miss Child) (Limited to 20)		I, II	MTWThF	209HE	Miss Steers

* Course 80 may be taken parallel with Agricultural Biochemistry 4.

No.	Title		Hour	Day	Bldg.	Instructor
80w	Food Preparation ..... (See 80f) (Limited to 20 each)	Sec. 1	VI, VII	MTWThF	209HE	Miss Steers
		2	VIII, IX	MTWThF		Miss Steers
80s	Food Preparation ..... (See 80f)	Sec. 1	III, IV	MTWFS	209HE	Miss Steers
		2	VI, VII	MTWThF		Miss Steers
83f,s	Food Management ..... (3 cred.; soph., jr., sr.; prereq., 80 or 81) (Limited to 20)	Sec. 1	III, IV	MWF	203, 207HE	Mrs. Niles
		2	VI, VII	MWF	203, 207HE	Miss Steers
83w	Food Management ..... (See 83f,w) (Limited to 20)		III, IV	MWF	203, 207HE	Mrs. Niles
90s	Home Management Problems for Social Workers ..... (3 cred.; jr., sr.; no prereq.)		III	MWF	2OPh	Miss Studley

Senior College Courses

17w	Advanced Clothing ..... (3 cred.; jr., sr.; prereq., 13, 53) (Limited to 24)		III, IV	MWF	305HE	Miss Carlotta Brown, Miss Gorham
17s	Advanced Clothing ..... (See 17w) (Limited to 24)		III, IV and III, IV or I, II	TS W Th	305HE	Miss Carlotta Brown, Miss Gorham
115f,w	Clothing Economics ..... (2 cred.; jr., sr.; prereq., 13, Econ. 6-7)		III	TTh	203HE	Miss Weller
131f	Home Management: House Planning and Equipment ..... (5 cred.; jr., sr.; prereq., 53) (Limited to 24)		III, IV	MTWFS	401HE	Miss H. Goldstein
131w	Home Management: House Planning and Equipment ..... (See 131f) (Limited to 24)		VI, VII	MTWThF	401HE	Miss H. Goldstein
131s	Home Management: House Planning and Equipment ..... (See 131f) (Limited to 24 each)	Sec. 1	III, IV	MTWFS	401HE	Miss V. Goldstein
		2	VI, VII	MTWThF	401HE	Miss H. Goldstein
150f,w,s	Art History and Appreciation .. (3 cred.; jr., sr.; prereq., permission of instructor)		VIII	MWF	313HE	Miss V. Goldstein

HOW TO STUDY

No.	Title		Hour	Day	Bldg.	Instructor
1f	How To Study ..... (2 cred.; all; prereq., permission of instructor)					
		Sec. 1	I	MWF	104OPh	Mr. Beers
		2	II	MWF	104OPh	Mr. Beers
		3	VII	MWF	104OPh	Mr. Bird
1w	How To Study ..... (See 1f)					
		Sec. 1	I	MWF	104OPh	Mr. Beers
		2	II	MWF	104OPh	Mr. Bird
1s	How To Study ..... (See 1f)					
		Sec. 1	I	MWF	104OPh	Mr. Beers
		2	II	MWF	104OPh	Mr. Beers

HUMAN ANATOMY

MEDICAL SCHOOL

For complete list of courses, see bulletin of the Medical School.

Students in this college may elect other courses in human anatomy (see Medical School bulletin) only by arrangement with the head of the Department of Anatomy.

3f,s. Elementary Anatomy. Primarily for nurses.

HUMAN PHYSIOLOGY

MEDICAL SCHOOL

Major Advisers

Professors Scott, McClendon, and Stenstrom.

Major Sequences

Sequence A. Physiology. Courses 100-101; 103; 104; 6 credits in courses numbered 113 to 140, or Zoology 109-110.

Sequence B. Physiologic Chemistry. Courses 100-101; 103; 104; 6 credits in courses numbered 138 to 164, or suitable courses in agricultural biochemistry approved by the major adviser.

Sequence C. Biophysics. Courses will be arranged by Professor Stenstrom with interested students subject to the approval of the dean for the Senior College.

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,s*	Elements of Physiologic Chemistry (3 cred.; all; no prereq.)					
		Lect.	I	MWThFS	Ar	Dr. Greisheimer and others
		Lab.	II, III, IV	T		
		Quiz	II	Th		

* Courses 1 and 2 compose a sequence required of three-year nursing students. Either or both courses open to others.

No.	Title		Hour	Day	Bldg.	Instructor
2f,s*	Elements of Physiology ..... (4 cred.; all; no prereq.)					
		Lect.	I	MWThFS	Ar	Dr. Greisheimer and others
		Lab.	II, III, IV	T		
		Quiz	II	Th		
4f,w,s	Human Physiology ..... (4 cred.; all; prereq., 1 qtr. zool., 1 qtr. chem.)					
	Lect., dem., or rec.		III, IV	MWF	301MH	Dr. Lyon, Dr. Greisheimer, Dr. King, and others
57f	Physiol. Chemistry ..... (4 cred.; jr., sr.; prereq., Zool., 1-2 or 5-6-7; Inorg. Chem. 1-2-3 or 4-5)		IV	M	MH	Dr. Hemingway, Dr. Cavett, Mr. Armstrong, and others
			I	TThS	MH	
59s	Human Physiology ..... (6 cred.; jr., sr.; prereq., Zool. 1-2 or 5-6-7; Inorg. Chem. 1-2-3 or 4-5)					
		Lect.	I	TWThS		Dr. King
		Rec.	II	Th		
		Lab.	II, III, IV	TW		
60s	Physiology of Exercise ..... (4 cred.; jr., sr.; prereq., 4 and 57)					
		Lect.	I	TThS	Ar	Dr. Collins
		Lab.	VI, VII, VIII	W		
100w-101s‡	Physiol. Chemistry ..... (10 cred.; jr., sr.; prereq., zool., org. chem., and physics)		IV	MWF	301MH	Dr. McClendon and others
	Div. A‡	Lab.	I, II, III	TTh		
	B‡	Lab.	I, II, III	FS		
	C‡	Lab.	VI, VII, VIII	TTh		
103f§	Physiology of Muscles, etc. .... (8 cred.; jr., sr.; prereq., zool. and org. chem.)					
		Lect.	II	MWThF		Dr. Scott, Dr. Lyon, Dr. Greisheimer, Dr. King, and others
			VI	T		
	Rec.	Sec. A	III	TTh		
		B	II	TS		
	Lab.	Sec. A	VI, VII, VIII	M		
			III, IV	F		
		B	III, IV	W		
			VI, VII, VIII	F		

For other courses see Medical School bulletin and programs.
All the above courses are repeated in the summer quarter.

* Courses *1* and *2* compose a sequence required of three-year nursing students. Either or both courses open to others.

‡ Div. A, B, primarily for medics; C primarily for others.

§ Students may register for lectures without laboratory.

No.	Title		Hour	Day	Bldg.	Instructor
104w*	Physiol. of Nervous System, etc. (7 cred., lect. only, 4 cred.; jr., sr.; prereq., 103 or org. chem. and neurol.)					
		Lect.	IV	MTWF	301MH	Dr. Lyon,
			VI	Th		Dr. Scott,
		Rec.	VIII	F		and others
	Lab.	Div. A	9-11:00	S		
			1:30-4:00	M		
		B	9-11:00	F		
			1:30-4:00	W		

JOURNALISM

Major Adviser

Professor Casey.

Major Sequences

Prerequisites: Courses 13, 14-15, and Composition 11-12 or 18-19. In addition to these prerequisites, the following junior college courses are recommended as providing, in most cases, the best foundation for a major in journalism: Political Science 1-2, 15, and 25; Sociology 1 and 6; Psychology 1-2 and 4-5; 10 credits in history; 10 credits in economics.

Courses 51-52, 55 or 56, 69 or 73-74, 75, 101 (for men), 110, 140-141-142, and 9 additional credits to be chosen in conference with the adviser. Students of marked ability may substitute for these 9 additional credits in journalism, senior college courses in other departments with the approval of the major adviser in journalism.

The additional credits will be arranged to prepare students for the following types of journalistic work: (1) metropolitan journalism—reporting, desk work, reference library work, financial writing, or press association work; (2) small daily and weekly journalism—editing and management; (3) journalism-advertising; (4) magazine editing—editorial direction and business management of trade, technical, and professional journals; (5) agricultural journalism—consult the bulletin of the College of Agriculture, Forestry, and Home Economics; (6) teacher training in journalism—consult the bulletin of the College of Education.

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

NOTE.—Sociology 116 and Agricultural Journalism 10, 11, 12 and 19 carry credit in the department.

Fees.—Students registered for any journalism course, except Course 5, are required to pay a general fee of $1 a quarter, regardless of the number of courses pursued. Courses 41, 51-52, 55, 56, and 58 require laboratory fees in addition to the general fee of $1.

No.	Title	Hour	Day	Bldg.	Instructor
5w	The American Newspaper ..... (3 cred.; soph., jr., sr.; prereq., average of C)	III	MWF	301F	Mr. Ford and others
5s	The American Newspaper ..... (See 5w)	II	MWF	301F	Mr. Ford and others

* Students may register for lectures without laboratory.

No.	Title	Hour	Day	Bldg.	Instructor
13f	Introduction to Reporting ..... (3 cred.; soph. with average of C, jr., sr.; prereq., Eng. A-B-C, Comp. 4-5-6 or exemption)				
	Sec. 1 Journalism majors	I	MWF	14P	Mr. Desmond
	2 Journalism minors	I	MWF	10P	Mr. Kildow
	Reporting conferences	Ar	Ar	Ar	Mr. Desmond, Mr. Ford, Mr. Barnhart, Mr. Kildow
14w-15s†	Newspaper Reporting ..... (6 cred.; soph., jr., sr., with average of C in 13, or professional experience, or consent of instructor, and Comp. 11-12 or 18-19§)	I	MWF	14P	Mr. Desmond
	Reporting conferences	Ar	Ar	Ar	Mr. Desmond, Mr. Ford, Mr. Barnhart, Mr. Kildow
17s‡	Newspaper Reference Methods .. (2 cred.; soph. with average of C, jr., sr.; prereq., 5, 13, or 14)	I	TTh	19P	Mr. Desmond
41w‖	Editing for Non-Majors ..... (3 cred.; jr., sr.; prereq., 13, and a professional or vocational major in colleges other than S. L. & A.)				
	Lect.	I	MW	10P	Mr. Kildow
	Lab. Sec. 1	VIII, IX	M	10P	
	2	I, II	T	19P	
	3	VII, VIII	Th	10P	
51f-52w*†	News Editing ..... (4 cred.; jr., sr.; prereq., 15)				
	Lect.	III	T	14P	Mr. Olson,
	Lab. Sec. 1	VI, VII	M	19P	Mr. Barnhart,
	2	VI, VII	T	19P	
	3	VIII, IX	W	19P	
	4	VII, VIII	Th	19P	
55f*¶	Advertising Typography ..... (3 cred.; jr., sr.; prereq., 41 or 51)				
	Lect.	IV	M	14P	Mr. Olson,
	Lab. Sec. 1	VII, VIII	MW	20P	Mr. Barnhart,
	2	VI, VII	TTh	20P	
	3	VII, VIII	WF	20P	
56w*¶	Newspaper Typography and Make-up ..... (3 cred.; jr., sr.; prereq., 41 or 51)				
	Lect.	IV	T	14P	Mr. Olson,
	Lab. Sec. 1	VIII, IX	MW	20P	Mr. Barnhart
	2	I, II	WF	20P	
	3	VI, VII	TTh	20P	

* A laboratory fee of $1 per credit hour is charged for this course.
† The entire course must be completed before credit is received for any quarter.
‡ No student may receive credit for both Journalism 17 and Library Methods 1.
§ May be taken at the same time.
¶ Credit will be allowed for only one quarter of Courses 55 and 56.
‖ A laboratory fee of $1 per quarter is charged for this course.

No.	Title	Hour	Day	Bldg.	Instructor
56s*¶	Newspaper Typography and Make-up ..... (See 56w)				
	Lect.	IV	T	14P	Mr. Olson,
	Lab. Sec. 1	VIII, IX	MW	20P	Mr. Barnhart
	2	VI, VII	TTh	20P	
	3	VI, VII	WF	20P	
58*	*Advanced Typography* ..... (2 cred.; jr., sr.; prereq., 55, 56, or 57)	*Not offered*			
60f-61w-62s†	The Weekly Newspaper ..... (9 cred.; jr., sr.; prereq., 15)	I	TThS	10P	Mr. Barnhart
65f	Women's Departments ..... (3 cred.; jr., sr.; prereq., 15)	I	TThS	14P	Mr. Kildow
69s	Newspaper and Magazine Articles (3 cred.; jr., sr.; prereq., 15 or 41)	I	MWF	10P	Mr. Kildow
70f-71w†	Business and Specialized Journalism ..... (6 cred.; jr., sr.; prereq., 15 or 69)	II	MWF	10P	Mr. Ford
73f-74w†	Newspaper and Magazine Articles (6 cred.; jr., sr.; prereq., 15)	VI	MWF	10P	Mr. Steward
75s	Law of the Press ..... (2 cred.; jr., sr.; prereq., 52)	III	TTh	14P	Mr. Desmond
76f	Critical Writing ..... (3 cred.; jr., sr.; prereq., 15, 69, or 73-74)	III	TThS	10P	Mr. Ford
78s	Press Relations ..... (3 cred.; jr., sr.; prereq., 69 or 73)	IV	MWF	19P	Mr. Barnhart
82s	Supervision of School Publications ..... (3 cred.; jr., sr.; prereq., 41 or 51)	IV	MWF	14P	Mr. Kildow
94f-95w†	Newspaper Administration ..... (3 cred.; jr., sr.; prereq., 52)	II	MWF	14P	Mr. Olson
96s	The Journalism of Finance and Commerce ..... (3 cred.; jr., sr.; prereq., 15, and 10 cred. in econ. or bus. adm.)	VI	MWF	10P	Mr. Steward
101w	The Reporting of Public Affairs (3 cred.; jr., sr., grad.; prereq., 52 and 10 cred. in pol. sci. Required of all men majors)	II	TThS	14P	Mr. Ford
103s	Literary Aspects of Journalism .. (3 cred.; jr., sr.; prereq., Eng. 21-22 or 22-23)	III	MWF	10P	Mr. Ford
110s	History of Journalism ..... (3 cred.; jr., sr., grad.; prereq., 15)	II	MWF	14P	Mr. Casey

* A laboratory fee of $1 per credit hour is charged for this course.
† The entire course must be completed before credit is received for any quarter.
¶ Credit will be allowed for only one quarter of Courses 55 and 56.

No.	Title	Hour	Day	Bldg.	Instructor
111f	Foreign News Sources ..... (3 cred.; jr., sr., grad.; prereq., 41 or 51 and a hist. or pol. sci. course in international relations, or consent of instructor)	III	MWF	14P	Mr. Desmond
112w	Current Newspaper Problems ... (3 cred.; jr., sr.; prereq., 110 or 111)	III	MWF	10P	Mr. Desmond
130f-131w-132s†	The Press and Public Opinion .. (9 cred.; sr., grad.; prereq., 20 credits in soc., psy., and pol. sci.)	IV	MWF	10P	Mr. Casey
140f-141w-142s†	Contemporary Affairs ..... (9 cred.; sr., grad.; prereq., 110 and 20 cred. in soc. sci.)	1:30-3:00	TTh	14P	Mr. Casey, Mr. Olson, Mr. Desmond
210	Research in Newspaper Problems (Seminar course for grad. students; 2 cred.; prereq., consent of dept.)	Ar	Ar	Ar	Mr. Casey, Mr. Olson

LATIN

Major Adviser

Professor Pike.

Major Sequence

Courses 51 or 71, 52 or 62, 53 or 63, and one of the following combinations: (a) 121, 122, 123, and 131, 132, 133, (b) 131, 122, 123, and Greek 51, 52, 53 or nine credits from the following: History 50-51-52, (c) 121, 132, 133, and Greek 51, 52, 53 or History 50-51-52.

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

Arrangements for tutorial instruction amounting to six senior college credits per quarter may be made with the department. This work is open only to students of exceptional ability.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

Students entering with one year of Latin will take 3, or 2 and 3. Students entering with two years of Latin will take 11 and 12 in their first year and any two of 21, 22, 23 in their second year. Students entering with three years of Latin will take any two of 21, 22, 23. Students entering with no Latin will take 1-2 and 3 in their first year; 11 and 12 in their second year; and any two of 21, 22, and 23 in their third year.

Junior College Courses

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†§	Beginning Latin ..... (10 cred.; fr., soph., jr., sr.; no prereq.)	IV	MTWFS	110F	Mrs. Babcock

† The entire course must be completed before credit is received for any quarter.
§ Credit is usually not given for more than one beginning language. See page 6.

No.	Title	Hour	Day	Bldg.	Instructor
3s	Caesar ..... (5 cred.; fr., soph., jr., sr.; prereq., 1-2, or 1 yr. Latin)	IV	MTWFS	110F	Mrs. Babcock
11f	Virgil I ..... (5 cred.; fr., soph., jr., sr.; prereq., 1-2, 3, or 2 yrs. Latin)	III	MTWFS	109F	Mr. Cram
12w	Virgil II ..... (5 cred.; fr., soph., jr., sr.; prereq., 1-2, 3, or 2 yrs. Latin)	III	MTWFS	109F	Mr. Cram
21f	Selections ..... (5 cred.; fr., soph., jr., sr.; prereq., any two of 11, 12, 13, or 3 or 4 yrs. of Latin)	IV	MTWFS	109F	Mr. Pike
22w	Selections and Survey ..... (5 cred.; fr., soph., jr., sr.; prereq., any two of 11, 12, 13, or 3 or 4 yrs. of Latin)	IV	MTWFS	109F	Mr. Pike
23s	Plautus and Terence ..... (5 cred.; fr., soph., jr., sr.; prereq., any two of 11, 12, 13, or 3 or 4 yrs. of Latin)	IV	MTWFS	109F	Mr. Cram

Students entering winter quarter.—Students with one year of Latin may elect 2w. Students with two years of Latin may elect 12w. Students with three or four years of Latin may elect 22w.

Students entering spring quarter.—Students with one year of Latin may elect 3s. Students with three or four years of Latin may elect 23s.

Senior College Courses

51	*Pliny's Letters* ..... (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	*Not offered*			
52	*Horace's Satires and Epistles* .. (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	*Not offered*			
53	*Suetonius, Selected Lives* ..... (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	*Not offered*			
62w	Horace's Odes and Epodes ..... (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	I	TThS	109F	Mr. Cram
63s	Apuleius ..... (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	I	TThS	109F	Mr. Cram
71f	Cicero's De Amicitia and De Senectute ..... (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	I	TThS	109F	Mr. Cram
73s	Advanced Grammar and Composition* ..... (3 cred.; jr., sr.; prereq., any two of 51, 52, 53, or equiv.)	III	MWF	109F	Mr. Pike
121f	Advanced Virgil ..... (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.)	II	MWF	109F	Mr. Pike

* Required of students who expect a teaching recommendation.

No.	Title	Hour	Day	Bldg.	Instructor
122	*Cicero's Letters* ..... (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.)	*Not offered*			
123	*Medieval Latin* ..... (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.)	*Not offered*			
131	*Juvenal* ..... (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.)	*Not offered*			
132w	Seneca's Epistles ..... (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.)	II	MWF	109F	Mr. Pike
133s	Vulgar Latin ..... (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.)	II	MWF	109F	Mr. Pike
221f-222w-223s	Graduate Seminar: Cicero's Phil. Works ..... (9 cred.)	VIII, IX	T	314Lib	Mr. Pike
241f-242w-243s	Graduate Seminar: Introduction to Classical Philology ..... (9 cred.)	VIII, IX	Th	314Lib	Mr. Cram

LIBRARY METHODS

NOTE.—For the special course in library training, see page 10. For program of professional courses in library instruction and for the course in hospital library service, consult the bulletin of the Division of Library Instruction.

No.	Title	Hour	Day	Bldg.	Instructor
1f,w,s*	Use of Books and Libraries .... (2 cred.; fresh., soph. only; no prereq.)				
	Sec. 1	II	MW	3Lib	Miss Firkins
	2	IV	MW	3Lib	Mr. Russell, Miss Moen
	3	VI	MW	5Lib	Mrs. Blomgren

MATHEMATICS

Major Advisers

Professors Brink, Hart, and Jackson; Associate Professor Underhill.

Major Sequence

Prerequisite: Mathematics 30.

Courses 50, 51, 52, 62; and either 15 additional credits in senior college courses, other than 70, or 6 additional credits in senior college courses, other than 70, and 10 credits of Physics 101-103-105; a comprehensive examination on the material related

* For students in the College of Science, Literature, and the Arts. Others must obtain a special card from the junior college office. Carries no professional credit.

to Courses 5, 6, 7, 30, 50 to be taken during the first quarter of residence after completing Course 50 or on transfering to this college with credit in differential calculus.

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

Placement tests.—In each of Courses 3, 4, 5, and 8 a placement test will be given at the *first meeting* of the class. Students who fail in this test will be advised to take a more elementary course. It is especially important to attend the first meeting of the class promptly. Late registrants must take the test before entering class.

Junior College Courses

No.	Title	Hour	Day	Bldg.	Instructor
3f*	Higher Algebra, Short Course .. (4 cred.; all; prereq., 1 yr. elem. alg.)	III	MWThF	206OLa	Ar
3w*	Higher Algebra, Short Course .. (See 3f)	IV	MTWF	206OLa	Ar
4f*	Trigonometry, Short Course .... (4 cred.; all; prereq., 3 or 5 or prep. higher alg.)	II	MTWF	166Ph	Ar
4w*	Trigonometry, Short Course .... (See 4f)	III	MWThF	206OLa	Ar
4s*	Trigonometry, Short Course .... (See 4f)	IV	MTWF	206OLa	Ar
5f	Higher Algebra ..... (5 cred.; all; prereq., 1 yr. elem. alg.)				
	Sec. 1	II	MWThFS	206OLa	Ar
	2	VI	MTWThF	166Ph	Ar
5w	Higher Algebra ..... (See 5f)	VI	MTWThF	133Ph	Ar
5s	Higher Algebra ..... (See 5f)	I	MWThFS	206OLa	Ar
6f¶	Trigonometry ..... (5 cred.; fr., soph., jr., sr.; prereq., 3 or 5, or prep. higher algebra)	II	MWThFS	104F	Ar
6w¶	Trigonometry ..... (See 6f)	VI	MTWThF	105F	Ar
6s¶	Trigonometry ..... (See 6f)	IV	MTWFS	105F	Ar
7f¶	College Algebra ..... (5 cred.; all; prereq., 5 and 6 or prep. higher algebra and 6)	I	MWThFS	105F	Ar

* For pre-med. and pre-dent. students, and others who desire only the mathematics necessary in the first course in physics.

¶ Course 8 involves some duplication of material with Courses 6 and 4. Any student who has taken Course 4 or 6 may take Course 8 for 4 credits. Any student who has taken Course 8 may take Course 4 for 3 credits or Course 6 for 4 credits. No student may receive credit for both Courses 7 and 8.

Pre-business students who elect mathematics to meet the requirement of 10 credits in mathematics or laboratory science, should take 5 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
7w¶	College Algebra ..... (See 7f)	II	MWThFS	104F	Ar
7s¶	College Algebra ..... (See 7f)	VI	MTWThF	105F	Ar
8f¶	Commerce Algebra ..... (5 cred.; pre-bus. stud.; prereq., 5 or prep. high. alg.)	I	MWThFS	206OLa	Ar
8w¶	Commerce Algebra ..... (See 8f)	II	MWThFS	206OLa	Ar
8s¶	Commerce Algebra ..... (See 8f)	VI	MTWThF	104F	Ar
20w	Mathematics of Investment .... (5 cred.; all; prereq., 8 or 47, or 6 and 7)	I	MWThFS	166Ph	Mr. Hart
20s	Mathematics of Investment ..... (See 20w)	II	MWThFS	133Ph	Ar
21	*Elements of the Mathematics of Life Insurance* ..... (3 cred.; all; prereq., 20)	*Not offered*			
30f	Analytic Geometry ..... (6 cred.; all; prereq., 6 and 7)	I	MTWThFS	104F	Mr. Underhill
30w	Analytic Geometry ..... (See 30f)	I	MTWThFS	105F	Mr. Brink
30s	Analytic Geometry ..... (See 30f)	II	MTWThFS	102F	Mr. Hart
	Senior College Courses				
50f	Calculus I ..... (5 cred.; jr., sr.; prereq., 30)	III	MTWFS	105F	Mr. Jackson
50w	Calculus I ..... (See 50f)	I	MWThFS	104F	Mr. Underhill
51w	Calculus II ..... (5 cred.; jr., sr.; prereq., 50)	III	MTWFS	105F	Mr. Jackson
51s	Calculus II ..... (See 51w)	I	MWThFS	104F	Mr. Underhill
52f	Calculus III ..... (5 cred.; jr., sr.; prereq., 51)	II	MWThFS	101F	Mr. Underhill
52s	Calculus III ..... (See 52f)	III	MTWFS	105F	Mr. Jackson
60s	Synthetic Metric Geometry ..... (3 cred.; jr., sr.; prereq., 30)	VI	MWF	102F	Miss Gibbens
62w	Theory of Equations I ..... (3 cred.; jr., sr.; prereq., 50)	VII	MWF	101F	Mr. Bussey
63	*Theory of Equations II* ..... (3 cred.; jr., sr.; prereq., 62)	*Not offered*			
70	*Hist. of Elem. Math.* ..... (3 cred.; jr., sr.; prereq., 30)	*Not offered*			
71f	Solid Analytic Geometry ..... (3 cred.; jr., sr.; prereq., 50)	III	TThS	101F	Mr. Bussey

¶ Course 8 involves some duplication of material with Courses 6 and 4. Any student who has taken Course 4 or 6 may take Course 8 for 4 credits. Any student who has taken Course 8 may take Course 4 for 3 credits or Course 6 for 4 credits. No student may receive credit for both Courses 7 and 8.

No.	Title	Hour	Day	Bldg.	Instructor
102s	Advanced Analytical Geometry .. (3 cred.; jr., sr., grad.; prereq., 51)	III	TThS	101F	Mr. Bussey
106f	Differential Equations ..... (3 cred.; jr., sr., grad.; prereq., 51)	III	MWF	101F	Miss Gibbens
107w-108s	Advanced Calculus ..... (6 cred.; jr., sr., grad.; prereq., 52)	III	MWF	101F	Miss Carlson
116w	Differential Geometry ..... (3 cred.; jr., sr., grad.; prereq., 52)	III	TThS	101F	Mr. Underhill
118f	Vector Analysis ..... (3 cred.; jr., sr., grad.; prereq., 51)	VII	MWF	101F	Mr. Hart
121-122-123	*Math. Theory of Statistics* ..... (9 cred.; jr., sr., grad.; prereq., 51 or 47, 48, 49)	*Not offered*			
131s	Advanced Algebraic Theory .... (3 cred.; jr., sr., grad.; prereq., 62)	VII	MWF	101F	Mr. Hart
141	*Projective Geometry* ..... (3 cred.; jr., sr., grad.; prereq., 51)	*Not offered*			
142	*Theory of Invariants* ..... (3 cred.; jr., sr., grad.; prereq., 51 and 62)	*Not offered*			
143	*Integral Equations* ..... (3 cred.; jr., sr., grad.; prereq., 107)	*Not offered*			
144f-145w-146s	Topics in Analysis ..... (9 cred.; jr., sr., grad.; prereq., 51)	VIII	MTF	105F	Mr. Jackson
222w-223s	Calculus of Variations ..... (6 cred.; grad.; prereq., 206, 207, 208)	Ar	Ar	Ar	Mr. Underhill
251f	Functions of Infinitely Many Variables ..... (3 cred.; grad.; prereq., 206, 207, 208)	Ar	Ar	Ar	Mr. Hart
271f-272w-273s	Theory of Linear Differential and Integral Equations ..... (9 cred.; grad.; prereq., 206, 207, 208)	Ar	Ar	Ar	Mr. Brink

NOTE.—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.

MECHANICAL ENGINEERING

COLLEGE OF ENGINEERING AND ARCHITECTURE

NOTE.—Students will register for these courses in the order 11-12-13. They may be reassigned by the department as the enrolment demands. A student transferred to 12 for his first quarter will follow this by 13 and then 11; a student transferred to 13 for his first quarter will follow this by 11 and then 12.

No.	Title	Hour	Day	Bldg.	Instructor
11f,w,s, 12f,w,s, 13f,w,s	Elem. Shop Practice	VI-IX‡	T	ME	Mr. Koepke
	(2 cred. per qtr.§; pre-dent. only; no prereq.)	VII	M	ME	and others

MILITARY SCIENCE AND TACTICS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w	First Year Basic Course				
	(No cred.; fr.; no prereq.)				
	Sec. 1	II	MWF	A	Ar
	2	III	MWF	A	Ar
	3	IV	MWF	A	Ar
	4	V	MWF	A	Ar
	5	VI	MWF	A	Ar
	6	VII	MWF	A	Ar
	7	VIII	MWF	A	Ar
	8	II	TThS	A	Ar
	9	III	TThS	A	Ar
3s	First Year Basic Course				
	(No cred.; fr.; no prereq.)				
	Sec. 1	II	MW & IX T	A	Ar
	2	III	MW & IX T	A	Ar
	3	IV	MW & IX T	A	Ar
	4	V	MW & IX W	A	Ar
	5	VI	MW & IX W	A	Ar
	6	VII	MW & IX W	A	Ar
	7	VIII	MW & IX W	A	Ar
	8	II	TTh & IX W	A	Ar
	9	III	TTh & IX W	A	Ar
4f-5w	Second Year Basic Course				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	II	MWF	A	Ar
	2	III	MWF	A	Ar
	3	IV	MWF	A	Ar
	4	V	MWF	A	Ar
	5	VI	MWF	A	Ar
	6	VII	MWF	A	Ar
	7	VIII	MWF	A	Ar
6s	Second Year Basic Course				
	(No cred.; soph.; no prereq.)				
	Sec. 1	II	MW & IX T	A	Ar
	2	III	MW & IX T	A	Ar
	3	IV	MW & IX T	A	Ar
	4	V	MW & IX W	A	Ar
	5	VI	MW & IX W	A	Ar
	6	VII	MW & IX W	A	Ar
	7	VIII	MW & IX W	A	Ar
	8	II	TTh & IX W	A	Ar
	9	III	TTh & IX W	A	Ar

‡ Students having conflicts with this program may register with one of the engineering sections, with permission from Mr. Koepke.

§ Does not carry credit except for pre-dental students.

No.	Title	Hour	Day	Bldg.	Instructor
51f-52w	First Year Advanced Course	Total of five hours to	be taken	as follows:	
	(Cred.*; prereq., 4-5-6)	One of the two-hour	sections:		
	Sec. 1	II	TTh	A	Ar
	2	III	TTh	A	Ar
		One of the three-hour	sections:		
	Sec. 1	II	MWF	A	Ar
	2	III	MWF	A	Ar
	3	VI	MWF	A	Ar
	4	VIII	MWF	A	Ar
53s	First Year Advanced Course	Total of five hours to	be taken	as follows:	
	(Cred.*; prereq., 4-5-6)	One of the four-hour	sections:		
	Sec. 1	II	MTWTh	A	Ar
	2	III	MTWTh	A	Ar
		One of the drill sections:			
		IX	T or W	A	Ar
54f-55w	Second Year Advanced Course ..	Total of five hours to	be taken	as follows:	
	(Cred.*; prereq., 4-5-6)	One of the two-hour	sections:		
	Sec. 1	II	TTh	A	Ar
	2	III	TTh	A	Ar
		One of the three-hour	sections:		
	Sec. 1	II	MWF	A	Ar
	2	III	MWF	A	Ar
	3	VI	MWF	A	Ar
	4	VIII	MWF	A	Ar
56s	Second Year Advanced Course ..	Total of five hours to	be taken	as follows:	
	(Cred.*; prereq., 4-5-6)	One of the two-hour	sections:		
	Sec. 1	II	MW	A	Ar
	2	III	MW	A	Ar
	3	II	TTh	A	Ar
	4	III	TTh	A	Ar
		One of the drill sections:			
	Sec. 1	II	MW & IX T	A	Ar
	2	III	MW & IX T	A	Ar
	3	IV	MW & IX T	A	Ar
	4	V	MW & IX W	A	Ar
	5	VI	MW & IX W	A	Ar
	6	VII	MW & IX W	A	Ar
	7	VIII	MW & IX W	A	Ar
	8	II	TTh & IX W	A	Ar
	9	III	TTh & IX W	A	Ar

MUSIC

NOTE.—Courses in music are not open to freshmen and sophomores except those working for a major in music. But under certain conditions, freshmen and sophomores are allowed to take practical music in the General Extension Division. See General Regulations, sec. 5.

Students may enter courses in practical music any quarter.

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 6 to 8, securing 144 credits in courses other than practical music (piano, voice, etc.) and physical education. During the first two years he will register for English A-B-C or Composi-

* For the amount of credit given for the work of the advanced R.O.T.C., see page 18.

tion 4-5-6,* foreign language, History 11-12-13, and Psychology 1-2 and 4-5 or 7, and the following courses in music: 1-2-3, 4-5-6, 7-8-9.

He must earn thirty-six credits in practical music, the number of credits in his major instrument to be determined by the department.§

Major Advisers

Professors Scott, Ferguson, and Killeen.

Major Sequences

A. Courses 103-104-105, 106-107-108, 109-110-111, 112-113-114, 121-122-123.
B. Courses 106-107-108, 100-101-102, 109-110-111, 112-113-114, 124-125-126.
C. Courses 86-87-88, 89-90-91, 106-107-108, 109-110-111, 112-113-114.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

Fees

Courses A-B-C, 10, 11, 12, 13

1 lesson per week, 2 credits in one subject	$35.00
2 lessons per week, 4 credits in one subject	65.00
2 lessons per week, 2 credits in each of two subjects	70.00

Courses 14 to 26

1 lesson per week, 2 credits in one subject	40.00
2 lessons per week, 4 credits in one subject	75.00
2 lessons per week, 2 credits in each of two subjects	80.00

NOTE.—Courses numbering from 10 to 26 inclusive carry either 2 or 4 credits per quarter and must be repeated until the practical music requirement has been met.

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s†	Harmony (9 cred.; fr. mu.; no prereq.)	VI	MWF	103Mu	Mr. Scott
1w-2s-3su†	Harmony (See 1f-2w-3s)	III	MWF	103Mu	Miss Reeves
4f-5w-6s†	Counterpoint (6 cred.; soph. mu.; prereq., 1-2-3)	III	TTh	103Mu	Mr. Ferguson
7f-8w-9s†	Ear Training (3 cred.; fr., soph. mu.; no prereq.)	VI	TTh	Mu	Miss Kendall, Miss Reeves
7w-8s-9su†	Ear Training (See 7f-8w-9s)	VII	TTh	103Mu	Miss Kendall

* Unless exempted by placement tests. See Composition program.

† The entire course must be completed before credit is received for any quarter.

§ Entrance requirements, according to instrument selected are:

Piano: Any major or minor scale in octaves, thirds, sixths, or tenths, M.M. quarter notes=108; Bach Invention or dance from one of the suites; a sonata by Haydn or Mozart; a modern composition of equal difficulty with the sonata.

Voice: Good natural equipment and two years of piano.

Violin: Major and minor scales, arpeggios; the simpler Kreutzer Etudes; a sonata by Handel, Haydn, Mozart, or Schubert; a more modern work displaying special technic peculiar to the violin.

Organ: Same as for piano.

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.

No.	Title	Hour	Day	Bldg.	Instructor
Af-Bw-Cs‡§	Piano ..... (6 or 12 cred.; no prereq.)	Ar	Ar	Mu	Ar
10f,w,s§	Organ	Ar	Ar	Mu	Ar
11f,w,s§	Piano	Ar	Ar	Mu	Ar
12f,w,s§	Voice	Ar	Ar	Mu	Ar
13f,w,s§	Violin	Ar	Ar	Mu	Ar
14f,w,s§	Viola	Ar	Ar	Mu	Ar
15f,w,s§	Cello	Ar	Ar	Mu	Ar
16f,w,s§	Double Bass	Ar	Ar	Mu	Ar
17f,w,s§	Flute	Ar	Ar	Mu	Ar
18f,w,s§	Oboe	Ar	Ar	Mu	Ar
19f,w,s§	Clarinet	Ar	Ar	Mu	Ar
20f,w,s§	Bassoon	Ar	Ar	Mu	Ar
21f,w,s§	Trumpet	Ar	Ar	Mu	Ar
22f,w,s§	French Horn	Ar	Ar	Mu	Ar
23f,w,s§	Trombone	Ar	Ar	Mu	Ar
24f,w,s§	Tuba	Ar	Ar	Mu	Ar
25f,w,s§	Percussion	Ar	Ar	Mu	Ar
26f,w,s§	Harp	Ar	Ar	Mu	Ar
40f-41w-42s*	Orchestra ..... (3 cred.; jr., sr.)	7:30 p.m.	W	MuAud	Mr. Pepinsky
43f-44w-45s¶	University Chorus ..... (3 cred.; all mu., acad. jr., sr.; prereq., consent of director)	IX	T	MuAud	Mr. Killeen
86f-87w-88s	Normal Piano ..... (6 cred.; jr.; prereq., 2 yrs. piano)	VII	MWF	103Mu	Miss Reeves
89f-90w-91s	Advanced Normal Piano ..... (6 cred.; sr.; prereq., 86-87-88)	VIII	MWF	103Mu	Miss Reeves
100f-101w-102s	Composition-Orchestration ..... (6 cred.; jr., sr.; prereq., 1-2-3, 4-5-6)	Ar	Ar	Mu	Mr. Ferguson
103f-104w-105s	Analysis ..... (3 cred.; soph., jr., sr.; prereq., 1-2-3)	III	T	4Mu	Mr. Pepinsky
106f-107w-108s†	History of Music ..... (9 cred.; jr., sr.; prereq., 1-2-3)	II	MWF	4Mu	Mr. Ferguson
109f-110w-111s	Bach and Beethoven ..... (9 cred.; sr.; prereq., 106-107-108)	VII, VIII	TTh	104Mu	Mr. Ferguson
112f-113w-114s	Ensemble ..... (6 cred.; jr.)				
	Instrumental Sec. 1	II	TTh	4Mu	Mr. Pepinsky
	Vocal 2	II	TTh	104Mu	Miss Hull
115f-116w-117s	Adv. Ensemble: Instrumental .. (6 cred.; sr.; prereq., 112-113-114)	IV	MW	104Mu	Mr. Pepinsky
121f-122w-123s	Romantic Movement ..... (6 cred.; jr., sr.; prereq., 106-107-108)	VII	WF	104Mu	Miss Kendall
124f-125w-126s	Advanced Harmony ..... (6 cred.; jr.; prereq., 4-5-6)	IV, V	T	103Mu	Mr. Scott

* Students majoring in music may take 4 years of orchestra.

† The entire course must be completed before credit is received for any quarter.

‡ Carries no credit for students majoring in piano. May be taken only with the consent of the instructor.

¶ Students may receive credit for 2 years of chorus.

§ See statement of fees, page 82.

No.	Title	Hour	Day	Bldg.	Instructor
127f-128w-129s	Advanced Composition ..... (6 cred.; sr.; prereq., 100-101-102)	Ar	Ar	Ar	Mr. Ferguson
201f-202w-203s	Basis of Musical Expression	Consult the office of the department			

ORIENTATION

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	Man in Nature and Society ..... (10 cred.; entering freshmen; no prereq.)				Mr. Sirich, Mrs. Kuypers, and others
	Lect.	III	Th	OLAud(f)	
	Sec. 1	I	MWThFS	101F	
	2	II	MWThFS	102F	
	3	III	MTWFS	102F	
	4	IV	MTWFS	5F	
	5	VI	MTWThF	5F	
	6	VII	MTWThF	5F	
1w-2s†	Man in Nature and Society ..... (See 1f-2w)	III	MTWFS	6F	

PHILOSOPHY

Major Adviser

Professor Wilde.

Major Sequence

From 27 to 36 credits in senior college courses, including Courses 50-51-52; 124 or 108-109-110 or 135-136; 141 or 147-148.

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	Problems of Philosophy ..... (5 cred.; soph., jr., sr.; no prereq.)				
	Sec. 1	I	MWThFS	321F	Mr. Conger
	2	II	MWThFS	321F	Ar
1w	Problems of Philosophy ..... (See 1f)				
	Sec. 1	III	MTWFS	321F	Mr. Swenson
	2	VII	MTWThF	321F	Mr. Conger
1s	Problems of Philosophy ..... (See 1f)	IV	MTWFS	321F	Mr. Conger
2f	Logic ..... (5 cred.; soph., jr., sr.; no prereq.)				
	Sec. 1	III	MTWFS	322F	Mr. Swenson
	2	IV	MTWFS	321F	Ar
2w	Logic ..... (See 2f)	VI	MTWThF	321F	Ar
2s	Logic ..... (See 2f)				
	Sec. 1	III	MTWFS	321F	Ar
	2	VII	MTWThF	321F	Ar

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
3f	Ethics ..... (5 cred.; soph., jr., sr.; no prereq.)	I	MWThFS	322F	Mr. Wilde
3w	Ethics ..... (See 3f)	I	MWThFS	321F	Ar
3s	Ethics ..... (See 3f)	I	MWThFS	322F	Mr. Wilde
10s	Science and Religion ..... (2 cred.; soph., jr., sr.; prereq., 10 cred. in phil. or a science)	VII	TTh	204F	Mr. Swenson
50f	Ancient Philosophy ..... (3 cred.; jr., sr.; prereq., 10 cred. or 15 cred. in phil. and soc. sci.)	IV	MWF	322F	Mr. Wilde
51w	Medieval and Renaissance Philosophy ..... (3 cred.; jr., sr.; prereq., 10 cred. or 15 cred. in phil. and soc. sci.)	IV	MWF	322F	Mr. Wilde
52s	Modern Philosophy ..... (3 cred.; jr., sr.; prereq., 10 cred. or 15 cred. in phil. and soc. sci.)	IV	MWF	322F	Mr. Wilde
100f	History of Religions ..... (3 cred.; jr., sr., grad.; prereq., 10 cred.)	II	TThS	322F	Mr. Conger
101w	Psychology of Religion ..... (3 cred.; jr., sr., grad.; prereq., 10 cred.)	II	TThS	322F	Mr. Conger
102s	Philosophy of Religion ..... (3 cred.; jr., sr., grad.; prereq., 10 cred.)	II	TThS	322F	Mr. Swenson
103	*Esthetics* ..... (3 cred.; jr., sr., grad.; prereq., 10 cred.)	*Not offered*			
104	*History of Esthetic Theory* .... (3 cred.; jr., sr., grad.; prereq., 10 cred.)	*Not offered*			
108f-109w-110s	History of Ethics ..... (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil.)	IV	TS	322F	Mr. Wilde
115w	Contemporary Philosophy ..... (3 cred.; jr., sr., grad.; prereq., 50 or 51)	III	MWF	322F	Mr. Conger
120f	Scandinavian Philosophy ..... (3 cred.; jr., sr., grad.; prereq., 10 cred.)	VII	MWF	322F	Mr. Swenson
124	*Political and Social Ethics* ..... (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil.)	*Not offered*			
129w	Development of Political Thought (Same as Pol. Sci. 165. 5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil.)	I	MWThFS	322F	Mr. Wilde

No.	Title	Hour	Day	Bldg.	Instructor
135w-136s	Philosophy of Plato ..... (6 cred.; jr., sr., grad.; prereq., 10 cred.)	VIII	MWF	339Lib	Mr. Swenson
141s	Metaphysics ..... (5 cred.; jr., sr., grad.; prereq., 10 cred. in phil. incl. 2)	III	MTWFS	322F	Mr. Conger
147f-148w	Advanced Logic ..... (6 cred.; jr., sr., grad.; prereq., 10 cred. in phil. incl. 2)	II	MWF	322F	Mr. Swenson
151-152	*Modern Idealism* ..... (6 cred.; sr., grad.; prereq., 15 cred. in phil.)	*Not offered*			
161f-162w-163s	Seminar in Philosophy ..... (9 cred.; sr., grad.; prereq., 20 cred. in phil. and consent of instructor)	Ar	Ar	Ar	Mr. Wilde, Mr. Swenson, Mr. Conger

PHYSICAL EDUCATION FOR MEN

A physical examination is required of all new matriculants and of all others using the departmental privileges, at the beginning of the year, and as often during their college course as their physical condition may indicate.

Courses 1, 2, and 3 are prescribed for all freshmen and must be taken in the first year of residence. Students entering in the winter and spring quarters will register for Courses 2 and 3, respectively, but must complete the entire sequence, 1f, 2w, 3s. Those students taking the required course in physical education, who cannot 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.

Advanced students who have not completed the previous requirement in freshman hygiene may register for Preventive Medicine 3.

For a special four-year professional course in physical education and athletic coaching, see bulletin of the College of Education. Students interested in this course should consult Professor Keller before registering.

Statement of fees.—For all courses, except 7, 8, 9, $1.50 per quarter. Maximum fee $1.50 per quarter.

No.	Title	Hour	Day	Bldg.	Instructor
1f,2w,3s‡	Freshman Physical Education .. (3 cred.; fr.; no prereq.)				
	Sec. 1	I	MWF	202S	
	2	I (winter and spring only)	TThS	202S	
	3	II	MWF	202S	
	4	II	TThS	202S	
	5	III	MWF	202S	
	6	III	TThS	202S	
	7	IV	MWF	202S	
	8	VI	MWF	202S	
	9	VII	MWF	202S	
	10	VIII	MWF	202S	

‡ See statement of fees, above.

No.	Title		Hour	Day	Bldg.	Instructor
7f,8w,9s	Advanced Leaders ..... (3 cred.; soph., jr., sr.; prereq., 1-2-3)					
		Lect.	IV	T	206A	Mr. Keller
		Lab.	Ar			
13f,14w,15s‡	Corrective Work ..... (3 cred.; by petition only)					
		Sec. 1	I	TThS	264S	Ar
		2	II	TThS		
		3	III	TThS		
16f,17w,18s‡	Drill Substitution ..... (No cred.; by petition only)					
		Sec. 1	I	MWF	264S	Ar
		2	II	MWF		
		3	III	MWF		
		4	IV	MWF		
		5	VI	MWF		
		6	VII	MWF		
		7	VIII	MWF		

PHYSICAL EDUCATION FOR WOMEN

This department aims to promote the physical efficiency of the women students. It gives physical examinations and advice to all on entrance, plans systematically to keep in close touch with them during their first two years of residence; gives courses in hygiene; organizes neuromuscular activity toward organic strength, nervous stability, conscious motor control, correct body mechanics, skill in handling the body in physical recreation, and the development of that valuable social quality known as good sportsmanship; co-operates 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 must be taken for six consecutive quarters in the Junior College. Every student must complete Courses 1, 2, and 3 in the order indicated. All sophomore students are allowed as free a choice as their physical condition permits (see Courses 7 to 31); except that students who cannot swim must register for Course 22-23 during the sophomore year. Physical examinations or consultations are required annually of all students. Additional six credits toward graduation can be gained by taking the following courses: 41, 42, 43-44, 45, 66-67-68, 69-70-71.

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 co-operation of others.

Statement of fees.—Elementary physical training, $2.50 a quarter. All other exercise courses, including swimming, for which registration is required, except Courses 24 and 27, $2 a quarter. Maximum fee paid by a student in physical education, $3.50 a quarter. No gymnasium fee is charged for Courses 4, 24, 27, or 45.

‡ See statement of fees, page 86.

No.	Title	Hour	Day	Bldg.	Instructor
1f§	Freshman Physical Education ... (½ cred.; required of all students; no prereq.)				
	Lect. Sec. 1	I	W	201WGm	Ar
	2	II	T	201WGm	Ar
	3	II	Th	201WGm	Ar
	4	III	Th	201WGm	Ar
	5	IV	M	201WGm	Ar
	6	IV	T	201WGm	Ar
	7	VI	W	201WGm	Ar
	8	VI	Th	201WGm	Ar
	Lab. Sec. 1	II	MWF	3,151,153WGm	Ar
	2	III	MWF	3,151,153WGm	Ar
	3	III	TThS	3,151,153WGm	Ar
	4	IV	MWF	3,151,153WGm	Ar
	5	VI	MWF	3,151,153WGm	Ar
	6	VIII	MWF	3,151,153WGm	Ar
2w-3s*§	Freshman Physical Education .. (See 1f)				
	Sec. 1	II	MWF	3,151,153WGm	Ar
	2	III	MWF	3,151,153WGm	Ar
	3	III	TThS	3,151,153WGm	Ar
	4	IV	MWF	3,151,153WGm	Ar
	5	VI	MWF	3,151,153WGm	Ar
	6	VIII	MWF	3,151,153WGm	Ar
4s‖	Preliminary Hygiene (for nurses and transfer students) ..... (No cred.; no prereq.)	II	T	201WGm	Ar
7f,8w*§	Sophomore Gymnastics ..... (½ cred.; soph.; prereq., 1-2-3)	IV	TS	153WGm	Ar
9s§	Sophomore Archery ..... (½ cred.; soph.; prereq., 1-2-3)				
	Sec. 1	II	MW	151WGm	Ar
	2	IV	TS		Ar
	3	VII	WF		Ar
10f-11w*§	Sophomore Orthopedic and Individual Gymnastics ..... (1 cred.; soph.; prereq., 1-2-3)				
	Sec. 1	I	WF	3WGm	
	2	IV	TS	3WGm	
	3	VI	TTh	3WGm	
12s§	Sophomore Orthopedic and Individual Gymnastics ..... (See 10f-11w)	IV	TS	3WGm	Ar
13f-14w-15s¶§	Sophomore Natural Dancing .... (1½ cred.; soph.; prereq., 1-2-3)	VI	TTh	151WGm	Miss Timberman
13f,s-14w¶§	Sophomore Natural Dancing .... (See 13f. ½ credit)	II	TTh	151WGm	Miss Timberman
16f,17w§	Sophomore Games and Folk Dancing ..... (½ cred.; soph.; prereq., 1-2-3)	I	WF	151WGm	Miss Dickson

* Students may enter any quarter.

¶ Students may not enter the second or third quarter of the course.

§ See statement of fees, page 87.

‖ Students who have not completed the requirement in preliminary hygiene may register for this course or for Preventive Medicine 3.

No.	Title	Hour	Day	Bldg.	Instructor
18s§	Tennis				
	(½ cred.; soph.; prereq., 1-2-3)				
	Sec. 1	I	TTh	151WGm	Ar
	2	IV	TS	151WGm	Ar
	3	VI	TTh	151WGm	Ar
	4	VII	WF	151WGm	Ar
	5	VIII	TTh	151WGm	Ar
19f§	Sophomore Hockey				
	(½ cred.; soph.; prereq., 1-2-3)				
	Sec. 1	V	MW	151WGm	Ar
	2	VII	WF	151WGm	Ar
	3	VIII	TTh	151WGm	Ar
20w§	Sophomore Basket-Ball				
	(½ cred.; soph.; prereq., 1-2-3)				
	Sec. 1	V	MW	151WGm	Ar
	2	VII	WF	151WGm	Ar
	3	VIII	TTh	151WGm	Ar
21s§	Sophomore Baseball	V	MW	151WGm	Ar
	(½ cred.; soph.; prereq., 1-2-3)				
22f,s-23w¶§**	Sophomore Elem. Swimming				
	(1 cred.; soph.; prereq., 1-2-3)				
	Sec. 1	II	TTh	51WGm	Miss Starr and others
	2	III	MW	51WGm	Ar
	3	IV	TS	51WGm	Ar
	4	IV	MW	51WGm	Ar
	5	VII	TTh	51WGm	Ar
	6	VIII (3:30)	TTh	51WGm	Ar
	7	VIII (4:00)	TTh	51WGm	Ar
22f,s-23w¶§**	Sophomore Elem. Swimming	VII	WF	51WGm	Ar
	(See 22f,s-23w)				
24f,s‡	Sophomore Horseback Riding ...				
	((½ cred.; soph.; prereq., 1-2-3)				
	Sec. 1	VIII	TTh	Ar	Miss Starr
	2	IX	TTh	Ar	Miss Starr
25f,s-26w¶§**	Sophomore Intermed. Swimming				
	(1 cred.; soph.; prereq., 1-2-3, elementary swimming test)				
	Sec. 1	III	TTh	51WGm	Ar
	2	VIII½ (4:00)	MW	51WGm	Ar
	3	VI	MW	51WGm	Ar
27f‖	Sophomore Golf—Advanced	VI	TTh	Ar	Ar
	(½ cred.; soph.; prereq., 1-2-3)				
27s‖	Sophomore Golf—Elementary ...				
	(½ cred.; soph.; prereq., 1-2-3)				
	Sec. 1	I	TTh	Ar	
	2	II	TTh	Ar	
	3	II	MW	Ar	
	4	VII	TTh	Ar	

‡ Students registering for this course will pay for riding lessons at about $1 per lesson, but not the regular physical education fee. Attendance at class hour is required for credit.

§ See statement of fees, page 87.

¶ The winter quarter is not open to students who have not had the fall quarter.

‖ Students must supply their own golf equipment. Golf course at university recreation field will be used for Course 27f. Student tickets 10 for $4.50.

** No student may register for more than two quarters of swimming without permission. Course 22 is never closed for senior registration.

No.	Title	Hour	Day	Bldg.	Instructor
28f,s-29w*§‖	Sophomore Advanced Swimming (1 cred.; soph.; prereq., 1-2-3, inter. swim. test)	VIII	MW	51WGm	Miss Starr
30s§	Sophomore Life Saving and Water Sports ..... (½ cred.; soph.; prereq., 1-2-3, adv. swim. test)	IX	MW	51WGm	Miss Starr
31w§**	Sophomore Skating ..... (½ cred.; soph.; prereq., 1-2-3)				
	Sec. 1	VII	WF		Ar
	2	II	TTh		
41f,42s§	Individual Projects in Physical Activity ..... (2 cred.; jr., sr.; prereq., 6 qtrs.)	Ar	Ar		Ar
43w-44s§	Elem. Games and Folk Dancing (1 cred.; soph., jr.; prereq., 6 qtrs.)	V(w)	TF	151WGm	Ar
		VIII(s)	MW	151WGm	Ar
45f	Theory and Function of Play .. (3 cred.; jr., sr.; prereq., 43-44)	II	MWF	201WGm	Ar
66f-67w†-68s§	Interpretive Dancing ..... (3 cred.; jr., sr.; prereq., 6 qtrs.)	VII	MF(f,w) TF(s)	153WGm	Ar
69f-70w-71s‡§	Advanced Interpretive Dancing .. (3 cred.; jr., sr.; prereq., 13-14-15 or 66-67-68)	II W & IV IV	TS(f,w) MTS(s)	153WGm	Ar

Activities for Which No Registration Is Required

Elective Sports	IX	MTWTh	151WGm	
(Fall)—field hockey, volley ball; (Winter)—basket-ball, ice hockey; (Spring—track, baseball (with permission of director) swimming				
General Swimming	IX	MTWTh	51WGm	

PHYSICS

Major Advisers

Professors Buchta, Erikson, Miller, Tate, Valasek, and Zeleny.

Major Sequence

Courses 101-103-105, plus 6 additional credits, and Mathematics 50, 51, and 52.

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

Courses 3, 4, 13, 23, 24, 33, 34, 43, 44 comprise a general course in physics extending through five quarters. Those who intend to teach physics in secondary schools are

* The winter quarter is not open to students who have not had the fall quarter.

† Two quarters must be completed before credit is received for either quarter.

‡ The entire course must be completed before credit is received for any quarter.

§ See statement of fees, page 87.

‖ No student may register for more than two quarters of swimming without permission. Course 22 is never closed for senior registration.

** Class meetings will be fifty minutes in length, since weather and ice conditions will cause omissions at times.

advised to take Courses 52, 104, 124, 134, 144 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.

NOTE.—Courses in laboratory require separate registration.

Fees.—A laboratory fee of $2 a quarter is charged for each of the following courses: 4, 24, 34, 44, 52, 124, 134, 136, 144, 146, 148, 150.

Introductory Courses

No.	Title		Hour	Day	Bldg.	Instructor
3f	Elem. of Mechanics ..... (3 cred.; all; prereq., Math. 4, or 6)					
		Lect.	VIII	MWF	150Ph	Mr. Erikson
		Quiz	II	Th	150Ph	
			or			
			IX	Th	150Ph	
3w,s	Elem. of Mechanics ..... (See 3f)					
		Lect.	VIII	MWF	150Ph	Mr. Erikson
		Quiz	IX	F	150Ph	
4f,w,s	Elem. of Mechanics Lab. ..... (1 cred.; all; prereq., 3 or reg. in 3)					
		Sec. 1	VI, VII	T	153Ph	Mr. Buchta
		2	VIII, IX	T	153Ph	and assts.
		3	I, II	Th	153Ph	
		4	VIII, IX	Th	153Ph	
11s	Physics Survey .... (3 cred.; all; no prereq.)					
		Lect.	I	MWF	166Ph	Mr. Erikson
		Quiz	IX	T	166Ph	and others
13w,s	Acoustics ..... (3 cred.; all; prereq., 3 or reg. in 3)		VIII	MWF	166Ph	Mr. Buchta
23f	Heat ..... (3 cred.; all; prereq., 3)					
		Lect.	III	TThS	166Ph	Mr. Miller
		Quiz	IX	T	166Ph	Mr. Miller
23w	Heat ..... (See 23f)					
		Lect. Sec. 1	II	MWF	150Ph	Mr. Miller
		2	VI	MWF	150Ph	
		Quiz Sec. 1	II	Th	150Ph	
		2	IX	Th	150Ph	
24f	Heat Laboratory ..... (1 cred.; all; prereq., 4, 23, or reg. in 23)					
		Sec. 1	I, II	T	244Ph	Mr. Miller
		2	VI, VII	T	244Ph	and assts.
		3	VIII, IX	Th	244Ph	
		4	I, II	F	244Ph	
		5	VIII, IX	F	244Ph	
24w	Heat Laboratory ..... (See 24f)					
		Sec. 1	VI, VII	T	244Ph	Mr. Miller
		2	VIII, IX	Th	244Ph	and assts.
		3	I, II	F	244Ph	
		4	VI, VII	Th	244Ph	

No.	Title	Hour	Day	Bldg.	Instructor
33f	Optics ..... (3 cred.; all; prereq., 3)				
	Lect.	I	TThS	133Ph	Mr. Buchta
	Quiz	IX	F	133Ph	
33s	Optics ..... (See 33f)				
	Lect.	I	TThS	133Ph	Mr. Buchta
	Quiz	IX	T	133Ph	
34f,s	Optics Laboratory ..... (1 cred.; all; prereq., 4 and 33 or reg. in 33)				
	Sec. 1	VI, VII	Th	236Ph	Mr. Valasek
	2	VI, VII	F		and assts.
43w	Electricity ..... (3 cred.; all; prereq., 3)				
	Lect.	III	TThS	150Ph	Mr. Zeleny
	Quiz	IX	T	150Ph	Mr. Zeleny
43s	Electricity ..... (See 43w)				
	Lect. Sec. 1	II	MWF	150Ph	Mr. Zeleny
	2	VI	MWF	150Ph	
	Quiz Sec. 1	II	Th	150Ph	
	2	IX	Th	150Ph	
44w	Electricity Laboratory ..... (1 cred.; all; prereq., 4, 43, or reg. in 43)				
	Sec. 1	VI, VII	Th	231Ph	Mr. Zeleny
	2	VIII, IX	Th	231Ph	and assts.
	3	VI, VII	M	231Ph	
44s	Electricity Laboratory ..... (See 44w)				
	Sec. 1	VI, VII	M	231Ph	Mr. Zeleny
	2	VI, VII	T	231Ph	and assts.
	3	VIII, IX	T	231Ph	
	4	I, II	T	231Ph	

Intermediate Courses

52f,w,s	Laboratory Arts ..... (3 cred.; jr., sr.; prereq., 16 cred. and approval of department)	VI, VII, VIII	TTh	39Ph	Mr. Haliday
101f-103w-105s	Theoretical Physics ..... (15 cred.; jr., sr., grad.; prereq., 12 cred. in phys., Math. 51)	IV	MTWFS	145Ph	Mr. Tate
104	*Precision Mechanics* ..... (3 cred.; jr., sr., grad.; prereq., 12 cred. and Math. 51)	*Not offered*			
114f-116w-118s	Elem. Phys. Investigation ..... (3 cred.; jr., sr., grad.; prereq., 104, Math. 51)	Ar	Ar	160Ph	Ar
115f-117w-119s	Problem Course ..... (3 cred.; jr., sr., grad.; prereq., 12 cred., Math. 51)	Ar	Ar	145Ph	Mr. Buchta
124s	Pyrometry and Heat ..... (3 cred.; jr., sr., grad.; prereq., 23 and 24)	V-IX or Ar	MW	245Ph	Mr. Miller
134f,w	Experimental Optics ..... (3 cred.; jr., sr., grad.; prereq., 34)	VI, VII, VIII	MW	79Ph	Mr. Valasek

No.	Title	Hour	Day	Bldg.	Instructor
136w	Spectrum Analysis ..... (3 cred.; jr., sr., grad.; prereq., 34)	VI, VII, VIII	MW	79Ph	Mr. Valasek
144f	Electricity Measurements ..... (3 cred.; jr., sr., grad.; prereq., 43 and 44)	See 144f, Engineering program			Mr. Zeleny
146w	Advanced Electricity Measurements ..... (3 cred.; by permission from instructor; prereq., 144)	Ar	Ar	232Ph	Mr. Zeleny
148s	Radioactivity ..... (3 cred.; jr., sr., grad.; prereq., 43, 44)	VII, VIII, IX	TTh	145Ph	Mr. Erikson
150w	Conduction Through Gases ..... (3 cred.; jr., sr., grad.; prereq., 144)	VII, VIII, IX	TTh	145Ph	Mr. Erikson
152f	X-Rays ..... (3 cred.; jr., sr., grad.; prereq., 43, 44)	I	TThS	166Ph	Mr. Erikson
154w,s	X-Ray Spectroscopy ..... (3 cred.; by permission from instructor; prereq., 152, Math. 51)				
	Lect.	Ar	Ar	Ar	Mr. Valasek
	Lab.	Ar	Ar	Ar	

For additional graduate courses see bulletin of the Graduate School.

POLITICAL SCIENCE

Major Advisers

Professors Anderson, Lambie, Quigley, and Young; Assistant Professor Mills.

Major Sequences

Prerequisites: 10 credits in history or economics and 15 credits in political science. In addition the student is urged to take one or more of the following courses: Economics 6-7, Principles of Economics; Geography 43, Political Geography; Psychology 1-2, General Psychology; and Sociology 45, Social Statistics.

A student majoring in political science is required to earn at least 33 credits in senior college courses, as follows: Course 81-82-83, required of all majors, 6 to 9 credits; also 9 credits in courses numbered from 101 to 140, 6 credits in courses numbered from 141 to 180, and 6 credits in courses numbered from 181 to 199, and enough additional credits from courses numbered from 101 to 199, and the following, to make 33 credits in senior college work. Beginning in 1931-32, a major sequence must include at least one full year sequence (9 credits) in some senior college subject, in addition to 81-82-83. The additional courses which may be included with the consent of the major adviser are: Economics 105; 106; 154; 161; 162; 164; 176; 191-192; 193; History 93-94-95; Journalism 130-131-132; Preventive Medicine 106; Psychology 140; 160; Sociology 100; 101; 102; 140; 141.

Minor Sequences

Nine credits in political science courses numbered from 101 to 199.

Honors Course

Students who are capable of doing better than average work, and who wish to study for graduation honors or to follow some special line of development, should consult the chairman of the department with reference to possible variations in major sequence requirements.

Bureau for Research in Government

This bureau, with its special library, serves as a center of study for advanced and graduate students in political science, and also as an agency for conducting and directing investigations into problems of politics, legislation, and administration, national, state, and local.

Training for Diplomatic and Consular Service

A special program taking the place of a major sequence will be arranged for students of good standing who intend to enter this field of work. The courses in this program will be drawn from Political Science, Economics, History, Geography, and related departments. Consult Mr. Quigley.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

NOTE.—Courses in political science which are indicated as being open to juniors, seniors, and graduates may be taken by graduate students for full credit, subject to the requirement of additional work over and above that assigned to undergraduates, or they may be taken by graduate students for limited credit.

No.	Title		Hour	Day	Bldg.	Instructor
1f-2w†	American Government and Politics ..... (10 cred.; soph., jr., sr., and fr. with 10 cred. in hist., econ., or geog.; no prereq.)					
		Lect.	IV	MW	OLAud	Mr. Anderson
		Sec. 1	I	MWF	111OL	
		2	I	TThS	111OL	
		3	II	TThS	112OL	
		4	III	TThS	112OL	
		5	III	MWF	209OL	
		6	VI	MWF	112OL	
1w-2s†	American Government and Politics ..... (See 1f-2w)					
		Lect.	VI	TTh	211OL	Mr. Anderson, Mr. Field
		Sec. 1	VI	MWF	211OL	
		2	II	MWF	209OL	
		3	III	TThS	124F	
		4	II	TThS	209OL	
1s†	American Government and Politics ..... (First qtr. of 1-2; see 1f-2w)					
		Lect.	IV	MW	OLAud	Mr. Anderson
		Sec. 1	I	MWF	25F	
		2	I	TThS	111OL	
		3	II	TThS	112OL	
		4	III	TThS	112OL	

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
2f*	State Government ..... (5 cred.; soph., jr., sr.; prereq., 1)				
	Lect.	IV	MW	211OL	Mr. Lambie
	Sec. 1	VI	MWF	211OL	
	2	II	MWF	209OL	
	3	II	TThS	209OL	
	4	III	TThS	124F	
3w,s	Comparative European Government ..... (5 cred.; soph., jr., sr.; prereq., 10 cred.)	I	MWThFS	209OL	Mr. Starr
15f,w	Elements of Political Science ... (5 cred.; soph., jr., sr.; prereq., 10 cred.)	VI	MTWThF	209OL	Mr. Lippincott
25f,s	World Politics ..... (5 cred.; soph., jr., sr.; prereq., Hist. 1-2)				
	Lect.	III	MWF	211OL	Mr. Mills
	Sec. 1	III	TTh	3F(f), 109F(s)	
	2	I	MW	221OL	
	3	IV	TS	209OL	
51f-52w-53s	Business Law	(See bulletin of the School of Business Administration)			
81f-82w-83s†‡	Readings in Political Science ... (Cred. ar., not to exceed 9; jr., sr.; prereq., 15 cred.)	Ar	Ar	Ar	Consult Mr. Anderson
91f-92w-93s†	Readings and Theses for Honors (Jr., sr.; cred. ar.; prereq., 15 cred.)	Ar	Ar	Ar	Consult Mr. Anderson
101f-102w†	Constitutional Law I, II ..... (6 cred.; jr., sr., grad.; prereq., 15 cred.)	VI	MWF	221OL	Mr. Field
103s	Constitutional Law III ..... (3 cred.; jr., sr., grad.; prereq., 101-102, or consent of instructor)	VI	MWF	221OL	Mr. Field
104f	American Constitutional Development I: To 1800 ..... (3 cred.; jr., sr., grad.; prereq., 15 cred. or Hist. 7-8)	II	MWF	221OL	Mr. Young
105w	American Constitutional Development II:1800-1865 ..... (3 cred.; jr., sr., grad.; prereq., 15 cred., or Hist. 7-8)	II	MWF	221OL	Mr. Young
106s	American Constitutional Development III: Since 1865 ..... (3 cred.; jr., sr., grad.; prereq., 15 cred. or Hist. 7-8)	II	MWF	221OL	Mr. Young
107f	Recent Social Legislation ..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 cred. in pol. sci.)	II	TThS	221OL	Mr. Young
108w	Legislative Power and Methods .. (3 cred.; jr., sr., grad.; prereq., 15 cred.)	II	TThS	221OL	Mr. Young

* Offered for the last time.

† The entire course must be completed before credit is received for any quarter.

‡ Students may enter this course any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
109s	Government and Business ..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 cred. in pol. sci.)	II	TThS	221OL	Mr. Young
111	Law of Public Utilities ..... (3 cred.; grad. and sr. of suitable prep.)	See Law School bulletin			
113f-114w†	Administrative Law ..... (6 cred.; sr., grad.; prereq., 20 cred.)	I	TThS	221OL	Mr. Field
115s	Topics in Constitutional and Administrative Law ..... (3 cred.; sr., grad.; prereq., 101-102, or 113-114, or consent of instructor)	I	TThS	221OL	Mr. Field
116s	Municipal Powers and Functions (3 cred.; jr., sr., grad.; prereq., 15 cred., or 11)	I	MWF	111OL	Mr. Anderson
117f	Municipal Administration ..... (3 cred.; jr., sr., grad.; prereq., 11, or 15 cred.)	III	TThS	111OL	Mr. Anderson
119*	Jurisprudence ..... (2 cred.; grad., and sr. of suitable prep.)	See Law School bulletin			Mr. Rottschaefer
131f-132w†	Principles of Public Administration ..... (6 cred.; sr., grad., and jr. with consent of instructor; prereq., 20 cred. in soc. sci. incl. 10 cred. in pol. sci.)	II	MWF	111OL	Mr. Lambie
133s	Problems in Public Administration ..... (3 cred.; jr., sr., grad.; prereq., 131-132, or consent of instructor)	II	MWF	111OL	Mr. Lambie
145f-146w†	Comparative Government and Politics ..... (6 cred.; jr., sr., grad.; prereq., 3, or consent of instructor)	III	TThS	209OL	Mr. Starr
149-150	*Government and Politics of the British Empire* ..... (6 cred.; jr., sr., grad.; prereq., 15 cred.)	*Not offered*			
151	*Problems in the British Empire* (3 cred.; jr., sr., grad.; prereq., 149-150, or consent of instructor)	*Not offered*			
153-154	*Far Eastern Government and Politics* ..... (6 cred.; jr., sr., grad.; prereq., 3, or 10 cred. and Hist. 1-2)	*Not offered*			
161w-162s†	Current Political Thought ..... (6 cred.; sr., grad.; prereq., 20 cred.)	III	MWF	111OL	Mr. Anderson

* Second semester.

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
163	*Topics in Current Political Thought* ..... (3 cred.; sr., grad.; prereq., 20 cred. in soc. sci., or 10 cred. in phil.)	*Not offered*			
165w	Develop. of Political Thought .. (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil. Same as Phil. 129)	I	MWThFS	322F	Mr. Wilde
169	*Problems of Democracy* ..... (3 cred.; jr., sr., grad.; prereq., 20 cred., incl. 15)	*Not offered*			
171s	Political Psychology ..... (3 cred.; jr., sr., grad.)	See Psychology 141			
175s	Political Parties ..... (3 cred.; jr., sr., grad.; prereq., 15 cred.)	III	TThS	111OL	Mr. Starr
176f-177w†	Scope and Methods of Political Science ..... (3 cred.; grad., and sr. with approval of instructor)	3:30-5:00	Th	221OL	Mr. Anderson
181f-182w	International Law ..... (6 cred.; sr., grad.; prereq., 20 cred. in soc. sci., incl. 10 cred. in pol. sci.)	IV	MWF	209OL	Mr. Quigley
183s	International Organization ..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.)	IV	MWF	209OL	Mr. Quigley
184s	Problems in International Law .. (3 cred.; sr., grad.; prereq., 181-182)	3:30-5:00	WF	312Lib	Mr. Quigley
191f-192w†	Far Eastern Diplomacy ..... (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 25, or 10 cred. in pol. sci. and Hist. 1-2)	VII	MWF	209OL	Mr. Quigley
193	*Problems of the Pacific* ..... (3 cred.; jr., sr., grad.; prereq., 153-154 or 191-192)	*Not offered*			
195f-196w†	Colonial Government and Administration ..... (6 cred.; jr., sr., grad.; prereq., 15 cred., or 20 cred. in soc. sci. incl. 10 cred. in pol. sci.)	VI	MWF	111OL	Mr. Mills
197s	Problems in Colonial Administration ..... (3 cred.; jr., sr., grad.; prereq., 195-196, or consent of instructor)	VI	MWF	111OL	Mr. Mills
	*Seminars Primarily for Graduate Students**				
201f-202w-203s†	Public Law	Ar	Ar	Ar	Mr. Anderson, Mr. Young, Mr. Field

* These courses are open to qualified seniors with the consent of the department.
† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
211f-212w-213s†	Modern Government and Political Theory	Ar	Ar	Ar	Mr. Anderson, Mr. Lippincott, Mr. Mills, Mr. Starr
221f-222w-223s†	Local Government and Public Administration	Ar	Ar	Ar	Mr. Anderson, Mr. Lambie
231f-232w-233s†	International Law and Relations	Ar	Ar	Ar	Mr. Quigley, Mr. Mills

PREVENTIVE MEDICINE AND PUBLIC HEALTH

MEDICAL SCHOOL

No.	Title	Hour	Day	Bldg.	Instructor
3f,w,s‡	Person. Hyg. and Elem. Sanita. (2 cred.; fresh., soph.; no prereq.; 3 sections for men, 40 each; 2 sections for women, 40 each)	IV (men) IX (men) IV (women)	TS TTh TS	*	Dr. Lees, Dr. Bullard, Dr. Ellis, Dr. Hinckley
50f,w,s	Public and Personal Health (3 cred.; jr., sr.; prereq., Zool. 1-2 and Psy. 1-2 or permission of instructor)	V	MWF	*	Dr. O'Brien
52w	Health Care of the Family (3 cred.; jr., sr.; prereq., Bact. 41, Hum. Physiol. 4) (Lab. sections limited to 20)				
	Lect.	VI	M	*	Dr. Boynton and
	Lab.	VI, VII	WF	*	Miss Fisher
53f,s	Elements of Preventive Medicine (3 cred.; jr., sr.; prereq., Psy. 1-2; Bact. 41 or equiv.)	II	MWF	*	Dr. Diehl, Dr. Lees
57s	Health of Infant and Pre-school Child (2 cred.; jr., sr.; prereq., Zool. 1-2, Psy. 1-2; or 50, or 53)	III	TTh	*	Dr. Boynton
58w	Maternal and Child Hygiene (2 cred.; jr., sr.; prereq., 50 or 53) (For public health nurses only)	III	MW	*	Dr. Boynton
59w	Social Hygiene (1 cred.; jr., sr.; prereq., 50, 52, or 53, or permission of instructor)	VII	M	Ar	Dr. Owings
60w	Tuberculosis and Its Control (2 cred.; jr., sr.; prereq., 50 or 52 or 53)	IV	TS	*	Dr. Myers
61w	Mental Hygiene (3 cred.; jr., sr.; prereq., 50 or 52 or 53, Psy. 1-2)	III	TThS	*	Dr. deBerry

* Classroom schedule will be posted on bulletin board in Millard Hall, also published in the *Official Daily Bulletin* at the beginning of each quarter.

† The entire course must be completed before credit is received for any quarter.

‡ Students may complete the former requirement in freshman hygiene by registering for this course.

No.	Title	Hour	Day	Bldg.	Instructor
62f,s	Principles of Public Health Nursing and Special Fields ..... (5 cred.; jr., sr.; public health nurses)	II I	TTh MWF	*	Miss Butzerin
64f,w,s	Field Practice in Infant Welfare Nursing ..... (4 cred.; jr., sr.; prereq., 58 and 62)	Ar	Ar	Ar	Miss Butzerin, Miss Peck
65f,w,s	Field Practice in School Nursing (2 cred.; jr., sr.; prereq., 62)	Ar	Ar	Ar	Miss Butzerin
66f,w,s	Field Practice in County Nursing (2 cred.; jr., sr.; prereq., 62)	Ar	Ar	Ar	Miss Butzerin
67f,w,s	Field Practice in a Tuberculosis Sanatorium ..... (2 cred.; jr., sr.; prereq., 60 and 62)	Ar	Ar	Ar	Miss Butzerin
68f,w,s	Field Practice in Visiting Nursing ..... (5 cred.; jr., sr.; prereq., 62)	Ar	Ar	Ar	Miss Butzerin, Miss Houlton
73w	Occupational Hygiene and Disease (2 cred.; jr., sr.; prereq., 53)	IV	MW	*	Dr. Myers
80w	Health Supervision of the School Child ..... (3 cred.; jr., sr.; prereq., 50 or 52 or 53)	II	MWF	*	Dr. Diehl
102w	Sanitation ..... (Cred. ar.; jr., sr., grad.; prereq., Bact. 101; Anal. Chem. 1-2 or 7; Org. Chem. 1-2 or 51-52-53; Phys. 24, 34, 44)	Ar	Ar	*	Mr. Whittaker
103s	Public Health Bacteriology ..... (3 cred. or ar.; jr., sr., grad.; prereq., Bact. 101, 116)	VII, VIII or ar	MWF or ar	*	Dr. McDaniel
106f,w,s	Public Health Administration .. (Cred. ar.; jr., sr., grad.; prereq., 53, 101, and permission)	Ar	Ar	Ar	Dr. Diehl
107s	Sanitary Surveys ..... (2 cred.; jr., sr., grad.; prereq., 53 or 100 and permission)	Ar	Ar	Ar	Dr. Diehl
210	Seminar in Preventive Medicine and Public Health ..... (By permission)	IX	F	Staff Room Health Service	Dr. Diehl and staff

PSYCHOLOGY

Major Advisers

Professors Elliott and Paterson; Associate Professor Bird; Assistant Professors Heron and Tinker.

Major Sequences

Prerequisites: For Sequence A, 1-2 and 4-5 or 7. Course 15 is recommended. For Sequence B, 9 credits. For Sequence C, 1-2 and 4-5 or 7. Course 3 is recommended.

A. General psychology. Courses 101-102-103; 125-126; and 12 additional credits in senior college courses.

* Classroom schedule will be posted on bulletin board in Millard Hall, also published in the *Official Daily Bulletin* at the beginning of each quarter.

B. Human and animal behavior. Courses 114-115; 151-152-153; and 12 additional credits in senior college courses either in psychology or zoology.

C. Differential psychology. Courses 125-126-127; Educational Psychology 134; and 16 additional credits in senior college courses.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

Honors Course

Students interested in the work of an honors course should consult the chairman of the department.

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	General Psychology ..... (6 cred.; soph., jr., sr.; no prereq.)				Mr. Elliott and others
	Sec. 1	I	MWF	OLAud	
	2	III	MWF	OLAud	
1w,2w	General Psychology ..... (See 1f-2w. Registration limited. Written permission must be obtained from junior college office‡. 6 cred.)	Ar	Ar	Ar	
1s,2s	General Psychology ..... (6 cred.; see 1f-2w. Registration limited. Written permission must be obtained from junior college office‡)	Ar	Ar	Ar	
3s	Psychology Applied to Daily Life (3 cred.; soph., jr., sr.; prereq., 1-2)	III	MWF	301F	Mr. Paterson and others
4f-5w†¶	Introd. Lab. Psychology ..... (4 cred.; soph., jr., sr.; with or after 1-2) (Sections limited to 48)				
	Sec. 1	I, II	TTh	211Psy	Mr. Tinker and others
	2	III, IV	TS	211Psy	
	3	VI, VII	TTh	211Psy	
	4	VIII, IX	TTh	211Psy	
	5	III, IV	MW	211Psy	
7s¶	Introd. Lab. Psychology ..... (Identical with 4-5 combined. See 4f-5w)				
	Sec. 1	VI, VII	MTThF	211Psy	Mr. Tinker and others
	2	III, IV	MTWF	211Psy	
9s	Introd. to Animal Psychology ... (3 cred.; soph., jr., sr.; prereq., 1-2)	III	MWF	109Psy	Mr. Heron
15s	Psychology of Sensation ..... (3 cred.; soph., jr., sr.; prereq., 1-2)	II	TThS	211Psy	Mr. Tinker

† The entire course must be completed before credit is received for any quarter.

‡ Offered II MTWThFS.

¶ A laboratory fee will be charged for the courses in Elementary Laboratory Psychology: $1 per quarter for Course 4-5, $2 for Course 7.

No.	Title	Hour	Day	Bldg.	Instructor
56w	Psychology of Advertising ..... (3 cred.; jr., sr.; prereq., 1-2, and Prin. of Econ.)	VII	MWF	133Ph	Mr. Longstaff
72f	Psychological Esthetics ..... (3 cred.; jr., sr.; prereq., 1-2, and 4-5, or Music 1-2-3, or Art Educ. 20-21 or 9 cred. fine arts)	III	MWF	115Psy	Miss Hevner
84f	Psychology of Learning ..... (3 cred.; jr., sr.; prereq., 1-2; 4-5 or 7)	IV	MWF	109Psy	Mr. Heron
90f,91w,92s	Readings in Psychology ..... (Cred. ar.; jr., sr.; prereq., 1-2; 4-5 or 7, or Zool. 1-2; and permission of instructor)	Ar	Ar	Ar	Mr. Elliott, Mr. Paterson, Mr. Bird, Miss Heidbreder, Miss Hevner, Mr. Heron, Mr. Tinker
101f-102w†-103s	Experimental Psychology ..... (3 cred. per qtr.; cred. ar. for honors students; sr., grad.; prereq., 1-2, and 4-5 or 7, or 8 cred. in physics)	VII VIII	MWF WF	116Psy	Mr. Tinker
108f	Systems of Psychology ..... (3 cred.; jr., sr., grad.; prereq., 1-2; 4-5 or 7)	III	TThS	109Psy	Miss Heidbreder
114w-115s†	Human Behavior ..... (6 cred.; sr., grad.; prereq., 1-2; 4-5 or 7, or Zool. 1-2)	II	TThS	115Psy	Mr. Elliott
125f-126w†-127s	Psy. of Individual Differences .. (3 cred. per qtr.; cred. ar. for honor students; sr., grad.; prereq., 1-2; 4-5 or 7, or Ed. Psy. 116-117)	II	MWF	115Psy	Mr. Paterson
130s	Vocational Psychology ..... (2 cred.; jr., sr., grad.; prereq., 1-2, 4 additional cred. in psy., educ., or a soc. sci.)	IX, X	F	301F	Mr. Paterson
140w	Social Psychology ..... (3 cred.; jr., sr., grad.; prereq., 1-2; 4-5 or 7, or Zool. 1-2 or 20 cred. in a soc. sci.)	III	TThS	115Psy	Mr. Bird
141s	Political Psychology ..... (3 cred.; jr., sr., grad.; prereq.‡)	III	TThS	115Psy	Mr. Bird
144f-145w†	Abnormal Psychology ..... (6 cred.; jr., sr., grad.; prereq., 1-2; 4-5 or 7, or Zool. 1-2 or 10 cred. in a soc. sci.)	IV	MWF	115Psy	Miss Heidbreder
151f-152w†-153s	Animal Psychology ..... (3 cred. per qtr.; cred. ar. for honor students; sr., grad.; prereq., 1-2; 4-5 or 7, Zool. 1-2)	VI Lab.	MWF Ar	Ar	Mr. Heron
160f	Psychology in Personnel Work .. (3 cred.; jr., sr., grad.; prereq., 1-2, and Prin. of Econ. or 10 cred. in pol. sci.)	VI	MWF	115Psy	Mr. Longstaff

† Two quarters must be completed before credit is received for any quarter.

‡ Open to majors in social science who have had Courses 1-2 and 4-5 or 7, or Zoology 1-2 and to majors in psychology who have had Courses 140 or 20 credits in social science.

ROMANCE LANGUAGES

Major Advisers

Professors Olmsted, Searles, Le Compte, Barton, and Sirich; Assistant Professors Clefton and Nissen.

Major Sequences

FRENCH

Six credits in conversation and composition (except French 20). Nine credits in literary courses (except French 21-22-23 and 24-25). A minimum of 12 additional credits chosen from courses numbered 50 or above.,

ITALIAN

Courses 70; 71; 72; 73; 74; 159-160 or 161-162; 164; and at least 3 additional credits chosen from the following: English 140, 146-147, 148-149; French 121-122-123, 153; Greek 108; Italian 159-160, 161-162; Latin 123.

SPANISH

Six credits in conversation and composition (except Spanish 20).

Nine credits in literary courses, and in addition enough credits chosen from courses numbered 50 or above to make a minimum of 27 credits in all.

MIXED (French, Italian, and Spanish)

Six credits 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 in all.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

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.

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 the Arts finals in June, and the Friday preceding the opening of the University in September.‡

FRENCH

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†*	Beginning French	I	MWThFS	213F	Ar
	(10 cred.; fr., soph., jr., sr.; no	II	MWThFS	227F	Ar
	prereq.)	IV	MTWFS	227F	Ar
		VI	MTWThF	226F	Ar
		VII	MTWThF	202F	Ar

* Credit is usually not given for more than one beginning language. See page 6.

† The entire course must be completed before credit is received for any quarter.

‡ Students entering the Medical School in September, 1932, and thereafter must present German.

No.	Title	Hour	Day	Bldg.	Instructor
1w-2s†‡	Beginning French	IV	MTWFS	202F	Ar
	(See 1f-2w)	VI	MTWThF	202F	Ar
1s†‡	Beginning French	I	MWThFS	227F	Ar
	(See 1f-2w)	IV	MTWFS	124F	Ar
2f†‡	Beginning French	I	MWThFS	202F	Ar
	(2nd qtr. of 1-2. See 1f-2w)	VI	MTWThF	213F	Ar
3f-4w	Intermediate French	I	MWThFS	124F	Ar
	(10 cred.; fr., soph., jr., sr.;	III	MTWFS	226F	Ar
	prereq., 1-2, or 2 yrs. high school French)	VII	MTWThF	213F	Ar
3w-4s	Intermediate French	I	MWThFS	202F	Ar
	(See 3f-4w)	VI	MTWThF	213F	Ar
3s	Intermediate French	I	MWThFS	213F	Ar
	(First qtr. of 3-4. See 3f-4w)	II	MWThFS	227F	Ar
		IV	MTWFS	227F	Ar
		VI	MTWThF	226F	Ar
		VII	MTWThF	202F	Ar
4f	Intermediate French	II	MWThFS	113F	Ar
	(Second qtr. of 3-4. See 3f-4w)	IV	MTWFS	124F	Ar
		VI	MTWThF	202F	Ar
8f-9w-10s§	Scientific French (pre-medic) ...	I	MWF	201F	Ar
	(9 cred.; pre-med.; prereq., 3 or equiv.)				
20f	Oral and Written French	III	MTWFS	303F	Mr. Borglum
	(5 cred.; all; prereq., 4 or 3 yrs. high school French)	VII	MTWThF	227F	Mr. Frelin
20s	Oral and Written French	I	MWThFS	124F	Ar
	(See 20f)	III	MTWFS	226F	Ar
		VII	MTWThF	213F	Mr. Frelin
21f-22w-23s†	Survey of French Lit.	II	TThS	226F	Mr. Barton
	(9 cred.; all; prereq., 3-4 or 20	III	MWF	201F	Mr. Clefton
	or 4 yrs. high school French)	VII	MWF	201F	Mr. Searles
24w-25s†	Survey of French Lit.	III	MTWFS	303F	Mr. LeCompte
	(10 cred.; all; prereq., 3-4 or 20 or 4 yrs. high school French)	VII	MTWThF	226F	Mr. Owens
49f,w,s	French Pronunciation	II	TThS	303F	Mr. Owens
	(3 cred.; all; prereq., 3-4 or 4 yrs. high school French)				
53f	French Composition	III	TThS	201F	Mr. Boyer
	(3 cred.; jr., sr.*; prereq., 3-4)	VI	MWF	201F	Mr. Borglum
54w-55s	French Conversation	III	TThS	201F	Mr. Boyer
	(4 cred.; jr., sr.*; prereq., 53 or 20)	VI	MWF	201F	Mr. Borglum
62w	Practical French Phonetics	II	TThS	203F	Miss Guinotte
	(3 cred.; jr., sr.*; prereq., 49)				
63f	Adv. French Composition	II	MWF	203F	Miss Guinotte
	(3 cred.; jr., sr.*; prereq., 53 or 20 with a grade of B)	VII	MWF	203F	Miss Guinotte
64w-65s	Adv. French Conversation	II	MWF	203F	Miss Guinotte
	(6 cred.; jr., sr.*; prereq., 54, 55 or 20 with a grade of B)	VII	MWF	203F	Mr. Borglum
80f-81w-82s	French Lit.: 19th Century	IV	MWF	201F	Mr. Barton
	(9 cred.; jr., sr.*; prereq., 21-22-23 or 24-25)	VII	MWF	207F	Mr. Clefton

* Open without petition to sophomores who have an average of C in all their previous work and in the prerequisite courses.

† The entire course must be completed before credit is received for any quarter.

‡ Credit is usually not given for more than one beginning language. See page 6.

§ Students may enter any quarter. No student may receive credit for more than two quarters.

No.	Title	Hour	Day	Bldg.	Instructor
100s	French Oral Diction ..... (4 cred.; jr., sr., grad.; prereq., 62)	I	MWThF	203F	Miss Guinotte
103f-104w-105s†	French Syntax and Comp. ..... (3 cred.; jr., sr., grad.; prereq.. 63)	VI	F	217F(f,w) 306F(s)	Mr. Barton
115f	Fr. Lit.: 17th Cent.: Formation of Classic Ideal ..... (4 cred.; jr., sr., grad.; prereq., 21-22-23, or 24-25)	IV	MTWF	203F	Mr. Searles
116w	Fr. Lit.: 17th Cent.: Molière, Racine, LaFontaine ..... (4 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25)	IV	MTWF	203F	Mr. Searles
117s	Fr. Lit.: 17th Cent.: Moral and Didactic Literature ..... (4 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25)	IV	MTWF	203F	Mr. Searles
118f-119w-120s	French Lit.: 18th Century ..... (9 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25)	III	TThS	217F	Mr. Sirich
121-122-123	*French Lit.: 16th Century* ..... (9 cred.; jr., sr., grad.; prereq., 80-81-82, or 115-116-117 or 118-119-120)	*Not offered*			
145w-146s	Explication de Textes ..... (4 cred.; jr., sr., grad.; prereq., 80-81-82 or 115-116-117, or 118-119-120)	VII	TTh	203F	Mr. Boyer
150f-151w-152s	French Dramatic Lit. ..... (6 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25)	III	TTh	203F	Mr. Olmsted
153s	Contemporary French Lyric Poetry (4 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25)	VI	MTWTh	306F	Mr. LeCompte
157w	Modern French Novel ..... (4 cred.; jr., sr., grad.; prereq., 21-22-23 or 24-25)	VI	MTWTh	217F	Mr. Boyer
171f-172w-173s†	History of French Language ... (3 cred.; jr., sr., grad.; prereq., 63)	VIII	Th	203F	Mr. LeCompte
174f-175w-176s	Contemp. French Novel and Drama: Lectures in French .. (6 cred.; jr., sr., grad.; prereq., 53-54-55 (or 20); and 80-81-82)	IX	TTh	201F	Mr. Boyer

ITALIAN

NOTE.—Students may receive credits for Italian 1-2 in addition to one other beginning language.

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	Beginning Italian ..... (10 cred.; fr., soph., jr,. sr.; no prereq.)	IV	MTWFS	226F	Miss Nissen
3s	Intermediate Italian ..... (First qtr. of 3-4. 10 cred.; fr., soph., jr., sr.; prereq., 1-2)	IV	MTWFS	226F	Miss Nissen

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
4	*Intermediate Italian* ..... (See 3s)	*Not offered*			
70f	Survey of Italian Lit. ..... (3 cred.; jr., sr.*; prereq., 3-4‡)	II	MWF	217F	Miss Nissen
71	*Modern Poetry (Leopardi, Carducci)* ..... (3 cred.; jr., sr.*; prereq., 3-4‡)	*Not offered*			
72w	Modern Drama (Giacosa, Bracco, Pirandello) ..... (3 cred.; jr., sr.*; prereq., 3-4‡)	II	MWF	217F	Miss Nissen
73	*Boccaccio* ..... (3 cred.; jr., sr.*; prereq., 3-4‡)	*Not offered*			
74s	Petrarch ..... (3 cred.; jr., sr.*; prereq., 3-4‡)	II	MWF	217F	Miss Nissen
159f-160w	Dante ..... (6 cred.; jr., sr., grad.; prereq., one course above 50)	II	TThS	217F	Miss Nissen
161-162	*The Sixteenth Century* ..... (6 cred.; jr., sr., grad.; prereq., one course above 50)	*Not offered*			
164s	Dante (in English) ..... (3 cred.; jr., sr., grad.; prereq., French 21-22-23 or 24-25, or 8 cred. in Eng. above 50)	II	TThS	212F	Miss Nissen

SPANISH

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†‖	Beginning Spanish	I	MWThFS	226F	Ar
	(10 cred.; fr., soph., jr., sr.; no	IV	MTWFS	125F	Ar
	prereq.)	VI	MTWThF	212F	Ar
1w-2s†‖	Beginning Spanish ..... (See 1f-2w)	VII	MTWThF	227F	Ar
1s†‖	Beginning Spanish ..... (First qtr. of 1-2)	II	MWThFS	201F	Ar
2f	Beginning Spanish ..... (Second qtr. of 1-2. See 1f-2w)	III	MTWFS	202F	Ar
3f-4w	Intermediate Spanish	II	MWThFS	201F	Ar
	(10 cred.; fr., soph., jr., sr.;	VI	MTWThF	102F	Ar
	prereq., 1-2 or 2 yrs. high school Spanish)				
3w-4s	Intermediate Spanish ..... (See 3f-4w)	III	MTWFS	202F	Ar
3s	Intermediate Spanish	I	MWThFS	226F	Ar
	(First qtr. of 3-4. See 3f-4w)	IV	MTWFS	125F	Ar
		VI	MTWThF	212F	Ar
4f	Intermediate Spanish	II	MWThFS	202F	Ar
	(Second qtr. of 3-4. See 3f-4w)	VI	MTWThF	227F	Ar
20s	Oral and Written Spanish ..... (5 cred.; all; prereq., 4, or 3 yrs. high school Spanish)	III	MTWFS	213F	Ar
30s	Spanish Commercial Correspondence ..... (3 cred.; all; prereq., 3)	VII	MWF	209F	Mr. LeFort

* Open without petition to sophomores who have an average of C in all their previous work and in the prerequisite courses.

† The entire course must be completed before credit is received for any quarter.

‡ For students beginning Italian in the Senior College, 1-2 and permission of instructor.

‖ Credit is usually not given for more than one beginning language. See page 6.

No.	Title	Hour	Day	Bldg.	Instructor
53f	Spanish Composition ..... (3 cred.; jr., sr.*; prereq., 3-4)	II	MWF	304F	Mr. LeFort
54w-55s	Spanish Conversation ..... (4 cred.; jr., sr.*; prereq., 53 or 20)	II	MWF	304F	Mr. LeFort
60f	Adv. Spanish Composition ..... (3 cred.; jr., sr.*; prereq., 53 or 20 with grade of B)	VI	MWF	203F	Ar
61w-62s	Adv. Spanish Conversation ..... (6 cred.; jr., sr.*; prereq., 54-55 or 20 with grade of B)	VI	MWF	203F	Ar
65f-66w-67s†	Survey of Spanish Lit. ..... (9 cred.; jr., sr.*; prereq., 3-4)	II	TThS	109F	Mr. LeFort
68w-69s†	Survey of Spanish Lit. ..... (10 cred.; jr., sr.*; prereq., 3-4)	VI	MTWThF	227F	Mr. LeFort
70w-71s	Latin American Culture and Development ..... (6 cred.; jr., sr.*; prereq., 3-4)	III	MWF	108F	Mr. LeFort
110f-111w-112s	Spanish Lit.: 19th Century ..... (9 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	IV	MWF	108F	Ar
115-116-117	*Spanish Lit.: 17th Century* .... (9 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	*Not offered*			
141s	Modern Spanish Novel ..... (4 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	VII	MTThF	102F	Ar
150	*Modern Spanish Drama* ..... (4 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	*Not offered*			
156f-157w-158s	Spanish Lit.: 16th Century ..... (9 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	II	TThS	304F	Ar
174f-175w-176s	Contemporary Spanish Literature: Lectures in Spanish ..... (6 cred.; jr., sr., grad.; prereq., 20 (or 53-54-55) and 65-66-67)	IX	TTh	202F	Ar

SCANDINAVIAN

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w‖	Beginning Norwegian ..... (10 cred.; fr., soph., jr., sr.; no prereq.)	I	MWThFS	206F	Mr. Madsen
3s	Intermediate Norwegian ..... (5 cred.; fr., soph., jr., sr.; prereq., 1-2, or 1 yr. high school)	I	MWThFS	206F	Mr. Madsen
4f-5w	Adv. Norwegian (Survey) .... (10 cred.; soph., jr., sr.; prereq., 1-2-3 or 2 yrs. high school)	III	MWThFS	206F	Mr. Madsen

* Open without petition to sophomores who have an average of C in all their previous work and in the prerequisite courses.

† The entire course must be completed before credit is received for any quarter.

‖ Credit is usually not given for more than one beginning language. See page 6.

No.	Title	Hour	Day	Bldg.	Instructor
7f-8w‖	Beginning Swedish ..... (10 cred.; fr., soph., jr., sr.; no prereq.)	II	MWThFS	206F	Mr. Stomberg
9s	Intermediate Swedish ..... (5 cred.; fr., soph., jr., sr.; prereq., 7-8 or 1 yr. high school)	II	MWThFS	206F	Mr. Stomberg
10f-11w	Advanced Swedish ..... (10 cred.; soph., jr., sr.; prereq., 7-8-9 or 2 yrs. high school)	I	MWThFS	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	MWThFS	110F	Mr. Stomberg
42w	Survey of Scandinavian Literature ..... (3 cred.; soph., jr., sr.; prereq., 1-2-3 or 7-8-9)	IV	MWF	206F	Mr. Stomberg
45s	Scandinavian Mythology ..... (3 cred.; jr., sr.§; prereq., none)	IV	MWF	206F	Mr. Stomberg
101-102-103	*Modern Norwegian Lit.* ..... (9 cred.; jr., sr., grad.; prereq., 4-5)	*Not offered*			
104f	Modern Scandinavian History .. (3 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 Literature ..... (9 cred.; jr., sr., grad.; prereq., 10-11)	VI	MWF	206F	Mr. Stomberg
110	*Ibsen* ..... (3 cred.; sr., grad.; prereq., 101-102-103)	*Not offered*			
111-112-113	*Old Norse (Icelandic)* ..... (6 cred.; sr., grad.; prereq., consent of instructor)	*Not offered*			
114f	Strindberg ..... (3 cred.; sr., grad.; prereq., 107-108-109)	Ar	Ar	Ar	Mr. Stomberg
117	*Earlier Norwegian Literature* ... (5 cred.; jr., sr., grad.; prereq., 4-5)	*Not offered*			
130-131-132	*Danish Lit. of the 19th Century* (9 cred.; jr., sr., grad.; prereq., 4-5)	*Not offered*			
136	*Björnson* ..... (3 cred.; sr., grad.; prereq., 101-102-103, or 130-131-132)	*Not offered*			
140f	History of the Norwegian Language and Literature ..... (3 cred.; jr., sr.; prereq., 4-5 or 10-11, or equivalent)	II	TThS	2F	Mr. Seip‡

§ Does not count as a senior college course. Not open to sophomores. See Course Numbering, page 24.

‡ Dr. Didrik A. Seip, professor of Scandinavian linguistics, of the University of Oslo will serve as visiting professor of Scandinavian during the fall quarter.

‖ Credit is usually not given for more than one beginning language. See page 6.

No.	Title	Hour	Day	Bldg.	Instructor
209f-210w-211s	Seminar in Modern Swedish Language and Literature	Ar	Ar	Ar	Mr. Stomberg
220f	Seminar in Ibsen ..... (3 cred.; sr., grad.; prereq., consent of instructor)	Ar	Ar	Ar	Mr. Seip

SOCIOLOGY AND SOCIAL WORK

Major Advisers

Professors Chapin and Willey; Associate Professors Kirkpatrick and Vaile; Assistant Professor Fenlason.

Major Sequences

Prerequisites: A total of 25 credits from among the following departments: Sociology, Economics, Education, History, Philosophy, Political Science, Psychology, and Zoology. Students who are deficient in prerequisites may be required to make up their deficiencies in junior college courses.

Sequence A. General sociology. Courses 52 or 53; three of 93, 100, 101, 102, 103; two of 115, 116, 119, or 160; two of 121, 122, 123; two of 120, 140, 141; 110 or 112 or 114.

Sequence B. Applied sociology. Courses 52, 53, 60, 70, 137; 128 or 134 or 152; two of 93, 100, 101, 102, 103; two of 115, 116, 119, 160; 120 or 121 or 123.

Sequence C. Rural sociology. Courses as follows: two of 52, 53, 60; two of 93, 100, 101, 102, 103; two of 115, 116, 119, 160; 121 or 122; 120 or 140 or 141 or 152; 110, 112, 114.

Modifications of these sequences will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

Preparation for professional social work is provided in the Training Course for Social and Civic Work, described on pages 12 and 13 of this bulletin.

Honors Course

Students entering the Senior College in 1931-32 will be accepted for registration in the Honors Course if they have had at least two courses in this department, if their grades in this department have averaged B and in other departments C, and if they are approved by a committee of the department. Instead of following a regular major sequence, a student in the Honors Course will pursue a comprehensive plan of study adjusted to his particular interests and approved by the department. He will be assigned to a member of the department who will serve as his tutor, and with whom he will meet at stated times for consultation. The group of honors students will meet once a week with one or more members of the staff for group discussions. At the end of each year the honors student will be expected to pass a comprehensive examination upon his work.

In no case will less than five quarters of work in residence in the Senior College be accepted as satisfying the requirements of the Honors Course. The proportion of the student's time devoted to the Honors Course is limited and subject to approval by the department.

No.	Title		Hour	Day	Bldg.	Instructor
1f,w	Introd. to Sociology ..... (5 cred.; 3rd qtr. fr., soph., jr., sr.; no prereq.)					
		Lect.	I	TTh	OLAud	Mr. Willey
		Sec. 1	I	MWF	109OPh	and others
		2	III	MWF	104OPh	
		3	IV	MWF	109OPh	
		4	V	MWF	109OPh	
		5	VI	MWF	104OPh(f), 2OPh(w)	
		6	VII	MWF	2OPh	
		7	III	TThS	109OPh	
	(Univ. Farm, 3 cred.)	8	IV	MWF	‡	
1s	Introduc. to Sociology ..... (See 1f)					
		Lect.	I	TTh	OLAud	Mr. Willey
		Sec. 1	I	MWF	109OPh	and others
		2	II	MWF	2OPh	
		3	III	MWF	104OPh	
		4	IV	MWF	109OPh	
		5	V	MWF	109OPh	
		6	VI	MWF	109OPh	
		7	VII	MWF	104OPh	
		8	II	TThS	104OPh	
		9	III	TThS	109OPh	
	(Univ. Farm, 3 cred.)	10	IV	MWF	‡	
6f,w	Social Interaction ..... (3 cred.; soph., jr., sr.; prereq., 1)					
		Lect.	II	WF	OPhAud	Mr. Kirkpatrick
		Sec. 1	I	T	2F	and others
		2	II	M	2OPh	
		3	II	T	104OPh	
		4	IV	T	109OPh	
6s	Social Interaction ..... (See 6f)					
		Lect.	III	MF	OPhAud	Mr. Kirkpatrick
		Sec. 1	III	T	104OPh	and others
		2	III	W	113F	
		3	III	Th	104OPh	
		4	II	T	104OPh	
14f,w,s	Rural Sociology ..... (3 cred.; soph., jr., sr.; prereq., 1)					
		Lect.	IV	MW	OPhAud	Mr. Zimmerman
		Sec. 1	III	Th	2OPh	and others
		2	III	S	2OPh	
		3	VI	Th	104OPh(f,s), 2OPh(w)	
		4	VI	Th	109OPh	
45f*	Social Statistics ..... (5 cred.; soph., jr., sr.; prereq., 1)		IV	MTWFS	104OPh	Mr. Vold
45w*	Social Statistics ..... (See 45f)		VI	MTWThF	104OPh	Mr. Vold
49f,w,s	The Socially Inadequate ..... (3 cred.; 3d qtr. soph., jr., sr.; prereq., 10 cred. in soc. or Soc. 1 and 10 cred in soc. sci. or psy.)		I	MWF	2OPh	Mrs. Fenlason
52f,w,s	Elem. Case Work ..... (3 cred.; jr., sr.; prereq., 49)		I	TThS	109OPh	Miss Vaile

* No student may receive credit for both Course 45 and Economics 14.

‡ Consult the bulletin of the College of Agriculture, Forestry, and Home Economics.

No.	Title	Hour	Day	Bldg.	Instructor
53f,w,s	Elem. of Criminology ..... (3 cred.; jr., sr.; prereq., same as for 49)	III	MWF	109OPh	Mr. Vold
55s	Social Aspects of Housing Problems ..... (3 cred.; jr., sr.; prereq., same as for 49)	I	MWF	6F	Miss Salsberry
60f,w	Social Protection of the Child .. (3 cred.; jr., sr.; prereq., 49 and 52)	VI	MWF	109OPh	Mrs. Doyle
70f,w*	Group Work in the Community (3 or 4 cred. on consulting with training course adviser; jr., sr.; prereq., 49)	I	MWF	10OPh	Miss Mead
71f,w-72f,w‡	Elementary Field Training in Group Work ..... (3 or 4 cred. each qtr.; jr., sr.; prereq., 49, 70, or simultaneously and consent of adviser in soc. work)	Ar	Ar	Ar	Miss Vaile, Miss Jones, Mrs. Fenlason
90f,w,s‡§	Field Survey and Social Case Work ..... (2 cred.; jr., sr.; prereq., 52, or simultaneously)	Ar	Ar	Ar	Ar
91f,w,s-92f,w,s‡	Elementary Field Training in Case Work ..... (4 cred. each qtr.; jr., sr.; prereq., 52; and 91 for 92 and consent of adviser in soc. work)	Ar	Ar	Ar	Ar
93f,s	The Social Heritage and the Individual ..... (3 cred.; jr., sr.; prereq., Soc. 1 and 15 cred. in soc. sci., ed., phil., or psy.)	I	MWF	133Ph	Mr. Finney
100f	Social Psychology ..... (3 cred.; jr., sr., grad.; prereq., Soc. 1 and 6, or Psy. 1-2, and 9 cred. in soc. sci., educ., phil., or psy.)	II	TThS	109OPh	Mr. Kirkpatrick
101s	Social Organization ..... (3 cred.; jr., sr., grad.; prereq., 4 courses in soc., or Soc. 1 and 15 cred. in soc. sci., educ., phil., or psy.)	II	MWF	110F	Mr. Chapin
102s	Social Control and Criminal Behavior ..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	II	MWF	109OPh	Mr. Vold
103w	Sociology of Conflict ..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	II	TThS	109OPh	Ar
110f	Rural Organization ..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	V	MWF	104OPh	Mr. Zimmerman
112w	The Rural Social Survey ..... (2 cred.; jr., sr., grad.; prereq., same as for 101)	V	MW	104OPh	Mr. Zimmerman

* An additional hour for students not going into social work.

‡ Field work fee of $3.50 each quarter.

§ Designed to meet needs of nurses and other students not going into social work.

No.	Title	Hour	Day	Bldg.	Instructor
114s	Rural Social Institutions ..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	I	MWF	*	Ar
115w	Religion As a Social Institution (3 cred.; jr., sr., grad.; prereq., same as for 101)	III	MWF	207F	Mr. Kirkpatrick
116w	The Newspaper As a Social Institution ..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	IV	MWF	104OPh	Mr. Willey
119f	The Family ..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	III	TThS	104OPh	Ar
120f	Social Progress ..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	II	MWF	109OPh	Mr. Wallis
121f-122w	Advanced Statistical Methods .. (6 cred.; jr., sr., grad.; prereq., 4 courses in soc. and for 122 Course 45 or 121 or equiv.)	VII	MWF	109OPh	Mr. Chapin
123s	Methods of Social Investigation .. (3 cred.; jr., sr., grad.; prereq., same as for 101)	VIII	MWF	109OPh	Ar
126s	Technique of Leadership in Group Work ..... (3 cred.; sr., grad.; prereq., 70, 71)	I	TThS	104OPh	Miss Mead
128s	Principles of Administration, Publicity and Finance Applied to Social Work ..... (2 cred.; jr., sr., grad.; prereq., same as for 101)	VIII, IX	Th	109OPh	Mr. Bradley
129w	Selected Problems in Social Case Work ..... (3 cred., jr., sr., grad.; prereq., 52; 91, or simultaneously)	IV	MWF	2OPh	Mrs. Fenlason
130s	Advanced Case Work ..... (3 cred.; sr., grad.; prereq., 92, 129)	IV	MWF	2OPh	Mrs. Fenlason
131w	Rural Social Case Work ..... (3 cred.; sr., grad.; prereq., 92)	III	MWF	2OPh	Miss Vaile
132	*Juvenile Courts and Probation* .. (2 cred.; jr., sr., grad.; prereq., 49, 52, 53)	*Not offered*			
133f	Social Case Work in Health Problems ..... (3 cred.; sr., grad.; prereq., 52, 91 and Prev. Med. 50, or 53, or simultaneously)	IX IV	Th S	109OPh	Miss Gardiner
134s	Legal Protection of the Child .. (3 cred.; jr., sr., grad.; prereq., same as for 101 incl. 60)	I	MWF	109F	Mr. Waite
135f,w,s ‡	Field Practice in Legal Protection of the Child ..... (2 cred.; jr., sr., grad.; prereq., 91, open to students taking 134)	Ar	Ar	Ar	Miss Vaile, Mrs. Fenlason

* Consult the bulletin of the College of Agriculture, Forestry, and Home Economics.
‡ Field work fee of $3.50 each quarter.

No.	Title	Hour	Day	Bldg.	Instructor
136f	Essentials of Medicine for Social Workers ..... (3 cred.; jr., sr., grad.; prereq., 91)	IX	MWF	2OPh	Med. Staff U.H. Miss Gardiner
137w	The History and Theory of Social Work ..... (3 cred.; jr., sr., grad.; prereq., 52)	I	TThS	2OPh	Miss Salsberry
138w-139s	Mental Case Work ..... (6 cred.; sr., grad.; prereq., 52, 91 and Psy. 144-145, or Prev. Med. 61, or simultaneously)	II	TS and ar	2OPh	Miss Leahy
140w	History of Social Theory ..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	II	MWF	109OPh	Mr. Wallis
141s	Contemp. Social Theory ..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	II	TThS	109OPh	Mr. Wallis
152f	Public Welfare Administration .. (3 cred.; jr., sr., grad.; prereq., 49, 52 and Pol. Sci. 1-2)	II	TThS	2OPh	Miss Vaile
153f,w,s-154f,w,s-155f,w,s‡	Advanced Field Training in Group or Case Work ..... (3 cred. per qtr.; jr., sr., grad.; prereq., 91 and 92)	Ar	Ar	Ar	Miss Vaile, Mrs. Fenlason
160s	Population Problems ..... (3 cred.; jr., sr., grad.; prereq., 4 courses in soc., or Soc. 1 and 15 cred. in soc. sci., ed., phil., or psy.)	III	MWF	9F	Ar

SPEECH

Major Advisers

Professor Rarig; Assistant Professor Bryngelson.

Major Sequences

Prerequisites: 41-42-43 or 45-46; Psychology 1-2. Human Physiology 4 is recommended for Sequence C.

A. Courses 55-56-57; 61; 67; 71-72-73; 81-82-83.

B. Courses 71-72-73; 81-82-83; 91-92-93; 105; 55-56 or 101-102.

C. Courses 61; 67; 121-122; 162-163; Psychology 114-115 or 125-126 and 144-145.

For requirements for the teacher's certificate consult the bulletin of the College of Education.

NOTE.—Students who desire treatment for stuttering should register for Course 41f-42w-43s III, MWF.

‡ Field work fee of $3.50 each quarter.

No.	Title	Hour	Day	Bldg.	Instructor
41f-42w-43s†*	Fundamentals of Speech ..... (9 cred.; soph., jr., sr.; prereq., Eng. A-B-C or Comp. 4-5-6 or exemption)				Mr. Rarig and others
	Sec. 1	I	MWF	308F	
	2	II	MWF	308F	
	3	III	MWF	409F	
	4	VI	MWF	308F	
	5	I	TThS	305F	
	6	II	TThS	308F	
	7	III	TThS	308F	
41w-42s†*	Fundamentals of Speech ..... (See 41f-42w-43s)	II	MWF	311F	
43f†*	Fundamentals of Speech ..... (3d qtr. of 41-42-43. See 41f-42w-43s)	II	MWF	226F	
45f-46w†*	Fundamentals of Speech ..... (10 cred.; soph., jr., sr.; prereq., Eng. A-B-C or Comp. 4-5-6 or exemption)				
	Sec. 1	III	MTWFS	402F	
	2	IV	MTWFS	402F	
	3	VI	MTWThF	402F	
	4	VII	MTWThF	308F	
	5	VIII	MTWThF	308F	
45w-46s†*	Fundamentals of Speech ..... (See 45f-46w)				
	Sec. 1	IV	MTWFS	102F(w), 25F(s)	
	2	VI	MTWThF	6F	
45s†*	Fundamentals of Speech ..... (First qtr. of 45-46. See 45f-46w)				
	Sec. 1	III	MTWFS	402F	
	2	IV	MTWFS	402F	
	3	VI	MTWThF	402F	
	4	VII	MTWThF	308F	
46f†*	Fundamentals of Speech ..... (Second qtr. of 45-46. See 45f-46w)				
	Sec. 1	IV	MTWFS	6F	
	2	VI	MTWThF	104F	
51s*	Advanced Public Speaking .... (3 cred.; jr., sr.; prereq., 41-42-43 or 45-46)	II	MWF	212F	Ar
55f-56w-57s†	Arg. and Debating ..... (9 cred.; jr., sr.; prereq., 41-42-43 or 45-46)	VII VII, VIII	T Th	OLAud	Mr. Gilkinson
61f	Speech Correction ..... (4 cred.; jr., sr.; prereq., 41-42-43 or 45-46; Psy. 1-2)	VI	MTThF	6F	Mr. Bryngelson
67s*¶	Phonetics ..... (3 cred.; jr., sr.; prereq., 41-42-43 or 45-46)	II	MWF	402F	Mr. Bryngelson

* Students taking these courses are required to pay a laboratory fee of $1 each quarter.

† The entire course must be completed before credit is received for any quarter. Students in Education not majoring in Speech may receive credit for Course 41-42. Other students must take all three quarters.

¶ Students intending to take Speech Pathology should take Phonetics the preceding spring.

No.	Title	Hour	Day	Bldg.	Instructor
71f-72w-73s*†	Elements of Play Production .. (9 cred.; jr., sr.; prereq., 41-42-43 or 45-46)	III	MWF	19Mu	Mr. Staadt
81f-82w-83s*	Interpretative Reading ..... (9 cred.; jr., sr.; prereq., 41-42-43 or 45-46)	IV	MWF	308F	Mr. Rarig
81w-82s*	Interpretative Reading ..... (See 81f-82w-83s)	I	TThS	308F	Mr. Rarig
91f-92w-93s†	Stagecraft and Direction ..... (9 cred.; jr., sr.; prereq., 71-72-73, 81-82-83, Eng. 55-56)	VII	MWF	19Mu	Mr. Staadt
97f,w,s	Intercollegiate Oratory and Debate ..... (3 cred.; jr., sr.; prereq.§)	Ar	Ar	308F	Mr. Rarig Mr. Gilkinson
101-102†	*Advanced Speech Composition* .. (6 cred.; jr., sr., grad.; prereq., 41-42-43 or 45-46; Psy. 1-2; 10 cred. soc. sci.)	*Not offered*			
105s	Theory of Reading and Acting (3 cred.; jr., sr., grad.; prereq., 41-42-43 or 45-46; 81-82-83, and Psy. 1-2)	III	MWF	308F	Mr. Rarig
121w-122s†*	Advanced Speech Problems .... (6 cred.; jr., sr., grad.; prereq., 41-42-43 or 45-46, Psy. 1-2)	II	TThS	409F	Mr. Holmes
141f-142w-143s*	Voice Science ..... (9 cred.; jr., sr., grad.; prereq., 41-42-43, Psy. 1-2 and 4-5 or 7)	Ar	Ar	Ar	Mr. Holmes
162w-163s‡*	Speech Pathology ..... (6 cred.; jr., sr., grad.; prereq., 41-42-43 or 45-46; 61; 67; Psy. 1-2)	Ar	Ar	Ar	Mr. Bryngelson
207f-208w-209s	Seminar in Orators	Ar	Ar	Ar	Mr. Rarig
261f-262w-263s	Seminar in Speech Correction ..	Ar	Ar	Ar	Mr. Bryngelson
291f-292w-293s	Research and Thesis	Ar	Ar	Ar	Mr. Rarig, Mr. Bryngelson, Mr. Holmes

ZOOLOGY

Major Advisers

Professors Minnich, Riley, Sigerfoos, and Wodsedalek; Associate Professor Ringoen; Assistant Professors Dawson, Eddy, and Mickel.

Major Sequences

Prerequisites: 1-2 and 3-4, or equivalent, and one each of the alternatives 21 or 22, 23 or 24, and 25 or 26. If possible beginning chemistry and at least one year of French or German should be completed during the junior college work.

* Students taking these courses are required to pay a laboratory fee of $1 each quarter.

† The entire course must be completed before credit is received for any quarter.

‡ Speech Clinic. A service clinic is conducted for university students who have particular speech defects, whether or not registered in courses in Speech. 410F. Mr. Bryngelson.

§ Open to the representative of the University in the Northern Oratoric League and to members of the intercollegiate debate squad.

A. In Zoology, Courses 109-110-111 or 117-118-119; 107-108 or 125-126-127 or 144-145-146; 148-149-150 or 160-161 or 181-182; 183, and additional credits in approved courses to make a total of 27 credits in senior college courses.

B. In special fields, such as cytology, ecology, embryology, entomology, experimental zoology, histology, parasitology, or protozoology, a major will consist of the respective one hundred course, five or more credits in a problem course in the special field, and additional credits in approved courses to make a total of 27 credits in senior college courses.

Honors Course in Zoology.—A student who has met all of the requirements for admission to the Senior College and who has maintained a grade of B in his work in the department may enroll for the Honors Course in Zoology. Such a student will carry at least twelve hours of problem work in some special phase of the work and will pursue under the direction of his adviser such special reading and outlined courses as may be required. The completion of the Honors Course will require a reading knowledge of either French or German.

Courses in human anatomy, embryology and hematology may be arranged for with the head of the Department of Anatomy.

Courses in general and human physiology may be arranged for with Dean Lyon.

For the requirements for the teacher's certificate, consult the bulletin of the College of Education.

No.	Title		Hour	Day	Bldg.	Instructor
1f-2w†	General Zoology: Lectures					
	(6 cred.; all)	Sec. 1	I	TThS*	313Z	Mr. Wodsedalek
	Sections limited to 160	2	II	TThS	313Z	Mr. Wodsedalek
		3	III	TThS	313Z	Mr. Minnich
1w-2s†	General Zoology: Lectures					
	(See 1f-2w)	Sec. 1	II	MWF	313Z	Mr. Turner
	Sections limited to 160	2	III	MWF	313Z	Mr. Wodsedalek
3f-4w†	General Zoology: Laboratory					
	(4 cred.; fr., soph., jr., sr., with or after 1-2. *Must be completed if zoology is offered as the required laboratory science.*)					
		Sec. 1	I, II	MWF	101Z	Mr. Dawson
		2	III, IV	MWF	101Z	Ar
3w-4s†¶	General Zoology: Laboratory ...					
	(See 3f-4w)	Sec. 1	VI, VII	MWF	101Z	Mr. Dawson
		2	VIII, IX	MWF	101Z	Ar
5f-6w-7s†¶	General Zoology					
	(12 cred.; pre-medical and pre-dental students, fr., soph., jr., sr.; no prereq.)					
	Lab.	Sec. 1	I, II	ThS(f)	101Z	Mr. Eddy
			I, II	TS(w,s)		
	(Pre-dental) Lect.		I	MWF	313Z	
	Lab.	2	III, IV	TS	101Z	
	(Pre-medical) Lect.		IV	MWF	313Z	Mr. Sigerfoos
14f-15w-16s†¶	General Zoology		See College of Agriculture bulletin.			
	(9 cred.; Agr., For.; no prereq.)					

* Section 1 is not open to first term freshmen in the fall quarter.
† The entire course must be completed before credit is received for any quarter.
¶ A laboratory fee of $1 a quarter is charged for this course.

No.	Title	Hour	Day	Bldg.	Instructor
17f-18w†¶	General Zoology ..... (6 cred.; H.E.; no prereq.)	See College of Agriculture bulletin.			
21s‡	Introd. to General Physiology .. (5 cred.; fr., soph., jr., sr.; prereq., 1-2, 3-4, chem. desirable)				
	Lect.	VI	MWF	10Z	Mr. Minnich
	Lab. Sec. 1	VII, VIII	MWF	10Z	
	2	VI, VII, VIII	TTh	10Z	
22s	General Ecology ..... (5 cred.; fr., soph., jr., sr.; prereq., 1-2, 3-4)	VI, VII, VIII VI, VII, VIII, IX	MW F	211Z, 401Z	Mr. Eddy
23f	Introd. Entomology ..... (5 cred.; soph., jr., sr.; prereq., 1-2, 3-4)				
	Lect.	VI	MWF	211Z	Mr. Mickel
	Lab.	VI, VII, VIII	TTh	208Z	
24f	Introd. Animal Parasitology .... (5 cred.; soph., jr., sr.; prereq., 1-2, 3-4)	VI, VII, VIII	MWF	208Z	Mr. Christenson
25w	Histology ..... (5 cred.; soph., jr., sr.; prereq., 1-2, 3-4, and permission of the head of the dept.)				
	Lect.	VI	MWF	211Z	Mr. Ringoen
	Lab. Sec. 1	VII, VIII	MWF	201Z	
	2	I, II	MWF	201Z	
26w§	Comp. Anatomy ..... (5 cred.; soph., jr., sr.; prereq., 1-2, 3-4)				
	Lect.	III	TThS	211Z	Mr. Eddy
	Lab. Sec. 1	III, IV	MWF	3SZ	
	2	VI, VII, VIII	TTh	3SZ	
	Sections limited to 25				
27f	Technique ..... (3 cred.; stud. in zool.; major and grad.; prereq., 15 cred.)				
	Lect.	III	Th	211Z	Miss Slider
	Lab.	VI, VII, VIII	M or T & Ar	202Z	
46w-47s†	Ornithology ..... (6 cred.; soph., jr., sr.; prereq., 1-2, 3-4 and permission of instructor)	VI, VII, VIII	MW	314Z	Dr. Roberts
75s	Nature Study ..... (3 cred.; jr., sr.; prereq., 20 cred. incl. 1-2, 3-4)	VI, VII, VIII	TTh	213Z	Mr. Wodsedalek
107f-108w†	Protozoology ..... (6 cred.; jr., sr., grad.; prereq., 15 cred.)	I, II	TThS	Ar	Mr. Sigerfoos
109f-110w-111s	Experimental Zoology ..... (9 cred.; jr., sr., grad.; prereq., 20 cred.)	IV	MWF	10Z	Mr. Minnich
117f-118w-119s	Animal Ecology ..... (9 cred.; jr., sr., grad.; prereq., 15 cred.)	VI, VII, VIII	TTh	401Z	Mr. Eddy, Mr. Hodson

† The entire course must be completed before credit is received for any quarter.
‡ Not open to pre-medical or pre-dental students or to those who have had college physiology.
¶ A laboratory fee of $1 a quarter is charged for this course.
§ A laboratory fee of $2 a quarter is charged for this course.

No.	Title	Hour	Day	Bldg.	Instructor
125f-126w-127s	Advanced Entomology ..... (9 cred.; jr., sr., grad.; prereq., 15 cred.)	Ar	Ar	208Z	Mr. Mickel
144f,s-145w-146s	Animal Parasites and Parasitism (9 cred.; jr., sr., grad.; prereq., 15 cred. or 1-2, 3-4, and 1 yr. chem.)	VI, VII, VIII	WF	208Z	Mr. Christenson
148f-149w-150s	Histology and Organology ..... (9 cred.; jr., sr., grad.; prereq., 15 cred. in zool., or 1-2, 3-4, and 1 yr. chem. Permission of head of dept. necessary)	III, IV	MWF	201, 211Z	Mr. Ringoen
160f-161w	Cytology ..... (6 cred.; jr., sr., grad.; prereq., 20 cred., incl. 27, with the consent of the instructor)	Ar	Ar	Ar	Mr. Wodsedalek
181w-182s	Embryology ..... (6 cred.; jr., sr., grad.; prereq., 25 or equiv.)	VI, VII, VIII	TTh	201Z	Mr. Ringoen
183s	Genetics and Eugenics ..... (3 cred.; jr., sr., grad.; prereq., 1-2, 3-4 and 5 other cred. in zool. or bot. or psych.)	III	TThS	313Z	Mr. Wodsedalek
197f-198w-199s	Problems ..... (5 or more cred.; jr., sr., grad.; prereq., 1-2, 3-4. spec. requirements)	Ar	Ar	Ar	Ar

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Students in this college may elect courses in Entomology and Economic Zoology by arrangement with the department. See program of the College of Agriculture, Forestry, and Home Economics.

COURSES IN OTHER COLLEGES

Certain courses in other colleges are open to election by seniors, according to General Information, Section 42 (Part I of this bulletin). Students interested in such courses may consult the assistant dean for the Senior College.

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Division of Library Instruction Announcement for the Year 1931-1932

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OFFICERS AND FACULTY

Frank K. Walter, M.A., M.L.S., University Librarian, Director of the Division of Library Instruction, and Professor of Library Methods

Ina Ten Eyck Firkins, B.L., Reference Librarian, Associate Professor of Library Methods

Lura C. Hutchinson, B.A., Assistant Professor of Cataloging, Classification, Reference, and Selection of Books

Harold Russell, B.A., B.L.S., Head of Order and Binding Sections, University Library, Assistant Professor of Library Methods and Bibliography

Miriam E. Carey (Univ. of Ill. certificate), Instructor in Classification

Della McGregor, B.A., Chief, Juvenile Department, St. Paul Public Library, Instructor in Work with Children

Harriet A. Wood, B.A., Assistant Director of Libraries and Supervisor of School Libraries, Minnesota State Education Department, Instructor in School Library Administration

Clara F. Baldwin, B.A., Director of Libraries, Minnesota State Education Department, Lecturer on Public Library Administration

Etta Claire Blomgren, B.S., Lecturer on Use of Books and Libraries

Edna L. Goss, B.L.S., Head, Catalog Department, University of Minnesota Library, Lecturer on Cataloging

Blanche Moen, B.A., Reference Assistant, University of Minnesota Library, Lecturer on Use of Books and Libraries

Helen M. Smith, B.A., Head, Circulation Department, University of Minnesota Library, Lecturer on Circulation Work

GENERAL INFORMATION

The Division of Library Instruction of the University of Minnesota was established by the regents of the University in April, 1928. The division unites for instructional and administrative purposes all the facilities of the University for training librarians for service in libraries of varied types. It submits to the different schools, colleges, or other units of the University interested in such training, curricula or programs suitable for the different types of work desired. It maintains an instructional staff to carry on such courses or curricula as may be approved for credit by these university units.

Credits for such courses are given by the school or college approving them for inclusion in its curriculum. Students who offer these courses in library training as a partial requirement for a degree must comply in every particular with the requirements of the school or college from which the degree is desired. These specific requirements are included in the regular announcements of the various schools and colleges of the University. These announcements may be obtained on application to the registrar of the University.

The professional courses in library instruction are for senior college students. At least two full years of approved college work are required as prerequisite for regular admission to any of these courses and at least three years of approved preliminary college work, in addition to a year in library instruction, are required for a degree. The College of Science, Literature, and the Arts accepts only library training students in senior standing. The College of Education will credit a minor of library training during the junior year. (See pages 6-7.) School of Business Administration students desiring library instruction credits must be in senior standing. Persons not eligible for regular registration may be admitted as unclassed students only by complying with such college regulations or by passing such tests as may be required from such students.

There is evidence that registration in library training courses is increasing more rapidly than positions for graduates of such courses. For this reason, prospective students of only average educational background and those who do not have marked aptitude for, and definite interest in, library work are not advised to register in this division. Library positions for beginners of more than thirty-five years of age are very few.

Registration.—All students, whether full time or part time, must be regularly registered. Full information concerning registration is given in the general information bulletin, which may be obtained on application to the registrar of the University.

Fees and expenses.—The tuition fees in library training are, for full time students, $40 per quarter for residents of Minnesota and $45 per quarter for nonresidents. Unclassed students, auditors, and others carrying less than full work in library instruction (15 credits per quarter) pay a tuition fee of $3 per credit per hour for all courses under the supervision of the Division of Library Instruction (except Library Methods 1), irrespective of their registration in courses in other subjects. The incidental, penalty, and other general fees are given in the general information bulletin, in which information concerning the cost of board and room and other estimated expenses may also be found.

COURSES OF STUDY

Two programs, one of one year in the College of Science, Literature, and the Arts, and the other in the College of Education, leading to the degree of bachelor of science are offered. Each requires for its completion four full years of work, including a full year of professional training in library methods, in the college in which the student is registered. All regulations of the college from which the degree is desired must be complied with before the degree will be granted. Credit for certain courses in library instruction will also be given in the School of Business Administration and the College of Agriculture. Permission for such credit must be obtained from the deans of these colleges.

A special course in Hospital Library Work, involving a fifth year of work, is outlined on pages 7-8.

DESCRIPTION OF COURSES

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).

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.

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. (See also pp. 5-6.) The hours of recitation are numbered by roman numerals, the day by the appropriate initial, the room by an arabic numeral, and the building by an abbreviation. For example (MWF III, 5Lib.) means that the class meets Monday, Wednesday, and Friday, the third recitation hour, in Room 5, Library.

FRESHMAN AND SOPHOMORE NON-PROFESSIONAL COURSE

Lib.Meth. 1. Use of Books and Libraries. Study of reference material for personal study and research. No credit toward a degree in library instruction, but general credit is given in the College of Science, Literature, and the Arts, and in such other schools and colleges as may, by special arrangement, desire their students to be registered in the course. (2 cred.; Sec. 1, MW II, 3Lib.; Sec. 2, MW IV, 3Lib.; Sec. 3, MW VI, 5Lib.) Miss Firkins, Mr. Russell, Mrs. Blomgren, Miss Moen.

PROFESSIONAL COURSES

The courses below, aggregating a full year of college work, are open for regular credit only to students who have met all the requirements for admission to the senior college courses in the colleges specified above, except as specified on pages 6-7.

Lib.Meth. 101f. Bibliography. Trade and national bibliography of the United States, Great Britain, and Europe; book ordering methods. (3 cred.; MWF III; 5Lib.) Mr. Russell.

Lib.Meth. 102f. Cataloging. Elements of dictionary cataloging. Lecture, problems, and practice. (3 cred.; Sec. 1, MWF I, Ed. students; Sec. 2, MWF IV.) Miss Hutchinson.

Lib.Meth. 103w. Cataloging. Continuation of Cataloging 102, with special attention to difficult books and administrative aspects of a catalog department. (3 cred.; prereq., Lib.Meth. 102; MWF IV; 5Lib.) Miss Hutchinson.

Lib.Meth. 104f. Classification. Classification by the Dewey Decimal System, subject headings, author numbers, shelf and accession records. (3 cred.; TThS II; 5Lib.) Miss Hutchinson.

Lib.Meth. 105w. Classification. Continuation of Lib.Meth. 104. Library of Congress and other classifications; classed catalogs; special adaptations of classification. (3 cred.; prereq., Lib.Meth. 104f; TThS II; 5Lib.) Miss Carey.

Lib.Meth. 107s. School Library Administration. Administrative methods and problems of school libraries. (3 cred.; prereq., 9 cred. in library methods; F III-IV, S IV; 3Lib.) Miss Wood.

Lib.Meth. 108s. Public Library Administration. Administration, equipment, finance, and extension work of public libraries. (3 cred.; prereq., 9 cred. in library methods; TThS I; 5Lib.) Miss Baldwin, Miss Wood.

Lib.Meth. 110f. Library Binding. Economics of library binding. Materials, processes, records, book repair. (1 cred.; T III; 5Lib.) Mr. Walter.

Lib.Meth. 111f,w,s. Library Practice. Practice, under supervision, in Minneapolis and St. Paul libraries. The time and character of the practice will be individually arranged to suit student aptitudes, usually in the second and third quarters. Required of all candidates as prerequisite for a degree in library training. (3 cred.; prereq., 15 cred. in library methods.) Mr. Walter.

Lib.Meth. 112w. Reference. Reference books and other material with emphasis on methods of search and adaptation of material to needs of users. (3 cred.; MWF III; 5Lib.) Miss Hutchinson.

Lib.Meth. 113s. Reference—Continued. Specialized reference material, public documents, and periodicals. Reference lists and reports on special problems. (3 cred.; prereq., Lib. Meth. 112; MWF III; 5Lib.) Miss Hutchinson.

Lib.Meth. 114s. Selection of Books for Adolescents. Principles of selection and criticism of representative books. Study and preparation of book lists for adolescents in school and public libraries. (3 cred.; prereq., 9 credits in library methods; MWF; II; 5Lib.) Miss McGregor.

Lib.Meth. 117w. Library Printing. Preparation of copy, editing, proof reading, layout of library publications. Criticism of typical printed material. (1 cred.; T III; 5Lib.) Mr. Walter.

Lib.Meth. 118s. Library Publicity. Preparation and use of print in library publicity. Library exhibits, etc. (1 cred.; prereq., 9 cred. in library methods; T III; 5Lib.) Mr. Walter.

Lib.Meth. 119f. Current Library Problems. Discussion of typical problems and conditions in American libraries. (3 cred.; prereq., 9 cred. in library methods or simultaneously with Lib.Meth. 101, 102, 104; MWF II; 5Lib.) Mr. Walter.

Lib.Meth. 120w. Current Library Problems. Further discussion of typical library problems, library buildings, library surveys, etc. (3 cred.; prereq., Lib.Meth. 119; MWF II; 5Lib.) Mr. Walter.

Lib.Meth. 121w. Library Work with Children. Administration of children's rooms and book selection. (3 cred.; prereq., 9 cred. in library methods or 6 cred. and one three-credit course in library training simultaneously with 121; MWF I; 5Lib.) Miss McGregor.

Lib.Meth. 122s. Library Work with Children. Further discussion of administration of children's rooms and book selection. (3 cred.; prereq., Lib.Meth. 121; MWF I; 5Lib.) Miss McGregor.

Lib.Meth. 123f. Selection of Books for Adults. Principles of selection and criticism of representative books. Criticism and preparation of book lists. (2 cred.; ThS III; 5Lib.) Miss Hutchinson.

Lib.Meth. 124w. Selection of Books for Adults. Further discussion of books and aids to book selection. (2 cred.; prereq., Lib.Meth. 123; ThS III; 5Lib.) Miss Hutchinson.

Lib.Meth. 125s. Selection of Books for Adults. (2 cred.; prereq., Lib.Meth. 124; ThS III; 5Lib.) Miss Hutchinson.

A special fifth year course in Hospital Library Training is outlined on pp. 7-8.

CURRICULUM IN THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

The successful completion of three years of work in the general course of the College of Science, Literature, and the Arts in addition to not less than 45 credits of courses listed on pages 4-6 will entitle the student to the degree of bachelor of science. The specific requirements for the three years of preliminary work may be found in the bulletin of the College of Science, Literature, and the Arts.

During the four years, the student must secure 180 credits and 180 honor points. For each five honor points in excess of one honor point per credit, the required number of credits will be diminished by one.

Students from other institutions desiring a degree in library training must meet the same specific requirements which students of the University of Minnesota must meet.

COLLEGE OF EDUCATION

SPECIALIZED CURRICULUM FOR SCHOOL LIBRARIAN

The successful completion of the following four-year curriculum will entitle the student to the degree of bachelor of science. Students also qualify for the Minnesota high school general certificate for teaching academic subjects in junior and senior high schools by completing one teaching major or two teaching minors. It will usually be wisest to choose majors and minors in the fields of English and history. Students who complete eighteen credits selected from Courses 102f, 104f, 107s, 108s, 112w, 114s, 121w and 122s will satisfy the requirements for a minor in library training. (See pp. 4-6 for description of courses.)

Freshman Year

Fall	Credits	Winter	Credits	Spring	Credits
English	5	English	5	English	5
Modern World	5	Modern World	5	History	5
Language	5	Language	5	Language	5
	15		15		15

Sophomore Year

Fall	Credits	Winter	Credits	Spring	Credits
Science	5	Science	5	Elective	5
Language	5	Elective[1]	7	Elective	5
Psychology	3	Psychology	3	Elective	5
Elective	2				
	15		15		15

[1] Electives should be chosen to meet the requirements of one teaching major or two teaching minors. See College of Education bulletin, Part I.

Junior Year

Fall	Credits	Winter	Credits	Spring	Credits
102 Cataloging	3	112 Reference	3	(6 credits selected from 107, 108, 114)	
103 Classification	3	121 Library Work with Children	3	107 Library Administration	3
55 Ed. Psy.	3	Ed. Ad. 65 The High School	3	108 Library Administration	3
Continuation of required elective academic courses	6	Continuation of required elective academic courses	6	114 Book Selections for Adolescents	3
	—		—	T. 15 Technique of H. S. Instruction	3
	15		15	Continuation of required elective academic courses	6
				From above, select total of	15

Senior Year

Fall	Credits	Winter	Credits	Spring	Credits
Special Methods and Practice Teaching	3	Special Methods and Practice Teaching	3	Special Methods and Practice Teaching	3

Completion of academic requirements—fall, winter, spring.
Library courses—27 credits—fall, winter, spring (see pp. 4-6).
Elective[1]—9 credits.

ADVANCED COURSE IN HOSPITAL LIBRARY SERVICE

This course is open to applicants who have completed four full years of approved college work, including at least a year (45 credits) of library training. Its purpose is to give the necessary social, scientific, and economic background for the successful application of library methods to the service of the sick and convalescent in hospital residence, and incidentally, to the professional staffs of these hospitals. The completion of a year's general course, or an equivalent, is prerequisite. It is open also to graduates of other library schools with equivalent standards. (See pp. 4-6 for general courses in a four-year program preparing for general or school library work.)

The field work will be given under careful supervision in hospitals of Minneapolis and St. Paul. Both cities have organized hospital library service under the direction of their public libraries.

The course of training for hospital library service consists of three years of approved academic work, one year (the fourth, 45 credits) of library training, and a fifth year of specialized training for hospital service. The completion of five years' work (225 credits and 225 honor points) will lead to the degree of bachelor of science or a certificate of proficiency in hospital library service.

The course will not be offered unless at least ten advance registrations for the year's work are received before June 1 of the academic year preceding that in which the work is to be taken.

The three years of academic work should include the following (or equivalent) courses, and their prerequisites, in the College of Science, Literature, and the Arts: English Composition 18-19; French 1-2, or 3-4; German 1-3, 4; History 1-2; Human Physiology 1; Psychology 1-2, 3, 4-5; Sociology 1, 49, 56, 6, 45; electives to make a total of 90 credits. English, history, foreign languages, and psychology are recommended.

Fourth Year

A minimum of 45 credits of library training. (See pp. 4-6.)

[1] At least 2 credits must be chosen from approved Education courses. See College of Education bulletin, Part I.

Fifth Year

Courses in preventive medicine, medical social service, sociology, and library methods, under the direction of an adviser. A recommended schedule is given below. This schedule is subject to some modification to meet individual cases, but all such modification is subject to the approval of the director of the Division of Library Instruction.

Department	No.	Course	Quarters	Credits
Preventive Medicine	53	Preventive Medicine	1	3
Preventive Medicine	61	Mental Hygiene	1	1
School of Nursing	2	Ethics of Nursing	1	1
Medical Social Service	60	Principles and Practice of Medical Social Service in Clinic, Hospital, and Home	1	2-4
Medical Social Service	65	Relationships of Hospital to Social Work	1	2-4
Medical Social Service	63	Occupational Therapy	1	1
Medical Social Service	62	Hospitals and Hospital Economics	1	2
Library Methods	130	Hospital Library Administration	1	1
Library Methods	131	Literature for Use of Hospital Groups	1	9
Library Methods	132	Field Work in Hospital Libraries	3	9
Electives (10-14 credits) to complete total of				45

COURSE IN MEDICAL TECHNOLOGY FOR LABORATORY TECHNICIANS

1930-32

See bound bulletin for 1930-31

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Department of Music Announcement for the Year 1931-1932

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DEPARTMENT OF MUSIC

FACULTY

Carlyle M. Scott, Professor and Chairman of the Department of Music
Donald N. Ferguson, M.A., Professor of Music
Gertrude Hull, Associate Professor of Music
Earle G. Killeen, M.Mus., Professor of Music
William Lindsay, Associate Professor of Music
George H. Fairclough, F.A.G.O., M.Mus., Assistant Professor of Music
Archie N. Jones, B.S., Assistant Professor of Education
Blanche Kendall, Assistant Professor of Music
Abe Pepinsky, B.A. Assistant Professor of Music
Gertrude Reeves, Assistant Professor of Music
Clyde W. Stephens, Assistant Professor of Piano
Harold Ayers, Instructor in Violin
Cecil Birder, LL.B., Instructor in Voice
Alexandre Duvoir, Instructor in Oboe
Christian Erck, Instructor in Cello
Roger Gauthier, Instructor in English Horn
Rudolph Goranson, B.S., Instructor in Public School Music
Georges Grisez, Instructor in Clarinet
Michael Jalma, Director of Band
Paul Lemay, Instructor in Viola
Richard Otto Lindenhahn, Instructor in French Horn
Karl Scheurer, Instructor in Violin
Miles Sery, Instructor in Tuba and Cornet
Agnes Rast Snyder, Instructor in Voice
George Stump, B.A., Instructor in Voice
Kate Mork Twichell, Instructor in Piano
Henry J. Williams, Instructor in Harp
Mary Malcolm, B.S., Assistant

COURSES OF STUDY

Two major courses of study are offered to the student of music as follows:

1. Course in Arts and Music leading to the degree of bachelor of arts with a major in music.

2. Course in Public School Music leading to the degree of bachelor of science in education and the state teacher's certificate.

Students desiring to follow the first course of study will register in the College of Science, Literature, and the Arts. Those desiring to follow the course in Public School Music will register in the College of Education.

Opportunities are also offered through registration in the General Extension Division to those who desire to take special work in practical and theoretical music without qualifying for a degree.

The Department of Music also offers its courses as electives to the students of any school or college of the University subject to the rules of the school or college in which the student is registered, and subject to satisfying the general requirements for admission to practical courses in music as stated below.

ADMISSION

1. *Admission to the freshman year.*—Admission to the University 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:

a. 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.

b. One unit of algebra and one unit of plane geometry or two units of unified mathematics.

c. 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.

2. *General requirements for admission to the work of the Music Department.*—All students wishing to register in one of the four-year courses of study listed above must, upon matriculation, choose a major subject in practical music and pass an examination in that subject before a committee of the faculty of the Music Department. Entrance requirements for a major, according to instrument are:

a. Piano: Any major or minor scale in octaves, thirds, sixths, or tenths, M.M. quarter notes = 108; Bach Invention or dance from one of the suites; a sonata by Haydn or Mozart; a modern composition of equal difficulty with the sonata.

b. Voice: Good natural equipment and 2 years of piano.

c. Violin: Major and minor scales, arpeggios; the simpler Kreutzer Etudes; a sonata by Handel, Haydn, Mozart, or Schubert; a more modern work displaying special technic peculiar to the violin.

d. Organ: Same as piano.

Also, all public school music students *not majoring* in piano and all Science, Literature, and the Arts students *majoring* in voice will be examined concerning requirements to be met in piano. (See I and II regarding practical music requirements for graduation.)

Students from other departments or colleges electing courses in practical music must take simple preliminary examinations in those courses.

3. *Admission to extension courses.*—Any student who meets the general requirements under 2, above, may register for extension courses in music. Such courses, however, will not carry credit toward a university degree until entrance requirements under 1, above, have been met.

FEES

DEGREE COURSES OF STUDY

Tuition fee (per quarter)	
Residents of Minnesota	$20.00
Non-residents	30.00
Credit hour tuition fee (unclassed students, auditors, and others carrying less than full work)	
Residents of Minnesota	1.75
Non-residents	2.50
Incidental fee (per quarter)	6.00
Matriculation deposit (first quarter only) ($5.00 for women)	15.00
Special fees	
Examination for removal of condition	1.00
Examination for credit (after the first quarter in residence)	5.00
Special examination	5.00
Special methods and practice teaching fee*	
Laboratory fee†	
Graduation fee	10.00
Music fees, per quarter (for piano, organ, voice, violin)	
Two lessons per week (one-half hour)	65.00
One lesson per week	35.00
Music fees, per quarter (for all courses except piano, organ, voice, and violin)	
Two lessons per week (one-half hour)	75.00
One lesson per week	40.00
Practice fees	
Organ (per hour)	
Small	.20
Large	.40
Piano (six hours per week) per quarter ($.50 per quarter for each additional hour per week)	5.00

* The following courses carry the special methods and practice teaching fee of $1 per credit hour:

Mu.Ed. 50. Elementary Methods
Mu.Ed. 51. Comparative Methods
Mu.Ed. 52. Technique of Teaching Appreciation
Mu.Ed. 53. High School Methods
Mu.Ed. 54. Operetta Conducting
Mu.Ed. 57. Orchestra Conducting
Mu.Ed. 58. Choral Conducting
Mu.Ed. 59. Advanced Conducting
Mu.Ed. 60. Supervision
Mu.Ed. 61. Practice Teaching
Mu.Ed. 65. Instrumentation

† The following courses carry the special laboratory fee of $1 per credit hour:

Mu.Ed. 1-2-3. Applied Instrumental Technique
Mu.Ed. 55-56. Survey of Materials (Vocal, Instrumental)

Tuition fee per credit hour $3.33
Music fee (for each course in practical music) same as above.

Students in other schools and colleges of the University are required to pay the music fees for each course in practical music in addition to the regular fees of the curriculum in which they are registered.

I. GENERAL COURSES LEADING TO DEGREE OF BACHELOR OF ARTS WITH A MAJOR IN MUSIC

The four-year course leading to the degree of bachelor of arts combines the theoretical and practical work in music with the study of psychology, modern languages, English literature, and history. The object is to provide a well-rounded cultural course for those whose major interest is music.

To secure the degree of bachelor of arts with a major in music, students must fulfill the requirements of both the Junior and Senior colleges as stated in the bulletin of the College of Science, Literature, and the Arts, securing 144 credits in courses other than practical music (piano, voice, etc.). They must earn 36 credits in practical music, the number of credits required in their major subject to be determined by the department. Students majoring in voice must, before graduation, meet the entrance requirement for a major in piano. (See 2a under Admission.)

SCIENCE, LITERATURE, AND THE ARTS

FRESHMAN AND SOPHOMORE YEARS

	Credits
English A-B-C or equivalent	15
Foreign language to fulfill the requirements for admission to Senior College	0 to 20*
History 11-12-13, Medieval History	10
Psychology 1-2 and 4-5 or 7, General Psychology with laboratory	10
Ear Training 1	3
Harmony 2-3-4	9
Counterpoint 5-6	6
Introduction to Music 7-8-9	6
Practical Music under the direction of an adviser	24
Physical Education	3
Electives to make a total of 90.	

JUNIOR AND SENIOR YEARS

A major sequence	27 or 30
A minor sequence (9 credits in senior college courses in one department)	9
Practical Music	12-24
Electives to make a total of 183 credits.	

* A student must present for entrance four years of one foreign language, or he must complete twenty credits of 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
One year of one language	15 credits in same language
Less than a year of one language	20 credits in one language

FIRST YEAR

Fall	Credits	Winter	Credits	Spring	Credits
English*	—	English	—	English	—
History 11	3	History 12	3	History 13	4
Music 1	3	Music 2	3	Music 3	3
Music 7	2	Music 8	2	Music 9	2
Practical Music	4	Practical Music	4	Practical Music	4
Physical Education	1	Physical Education	1	Physical Education	1
Electives		Electives		Electives	

SECOND YEAR

Psychology 1	3	Psychology 2	3	Psychology 7†	4
Language	0 or 5	Language	0 or 5	Language	0 or 5
Music 4	3	Music 5	3	Music 6	3
Practical Music	4	Practical Music	4	Practical Music	4
Physical Education	1	Physical Education	1	Physical Education	1
Electives		Electives		Electives	

THIRD YEAR§

Major Sequence A		*Major Sequence B*		*Major Sequence C*	
Ensemble	6	Advanced Harmony	6	Ensemble	6
History of Music	9	Ensemble	6	History of Music	9
Analysis	3	History of Music	9	Normal Piano	6
Practical Music	6 or 12	Practical Music	6 or 12	Practical Music	6 or 12

FOURTH YEAR§

Major Sequence A		*Major Sequence B*		*Major Sequence C*	
Bach-Beethoven	9	Bach-Beethoven	9	Advanced Normal Piano	6
Romantic Movement	6	Composition-Orchestration	6	Bach-Beethoven	9
Practical Music	6 or 12	Practical Music	6 or 12	Practical Music	6 or 12
Electives		Electives		Electives	

II. FOUR-YEAR COURSE IN PUBLIC SCHOOL MUSIC LEADING TO THE DEGREE OF BACHELOR OF SCIENCE

The Public School Music Course is a four-year course leading to the degree of bachelor of science, in which the theoretical, practical, and methods courses in music are combined with the study of English composition, psychology, and such subjects as the College of Education demands as a definite requirement. The object is to provide a well-rounded course for candidates for the bachelor of science degree in public school music.

For graduation, students must earn 185 credits and 185 honor points for women and 186 credits and 186 honor points for men and a C+ average in their major instrument with a C average in the rest of the work. They must earn 24 credits in Practical Music, 18 of which shall be the minimum requirement for their major subject and six of which must be in a second field other than the major. Either the major or minor must be in voice. (Students not majoring in piano shall be required to take one year of Piano A, B, C, 2 credits per quarter, exemption dependent upon entrance examination.) (See 2 under Admission.)

* English A, B, C, or 4, 5, 6, or exemption from requirement. See Composition program.

† General Psychology and laboratory may be taken concurrently.

§ Credits in each case are for one year's work.

A teaching minor in one academic secondary school subject is required, English, history or languages are suggested.

Pending the development of a specialized curriculum in instrumental music, elective credits to the extent of 7, may be used.

An academic minor is required for graduation of all public school music students. For advice concerning a minor, see departmental adviser.

FIRST YEAR

Fall	Credits	Winter	Credits	Spring	Credits
English*	3	English	3	English	3
Practical Music	2 or 4	Practical Music	2 or 4	Practical Music	2 or 4
Music 7	2	Music 8	2	Music 9	2
Music 1	3	Music 2	3	Music 3	3
Physical Education	1	Physical Education	1	Physical Education	1
Electives		Electives		Electives	

SECOND YEAR

Practical Music	2	Practical Music	2	Practical Music	2
Music Education 1	2	Music Education 2	2	Music Education 3	2
General Psychology	3	General Psychology	3	Educational Psychology	3
Chorus or Orchestra†	1	Chorus or Orchestra†	1	Chorus or Orchestra†	1
Physical Education	1	Physical Education	1	Physical Education	1
Medieval History	3	Medieval History	3	Medieval History	4
Electives		Electives		Electives	

THIRD YEAR

Practical Music	2	Practical Music	2	Practical Music	2
Music Education 50	3	Music Education 51	2	Music Education 52	1
Music 63	2	Music Education 53	3	Music Education 54	3
Music 60	2	Music Education 70‡	2	Music Education 65	3
Chorus or Orchestra†	1	Chorus or Orchestra†	1	Chorus or Orchestra†	1
Electives		The High School Ed.Ad. 65	3	Technic of High School Instruction Ed.T. 15	3
		Electives		Music 59	2
				Electives	

FOURTH YEAR

Music 76	3	Music Education 55	1	Music Education 56	1
Music Education 57	2	Music Education 58	2	Music Education 59	2
Music Education 60	3	Music Education 61§	6	Special Methods—Academic Minor	2
Special Methods—Academic Minor	2	Special Methods—Academic Minor	2	Electives	
Electives		Electives			

COLLEGE OF SCIENCE, LITERATURE, AND ARTS

A New Course

Mu.7f,8w,9s. Introduction to Music. Analytical and historical discussion of the elements, principles of structure, and various forms of music, designed to give a general survey of musical literature and the foundations of an appreciative attitude. Extensively illustrated. No prerequisite.

* Unless exempted by placement tests. See all three quarters Composition program.

† Three credits in chorus required, plus three credits in either chorus or orchestra.

‡ Elective.

§ See instructor for assignments.

New Courses

Mu.Ed.51. Comparative Methods. An analysis of the various techniques of music teaching and supervision, stressing the learning processes, psychology of method, and standards of attainment of each.

Mu.Ed.52. Technique of Teaching Appreciation. A practical course in the teaching of appreciation of music to children in the elementary grades. Materials and methods of presentation will be discussed and demonstrated, using the class as a laboratory.

Mu.Ed.55. Survey of Materials (Vocal). A laboratory course in materials used by the music departments of the public schools, paying particular attention to the psychology of program building. A survey of the well-known and newer publications in the field of public school music.

Mu.Ed.56. Survey of Materials (Instrumental). A laboratory course in materials used by instrumental ensembles, paying particular attention to the psychology of program building. A survey of the well-known and newer publications in the field of public school music.

Mu.Ed.59. Advanced Conducting. A study of the techniques of conducting, interpretation, and expression, the art of program making, rehearsals, organization, and the essentials of musical leadership.

Mu.Ed.70. Accompanying and Sight Reading. A laboratory course aimed to develop proficiency in the art of accompanying and sight reading.

Students should retain this bulletin for use throughout the year

The Bulletin *of the* University *of* Minnesota

College of Engineering and Architecture
and
School of Chemistry
1931-1932

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Act of October 3, 1917, authorized July 12, 1918

FRESHMAN WEEK

All entering freshmen are *required* to be in attendance at the University during the Freshman Week period from 8:30 a.m., Wednesday, September 23, until noon on Saturday, September 26, to take part in a program arranged by the University. *Those who have not completed their psychological and English tests (given at the high schools last May), must report for these tests on Monday, September 21.* It is recommended that as many others as possible present themselves for registration on Monday, September 21, in order to avoid inconvenience and delay incident to the congestion on the last day. A special handbook of Freshman Week is sent to applicants for admission; it may be obtained from the registrar of the University upon request.

Entering freshmen who are not residents of either Minneapolis or St. Paul are urged to arrive a sufficient time prior to the beginning of Freshman Week to enable them to arrange for board and room. Beginning at 8:30 Wednesday morning, freshmen will have their time fully occupied with required activities which will give them little opportunity for making such arrangements.

Events during the Freshman Week period will follow a definite schedule which, for students entering Engineering, Architecture, or Chemistry, will include the following:

a. Matriculation
b. Physical examination
c. Registration and payment of fees
d. Special required lectures
e. Placement tests in
    Mathematics
    Chemistry
    English
f. Examinaton in algebra
g. Classification and preparation of study program

Attendance at each of the above events is taken by means of coupons which are issued in book form to students when they matriculate at the registrar's office.

Besides the required activities it is suggested that new students during their leisure time visit not only the buildings and laboratories of the engineering and chemistry group, but acquaint themselves with other buildings and points of interest on both the main and farm campuses. Information booths for their convenience will be located at various points on both campuses.

In the evenings, musical and social entertainments are arranged with the co-operation of the Student Council and various religious bodies. Students are urged to attend.

1931

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	..
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AUGUST

Su	Mo	Tu	W	Th	Fr	Sa
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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
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13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	..	..	..
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OCTOBER

Su	Mo	Tu	W	Th	Fr	Sa
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11	12	13	14	15	16	17
18	19	20	21	22	23	24
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NOVEMBER

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DECEMBER

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1932

JANUARY

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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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SEPTEMBER

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OCTOBER

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NOVEMBER

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27	28	29	30	..	..	..
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DECEMBER

Su	Mo	Tu	W	Th	Fr	Sa
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25	26	27	28	29	30	31
..	..	..	..	..	..	..

UNIVERSITY CALENDAR

1931-32

Fall Quarter

1931			
September	17	Thursday	Payment of fees closes, except for new students
September	21	Monday	Entrance tests
September	21-25		Examinations for removal of conditions
			Physical examinations
September	23-26		Freshman Week
September	25	Friday	Registration day[1] for the College of Engineering and Architecture, and the School of Chemistry
			Payment of fees for new students closes
September	28	Monday	Fall quarter classes begin, 8:30 a.m.[2]
October	15	Thursday	Senate meeting, 4:30 p.m.
October	31	Saturday	Homecoming Day
November	4	Wednesday	Mid-quarter grades due
November	11	Wednesday	Armistice Day Convocation
November	26	Thursday	Thanksgiving Day; a holiday
December	3	Thursday	State Day Convocation
December	14-19		Final examination period
December	17	Thursday	Commencement Convocation
			Senate meeting, 4:30 p.m.
December	19	Saturday	Fall quarter ends, 6:00 p.m.
December	26	Saturday	Payment of fees closes for all students in residence fall quarter[3]

Winter Quarter

1932			
January	2	Saturday	Entrance tests
			Registration day for all students in the College of Engineering and Architecture, and the School of Chemistry
			Payment of fees for new students closes
January	4	Monday	Winter quarter classes begin, 8:30 a.m.[2]
February	9	Tuesday	Mid-quarter grades due
February	12	Friday	Lincoln's Birthday; a holiday

[1] Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, page 20. No student will be allowed to register in the University later than one week after the beginning of the quarter excepting in unusual cases wherein special circumstances shall justify the appropriate committee of the college concerned permitting registration at a later date.

[2] First hour classes begin at 8:15 a.m. at University Farm.

[3] New students must pay fees on dates announced for registration.

February	18	Thursday	Charter Day Convocation
			Senate meeting, 4:30 p.m.
February	22	Monday	Washington's Birthday; a holiday
March	14-19		Final examination period
March	17	Thursday	Commencement Convocation
			Payment of fees closes for all students[1] in residence winter quarter
March	19	Saturday	Winter quarter ends, 6:00 p.m.

Spring Quarter

March	26	Saturday	Entrance tests
			Registration day for all students in the College of Engineering and Architecture, and the School of Chemistry
			Payment of fees for new students closes
March	28	Monday	Spring quarter classes begin, 8:30 a.m.[2]
May	4	Wednesday	Mid-quarter grades due
May	12	Thursday	Cap and Gown Day Convocation
May	19	Thursday	Senate meeting, 4:30 p.m.
May	30	Monday	Memorial Day; a holiday
June	5	Sunday	Baccalaureate service
June	6	Monday	Sixtieth annual commencement
June	6-11		Final examination period
June	11	Saturday	Spring quarter closes, 6:00 p.m.

Summer Quarter

June	13-14		Registration, first term
June	15	Wednesday	Classes begin, 8:00 a.m.
July	4	Monday	Independence Day; a holiday
July	23	Saturday	Registration and payment of fees for second term closes at 12 m.
			First term closes
July	25	Monday	Second term classes begin, 8:00 a.m.
August	27	Saturday	Second term closes

Entrance Examinations

Entrance examinations for admission to the College of Engineering and Architecture and School of Chemistry will be conducted for students whose credentials do not meet the requirements.

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

For further information concerning these examinations see "Admission by Examination," page 19.

[1] New students must pay fees on dates announced for registraion.

[2] First hour classes begin at 8:15 a.m. at University Farm.

COLLEGE OF ENGINEERING AND ARCHITECTURE AND SCHOOL OF CHEMISTRY

FACULTY AND STAFF

ADMINISTRATION

Lotus Delta Coffman, Ph.D., LL.D., President

Ora Miner Leland, B.S., C.E., Dean of the College of Engineering and Architecture and the School of Chemistry

Samuel Colville Lind, Ph.D., Professor of Chemistry and Director of the School of Chemistry

Robert W. French, B.S.(C.E.), Chairman of Students' Work Committee (Engineering and Architecture)

Carl A. Herrick, M.E., Chairman of Registration and Schedule Committees (Engineering and Architecture)

Howard D. Myers, B.S.(C.E.), Chairman of Advanced Standing Committee (Engineering and Architecture)

Hervey H. Barber, Ph.D., Superintendent of Supply and Equipment (Chemistry)

Lillian Cohen, Ph.D., Chairman of Registration and Schedule Committees (Chemistry)

I. William Geiger, Ph.D., Chairman of Advanced Standing Committee (Chemistry)

Norville C. Pervier, Ph.D., Chairman of Students' Work Committee (Chemistry)

AERONAUTICAL ENGINEERING

John D. Akerman, B.S.(Aero.E.), Professor of Aeronautical Engineering and Head of the Department

Charles Boehnlein, B.S., M.E., Assistant Professor of Aerodynamics

————, Instructor in Aeronautical Engineering

AGRICULTURAL BIOCHEMISTRY

Ross A. Gortner, Ph.D., Professor of Agricultural Biochemistry and Chief of the Division

William M. Sandstrom, Ph.D., Assistant Professor of Agricultural Biochemistry

AGRICULTURAL ECONOMICS

Oscar B. Jesness, Ph.D., Professor of Agricultural Economics and Chief of the Division

Andrew Boss, D.Sc., Professor of Farm Management and Vice-Director of Agricultural Experiment Station

Lewis F. Garey, M.S., Assistant Professor of Farm Management

Don S. Anderson, B.S.(Agr.), Instructor in Agricultural Economics

AGRICULTURAL ENGINEERING

William Boss, Professor of Agricultural Engineering and Chief of the Division

Harry B. Roe, B.S.(Eng.), Professor of Drainage and Irrigation

Arthur J. Schwantes, M.S., Associate Professor of Farm Machinery

Mark J. Thompson, M.S., Associate Professor of Land Clearing

Jesse H. Neal, M.S.(A.E.), Assistant Professor of Drainage and Irrigation

Julius Romness, B.S., Assistant Professor of Agricultural Physics
James B. Torrance, B.S.(Agr.), Assistant Professor of Farm Mechanics
Arthur G. Tyler, B.S., Assistant Professor of Agricultural Physics
Hall B. White, M.S., Assistant Professor of Farm Buildings
Chester L. Berggren, B.S.(Agr.), Instructor in Farm Buildings
J. Grant Dent, Instructor in Mechanical Training
Orlando W. Howe, B.S.(A.E.), Instructor in Surveying
Loren W. Neubauer, B.S.(C.E.), Instructor in Mechanical Drawing
Lawrence H. Schoenleber, M.S.(Ag.E.), Instructor in Land Clearing

AGRONOMY AND PLANT GENETICS

Herbert K. Hayes, D.Sc., Professor of Plant Genetics and Chief of the Division
Iver J. Johnson, M.S., Instructor in Agronomy and Plant Genetics

ANIMAL HUSBANDRY

Walter H. Peters, M.Agr., Professor of Animal Husbandry and Chief of the Division

ARCHITECTURE

Frederick M. Mann, M.S.(Arch.), C.E., Professor of Architecture and Head of the School of Architecture
Leon Arnal,[1] Architecte Diplômé by the Government of France, Professor of Architectural Design
S. Chatwood Burton, M.A., Professor of Fine Arts
Robert T. Jones, B.S.(Arch.), Professor of Architectural Construction
Roy C. Jones, M.S.(Arch.), Professor of Architectural Design
Rhodes Robertson, B.A., M.Arch., Associate Professor of Architectural Design
Ira D. Beals, M.S.(Arch.), Assistant Professor of Architectural Design
Elmer E. Young, Assistant Professor of Fine Arts
Ruth Carter, B. Int. Dec., Instructor in Interior Architecture
David J. Deneen, B.S.(Arch.), Instructor in Architecture
Ivan Doseff, B.S., Instructor in Drawing and Painting
Paul M. Havens, B.S.(Arch.), Instructor in Architecture
Donald C. Heath, B.S.(Arch.), Instructor in Architecture
Arthur R. Nichols, B.S.(Arch.), Lecturer in Landscape Architecture
Leon H. Sault, B.S.(C.E.), Lecturer in Estimating
Francis Gorman, B. in Arch., Assistant in Architecture

ART EDUCATION

Ruth Raymond,[1] M.A., Professor of Art Education and Chairman of the Department
Robert S. Hilpert, B.S., Assistant Professor of Art Education

ASTRONOMY

Willem J. Luyten, Ph.D., Professor of Astronomy

BACTERIOLOGY AND IMMUNOLOGY

Winford P. Larson, M.D., Professor of Bacteriology and Immunology and Head of the Department

[1] Leave of absence, 1931-32.

Halvor O. Halvorson. Ch.E., Ph.D., Assistant Professor of Bacteriology and Immunology

Beryl B. Green, M.A., Instructor in Bacteriology and Immunology

BOTANY

Carl O. Rosendahl, Ph.D., Professor of Botany and Acting Chairman of the Department

William S. Cooper, Ph.D., Professor of Botany

Josephine E. Tilden, M.S., Professor of Botany

George O. Burr, Ph.D., Associate Professor of Botany

Frederic K. Butters, B.S., Ph.D., Associate Professor of Botany

Ned L. Huff, M.A., Assistant Professor of Botany

INORGANIC CHEMISTRY

M. Cannon Sneed, Ph.D., Professor of Inorganic Chemistry and Chief of the Division

Lloyd H. Reyerson, Ph.D., Professor of Inorganic Chemistry

Lillian Cohen, Ph.D., Associate Professor of Inorganic Chemistry

George Glockler, Ph.D., Associate Professor of Inorganic Chemistry

Hervey H. Barber, Ph.D., Assistant Professor of Inorganic Chemistry and Superintendent of Supply and Equipment

Norville C. Pervier, Ph.D., Assistant Professor of Inorganic Chemistry

Henry N. Stephens, Ph.D., Assistant Professor of Inorganic Chemistry

Gladstone B. Heisig, Ph.D., Instructor in Inorganic Chemistry

J. Lewis Maynard, B.A., Instructor in Inorganic Chemistry

Charles E. Bartsch, B.A., Assistant in Inorganic Chemistry

Melvin Calvin, B.S., Assistant in Inorganic Chemistry

Charles S. Copeland, B.S.(Chem.), Assistant in Inorganic Chemistry

Henry M. Davis, M.S., Assistant in Inorganic Chemistry

Russell O. Denyes, B.A., Assistant in Inorganic Chemistry

Charles L. Faust, B.S.(Ch.E.), M.S.(Chem.), Assistant in Inorganic Chemistry

Keren E. Gilmore, M.A., Assistant in Inorganic Chemistry

Lucille R. Hac, M.S., Assistant in Inorganic Chemistry

Harold S. Julsrud, Jr., B.S., Assistant in Inorganic Chemistry

George E. Lorenz, B.S., Assistant in Inorganic Chemistry

Clinton W. MacMullen, B.Ch.E., Assistant in Inorganic Chemistry

Louisa G. Plummer, B.A., Assistant in Inorganic Chemistry

John Rehner, Jr., B.S.(Ch.E.), Assistant in Inorganic Chemistry

Grant W. Smith, B.S., Assistant in Inorganic Chemistry

F. Lowell Taylor, B.S.(Chem.), Assistant in Inorganic Chemistry

Lloyd B. Thomas, B.A., Assistant in Inorganic Chemistry

Edward M. Van Duzee, B.Ch.E., Assistant in Inorganic Chemistry

Samuel H. Weidman, M.S., Assistant in Inorganic Chemistry

ANALYTICAL CHEMISTRY

Isaak M. Kolthoff, Ph.D., Professor of Analytical Chemistry and Chief of the Division

Charles F. Sidener, B.S., Professor of Analytical Chemistry, Emeritus

I. William Geiger, Ph.D., Associate Professor of Analytical Chemistry
Landon A. Sarver, Ph.D., Assistant Professor of Analytical Chemistry
Romund Moltzau, B.A., Assistant in Analytical Chemistry
Vernon A. Stenger, M.S., Assistant in Analytical Chemistry
August Willman, M.A., Assistant in Analytical Chemistry
Ernest B. Sandell, B.S., duPont Fellow

ORGANIC CHEMISTRY

William H. Hunter, Ph.D., Professor of Organic Chemistry and Chief of the Division
George B. Frankforter, Ph.D., Professor of Industrial Organic Chemistry, Emeritus
Lee I. Smith, Ph.D., Associate Professor of Organic Chemistry
Walter M. Lauer,[1] Ph.D., Assistant Professor of Organic Chemistry
Murray M. Sprung, Ph.D., Instructor in Organic Chemistry
William F. Filbert, B.S., Assistant in Organic Chemistry
Carl M. Langkammerer, B.Ch.E., Assistant in Organic Chemistry
Sidney E. Miller, B.S., Assistant in Organic Chemistry
Marvin A. Spielman, B.S., Assistant in Organic Chemistry
Frank H. Stodola, B.Ch.E., Assistant in Organic Chemistry

PHYSICAL CHEMISTRY

Frank H. MacDougall, Ph.D., Professor of Physical Chemistry
Samuel C. Lind, Ph.D., Professor of Photo- and Radio-Chemistry
Robert S. Livingston, Ph.D., Assistant Professor of Physical Chemistry
Nelson W. Taylor, Ph.D., Assistant Professor of Physical Chemistry
Angus E. Cameron, B.A., Assistant in Physical Chemistry
Donald L. Fuller, B.Ch.E., Assistant in Physical Chemistry
Samuel Yuster, B.S., Shevlin Fellow

TECHNOLOGICAL CHEMISTRY

Everhart P. Harding, Ph.D., Associate Professor of Technological Chemistry
Arthur E. Stoppel, Ph.D., Assistant Professor of Technological Chemistry
Frederick C. Beyer, B.Ch.E., Assistant in Technological Chemistry
L. Wallace Cornell, B.S., Assistant in Technological Chemistry
Oscar J. Swenson, B.Ch.E., Assistant in Technological Chemistry

CHEMICAL ENGINEERING

Charles A. Mann, Ph.D., Professor of Chemical Engineering and Chief of the Division
George H. Montillon, Ph.D., Professor of Chemical Engineering
Ralph E. Montonna, Ph.D., Associate Professor of Chemical Engineering
Burrell F. Ruth, M.S., Instructor in Chemical Engineering
John L. Beal, B.Ch.E., Assistant in Chemical Engineering
Edward E. Litkenhous, B.S.(Ch.E.), Assistant in Chemical Engineering
Charles C. Winding, B.Ch.E., Assistant in Chemical Engineering

[1] Absent on leave, 1931-32.

CIVIL ENGINEERING

Frederic H. Bass, B.S., Professor of Municipal and Sanitary Engineering and Chairman of the Department
Alvin S. Cutler, C.E., Professor of Railway Engineering
Fred C. Lang, C.E., Professor of Highway Engineering
John I. Parcel, B.A., B.S.(C.E.), Professor of Structural Engineering
Chester A. Hughes. M.A.Sc., Associate Professor of Structural Engineering
Joseph A. Wise, B.S.(C.E.), Associate Professor of Structural Engineering
Otto S. Zelner, B.S.(C.E.), Associate Professor of Surveying
Leonard F. Boon, C.E., Assistant Professor of Civil Engineering
————, Teaching Fellow in Civil Engineering
Eldred B. Murer, B.S.(C.E.), Research Fellow in Structural Engineering
Albert L. Nowicki, C.E., Research Fellow in Civil Engineering
Gordon H. Thomson, B.S.(C.E.), Research Fellow in Structural Engineering
————, Research Fellow in Highway Engineering

DAIRY HUSBANDRY

Clarence H. Eckles, D.Sc., Professor of Dairy Husbandry and Chief of the Division
Willes B. Combs, M.A., Professor of Dairy Husbandry

DRAWING AND DESCRIPTIVE GEOMETRY

William H. Kirchner, B.S., Professor of Drawing and Descriptive Geometry and Head of the Department
Robert W. French, B.S.(C.E.), Professor of Drawing and Descriptive Geometry
Leon Archibald, B.Sc., Assistant Professor of Drawing and Descriptive Geometry
Henry C. T. Eggers, B.S.(Eng.), E.E., Assistant Professor of Drawing and Descriptive Geometry
Alex S. Levens, M.S.(C.E.), C.E., Assistant Professor of Drawing and Descriptive Geometry
Howard D. Myers, B.S.(C.E.), Assistant Professor of Drawing and Descriptive Geometry
Orrin W. Potter, E.M., M.S., Assistant Professor of Drawing and Descriptive Geometry
Robert F. Schuck, B.S.(E.E.), Assistant Professor of Drawing and Descriptive Geometry
William S. Williams, B.S.(E.E.), Assistant Professor of Drawing and Descriptive Geometry
Charles L. Brainard, B.S.(Arch.), Instructor in Drawing and Descriptive Geometry
Fred T. Cruzen, B.S.(E.E.), Instructor in Drawing and Descriptive Geometry
Arthur C. Kurzweil, C.E., Instructor in Drawing and Descriptive Geometry
Lloyd J. Quaid, B.S.(E.E.), Instructor in Drawing and Descriptive Geometry
Emmett O. Shultz, B.S.(M.E.), Instructor in Drawing and Descriptive Geometry

ECONOMICS AND BUSINESS ADMINISTRATION

Russell A. Stevenson, Ph.D., Dean of the School of Business Administration
George Filipetti, Ph.D., Professor of Economics and Adviser in Engineering Pre-Business and Industrial Administration Courses
Roy G. Blakey, Ph.D., Professor of Economics

Frederic B. Garver, Ph.D., Professor of Economics
Alvin H. Hansen, Ph.D., Professor of Economics
Arthur W. Marget, Ph.D., Professor of Economics and Banking
Bruce D. Mudgett, Ph.D., Professor of Economics
J. Warren Stehman, Ph.D., Professor of Economics
Roland S. Vaile, M.A., Professor of Marketing
Jeremiah S. Young, Ph.D., Professor of Political Science
Ernest A. Heilman, Ph.D., Associate Professor of Accounting
Walter R. Myers, Ph.D., Assistant Professor of Finance
Harry J. Ostlund, B.A., Assistant Professor of Accounting
William H. Stead, Ph.D., Assistant Professor of Economics
John P. Dalzell, B.A., LL.B., Lecturer in Business Law
Ben W. Palmer, M.A., LL.B., Lecturer in Political Science
Richard Graves, M.A., Instructor in Insurance
Reuel I. Lund, M.A., C.P.A., Instructor in Accounting
Robert B. Westbrook, M.A., Instructor in Economics

ELECTRICAL ENGINEERING

John M. Bryant, M.S., E.E., Professor of Electrical Engineering and Head of the Department
William T. Ryan, E.E., Professor of Electric Power Engineering
Franklin W. Springer, E.E., Professor of Electrical Engineering
Henry E. Hartig, B.S.(E.E.), Ph.D., Associate Professor of Telephone and Telegraph Engineering
John H. Kuhlmann, B.A., (E.E.), Associate Professor of Electrical Design
James S. Webb, M.S., Ph.D., Associate Professor of Radio Engineering
Loyst C. Caverley, M.S.(E.E.), Assistant Professor of Electric Power Engineering
Elmer W. Johnson, B.S., M.E., E.E., Assistant Professor of Electric Power Engineering
Milo E. Todd, B.A., E.E., Assistant Professor of Electric Power Engineering
Marvin O. C. Johnson, B.E.E., Teaching Fellow in Electrical Engineering
Edward S. Loye, B.E.E., Teaching Fellow in Electrical Engineering
Alfred O. C. Nier, B.E.E., Teaching Fellow in Electrical Engineering
John H. Roe, B.E.E., Teaching Fellow in Electrical Engineering

ENGLISH

Cecil A. Moore, Ph.D., Professor of English and Chairman of the Department
Harlow C. Richardson, B.A., Assistant Professor of English, in charge of Engineering English
Luther N. Becklund, B.A., Instructor in English
Ledru O. Guthrie, M.A., Instructor in English
Clifford I. Haga, B.A., Instructor in English
Paul Mahon, B.A., Instructor in English
John Rusinko, M.A., Instructor in English

FORESTRY

Henry Schmitz, Ph.D., Professor of Forestry and Chief of the Division
Edward G. Cheyney, B.A., Professor of Forestry

GENERAL ENGINEERING

Egerton W. Kibbey, LL.B., Lecturer in Engineering Contracts and Specifications

GEOLOGY AND MINERALOGY

William H. Emmons, Ph.D., Professor of Geology and Mineralogy and Head of the Department

John W. Gruner, Ph.D., Associate Professor of Geology and Mineralogy

George M. Schwartz, Ph.D., Associate Professor of Geology and Mineralogy

GERMAN

Samuel Kroesch, Ph.D., Professor of German and Head of the Department

George F. Lussky, Ph.D., Associate Professor of German

James Davies, Ph.D., Assistant Professor of German

Fred B. Gerstung, B.A., Instructor in German

HORTICULTURE

William H. Alderman, B.S.A., Professor of Horticulture and Chief of Division

Wilfrid G. Brierley, M.S., Associate Professor of Horticulture

Lewis E. Longley, M.S., Assistant Professor of Horticulture

MATHEMATICS AND MECHANICS

William E. Brooke, B.C.E., M.A., Professor of Mathematics and Mechanics and Head of the Department

Hans H. Dalaker, Ph.D., Professor of Mathematics and Mechanics

George C. Priester, Ph.D., Professor of Materials of Engineering

Carl A. Herrick, M.E., Associate Professor of Mathematics and Mechanics

Lorenz G. Straub, Ph.D., Associate Professor of Hydraulics

Hugh B. Wilcox, B.S.(E.E.), M.S., Associate Professor of Mathematics and Mechanics

Charles Boehnlein, B.S., M.E., Assistant Professor of Aerodynamics

Harry A. Doeringsfeld, C.E., Assistant Professor of Mathematics and Mechanics

William M. McClintock, M.A., Assistant Professor of Mathematics and Mechanics

Forrest E. Miller, M.S.(Ag.E.), Assistant Professor of Mathematics and Mechanics

Michael A. Sadowsky, Dr.Ing., Assistant Professor of Mathematics and Mechanics

Roderick W. Siler, B.S., Assistant Professor of Mathematics and Mechanics

Charles L. Barker, M.A., M.S., Instructor in Mathematics and Mechanics

John A. Henry, B.S.(C.E.), Instructor in Mathematics and Mechanics

Glenn H. Peebles, M.S., Instructor in Mathematics and Mechanics

Max G. Scherberg, Ph.D., Instructor in Mathematics and Mechanics

MECHANICAL ENGINEERING

John R. DuPriest, B.S.(E.E.), M.E., M.M.E., Professor of Mechanical Engineering and Head of the Department

Frank B. Rowley, B.S., M.E., Professor of Mechanical Engineering and Director of the Experimental Engineering Laboratories

Charles F. Shoop, B.S., B.S.(M.E.), Professor of Steam Engineering

Charles A. Koepke, M.S.(M.E.), Associate Professor of Industrial Engineering and Superintendent of Shops

John V. Martenis, M.E., Associate Professor of Machine Design

Burton J. Robertson, B.S., E.E., Associate Professor of Internal Combustion Engines
Arthur R. Ford, B.S., M.S.(M.E.), Assistant Professor of Internal Combustion Engines
Russell E. Gibbs, B.S.(M.E.) Assistant Professor of Steam Engineering
William H. Richards, Assistant Professor of Woodworking
James J. Ryan, M.S.(M.E.), Assistant Professor of Machine Design
Axel B. Algren, B.S.(M.E.), Instructor in Mechanical Engineering and Assistant Director of the Experimental Engineering Laboratories
Jesse M. Campbell, B.S.(M.E.) Instructor in Mechanical Engineering
William H. Easton, B.S.(M.E.), Instructor in Mechanical Engineering
Thomas P. Hughes, B.S., Instructor in Forging
John H. Moffett, Met.E., Instructor in Foundry Practice
Herald K. Palmer, B.S., B.S.(E.E.), Instructor in Mechanical Engineering
Dayton A. Rogers, Instructor in Machine Shop Practice
————, Instructor in Steam Engineering
————, Instructor in Mechanical Engineering
E. H. Spencer Alden, Assistant in Foundry Practice
Harry N. Martinson, Assistant in Machine Shop Practice
Carl T. Peterson, Assistant in Woodworking
Fred Teal, Assistant in Forging
William A. Eckley, B.M.E., M.S.(M.E.). Research Fellow in Heating and Ventilation
Charles H. Pesterfield, B.S.(M.E.), Research Fellow in Heating and Ventilation
Anton Schwertfeger, B.S.(M.E.), Research Fellow in Heating and Ventilation

METALLOGRAPHY

Ralph L. Dowdell, Met.E., M.S., Ph.D., Professor of Metallography and Head of the Department
Arthur C. Forsyth, Met.E., M.S., Instructor in Metallography
Henry S. Jerabek, M.S., Instructor in Metallography

METALLURGY

William R. Appleby, M.A., Professor of Metallurgy and Dean of the School of Mines and Metallurgy
Peter Christianson, B.S., E.M., Professor of Metallurgy
Levi B. Pease, M.S., Professor of Metallurgy

MILITARY DEPARTMENT

John H. Hester, Major, Infantry, Professor of Military Science and Tactics and Head of the Department
William G. Guthrie, Major, Medical Corps, Assistant Professor of Military Science and Tactics
Willis Shippam, Major, Coast Artillery Corps, Assistant Professor of Military Science and Tactics and Head of the Coast Artillery Corps Unit
William C. Webb, Jr., Major, Dental Corps, Assistant Professor of Military Science and Tactics
Murray T. Davenport, Captain, Infantry, Assistant Professor of Military Science and Tactics
William A. Ellis, Captain, Infantry, Assistant Professor of Military Science and Tactics
Emil Krause, Captain, Infantry, Assistant Professor of Military Science and Tactics

William G. Walker, Captain, Infantry, Assistant Professor of Military Science and Tactics

Porter P. Wiggins, Captain, Infantry, Assistant Professor of Military Science and Tactics

Vincent J. Conrad, First Lieutenant, Infantry, Assistant Professor of Military Science and Tactics

Richard A. Ericson, First Lieutenant, Coast Artillery Corps, Assistant Professor of Military Science and Tactics

Harlan N. Hartness, First Lieutenant, Infantry, Assistant Professor of Military Science and Tactics

Rex W. Minckler, First Lieutenant, Signal Corps, Assistant Professor of Military Science and Tactics and Head of the Signal Corps Unit

Hewitt W. Richmond, First Lieutenant, Coast Artillery Corps, Assistant Professor of Military Science and Tactics

Alfred Brandt, Master Sergeant, Infantry, Instructor in Military Science and Tactics

Harry E. Strider, Master Sergeant, Signal Corps, Instructor in Military Science and Tactics

Aubrey R. Dunkum, Technical Sergeant, Coast Artillery Corps, Instructor in Military Science and Tactics

John Coop, Sergeant, Infantry, Instructor in Military Science and Tactics

Roy Cunningham, Staff Sergeant, Infantry, Instructor in Military Science and Tactics

Ernest R. Mylk, Sergeant, Coast Artillery Corps, Instructor in Military Science and Tactics

Clayton A. Peterson, Sergeant, Infantry, Instructor in Military Science and Tactics

PHYSICAL EDUCATION FOR MEN

Herbert O. Crisler, Ph.B., Professor of Physical Education and Director of Physical Education and Athletics

Fred W. Luehring, Ph.M., Professor of Physical Education

Louis J. Cooke, M.D., Associate Professor of Physical Education and Assistant Director of Physical Education and Athletics

Louis F. Keller, M.A., Associate Professor of Physical Education

David MacMillan, B.S., Assistant Professor of Physical Education

Blaine McKusick, B.A., LL.B., Instructor in Physical Education for Men

Guy O. Penwell, LL.B., Instructor in Physical Education

Ralph A. Piper, B.Phys.Ed., Instructor in Physical Education

Niels Thorpe, Instructor in Physical Education for Men

PHYSICAL EDUCATION FOR WOMEN

J. Anna Norris, M.D., Professor of Physical Education for Women and Director of Health and Physical Education for Women

Gertrude M. Baker, M.A., Assistant Professor of Physical Education for Women

May S. Kissock,[1] M.A., Assistant Professor of Physical Education for Women

Alice J. H. Tolg,[1] M.D., Assistant Professor of Physical Education for Women

Florence Warnook, M.A., Assistant Professor of Physical Education for Women

Grace Christensen, B.S., Instructor in Physical Education for Women

Josephine Dickson, B.S., Instructor in Physical Education for Women

[1] Absent on leave 1931-32.

Mildred Lee, B.S., Instructor in Physical Education for Women
Florence A. Mahoney, M.S., Instructor in Physical Education for Women
Elizabeth Noyes, M.A., Instructor in Physical Education for Women
Catherine Snell, B.S., Instructor in Physical Education for Women
Helen Starr, B.S., Instructor in Physical Education for Women
Alice Timberman, B.S., Instructor in Physical Education for Women

PHYSICS

Henry A. Erikson, B.E.E., Ph.D., Professor of Physics and Chairman of the Department
Louallen F. Miller, Ph.D., Professor of Physics
John T. Tate, Ph.D., Professor of Physics
Anthony Zeleny, Ph.D., Professor of Physics
J. William Buchta, Ph.D., Associate Professor of Physics
Joseph Valasek, Ph.D., Associate Professor of Physics
Edward L. Hill, Ph.D., Assistant Professor of Theoretical Physics

PHYSIOLOGIC CHEMISTRY

Jesse F. McClendon, Ph.D., Professor of Physiologic Chemistry
Allan Hemingway, Ph.D., Assistant Professor of Physiologic Chemistry
Jesse W. Cavett, Ph.D., Instructor in Physiologic Chemistry
Robert H. Hamilton, Jr., B.S., Teaching Fellow in Physiologic Chemistry

PREVENTIVE MEDICINE AND PUBLIC HEALTH

Harold S. Diehl, M.A., M.D., Professor of Preventive Medicine and Public Health and Director of Health Service
J. Arthur Myers, Ph.D., M.D., Associate Professor of Preventive Medicine and Public Health
William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine
Harry DeWitt Lees, M.D., Assistant Professor of Preventive Medicine and Public Health
Dalmon V. Boardman, M.D., Instructor in Preventive Medicine and Public Health

RHETORIC
(College of Agriculture)

Robert C. Lansing, M.A., Assistant Professor of Rhetoric
William J. Routledge, B.A., Assistant Professor of Rhetoric
Helen Thompson, M.A., Instructor in Rhetoric
Marjorie H. Thurston, M.A., Instructor in Rhetoric

SOILS

Frederick J. Alway, Ph.D., Professor of Soils and Chief of Division
Clayton O. Rost, Ph.D., Associate Professor of Soils
Paul R. McMiller, M.S., Assistant Professor of Soils

SPEECH

Frank M. Rarig, M.A., Professor of Speech and Chairman of the Department
Luverne C. Ramsland, M.A., Teaching Assistant in Speech

ZOOLOGY

Dwight E. Minnich, Ph.D., Professor of Zoology and Head of the Department
Ralph Dawson, M.A., Assistant Professor of Zoology

GENERAL INFORMATION

COLLEGE OF ENGINEERING AND ARCHITECTURE

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. In 1925, the name of the Department of Architecture was changed to the School of Architecture. The course in Interior Architecture was established in 1923 being called Interior Decoration until 1929. The Agricultural Engineering course was offered in 1925, and the courses in Aeronautical Engineering and Landscape Architecture in 1928.

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 those principles successfully. 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, the importance of the broader training in economic and commercial principles and industrial relations is recognized.

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.

SCHOOL OF CHEMISTRY

The School of Chemistry was established in 1897 as a school of analytical and applied chemistry, subsidiary to the College of Science, Literature, and the Arts. In 1904 it was made a separate unit of the University, and in 1919, its present name was adopted.

It occupies a large modern building, 180 by 200 feet, having six floors. Its laboratories are designed to afford facilities for instruction in the various branches of chemistry. The chemistry library is well provided with complete

sets of journals and compendia of chemical literature, among which are important sets not frequently found in university libraries. Many special laboratories for private research have been provided and facilities are available for graduate work leading to the higher degrees.

COURSES AND DEGREES

The College of Engineering and Architecture offers four-year courses of study in Aeronautical, Agricultural, Architectural, Civil, Electrical, and Mechanical Engineering, Architecture, and Landscape Architecture. These courses lead to the degree of bachelor of aeronautical, agricultural, architectural, civil, electrical, or mechanical engineering, architecture, or landscape architecture. In some of the courses, optional groups of electives are arranged for the guidance of students who desire to devote special attention to certain fields.

A four-year course in Interior Architecture is provided, of which the first two years are taken in the College of Science, Literature, and the Arts and the last two years in the College of Engineering and Architecture, leading to the degree of bachelor of interior architecture.

The Engineering Pre-Business course requires the first two years of work in this college. This is followed by two years in the School of Business Administration upon the completion of which the degree of bachelor of business administration is conferred.

In co-operation with the College of Science, Literature, and the Arts, a five-year course in Arts and Architecture is offered. It leads to the degrees of bachelor of arts, at the end of four years in the College of Science, Literature, and the Arts, and bachelor of architecture at the end of the fifth year in the College of Engineering and Architecture.

The School of Chemistry offers two courses which lead to degrees, namely, (1) the four-year course in Chemistry, and (2) the course in Chemical Engineering. The former course leads to the degree of bachelor of chemistry. The course in Chemical Engineering leads to the degree of bachelor of chemical engineering at the end of four years, and to the Master's degree in chemical engineering at the end of the fifth year, which is taken in the Graduate School.

These colleges also offer work in the Graduate School leading to the Master's degree in the appropriate branch of engineering, in architecture, or in chemistry, or to the Doctor's degree.

The professional degree of aeronautical, agricultural, chemical, civil, electrical, or mechanical engineer will be conferred upon those who have received the degree of bachelor of aeronautical, agricultural, chemical, civil, electrical, or mechanical engineering, when they have completed the equivalent of one additional year's college work, four years of engineering experience in positions of responsibility, and have presented a satisfactory professional thesis.

Graduates of these colleges may be granted permission to pursue the year of graduate study *in absentia* under the direction of the faculty. It is recommended, however, that this year be spent in residence at this University and that the Master's degree be obtained in this manner. There are many advantages in taking this year immediately following graduation from the four-year course, thus making a five-year course leading to the Master's degree in the corresponding branch of engineering or in architecture. Then after four years of approved experience

and the preparation of the professional thesis, the Engineer degree may be obtained. This procedure is especially recommended to those students whose undergraduate work is of high grade and who desire additional preparation for the higher positions which require strong character and leadership.

Candidates for the Engineer degrees register in the Graduate School.

ADMISSION

Detailed information concerning admission, entrance requirements, advanced standing, and expenses will be found in the bulletin of general information which will be sent to any address upon application to the registrar, University of Minnesota.

Students are admitted on certificate or by examination. In special cases, with the approval of the dean of the college, persons of mature age (twenty-four years or older) and experience may be admitted as adult special students to pursue specific courses of study.

Admission by certificate.—Applicants must present twelve units of work obtained in the last three years of high school (senior high school) of which at least nine must be included in Groups A, B, C, D, and E as listed below. These nine units must include a major of three units in one group and two minors of two units each in two other groups. Subject to these requirements, the applicant must include at least two units of English and two units of mathematics. One unit of mathematics and one unit of foreign language taken in the ninth grade may be counted in the minors. Students who do not present *higher algebra and solid geometry* for admission will be required to take these subjects in the first quarter at the University without credit. (They will be given by the Extension Division, and special fees will be charged.) This will usually necessitate their attending summer quarter to complete the work of the freshman year. 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 quarter or Extension Division before admission here. Chemistry is required for admission to the School of Chemistry.

NOTE.—Beginning in 1932, higher algebra and solid geometry will be required for admission, thus making *three* units of mathematics.

Students who expect to enter the College of Engineering and Architecture or School of Chemistry are urged to include in their high school courses English, three units; elementary algebra, one unit; plane geometry, one unit; higher algebra, one or one-half unit; solid geometry, one-half unit; Latin, two units; German or French, two units; chemistry, one unit; physics, one unit; ancient, modern, and American history; and American government or civics. French is desirable for students in architecture. German is important for students entering the School of Chemistry.

List of entrance subjects.—Only those subjects included in the following groups may be counted toward admission.

The term *unit* means not less than five recitations of forty minutes each per week for a school year of thirty-six weeks. In laboratory, drawing, and other manual courses, twice this amount of class time is required for one unit.

Group A English: 1 to 3 units.
Group B Foreign languages: Latin, Greek, German, French, Spanish, Scandinavian, 1 to 4 units each.
Group C History and social sciences: European history, ½ to 2 units; English and American history, ½ or 1 unit each; economics and sociology, ½ unit each; American government, commercial geography, and history of commerce, ½ or 1 unit each.
Group D Mathematics: elementary algebra and plane geometry, 1 unit each; unified mathematics, 2 units; higher algebra, ½ or 1 unit; solid geometry and trigonometry, ½ unit each.
Group E Natural sciences: biology, physics, and chemistry, 1 unit each; botany and zoology, ½ or 1 unit each; physiology, astronomy, and geology, ½ unit each.
Group F Vocational and miscellaneous subjects: The three units which are not required to be in Groups A, B, C, D, E, may be in work which the superintendent certifies as being of acceptable nature and as having been counted toward the applicant's graduation.

Admission by examination.—Applicants who are high school graduates or at least nineteen years of age may be admitted provisionally and subject to one year of satisfactory work, upon passing the following tests:

a. College aptitude test
b. Test of proficiency in English
c. Test in mathematics including arithmetic, algebra, and geometry.

Time of admission.—The regular time to enter the college is in September. However, students will be admitted at the beginning of the winter quarter in January; then by attending the following summer quarter it is possible to complete most of the work of the freshman year. Admission at the opening of the spring quarter is permitted altho a full regular program of work will not usually be obtainable.

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. See Requirements for Graduation.

Students who have taken college algebra or trigonometry in high school with satisfactory records may be permitted to take comprehensive examinations for credit in these subjects.

REGISTRATION

All undergraduate students are required, at the beginning of each quarter of residence, to pay the prescribed fees to the university bursar, to fill and file at the Main Engineering Building (Chemistry Building for students registering in School of Chemistry) 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 send or present their credentials to the registrar of the University, who will notify each 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* or *Handbook for Students in the School of Chemistry* for regulations governing registration and scholastic work.

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 7 days after the beginning of the quarter.

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.

Tuition fee (per quarter):	
Residents of Minnesota	$30.00
Non-residents	40.00
Fee for higher algebra in Extension Division	12.50
Fee for solid geometry in Extension Division	7.50
Deposit[1] (first quarter only)	5.00
Incidental fee, per quarter	6.40
Military deposit (required of all students taking military drill)	10.00
Special fees:	
Examination for removal of condition	1.00
Examination for credit (after the first quarter in residence)	5.00
Special examination	5.00
Chemistry deposit, including laboratory fee of $2.00 per quarter	5.00
Graduation fee	10.00

Registration penalty fees.—A penalty fee of two dollars ($2) is charged for late registration, late change of registration, or late payment of fees 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.

Living expenses.—Detailed statements regarding living expenses may be found in the bulletin of general information.

THE UNIT OF CREDIT

The standard unit of credit in the University is the quarter credit, or simply, the *credit*. It corresponds to one class period per week for one quarter. This class period may be a one-hour lecture or recitation, or a two- or three-hour class in laboratory, drawing, surveying, or computations, but in any case one credit is supposed to require three actual hours of the average student's time per week for one quarter. One hour of recitation is assumed to require two hours of preparation or study. A two-hour laboratory period may require one hour of home work to complete the credit. A three-hour period usually carries one credit without additional work outside of class. The credit allowed for a lecture may be from one-third to one hour depending upon the amount of outside work or study required in connection with it.

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. This includes work done in extension classes, by correspondence, by the aid of a private tutor, by individual study, through practical experience, or otherwise.

[1] This deposit is made to cover such charges as may be incurred for lockers, library penalties, laboratory breakage, etc.

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 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 each special examination must be paid unless it be taken within six weeks after first entering the University.

EXTENSION COURSES

Certain courses in engineering, architecture, and chemistry 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 valuable instruction in this manner.

Credit for certain required courses in the College of Engineering and Architecture or the School of Chemistry on the basis of work done in the Extension Division is obtainable on petition by passing a comprehensive examination in each course given by the department concerned. A fee of five dollars ($5) is charged for each examination except when taken within six weeks after admission. Definite information regarding extension work will be found in the bulletins of the General Extension Division.

ATTENDANCE

It is expected that all students will be regular in attendance at all class exercises and that they will do all the work of their courses. 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 the course." *Senate, May 11, 1921.*

JUNIOR RULE IN ENGINEERING AND ARCHITECTURE

In the College of Engineering and Architecture every student must complete 90 credits, including all the work of the freshman year, and must not lack more than 12 credits of the required (non-elective) courses of his sophomore year before he will be allowed to register for any junior or senior courses in his curriculum.

JUNIOR REVIEW EXAMINATIONS IN CHEMISTRY

The Junior Review Examinations in chemistry, courses Inorganic Chemistry 51 and 52, and Analytical Chemistry 53, are required of all students registered in the School of Chemistry, but not of students in other colleges who may be taking chemistry courses. The following rules apply only to students registered in the School of Chemistry.

1. These examinations are prerequisites for all other courses offered in the School of Chemistry having numbers greater than 53, with the exception of Advanced Inorganic Chemistry 103-104-105, Chemical Engineering 101-102-103, 131-132, Physical Chemistry 101-102-103, and Technological Chemistry 105 and 106.

2. They will be held regularly at the beginning of the fall, winter, spring, and summer quarters, on the day before registration. They need not be taken

simultaneously, but each must be preceded by Analytical Chemistry 1 and 2, Quantitative Analysis.

3. Students who have taken their general inorganic courses, qualitative courses, and quantitative courses in the School of Chemistry and with an average in any of these subjects higher than "C," will be excused from the Junior Review Examination in the corresponding subject.

4. Students may be conditioned or failed in one or more of the Junior Review Examinations. To remove a condition a student must pay the usual fee of $1 for this examination. This examination would be taken at the next regular Junior Review Examination period, namely the day before registration for the next quarter. The usual fee of $5 must be paid for permission to repeat any Junior Review Examination in which a failure has been received.

5. Students who transfer to the School of Chemistry from another college or another institution will be required to take and pass the Junior Review Examinations in those subjects for which they have received advanced standing, before entering courses having numbers greater than 53, with the exception of the courses specified in Rule 1.

CHEMICAL ENGINEERING INSPECTION TRIP

All seniors registered in Chemical Engineering are required to go on a trip of inspection and observation through certain large industrial plants. This trip is usually taken during the spring vacation and is under the personal supervision and guidance of members of the faculty. It includes plants in Milwaukee, Chicago, and near-by points. The expenses of the trip are minimized as far as possible, and must be defrayed by the individual student. They amount to from $75 to $100 per student.

REQUIREMENTS FOR GRADUATION

To be recommended for the degree of bachelor of aeronautical, architectural, civil, electrical, or mechanical engineering, of architecture, or of landscape architecture, the student must satisfactorily complete all of the courses prescribed in the corresponding curriculum together with sufficient electives to make a total of at least 204 credits. In agricultural engineering and chemistry, 210 credits are required for graduation. For the degree of bachelor of interior architecture, the requirements are 195 credits, including all required courses, plus 93 honor points. For the degree of bachelor of chemical engineering, 218 credits are required.

In cases of continued low scholarship, even tho all the courses of the curriculum have been passed, the faculty reserves the right to require additional work to be completed, over and above the regular curriculum, and with a specified grade, before the degree will be recommended.

Students entering the College of Engineering and Architecture or School of Chemistry with advanced standing from other colleges or universities must spend at least one year in residence here 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

Research fellowships.—In the Engineering Experiment Station there are several 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 twenty hours per week, that is, about half of his time, to such research service as may be assigned him. In addition he is expected to carry half-time work in the Graduate School toward an advanced degree.

Teaching fellowships in civil and electrical engineering are open to graduates in these fields. The stipend is $750 per year of nine months. Each fellow renders part time service in instruction while pursuing graduate study.

The Shevlin Fellowship in Chemistry.—The Shevlin Fellowship in Chemistry, established by the late Thomas H. Shevlin, of Minneapolis, is awarded annually and yields $500. Candidates for this fellowship should file their applications before March 1 with the dean of the Graduate School. The Shevlin fellow devotes his entire time to graduate work and is not required to render any service to the University.

The du Pont Fellowship in Chemistry.—This fellowship was founded by E. I. du Pont de Nemours and Company, Wilmington, Delaware, and yields $750 annually. The holder devotes his entire time to graduate work and is not required to render any service to the University. Applications for this fellowship should be submitted to the dean of the School of Chemistry before March 15.

The Albert Moorman Memorial Fellowship in Architecture.—This covers the traveling expenses of the recipient on a trip to study notable examples of architecture in this country. It is awarded for excellence in architectural design as determined by competition in the senior class.

Assistants.—The School of Chemistry employs thirty assistants at $650 to $750 per annum. They are required to devote twelve hours per week to instruction and other assigned work. They thereby obtain valuable experience in laboratory teaching under competent direction. In addition to these duties, each assistant is expected to pursue graduate work toward a higher degree. Application should be made to the dean of the School of Chemistry.

Prizes.—Various prizes in the University are open to students in these colleges. A list of them is given in the general information bulletin. Certain prizes are awarded to students in Engineering only, such as the prizes of the Northwestern Section of the American Society of Civil Engineers and the Twin Cities sections of the American Society of Mechanical Engineers. The Tau Beta Pi, Chi Epsilon, and Pi Tau Sigma honorary engineering fraternities also offer prizes.

Two prizes are open to sophomores in chemistry and chemical engineering. These have been established by the Phi Lambda Upsilon honorary chemical fraternity and the Twin City Alumni Association of the Alpha Chi Sigma chemical fraternity. The chemistry faculty offers a prize to seniors.

Twelve prizes and two medals are open to students registered in the School of Architecture. Medals are offered by the American Institute of Architects and the Scarab Fraternity. The prizes were established respectively by the Minnesota section of the American Institute of Architects, the faculty of the school, Magney and Tusler of Minneapolis, Mr. William A. French of Minneapolis, Alpha Alpha Gamma Sorority, the Gargoyle Club, and the Northern States Power Company.

Loan funds.—Various loan funds are available from which worthy students may obtain financial assistance after they have been in attendance a sufficient length of time to establish satisfactory records of accomplishment. Application should be made to the dean of student affairs.

RESERVE OFFICERS TRAINING CORPS

The War Department has established at this University units of infantry, coast (anti-aircraft) artillery, signal corps, medical corps, and dental corps in which both basic and advanced courses are given. The artillery and signal corps units are made up almost entirely of students in engineering, architecture, chemistry, and mines, for whom this technical and military training is particularly valuable. The basic course is required for the first two years; the advanced course is elective for the third and fourth years.

Students in this college may enroll in the advanced course of the infantry, signal corps, or artillery under the prescribed regulations, and receive for this work eighteen elective credits toward graduation. They receive an allowance of cash and clothing from the government during the two years of the course, pay and transportation to attend a special training camp in the summer, and if successful, a commission in the Reserve Corps of the U. S. Army after graduation. Special arrangements may be made in the student's program to enable him to take this course, the advantages of which are recognized.

SELF-SUPPORT AND OUTSIDE ACTIVITIES

A large number of students contribute to their financial support by means of part time work during the college year. Frequently such students undertake too much. They are advised to carry a lighter program of studies and to plan to spend more than four years in the college course if outside work requires a large amount of their time. Information regarding work for self-support during the college course may be obtained from the University Employment Service or the University Young Men's Christian Association.

Freshmen, in particular, are advised that the work of the first year in this college will require their closest attention and application if they are to succeed. They should refrain from participation in unnecessary outside activities, while bearing in mind the importance of physical as well as mental development.

HANDBOOK FOR STUDENTS

Regulations and instructions for the guidance of students are issued at the time of registration in the form of a small pamphlet. Each student is expected to observe these instructions.

CHANGES IN BULLETIN

The faculties of the College of Engineering and Architecture and the School of Chemistry reserve the right to change their curricula and 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.

SOCIETIES

Branches of the following national professional societies are maintained at the University of Minnesota by students and faculty members: American Chemical Society, American Institute of Chemical Engineers, American Institute of Electrical Engineers, American Society of Civil Engineers, American Society of Mechanical Engineers, and American Society of Agricultural Engineers. In addition there are the Architectural Society and the Minnesota Society of Aeronautical Engineers.

CURRICULA

COLLEGE OF ENGINEERING AND ARCHITECTURE

SCHOOL OF CHEMISTRY

FRESHMAN YEAR

The freshman year for the courses in Aeronautical, Agricultural, Civil, Electrical, and Mechanical Engineering and Engineering Pre-Business is shown on page 26. The freshman year for Architecture, Architectural Engineering, and Landscape Architecture is shown on page 32 and in Chemistry and Chemical Engineering on page 36.

Mathematics.—Freshmen entering without high school higher algebra will take Course 9 (Higher Algebra) in the Extension Division without credit (fee $12.50); and those who have had higher algebra will register for Course 11 (College Algebra). Course 9 should be followed by Courses 11, 12, and 13 during the winter and spring quarters and the *following summer quarter,* respectively.

Students who do not offer *solid geometry* for entrance will take M. & M. 10 (Solid Geometry) instead of Drawing during the fall quarter and without university credit. It will be given in the Extension Division (fee $7.50). Students in the College of Engineering should follow this by Drawing 1, 2, and 3 in the winter and spring quarters and the summer quarter, respectively, and in the School of Chemistry by Drawing 7 and 8 in the winter and spring quarters.

Those who have had *solid geometry* but do not complete College Algebra in the fall quarter will have to postpone Drawing 3 until the summer quarter since they cannot complete its prerequisites, M. & M. 11 and 12 (College Algebra and Trigonometry), until the spring quarter.

Students who do not complete College Algebra in the fall quarter should plan to take M. & M. 11, 12, and 13 in the winter and spring quarters and the summer quarter, respectively.

NOTE.—Beginning in fall of 1932, higher algebra and solid geometry will be required for admission to engineering. architecture, or chemistry.

Chemistry.—Students entering the College of Engineering and Architecture who have not had high school *chemistry* will take Inorganic Chemistry 14f-15w, five credits per quarter, instead of Inorganic Chemistry 4f-5w, four credits per quarter.

Students entering the School of Chemistry are required to present chemistry for admission.

Military Science and Tactics.—Students who, for any reason, are not required to take military science and tactics for their freshman and sophomore years, must take physical education both years in its stead and without credit. This applies to women and foreign students, as well as others.

REGULAR FRESHMAN PROGRAM

(For Aeronautical, Agricultural, Civil, Electrical, and Mechanical Engineering, and Pre-Business)

(For students who satisfy the requirements in higher algebra and solid geometry and who have presented entrance credit in high school chemistry.)

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M.&M. 11	College Algebra	5	5	..	..
Inorg. Chem. 4	Inorganic Chemistry	4	1	3	3
Engl. 4	Rhetoric and Composition	3	3	..	..
Draw. 1	Engineering Drawing	3	..	1	6
M.E. 11, 12, or 13*	Shop Practice	2	..	1	4
G.E. 11	Orientation	0	..	1	..
Mil. Sci. 1	First Year Basic Course	0	..	..	3
	Winter Quarter				
M.&M. 12	Trigonometry	5	5	..	..
Inorg. Chem. 5	Inorganic Chemistry	4	1	3	3
Engl. 5	Rhetoric and Composition	3	3	..	..
Draw. 2	Engineering Drawing	3	..	1	6
M.E. 11, 12, or 13*	Shop Practice	2	..	1	4
G.E. 12	Orientation	0	..	1	..
Mil. Sci. 2	First Year Basic Course	0	..	..	3
	Spring Quarter				
M.&M. 13	Analytical Geometry	5	5	..	..
Inorg. Chem. 16	Qualitative Analysis	5	..	3	6
Engl. 6	Rhetoric and Composition	3	3	..	..
Draw. 3	Descriptive Geometry	3	..	1	6
M.E. 11, 12, or 13*	Shop Practice	2	..	1	4
P.H. 12†	Hygiene and First Aid	0	..	1	..
Mil. Sci. 3	First Year Basic Course	0	..	..	3

* Freshmen entering in the year 1931-32 in aeronautical, civil, electrical, and mechanical engineering will omit these courses, M.E. 11, 12, and 13, in their freshman year, subject to such arrangements as may be made to include this work in the later years of these curricula.

† Hygiene course for women is included in Phys.Ed. 1f for Women.

AERONAUTICAL ENGINEERING

Four-year course leading to the degree of bachelor of aeronautical engineering, B.Aero.E.

In addition to the prescribed courses, 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 for 12 quarters.

The course in aeronautical engineering is intended to provide instruction and training for students who wish to enter this field of engineering as a profession. With the rapid development of aviation in recent years, aeronautical engineering is

assuming a prominent and important position among the engineering professions. The production of airplanes in the United States is increasing at a rapid rate. More attention is being given to lighter-than-air craft as well. Aeronautical engineers are required in all stages of the process, from the research work preliminary to improvements in design to the actual construction, testing, operation, and maintenance.

The aeronautical engineering course is similar to mechanical engineering. The fundamental studies are the same. As a result, the graduates in aeronautical engineering should be prepared to enter various branches of the mechanical engineering field if, for any reason, they should prefer to do so.

The first year of the course is the same as that of civil, electrical, mechanical, and agricultural engineering.

As in other technical courses, so in aeronautical engineering, mathematics plays an important part. No student should enter this course who feels poorly prepared in mathematics. Preferably, he should have had three years of algebra and geometry in high school; a fourth year is desirable.

It should be understood that this is a professional engineering course and not a training course for airplane pilots. It deals with the preparation of students for research, design, construction, operation, management, and maintenance of aircraft from the standpoint of the engineer or manager. However, practical flight training is important for aeronautical engineers and students are urged to take advantage of their opportunities to obtain it. Special arrangements have been made for seniors to take this instruction and obtain a government license.

The sophomore course in aviation serves as the ground school course of training for the Air Reserve Corps of the U. S. Navy, and upon graduation, properly qualified students may be accepted for actual flight training, leading to a commission in the Naval Reserve.

For freshman year, see page 26.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M.&M. 24	Differential Calculus	5	5	..	..
Phys. 3	Elements of Mechanics	3	1	3	..
Phys. 4	Elements of Mechanics Laboratory	1	..	..	2
Draw. 28*	Drafting	2	..	..	6
Aero.E. 1	Aviation	3	3	..	..
M.E. 19	Mechanical Technology	1	..	2	..
Mil. Sci. 4	Second Year Basic Course	0	..	..	3
	Winter Quarter				
M.&M. 25	Integral Calculus	5	5	..	..
Phys. 23	Heat	3	1	3	..
Phys. 24	Heat Laboratory	1	..	..	2
Draw. 29	Drafting	2	..	..	6
Aero.E. 2	Auto and Airplane Engines	3	3	..	..
M.E. 14	Machine Shop Practice	3	..	1	7
Mil. Sci. 5	Second Year Basic Course	0	..	..	3

* For permissible substitute, see page 57.

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Spring Quarter				
M.&M. 26	Technical Mechanics (Statics)	5	5	..	..
Phys. 43	Electricity	3	1	3	..
Phys. 44	Electricity Laboratory	1	..	..	2
M.E. 15	Machine Shop Practice	3	..	1	7
Aero.E. 3	Aviation	3	3	..	..
C.E. 17	Surveying	3	..	1	7
Mil. Sci. 6	Second Year Basic Course	0	..	..	3

JUNIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab
	Fall Quarter				
M.&M. 127	Technical Mechanics (Dynamics)	5	5	..	..
Phys. 33	Optics	3	1	3	..
Phys. 34	Optics Laboratory	1	..	..	2
Aero.E. 100	Aerodynamics	3	3	..	..
M.E. 30	Steam Engineering	3	3	..	..
M.E. 33	Elementary Mechanical Laboratory	2	..	..	4
	Winter Quarter				
M.&M. 128	Strength of Materials	5	5	..	..
M.&M. 141	Materials Testing Laboratory	2	..	1	3
Aero.E. 101	Aerodynamics	3	3	..	..
M.E. 26	Mechanism and Kinematics	3	3	..	..
M.E. 31	Thermodynamics	3	2	..	3
M.E. 34	Mechanical Laboratory	2	..	..	4
	Spring Quarter				
M.&M. 129	Hydraulics	4	4	..	..
M.&M. 143	Hydraulics Laboratory	1	..	..	2
Aero.E. 83	Stresses in Simple Structures	3	..	1	7
Aero.E. 102	Aerodynamics	3	3	..	..
M.E. 27	Machine Design	3	..	1	6
M.E. 32	Thermodynamics	3	2	..	3

SENIOR YEAR

	Fall Quarter				
E.E. 46	Electric Power	4	3	..	2
M.E. 150	Internal Combustion Engines	3	3	..	..
Met. 152	Metallography	3	..	2	3
Aero.E. 115	Airplane Stresses	3	2	..	2
Aero.E. 120	Airplane Design	2	1	..	3
Aero.E. 140	Aeronautical Laboratory	2	..	..	6
Aero.E. 190	Seminar	1	1	..	..
	Winter Quarter				
E.E. 47	Electric Power	4	3	..	2
M.E. 151	Internal Combustion Engines	3	3	..	..
M.E. 156	Design of Internal Combustion Engines	2	..	..	6
Aero.E. 121	Airplane Design	4	2	..	6
Aero.E. 141	Aerodynamics Laboratory	2	..	..	6
Aero.E. 191	Seminar	1	1	..	..

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Spring Quarter				
E.E. 48	Electric Power	4	3	..	2
M.E. 152	Aero Engine Testing	2	..	..	6
Aero.E. 122	Airplane Design	3	1	..	6
Aero.E. 160	Airships	3	2	..	3
Aero.E. 170	Air Transport	2	2	..	..
Aero.E. 192	Seminar	1	1	..	..

AGRICULTURAL ENGINEERING

Four-year course leading to the degree of bachelor of agricultural engineering, B.Agr.E., in co-operation with the College of Agriculture, Forestry, and Home Economics.

Requirements for graduation include all prescribed courses with sufficient approved electives to make a total of at least 210 credits. This is an average of 17½ credits per quarter for 12 quarters.

Agricultural engineering activities are usually grouped under the heads of *farm machinery, farm structures,* and *reclamation.* There is also need for service in the entire field necessitating general preparation in all three lines.

The farm machinery field covers the selection and proper operation of machinery and equipment best suited to produce good results locally on any given type of farm, the design and construction of such machinery or equipment where it does not yet exist, the improvement of such design to meet special needs, and the adaptation of available types of power to local farm conditions. The farm structures field covers arrangement of the structures on the farmstead for economy, convenience, and comfort, the design and construction of farm buildings and related structures, and the adaptation of available types of building materials to local farm conditions. The reclamation field covers development of virgin lands suited to agriculture and the improvement of lands already under cultivation through economical clearing operations, and soil conditioning through efficient design and proper installation of drainage and irrigation works and control of soil erosion.

The field, as yet comparatively new and uncrowded, offers many opportunities among which the following are prominent: with manufacturers of farm machinery, equipment, and building materials; as executives, research engineers, publicity and sales managers, and technical field experts; as managers of large farms requiring extensive machinery or equipment; as reclamation engineers with the local, state, and federal governments, and with development companies; as agricultural advisers with power companies in development of rural service; as agricultural engineering editors for farm papers and trade journals; as rural architects and builders; as teachers, investigators, and extension specialists in state agricultural colleges, experiment stations, and in the United States Department of Agriculture; as consulting agricultural engineers in general practice.

For freshman year, see page 26.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M.&M. 24	Differential Calculus	5	5	..	..
Phys. 3	Elements of Mechanics	3	1	3	..
Phys. 4	Elements of Mechanics Laboratory	1	..	..	2
Ag.E. 13	Gas Engines	3	..	2	4
Ag.E. 19	Elementary Surveying	3	..	2	4
Soils 4	Soils	3	..	2	2
Mil. Sci 4	Second Year Basic Course	0	..	..	3
	Winter Quarter				
M.&M. 25	Integral Calculus	5	5	..	..
Phys. 23	Heat	3	1	3	..
Phys. 24	Heat Laboratory	1	..	..	2
Ag.E. 7	Farm Structures, I	3	1	1	3
Ag.E. 31	Principles of Drainage	3	1	2	..
Soils 8	Physical Properties of Soils	3	..	1	4
or					
Ag.E. 42	Principles of Irrigation	3	1	2	..
Mil. Sci. 5	Second Year Basic Course	0	..	..	3
	Spring Quarter				
M.&M. 84*	Technical Mechanics	5	5	..	..
Phys. 43	Electricity	3	1	3	..
Phys. 44	Electricity Laboratory	1	..	..	2
Ag.E. 14	Tractors	3	..	2	4
Ag.E. 20	Advanced Surveying	3	..	2	4
Mil. Sci. 6	Second Year Basic Course	0	..	..	3

JUNIOR YEAR

	Fall Quarter				
M.&M. 128	Strength of Materials	5	5	..	..
C.E. 51	Highways and Pavements	3	..	2	3
Econ. 8	General Economics	3	3	..	..
Ag.E. 71	Power Machinery	3	..	2	3
Hort. 6	Fruit Growing	3	..	2	4
	Winter Quarter				
M.&M. 86*	Hydraulics	2	2	..	..
M.&M. 143	Hydraulic Laboratory	1	..	..	2
Econ. 9	General Economics	3	3	..	..
Ag.E. 37	Rural Sanitation	3	..	3	..
Ag.E. 42	Principles of Irrigation	3	1	2	..
or					
Soils 8	Physical Properties of Soils	3	..	1	4
M.E. 26	Mechanism and Kinematics	3	2	1	..
	Elective to complete program.				
	Spring Quarter				
Agron. 1	General Farm Crops	3	..	2	4
or					
A.H. 15	Fundamentals of Livestock Production	3	..	2	4
C.E. 42	Structural Engineering	3	..	2	4
D.H. 7	Elements of Dairying	3	..	3	..
M.E. 27	Machine Design	3	..	1	6
Econ. 28	Business Law	3	3	..	..
	Elective to complete program.				

* For permissible substitutes, see page 57.

SENIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
C.E. 144	Reinforced Concrete	3	..	2	5
Geol. 5	Engineering Geology	3	..	3	..
Rhet. 22	Public Speaking	3	3	..	..
	Electives to complete program.				
	Winter Quarter				
Ag.E. 70	Steam Boilers and Engines	3	..	3	..
Ag.E. 72	Applied Electricity	3	..	1	6
Ag.Econ. 102	Farm Management: Organization	3	..	3	..
G.E. 101	Contracts and Specifications	3	..	3	..
	Electives to complete program.				
	Spring Quarter				
Ag.Ec. 103	Farm Management: Operation	3	..	3	..
Ag.E. 150	Seminar	2	2	..	..
Agron. 1	General Farm Crops	3	..	2	4
or					
A.H. 15	Fundamentals of Livestock Production	3	..	2	4
G.E. 193	Engineering Practice	2	..	2	..
Rhet. 22	Public Speaking	3	3	..	..
	Electives to complete program.				

RECOMMENDED ELECTIVES

The following courses are suggested for the guidance of students who wish to elect work along the general lines indicated.

Course No.	Title	Credits
	Farm Structures	
Ag.E. 5f	Farm Building Construction	3
Ag.E. 40f,s	Mechanical Training I	3
Ag.E. 67s	Farm Structures II	3
Ag.E.111f,112w,113s	Farm Building Problems, per quarter	3–6
For. 27w	Farm Woodlots and Windbreaks	3
Hort. 77w	Principles of Landscape Design	3
	Farm Mechanics	
Ag.E. 15f	Ignition and Carburetion	3
Ag.E. 28w	Land Clearing	3
Ag.E. 40f,s	Mechanical Training I	3
Ag.E. 101f	Drainage Engineering and Works	3
Ag.E.121f,122w,123s	Farm Power and Machinery Problems, per quarter	3–6
Ag.E. 126s	Selection of Farm Equipment	3
	Reclamation	
Ag.E. 28w	Land Clearing	3
Ag.E. 40f,s	Mechanical Training I	3
Ag.E. 68f	Drainage Engineering and Works	3
Ag.E.101f,102w,103s	Advanced Drainage Problems, per quarter	3–6
Ag.E. 69s	Irrigation Engineering and Works	3
C.E. 161f	Hydrology	3
Hort. 77w	Principles of Landscape Design	3

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. 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. Each course requires normally four years for its completion.

Students who wish to broaden their architectural training may arrange to extend their studies over a period of five years by taking the B.A. course with a major in Architecture, in the College of Science, Literature, and the Arts, including the required work of the first three years of the course in Architecture, and completing the work required for the degree of B. Arch. in the College of Engineering and Architecture in one additional year. Such a five-year undergraduate course is recommended by the American Institute of Architects and those who are able thus to extend their studies are strongly advised to do so. Full collegiate training in Architecture includes a sixth year in the Graduate School leading to the Master's degree in architecture.

REGULAR FRESHMAN PROGRAM

The freshman year is the same for Architecture, Architectural Engineering, and Landscape Architecture.

(For students who have satisfied the requirements in higher algebra and solid geometry.)

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M.&M. 11	College Algebra	5	5	..	..
Engl. 4	Rhetoric and Composition	3	3	..	..
Arch. 21	Freehand Drawing	2	..	..	6
Arch. 31	Elements of Architecture	3	..	2	6
Draw. 61	Projections	2	..	1	3
G.E. 11	Orientation	0	..	1	..
Mil. Sci. 1†	First Year Basic Course	0	..	..	3
	Winter Quarter				
M.&M. 12	Trigonometry	5	5	..	..
Engl. 5	Rhetoric and Composition	3	3	..	..
Arch. 22	Freehand Drawing	2	..	..	6
Arch. 32	Elements of Architecture	3	..	2	6
Draw. 62	Shades and Shadows	2	..	1	3
G.E. 12	Orientation	0	..	1	..
Mil. Sci. 2†	First Year Basic Course	0	..	..	3
	Spring Quarter				
M.&M. 13	Analytical Geometry	5	5	..	..
Engl. 6	Rhetoric and Composition	3	3	..	..
Arch. 23	Freehand Drawing	2	..	..	6
Arch. 33	Elements of Architecture	3	..	2	6
Draw. 63	Perspective	2	..	1	3
P.H. 12†	Hygiene and First Aid	0	..	1	..
Mil. Sci. 3†	First Year Basic Course	0	..	..	3

† Women take Phys. Ed. for Women, Courses Phys. Ed. 1, 2, 3 in place of Mil. Sci. 1, 2, 3 and P.H. 12.

ARCHITECTURE

Four-year course leading to the degree of bachelor of architecture, B.Arch.

In addition to the prescribed courses, sufficient electives must be taken to complete a total of at least 204 credits. Also, 1,008 design points must be earned (see note, page 65).

For freshman year, see page 32.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M.&M. 91*	Calculus for Architects	4	4	..	..
Phys. 3	Elements of Mechanics	3	1	3	..
Arch. 14	Architectural History	2	..	2	..
Arch. 24	Freehand Drawing	2	..	..	6
Arch. 34	Architectural Design, Grade I	4	..	..	12
Arch. 44	Building Construction	2	1	2	..
Mil. Sci. 4†	Second Year Basic Course	0	..	..	3
	Winter Quarter				
M.&M. 92*	Mechanics for Architects	4	4	..	..
Phys. 23	Heat	3	1	3	..
Arch. 15	Architectural History	2	..	2	..
Arch. 25	Freehand Drawing	2	..	..	6
Arch. 35	Architectural Design, Grade I	4	..	..	12
Arch. 45	Building Construction	2	1	2	..
Mil. Sci. 5†	Second Year Basic Course	0	..	..	3
	Spring Quarter				
M.&M. 93*	Strength of Materials for Architects	4	4	..	..
Phys. 43	Electricity	3	1	3	..
Arch. 16	Architectural History	2	..	2	..
Arch. 26	Freehand Drawing	2	..	..	6
Arch. 36	Architectural Design, Grade I	4	..	..	12
Arch. 46	Building Construction	2	1	2	..
Mil. Sci. 6†	Second Year Basic Course	0	..	..	3

JUNIOR YEAR

	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 in Structures	3	..	3	..
	Elective.				
	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	..	3	..
	Elective.				

* For permissible substitutes, see page 57.

† Women take Phys. Ed. for Women in place of Mil. Sci. 4, 5, 6.

Course No.	Title	Credits	Rec.	Lect.	Lab.
	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	..	3	..
	Elective.*				
	SENIOR YEAR				
	Fall Quarter				
Arch. 131	Architectural Design, Grade III	10	..	..	30
Arch. 141	Building Construction	2	..	2	..
Arch. 151	Architectural Seminar	1	..	1	..
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. 142	Building Construction	2	..	2	..
Arch. 152	Estimating	1	..	1	..
Arch. 162	Landscape Design	2	..	2	..
C.E. 171	Building Sanitation	2	..	2	..
	Spring Quarter				
Arch. 133	Architectural Design, Grade III	9	..	..	27
Arch. 143	Building Construction	2	..	2	..
Arch. 153	Business Relations	2	..	2	..
Arch. 163	History of Painting and Sculpture	2	..	2	..
M.E. 164	Heating and Ventilating	2	..	2	..

ARCHITECTURAL ENGINEERING

Four-year course leading to the degree of bachelor of architectural engineering, B.Arch.E.

In addition to the prescribed courses, 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 for 12 quarters.

The freshman year of this course is identical with the freshman year of the course in Architecture, page 32.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M.&M. 24	Differential Calculus	5	5	..	..
Phys. 3	Elements of Mechanics	3	1	3	..
Phys. 4	Elements of Mechanics Laboratory	1	..	..	2
Arch. 14	Architectural History	2	..	2	..
Arch. 34	Architectural Design, Grade I	4	..	..	12
Arch. 44	Building Construction	2	1	2	..
Mil. Sci. 4	Second Year Basic Course	0	..	..	3

* For list of elective courses in other colleges, see page 58.

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
Arch. 15	Architectural History	2	..	2	..
Arch. 35	Architectural Design, Grade I	4	..	..	12
Arch. 45	Building Construction	2	1	2	..
Mil. Sci. 5	Second Year Basic Course	0	..	..	3
	Spring Quarter				
M.&M. 26	Technical Mechanics (Statics)	5	5	..	..
Phys. 43	Electricity	3	1	3	..
Phys. 44	Electricity Laboratory	1	..	..	2
Arch. 16	Architectural History	2	..	2	..
Arch. 36	Architectural Design, Grade I	4	..	..	12
Arch. 46	Building Construction	2	1	2	..
Mil. Sci. 6	Second Year Basic Course	0	..	..	3
	JUNIOR YEAR				
	Fall Quarter				
M.&M. 128	Strength of Materials	5	5	..	..
M.&M. 141	Materials Testing Laboratory	2	1	..	3
C.E. 31	Stresses in Structures	2	..	1	2
Arch. 17	Architectural History	2	..	2	..
Arch. 47	Building Construction	2	..	..	6
Chem. 1	Inorganic Chemistry	4	..	3	4
	Winter Quarter				
M.&M. 127	Technical Mechanics (Dynamics)	5	5	..	..
C.E. 35	Analysis of Buildings	3	..	1	4
Arch. 18	Architectural History	2	..	2	..
Arch. 48	Building Construction	2	..	..	6
Chem. 2	Inorganic Chemistry	4	..	3	4
	Spring Quarter				
M.&M. 129	Hydraulics	4	3	1	..
M.&M. 143	Hydraulics Laboratory	1	..	..	2
C.E. 36	Design of Steel Frame Buildings	4	..	1	6
Arch. 19	History of Architecture	2	..	2	..
Arch. 49	Building Construction	3	..	..	9
Chem. 3	Inorganic Chemistry	4	..	3	4
	SENIOR YEAR				
	Fall Quarter				
Arch. 141	Building Construction	2	..	2	..
M.E. 163	Heating and Ventilating	4	2	1	4
C.E. 141a	Reinforced Concrete	3	1	..	2
E.E. 40	Electric Wiring and Equipment	2	..	2	..
	Electives*				

* Program is arranged to accommodate Econ. 8f-9w, 28s; Engl. 7w; Geol. 5f.

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Winter Quarter				
Arch. 142	Building Construction	2	..	2	..
Arch. 152	Estimating	1	..	1	..
C.E. 142a	Reinforced Concrete	3	1	..	2
C.E. 171	Building Sanitation	2	..	2	..
E.E. 49	Electric Motors	2	2	..	..
	Electives*				
	Spring Quarter				
Arch. 153	Business Relations	2	..	2	..
C.E. 18	Surveying	3	..	..	8
C.E. 135	Reinforced Concrete Design	4	..	2	6
M.E. 140	Heat Engines	4	3	..	4
Arch. 143	Building Construction	2	..	2	..
	Electives*				

* Program is arranged to accommodate Econ. 8f-9w, 28s; Engl. 7w; Geol. 5f.

CHEMISTRY AND CHEMICAL ENGINEERING

FRESHMAN AND SOPHOMORE YEARS

The freshman year and the first two quarters of the sophomere year are the same in Chemistry as in Chemical Engineering, so that the student may postpone his choice between these two curricula until the winter of his sophomore year.

REGULAR FRESHMAN YEAR

For students satisfying the requirements of higher algebra and solid geometry.

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M.&M. 11	College Algebra	5	5	..	..
Inorg. Chem. 9	General Inorganic Chemistry	5	1	3	5
English 4	Rhetoric and Composition	3	3	..	..
Drawing 4*	Drawing and Descriptive Geometry	2	..	..	6
M.E. 12, 13, or 17*	Shop	2	..	1	4
Mil. Sci. 1†	First Year Basic Course	0	..	..	3
	Freshman Assembly	0	..	1	..
	Winter Quarter				
M.&M. 12	Trigonometry	5	5	..	..
Inorg. Chem. 10	General Inorganic Chemistry	5	1	3	5
English 5	Rhetoric and Composition	3	3	..	..
Drawing 5*	Drawing and Descriptive Geometry	2	..	..	6
M.E. 12, 13, or 17*	Shop	2	..	1	4
Mil. Sci. 2†	First Year Basic Course	0	..	..	3
	Spring Quarter				
M.&M. 13	Analytic Geometry	5	5	..	..
Inorg. Chem. 12	Qualitative Analysis	5	2	1	6
English 6	Rhetoric and Composition	3	3	..	..
Drawing 6*	Drawing and Descriptive Geometry	2	..	..	6
M.E. 12, 13, or 17*	Shop	2	..	1	4
P.H. 12†	Hygiene and First Aid	0	..	1	..
Mil. Sci. 3†	First Year Basic Course	0	..	..	3

* For permissible substitutes, see page 57.

† Women take Phys. Ed. for women, courses Phys.Ed. 1, 2, 3 in place of Mil. Sci. 1, 2, 3 and P.H. 12.

REGULAR SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M.&M. 24	Differential Calculus	5	5	..	..
Inorg. Chem. 13	Qualitative Analysis	5	2	..	9
Physics 3	Elements of Mechanics	3	1	3	..
Physics 4	Elements of Mechanics Laboratory	1	..	..	2
German 24	Chemical German	4	4	..	..
Mil. Sci. 4†	Second Year Basic Course	..	..	..	3
	Winter Quarter				
M.&M. 25	Integral Calculus	5	5	..	..
Anal. Chem. 1	Quantitative Analysis	5	1	1	10
Physics 23	Heat	3	1	3	..
Physics 24	Heat Laboratory	1	..	..	2
German 25	Chemical German	4	4	..	..
Mil. Sci. 5†	Second Year Basic Course	..	..	..	3
	Spring Quarter (Chemistry)				
M.&.M. 84*	Technical Mechanics	5	5	..	..
Anal. Chem. 2	Quantitative Analysis	5	1	1	10
Physics 43	Electricity	3	1	3	..
Physics 44	Electricity Laboratory	1	..	..	2
German 26	Chemical German	4	4	..	..
Mil. Sci. 6†	Second Year Basic Course	..	..	..	3
	Spring Quarter (Chemical Engineering)				
M.&M. 84*	Technical Mechanics	5	5	..	..
Anal. Chem. 2	Quantitative Analysis	5	1	1	10
Chem. E. 80	Chemical Engineering Materials	1	..	2	..
Physics 43	Electricity	3	1	3	..
Physics 44	Electricity Laboratory	1	..	..	2
German 26	Chemical German	4	4	..	..
Mil. Sci. 6	Second Year Basic Course	0	..	..	3

* For permissible substitutes, see page 57.
†Women take Phys. Ed. in place of Mil. Sci. 4, 5, 6.

CHEMISTRY

Four-year course leading to the degree of bachelor of chemistry, B.Chem.

In addition to the prescribed courses, sufficient approved electives must be taken to complete a total of at least 210 credits. Fifteen elective credits must be taken in chemistry.

This professional course in Chemistry is designed to provide thoro training in the fundamentals of chemistry and related subjects. It serves as a basis for further specialization and a foundation for graduate work. Its graduates secure positions in practical chemistry, research, and teaching, in chemical industries, the government service, in colleges and laboratories, etc.

For freshman year see page 36.

JUNIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab
	Fall Quarter				
Org. Chem. 51	Organic Chemistry	5	1	3	6
Phys. Chem. 101	Physical Chemistry	5	1	3	6
Physics 33	Optics	3	1	3	..
	Electives to complete program.‡				

‡ For list of suggested electives in other colleges see page 58. A total of 15 elective credits must be taken in Chemistry for graduation.

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Winter Quarter				
Org. Chem. 52	Organic Chemistry	5	1	3	6
Phys. Chem. 102	Physical Chemistry	5	1	3	6
Chem.E. 131	Industrial Inorganic Chemistry	4	1	4	..
	Electives to complete program.†				
	Spring Quarter				
Org. Chem. 53	Organic Chemistry	5	1	3	6
Phys Chem. 103	Physical Chemistry	5	1	3	6
Chem.E. 132	Industrial Organic Chemistry	4	1	4	..
Inorg. Chem. 51	Junior Review Exam. (General Inorg.)	0	2	..	..
Inorg. Chem. 52	Junior Review Exam. (Qualitative)	0	1	..	..
Inorg. Chem. 53	Junior Review Exam. (Quantitative)	0	2	..	..
	Electives to complete program.†				
	SENIOR YEAR (See note below)				
	Fall Quarter				
Inorg. Chem. 103	Advanced Inorganic Chemistry	3	..	3	..
Anal. Chem. 131	Applications of Indicators	3	..	2	5
Phys. Chem. 161	Radioactivity	2	..	2	..
	Electives to complete program.†				
	Winter Quarter				
Inorg. Chem. 104	Advanced Inorganic Chemistry	3	..	3	..
Anal. Chem. 132	Electrometric Measurements and Titrations	3	..	2	5
Phys. Chem. 162	Radioactivity	2	..	2	..
	Electives to complete program. †				
	Spring Quarter				
Inorg. Chem. 105	Advanced Inorganic Chemistry	3	..	3	..
*Org. Chem. 122	The Aromatic Compounds	3	..	3	..
Tech. Chem. 110	Special Analytical Apparatus	3	..	1	6
	Electives to complete program. †				

*** Students taking the minor in geology will replace Org. Chem. 122 by Org. Chem. 113.**

† For list of suggested electives in other colleges see page 58. A total of 15 elective **credits must be taken in Chemistry for graduation.**

NOTE.—At the beginning of his senior year, each student will choose a major adviser from the following list. In consultation with the adviser he will plan a program of work for the entire senior year, based normally upon concentration of electives around a chosen field of chemistry.

LIST OF ADVISERS FOR SENIORS

Inorganic Chemistry: Professors Sneed, Cohen, Stephens, Pervier, Barber.

Analytical Chemistry: Professors Kolthoff, Geiger, Sarver.

Organic Chemistry: Professors Hunter, Smith, Lauer.

Physical Chemistry: Professors Lind, MacDougall, Reyerson, Glockler, Taylor, Livingston.

Technological Chemistry: Professors Harding, Stoppel.

Chemical Engineering: Professors Mann, Montillon, Montonna.

Specialization in Bacteriology, Biochemistry, and Geology

For the benefit of students in chemistry who may desire to specialize in related fields, minor groups of electives have been arranged in bacteriology, biochemistry, and geology which may be taken in the junior and senior years in addition to the required courses of the regular chemistry curriculum shown above. The completion of one of these groups will qualify the chemistry graduate to enter upon graduate work in that department towards the Doctor's degree, thus providing an exceptionally strong foundation in chemistry for specialization in the chosen field.

Minor in Bacteriology

JUNIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
Zool. 14	General Zoology	3	..	2	4
	Winter Quarter				
Zool. 15	General Zoology	3	..	2	4
	Spring Quarter				
Zool. 16	General Zoology	3	..	2	4

SENIOR YEAR

	Fall Quarter				
Bact. 41	General Bacteriology	5	..	3	6
	Winter Quarter				
Bact. 121	Industrial Bacteriology	3	..	2	2
	Spring Quarter				
Bact. 122	Industrial Bacteriology	3	..	2	2

Minor in Biochemistry

JUNIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
Zool. 14*	General Zoology	3	..	2	4
	Winter Quarter				
Zool. 15*	General Zoology	3	..	2	4
	Spring Quarter				
Zool. 16*	General Zoology	3	..	2	4

SENIOR YEAR

	Fall Quarter				
Ag. Biochem. 111	Biochemistry	3	..	4	..
Ag. Biochem. 113	Biochemical Laboratory Methods	2	..	..	6
Bact. 41	General Bacteriology	5	..	3	6

* 9 credits of Botany may be substituted for Zoology 14-15-16.

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Winter Quarter				
Ag. Biochem. 112	Biochemistry	3	..	4	..
Ag. Biochem. 114	Biochemical Laboratory Methods	2	..	..	6
	Spring Quarter				
Ag. Biochem. 115	Biochemical Laboratory Methods	2	..	..	6

Minor in Geology

JUNIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Winter Quarter				
Min. 23	Elements of Mineralogy	4	1	2	4
	Spring Quarter				
Min. 24	Elements of Mineralogy	4	1	2	4
	SENIOR YEAR				
	Fall Quarter				
Geol. 1	General Geology	5	..	4	4
Geol. 121	Crystallography	3	..	3	2
	Winter Quarter				
Geol. 3	General Geology (Dynamic and Economic)	5	..	4	4
	Spring Quarter				
Org. Chem. 113	The Aliphatic Compounds (To replace Org. Chem. 122—3 credits.)	3	..	3	..

CHEMICAL ENGINEERING

Four-year course leading to the degree of bachelor of chemical engineering, B.Ch.E.

In addition to the prescribed courses, sufficient approved electives must be taken to complete a total of 218 credits.

The additional eight credits above the course in Chemistry are made up of two credits for the inspection trip in the spring vacation of the senior year and six credits for the two courses in Chemical Manufacture in the Summer Session following the junior year. Thus the term requirements of the two courses are equal in amount and average 17½ credits per quarter for 12 quarters.

Chemical engineering deals with the unit operations, such as crushing, grinding, sifting, mixing, filtration, evaporation, drying, distillation, and crystallization that are so vital in making any industry based on a chemical transformation of matter a commercial success. The chemist uses these operations in the laboratory but in order to apply them to large scale industrial processes he must have a thoro understanding of the fundamental physico-chemical and engineering principles on which they are based. The study of such principles constitutes the applied science of chemical engineering. For this purpose the chemical engineer must be thoroly trained in the various branches of chemistry, physics, and mathematics and he must

have a good training in the fundamentals of mechanical and electrical engineering so that he can design, construct, and successfully operate a plant using these unit operations.

The chemical engineer is primarily a producer. It is his province to develop a process from the laboratory stage through semi-works equipment to the production stage which uses engineering materials for the manufacture of unit process equipment in accordance with fundamental chemical engineering principles.

As many industries are based on some chemical operation, the chemical engineer is much in demand. He may be engaged in the manufacture of inorganic products—the mineral acids, alkalies, ammonia, paint pigments, fertilizers; in the organic industries—dyes, explosives, lacquers, solvents, medicinals; in the manufacture of gases—coal gas, carbureted blue gas, hydrogen, acetylene, helium; in the electrochemical industries such as the manufacture of graphite, calcium carbide, carborundum and other abrasives, wet and dry batteries, electroplating; in the metallurgical industries; and even in the food industries such as the manufacture of sugar, flour, salt, and starch. There are many others as leather, paper, textiles, soaps, petroleum, glass, and cement.

In these industries the chemical engineer does investigational work, development work, design of equipment, and plant operation. Some enter the field of sales engineering and technical writing.

For freshman and sophomore years see pages 36 and 37.

JUNIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
Chem. E. 101	Unit Processes	3	..	5	..
Org. Chem. 51	Organic Chemistry	5	1	3	6
Tech. Chem. 105	Methods of Technical Analysis	3	..	1	6
M.&M. 85*	Strength of Materials (with lab.)	4	3	..	2
Physics 33	Optics	3	1	3	..
	Winter Quarter				
Chem. E. 131	Industrial Inorganic Chemistry	4	1	4	..
Org. Chem. 52	Organic Chemistry	5	1	3	6
Tech. Chem. 106	Methods of Technical Analysis	3	..	1	6
M.&M. 86*	Hydraulics	2	2	..	..
M.&M. 143	Hydraulic Laboratory	1	..	..	2
M.E. 38	Heat Engines	4	..	3	4
	Spring Quarter				
Chem. E. 102	Unit Processes	3	3	..	..
Chem. E. 132	Industrial Organic Chemistry	4	1	4	..
Chem.E. 150	Unit Process Laboratory	1	..	..	3
Org. Chem. 53	Organic Chemistry	5	1	3	6
M.E. 28	Machine Design	3	..	1	6
M.E. 39	Heat Engines	3	..	2	4
Inorg. Chem. 51	Junior Review Exam. (General Inorg.)	0	2	..	..
Inorg. Chem. 52	Junior Review Exam. (Qualitative)	0	1	..	..
Anal. Chem. 53	Junior Review Exam. (Quantitative)	0	2	..	..

* For permissible substitutes, see page 57.

SUMMER QUARTER

Summer practice consisting of Chem. E. 151f,su-152w,su. Chemical Manufacture, will be taken by students in Chemical Engineering in the regular summer quarter between their junior and senior years. It is required for the degree of bachelor of chemical engineering.

SENIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
Chem. E. 103	Unit Process Problems	3	3	..	..
Phys. Chem. 101	Physical Chemistry	5	1	..	..
E.E. 43	Electric Power	3	..	3	2
Met. 160	Metallography	3	..	2	3
	Electives to complete program.*				
	Winter Quarter				
Chem. E. 104	Unit Process Problems	3	3	..	..
Chem. E. 121	Chemical Engineering Economics	3	1	2	..
Phys. Chem. 102	Physical Chemistry	5	1	3	6
E.E. 44	Electric Power	3	..	3	2
	Electives to complete program.*				
	Spring Quarter				
Chem. E. 187	Inspection Trip, spring vacation	2	..	..	..
Chem. E. 117	Chemical Engineering Equipment Design	3	..	..	6
Phys. Chem. 103	Physical Chemistry	5	1	3	6
E.E. 45	Electric Power	3	..	3	2
	Electives to complete program.*				

* See page 58 for list of electives in other colleges.

CIVIL ENGINEERING

Four-year course leading to the degree of bachelor of civil engineering, B.C.E.

In addition to the prescribed courses, 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 for 12 quarters.

The principal aim of the course in civil engineering is to present to the student an opportunity to become familiar with the methods of science, so that in his attack upon any professional problem he may employ his abilities with economy and secure dependable conclusions. A secondary but important object of the course is to train the student in technique, so that at graduation he may be able to be an economic asset to his employer.

The technique of surveying and platting, drawing, and certain laboratory procedures is taught throughout the course. Typical problems of railroad, highway, hydraulic, structural, and municipal engineering occupy the greater part of the last two years. In the junior year, there is a course of lectures and conferences on the relations of engineering projects to business and to public affairs. Elective courses are available in each of the three upper years; these offer a wide range of choice to the student who desires to extend his range of interests to those fields of knowledge and action related to civil engineering, but not strictly included therein.

The field of civil engineering is so comprehensive that no attempt is made toward specialization in the regular course of four years. Special courses for graduate students are offered in all of the divisions of railroad, highway, structural, hydraulic, and municipal engineering.

For freshman year, see page 26.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M.&M. 24	Differential Calculus	5	5	..	..
Phys. 3	Elements of Mechanics	3	1	3	..
Phys. 4	Elements of Mechanics Laboratory	1	..	..	2
Draw. 21	Drafting	2	..	..	6
C.E. 11	Surveying	3	1	..	7
Mil. Sci. 4	Second Year Basic Course	0	..	..	3
	*Elective.				
	Winter Quarter				
M.&M. 25	Integral Calculus	5	5	..	..
Phys. 23	Heat	3	1	3	..
Phys. 24	Heat Laboratory	1	..	..	2
Draw. 22	Drafting	2	..	..	6
C.E. 12	Surveying	3	1	..	7
Mil. Sci. 5	Second Year Basic Course	0	..	..	3
	*Elective.				
	Spring Quarter				
M.&M. 26	Technical Mechanics (Statics)	5	5	..	..
Phys. 43	Electricity	3	1	3	..
Phys. 44	Electricity Laboratory	1	..	..	2
Draw. 23	Drafting	2	..	..	6
C.E. 13	Surveying	3	1	..	7
Mil. Sci. 6	Second Year Basic Course	0	..	..	3
	*Elective.				

JUNIOR YEAR

	Fall Quarter				
M.&M. 128	Strength of Materials	5	5	..	..
M.&M. 141	Materials Laboratory	2	..	1	3
C.E. 14	Surveying	3	..	..	8
C.E. 31	Stresses in Structures	2	..	1	2
C.E. 51	Highways and Pavements	3	..	2	3
	*One or more electives.				
	Winter Quarter				
M.&M. 129	Hydraulics	4	3	1	..
M.&M. 143	Hydraulics Laboratory	1	..	..	1
C.E. 15	Surveying	2	..	4	..
C.E. 21	Railway Engineering	2	1	..	4
C.E. 32	Stresses in Structures	3	..	1	4
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	Elementary Structural Design	4	..	1	4
C.E. 53	Civil Engineering Practice	3	1	2	..
	*One or more electives.				

* For list of elective courses in other colleges. see page 58.

Summer Camp

C.E. 23 — Summer camp is held in the vacation preceding the senior year for 6 weeks beginning about the middle of August. Nine credits. Required of all students taking the course in Civil Engineering. Fee, $25.

SENIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
C.E. 121	Railway Engineering	3	..	1	6
C.E. 134	Statically Indeterminate Structures	3	2	..	2
C.E. 141	Reinforced Concrete	3	1	..	2
C.E. 161	Hydrology	3	1	1	3
C.E. 146	Plain Concrete	3	..	2	4
or					
C.E. 164	Water Power	3	..	1	6
	*Electives to complete program.				
	Winter Quarter				
C.E. 124	Transportation	3	3	..	..
C.E. 131	Bridge Analysis	3	1	..	2
C.E. 142	Reinforced Concrete Design	3	1	..	2
C.E. 162	Water Supply and Sewerage	3	..	2	4
E.E 42	Electric Power	4	3	..	2
or					
M.E. 140	Heat Engines	4	3	..	4
	*Electives to complete program.				
	Spring Quarter				
C.E. 132	Bridge Design	3	..	1	6
C.E. 163	Water Supply and Sewerage	3	..	2	5
C.E. 146	Plain Concrete	3	..	2	4
or					
C.E. 164	Water Power	3	..	1	6
E.E. 42	Electric Power	4	3	..	2
or					
M.E. 140	Heat Engines	4	3	..	4
	*Electives to complete program.				

SPECIAL SENIOR YEAR

(For students who have completed Courses C.E. 23, 131, 132, 134.† Such students may be able to graduate at the end of the winter quarter if they have sufficient electives and no deficiencies.)

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
C.E. 121	Railway Engineering	3	..	1	6
C.E. 141	Reinforced Concrete Design	3	1	..	2
C.E. 161	Hydrology	3	1	1	3
C.E. 162	Water Supply and Sewerage	3	..	1	6
M.E. 140	Heat Engines	4	3	..	4
	*Electives to complete program.				

* For list of elective courses in other colleges. see page 58.

† Courses C.E. 131, 132, and 134 have been offered in the summer quarter by special arrangement only.

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Winter Quarter				
C.E. 124	Transportation	3	3	..	..
C.E. 142	Reinforced Concrete Design	3	1	..	2
C.E. 146	Plain Concrete	3	..	1	4
C.E. 163	Water Supply and Sewerage	3	..	2	5
C.E. 164	Water Power	3	..	1	6
E.E. 42	Electric Power	4	3	..	2
	*Electives to complete program.				

* For list of elective courses in other colleges. see page 58.

ELECTRICAL ENGINEERING

Four-year course leading to the degree of bachelor of electrical engineering, B.E.E.

In addition to the prescribed courses, sufficient electives must be taken to complete a total of at least 204 credits for gaduation. This is an average of 17 credits per quarter for 12 quarters.

The course in Electrical Engineering is designed to fit the student for a position of responsibility in the electrical field. This work is based upon the principles of electricity and magnetism contained in the prescribed courses in general physics and upon the principles of mathematics. In the senior year, specialized courses may be selected in the field of electric power generation, transmission, and utilization, in telephone and radio communication or in illumination.

The main laboratory of the department is well equipped for preliminary training in the operation of electrical machinery and for advanced research problems in this field. The communication laboratories contain, besides the general equipment for study of circuits and equipment, a complete commercial radio broadcasting station and an experimental high frequency, short wave station.

Graduate courses in this department, together with graduate courses in physics and mathematics, are available for those with exceptional ability who desire training beyond the usual four-year undergraduate curriculum. For those desiring to fit themselves for the managerial and commercial side of engineering, the Engineering Administration curriculum is provided. Graduates of this department are in demand by various operating and manufacturing companies. After a short period in the laboratories and offices of these companies, the graduates are advanced to positions of increasing responsibility.

For freshman year, see page 26.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M.&M. 24	Differential Calculus	5	5	..	..
Phys. 3	Elements of Mechanics	3	1	3	..
Phys. 4	Elements of Mechanics Laboratory	1	..	..	2
M.E. 16§	Machine Shop	2	..	..	6
E.E. 11	Elements of Electrical Engineering	3	2	1	2
Mil. Sci. 4	Second Year Basic Course	0	.	..	3
	*Elective.				

* For list of elective courses in other colleges. see page 58.
§ For permissible substitute, see page 57.

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
Draw. 26§	Drafting	2	..	..	6
E.E. 13	Elements of Electrical Engineering	3	2	1	2
Mil. Sci. 5	Second Year Basic Course	0	..	..	3
	*Elective.				
	Spring Quarter				
M.&M. 26	Technical Mechanics (Statics)	5	5	..	..
Phys. 43	Electricity	3	1	3	..
Phys. 44	Electricity Laboratory	1	..	..	2
Draw. 27	Drafting	2	..	..	6
E.E. 15	Elements of Electrical Engineering	3	2	1	2
Mil. Sci. 6	Second Year Basic Course	0	..	..	3
	*Elective.				
	JUNIOR YEAR				
	Fall Quarter				
M.&M. 129	Hydraulics	4	3	1	..
M.&M. 143	Hydraulics Laboratory	1	..	..	2
E.E. 111	Electrical Engineering	4	4	..	..
E.E. 112	Electrical Engineering Laboratory	2	..	..	4
Phys. 144	Electrical Measurements	3	1	1	4
	*One or more electives.				
	Winter Quarter				
M.&M. 127	Technical Mechanics (Dynamics)	5	5	..	..
E.E. 113	Electrical Engineering	4	4	..	..
E.E. 114	Electrical Engineering Laboratory	2	..	..	4
M.E. 26	Mechanism and Kinematics	3	3	..	..
	*One or more electives.				
	Spring Quarter				
M.&M. 128	Strength of Materials	5	5	..	..
M.&M. 141	Materials Laboratory	2	..	1	3
E.E. 115	Electrical Engineering	4	4	..	..
E.E. 116	Electrical Engineering Laboratory	2	..	..	4
Phys. 33	Optics	3	1	3	..
	*One or more electives.				
	SENIOR YEAR				
	Fall Quarter				
E.E. 121	Alternating Current Machinery	3	3	..	..
E.E. 122	Electrical Engineering Laboratory	2	..	..	4
E.E. 132	Electrical Design†	2	2	..	..
M.E. 138	Heat Engines†	3	2	..	3
	*One or more electives.				

* For list of elective courses in other colleges. see page 58.

† See (†) footnote, page 47.

§ For permissible substitute, see page 57.

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Winter Quarter				
E.E. 123	Alternating Current Machinery	3	3	..	..
E.E. 124	Electrical Engineering Laboratory	2	..	..	4
E.E. 134	Electrical Design†	2	2	..	..
M.E. 139	Heat Engines†	3	2	..	3
	*One or more electives.				
	Spring Quarter				
E.E. 125	Alternating Current Machinery	3	3	..	..
E.E. 126	Electrical Engineering Laboratory	2	..	..	4
E.E. 136	Electrical Design†‡	2	2	..	..
M.E. 155	Internal Combustion Engines	3	2	..	3
	*One or more electives.				

* For list of elective courses in other colleges, see page 58.

† Students specializing in chemistry, physics, or electrical communications may substitute electives in that department for courses E.E. 132, 134, 136 and M.E. 138, 139, and 155. Such specialization requires at least 18 credits of elective work in chemistry or the same number in physics; in electrical communications the requirement is courses E.E. 61-63-65, 161-162-163, 164-165-166, a total of 21 credits.

‡ Students specializing in business may substitute an approved elective in that department for Course E.E. 136.

SPECIALIZED COURSES IN ELECTRICAL ENGINEERING

The number of electives in the electrical engineering course makes it practicable to obtain either a broad or a specialized education. Further to facilitate such election, certain courses (indicated†) in the senior year may be replaced by substitutes in physics, chemistry, or electrical communication, subject to the approval of the head of the department and the Students' Work Committee. By properly choosing prerequisite subjects during the sophomore or junior year, a far-seeing student may prepare for advanced specialized courses in the following undergraduate and graduate years. As examples, one may specialize in business, chemistry, communication, illumination, manufacturing, military science, physics, power generation and distribution, public utilities, railway engineering, or other chosen line. Students are advised to consult with their classifier, or with the head of the department, concerning desirable sequences of general or special courses.

INTERIOR ARCHITECTURE

Four-year course leading to the degree of bachelor of interior architecture, B.Int.Arch.

The course in interior architecture is primarily designed to meet vocational needs of women who wish to prepare for the practice of architecture, or interior decoration. This course requires normally four years for its completion, the first two years in the College of Science, Literature, and the Arts, and the last two years in the College of Engineering and Architecture.

For the freshman and sophomore years, students register in the College of Science, Literature, and the Arts and complete the requirements of the Junior College, including the required courses, 93 credits, and 93 honor points.

Courses Required in the First Two Years

	Credits
English A-B-C	0 to 15
Mathematics 4 or 6 (with prerequisite)	4 to 10
French (see Junior College Requirements, page 7, S. L. A. bulletin)	0 to 20
History 11-12-13	10
Physics 3 and 4 and any one of the continuations, 23, 33, 43, with laboratory	8
or	
Chemistry 1-2-3 or 4-5	8 to 12
Architecture 21-22-23	6
Architecture 31-32-33	15
Drawing 61-62-63	6
Physical Education	3

For Those Who Enter without High School French, Chemistry, or Higher Algebra

FRESHMAN YEAR

Fall	Credits	Winter	Credits	Spring	Credits
English A*	5	English B	5	English C	5
French 1	5	French 2	5	French 3	5
Chemistry 1	4	Chemistry 2	4	Chemistry 3	4
Phys. Ed. 1	½	Phys. Ed. 2	½	Phys. Ed. 3	½

SOPHOMORE YEAR

French 4	5	Math. 5	5	Math. 4	4
				or	
Arch. 21	2	Arch. 22	2	Math. 6	5
Arch. 31	5	Arch. 32	5	Arch. 23	2
Draw. 61	2	Draw. 62	2	Arch. 33	5
Hist. 11	3	Hist. 12	3	Draw. 63	2
Phys. Ed.	½	Phys. Ed.	½	Hist. 13	4
				Phys. Ed.	½

For Those Who Enter with Higher Algebra and Two Years of French

FRESHMAN YEAR

Fall	Credits	Winter	Credits	Spring	Credits
English A*	5	English B	5	English C	5
Mathematics	4 or 5	French	5	French	5
Phys. Ed. 1	½	Phys. Ed. 2	½	Phys. Ed. 3	½
Elective	5	Elective	5	Elective	5

SOPHOMORE YEAR

	Credits
Architecture 21-22-23	6
Architecture 31-32-33	15
History 11-12-13	10
Chemistry or physics	8 to 12
Drawing 61-62-63	6
Physical Education	1½

Electives to complete a total of 93 for the two years.

* See English requirement, page 5, A, Science, Literature, and the Arts bulletin, Part II.

Having satisfied the requirements of the Junior College, the students transfer to the College of Engineering and Architecture and pursue the following curriculum, amounting to 102 credits for the remaining two years:

JUNIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
Arch. 14	Architectural History	2	..	2	..
Arch. 34	Architectural Design	4	..	..	12
Arch. 51	Building Construction	2	..	2	..
Arch. 74	Freehand Drawing	3	..	..	9
Art. Ed. 20	Principles of Harmony in Form and Color	3	..	..	6
	Non-technical electives	3			
	Winter Quarter				
Arch. 15	Architectural History	2	..	2	..
Arch. 35	Architectural Design	4	..	..	12
Arch. 52	Building Construction	2	..	2	..
Arch. 75	Freehand Drawing	3	..	..	9
Art. Ed. 21	Principles of Harmony in Form and Color	3	..	..	6
	Non-technical electives	3			
	Spring Quarter				
Arch. 16	Architectural History	2	..	2	..
Arch. 36	Architectural Design	4	..	..	12
Arch. 53	Building Construction	2	..	2	..
Arch. 76	Freehand Drawing	3	..	..	9
Art. Ed. 22	Principles of Harmony in Form and Color	3	..	..	6
	Non-technical electives	3			

SENIOR YEAR

	Fall Quarter				
Arch. 17	Architectural History	2	..	2	..
Arch. 27	Freehand Drawing	2	..	..	6
Arch. 134	Interior Design	7	..	..	21
Arch. 151	Seminar	1	..	1	..
Arch. 182	Furniture and Decoration	3	..	3	..
	Non-technical electives	3			
	Winter Quarter				
Arch. 18	Architectural History	2	..	2	..
Arch. 28	Freehand Drawing	2	..	..	6
Arch. 135	Interior Design	7	..	..	21
Arch. 183	Furniture and Decoration	3	..	3	..
	Non-technical electives	3			
	Spring Quarter				
Arch. 19	Architectural History	2	..	2	..
Arch. 29	Freehand Drawing	2	..	..	6
Arch. 136	Interior Design	7	..	..	21
Arch. 163	History of Sculpture and Painting	2	..	2	..
Arch. 184	Furniture and Decoration	3	..	3	..

LANDSCAPE ARCHITECTURE

Four-year course leading to the degree of bachelor of landscape architecture, B.L.A.

In addition to the prescribed courses, 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 for 12 quarters.

The course in landscape architecture is intended to provide instruction and training for students who desire to enter this profession. It involves the same fundamental preparation as the course in architecture, and, also, special attention is given to architectural as well as landscape design.

The profession of landscape architecture is a broad one and should not be confused with the work of the landscape gardener. The landscape architect may be concerned in the design and construction involved in parks and park systems, real estate development of a high order, and on a large scale, university campuses, civic centers, municipal and state building plans, town and city planning, etc. His professional relations with architects are so intimate as to require familiarity with the architectural profession. This is given consideration in the close relationship between the course in landscape architecture and the course in architecture.

For freshman year, see page 32.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M.&M. 91*	Calculus	4	4	..	..
Arch. 14	Architectural History	2	..	2	..
Arch. 24	Freehand Drawing	2	..	..	6
Arch. 34	Architectural Design	4	..	..	12
Bot. 1	General Botany	4	1	3	..
Mil. Sci. 4	Second Year Basic Course	0	..	..	3
	Winter Quarter				
M.&M. 92*	Technical Mechanics	4	4	..	..
Arch. 15	Architectural History	2	..	2	..
Arch. 25	Freehand Drawing	2	..	..	6
Arch. 35	Architectural Design	4	..	..	12
Bot. 21	Elementary Ecology	3	..	..	6
Mil. Sci. 5	Second Year Basic Course	0	..	..	3
	Spring Quarter				
M.&M. 93*	Strength of Materials	4	4	..	..
Arch. 16	Architectural History	2	..	2	..
Arch. 26	Freehand Drawing	2	..	..	6
Arch. 36	Architectural Design	4	..	..	12
Bot. 7	Taxonomy of Flowering Plants	3	..	1	5
Mil. Sci. 6	Second Year Basic Course	0	..	..	3
	Summer Session between Sophomore and Junior Years				
Arch. 20	Outdoor Sketching	1			
Geol. 1	General Geology	5			
Hort. 70†	Plant Materials	3			

* For permissible substitutes, see page 57.

† Given by special arrangement.

JUNIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
Arch. 27	Freehand Drawing	2	..	..	6
Arch. 84	Modeling	2	..	..	6
C.E. 11	Surveying	3	1	..	7
Econ. 8	General Economics	3	3	..	..
Hort. 71	Elementary Design and Plant Material	3	..	1	4
Phys. 3	Elements of Mechanics	3	1	3	..
Phys. 4	Elements of Mechanics Laboratory	1	..	..	2
	Winter Quarter				
Arch. 28	Freehand Drawing	2	..	..	6
Arch. 85	Modeling	2	..	..	6
C.E. 12	Surveying	3	1	..	7
Econ. 9	General Economics	3	3	..	..
Hort. 74	Principles of Landscape Design	3	...	1	4
Phys. 23	Heat	3	1	3	..
Phys. 24	Heat Laboratory	1	..	..	2
	Spring Quarter				
Arch. 29	Freehand Drawing	2	..	..	6
Arch. 86	Modeling	2	..	..	6
C.E. 13	Surveying	3	1	..	7
Econ. 28	Business Law	3	3	..	..
Hort. 72	Woody Plants and Garden Flowers	2	..	1	2
Phys. 43	Electricity	3	1	3	..
Phys. 44	Electricity Laboratory	1	..	..	2

SENIOR YEAR

	Fall Quarter				
Arch. 160	History of Landscape Architecture	2	..	2	..
C.E. 14	Surveying	3	..	..	8
C.E. 51	Highways and Pavements	3	2	..	3
C.E. 144	Reinforced Concrete	3	2	..	2
For. 1	General Forestry	3	..	3	..
or					
Soils 4	Soils	3	..	2	2
	One or more electives.				
	Winter Quarter				
G.E. 81	Estimating	3	3	..	..
Hort. 75	Landscape Problems	3	..	1	4
Phys. 33	Optics	3	1	3	..
Phys. 34	Optics Laboratory	1	..	..	2
Sp.35	Public Speaking	3	3	..	..
	One or more electives.				
	Spring Quarter				
Ag.E. 31	Principles of Drainage	3	1	2	..
C.E. 172	City Planning	3	..	3	..
Engl. 31	Technical Writing	3	3	..	..
Hort. 76	Landscape Construction	3	..	1	4
	One or more electives.				

RECOMMENDED ELECTIVES

Arch. 44f,45w,46s	Building Construction .....per quarter	2
Hort. 56s	Plant Propagation	3
Soils 4f	Soils	3

MECHANICAL ENGINEERING

Four-year course leading to the degree of bachelor of mechanical engineering, B.M.E.

In addition to the prescribed courses, 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 for 12 quarters.

It is recommended that each student in Mechanical Engineering spend at least one summer vacation in machine shop practice.

At the beginning of the junior year, the student should confer with his classifier with regard to the particular line of work, if any, for which he desires to prepare. He can then select his electives according to this plan.

The field of mechanical engineering is so broad that the young graduates enter almost every kind of industry, both in technical and executive positions.

The profession includes the following divisions: design of machinery and apparatus for all purposes; production and manufacturing methods; inspection and testing of materials and apparatus; operation of industrial plants; sales engineering; research and development; management of industry.

The course is planned to give broad training rather than highly specialized work. Fundamental courses in mathematics, physics, chemistry, and *English* are followed by strong courses in steam and gas machinery, electricity, hydraulics, machine design, materials testing, and mechanical laboratory work. Courses in economics, industrial management, and finance may be elected if desired.

The young man graduating in mechanical engineering will find an ever widening field of service in the future both in technical work and in administrative positions, and there is no limit to future progress except the ability of the individual.

For freshman year, see page 26.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M.&M. 24	Differential Calculus	5	5	..	..
Phys. 3	Elements of Mechanics	3	1	3	..
Phys. 4	Elements of Mechanics Laboratory	1	..	..	2
M.E. 19	Mechanical Technology	1	..	2	..
M.E. 21	Elementary Machine Design	2	..	..	6
Tech. Chem. 1†*	Power Plant Chemistry	3	1	1	6
or					
Phys. 33	Optics	3	1	3	..
C.E. 19§	Surveying	3	1	..	7
or					
M.E. 50	Auto and Airplane Engines	3	3	..	..
Mil. Sci. 4	Second Year Basic Course	0	..	..	3

* Students may take either Tech. Chem. 1, Power Plant Chemistry or Phys. 33, Optics to satisfy the requirements of the sophomore year.

† Auto and Airplane Engines, Power Plant Chemistry, and Optics may be taken any quarter. The Power Plant Chemistry sections are limited to 20 students each.

§ Surveying may be taken in either the fall or spring quarter.

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
M.E. 14	Machine Shop Practice	3	..	1	7
Phys. 33†§	Optics	3	1	3	..
or					
Tech. Chem. 1	Power Plant Chemistry	3	1	1	6
Sp. 35‡	Fundamentals of Speech	3	3	..	..
or					
M.E. 50	Auto and Airplane Engines	3	3	..	..
Mil. Sci. 5	Second Year Basic Course	0	..	..	3
	Spring Quarter				
M.&M. 26	Technical Mechanics (Statics)	5	5	..	..
Phys. 43	Electricity	3	1	3	..
Phys. 44	Electricity Laboratory	1	..	..	2
M.E. 15	Machine Shop Practice	3	..	1	7
M.E. 20	Kinematics	2	..	..	6
Sp. 35‡	Fundamentals of Speech	3	3	..	..
or					
C.E. 19	Surveying	3	1	..	7
Mil. Sci. 6	Second Year Basic Course	0	..	..	3
	*Elective.				

JUNIOR YEAR

	Fall Quarter				
M.&M. 127	Technical Mechanics (Dynamics)	5	5	..	..
M.E. 22	Mechanism	3	3	..	..
M.E. 30	Steam Engineering	3	3	..	..
M.E. 33	Elementary Mechanical Laboratory	2	..	..	4
	*One or more electives.				
	Winter Quarter				
M.&M. 128	Strength of Materials	5	5	..	..
M.&M. 141	Materials Laboratory	2	..	1	3
M.E. 23	Machine Design	3	..	2	6
M.E. 31	Thermodynamics	3	2	..	3
M.E. 34	Mechanical Laboratory	2	..	..	4
	*One or more electives.				
	Spring Quarter				
M.&M. 129	Hydraulics	4	3	1	..
M.&M. 143	Hydraulics Laboratory	1	..	..	2
M.E. 24	Machine Design	3	3	..	..
M.E. 32	Thermodynamics	3	2	..	3
M.E. 35	Elementary Steam and Power Laboratory	2	..	..	4
M.E. 63	Heating and Ventilation	3	1	2	..
	*One or more electives.				

* For list of elective courses in other colleges, see page 58.

† Auto and Airplane Engines, Power Plant Chemistry, and Optics may be taken any quarter. The Power Plant Chemistry sections are limited to 20 students each.

‡ Fundamentals of Speech may be taken in either the winter or spring quarter.

§ Students may take either Tech. Chem. 1, Power Plant Chemistry or Phys. 33, Optics to satisfy the requirements of the sophomore year.

SENIOR YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M.E. 121	General Engineering Design	2	..	..	6
M.E. 144	Power Plant Engineering	3	3	..	..
M.E. 149	Advanced Steam Laboratory	2	..	..	4
or					
M.E. 159	Power and Gas Engine Laboratory	2	..	..	4
or					
M.E. 169	Heating and Ventilation Laboratory	2	..	..	4
M.E. 150	Internal Combustion Engines	3	3	..	..
M.E. 171	Production Factors	3	3	..	..
M.E. 190	Seminar	1	1	..	..
E.E. 36	Electric Power	3	2	..	2
	*One or more electives.				
	Winter Quarter				
M.E. 149	Advanced Steam Laboratory	2	..	..	4
or					
M.E. 159	Power and Gas Engine Laboratory	2	..	..	4
or					
M.E. 169	Heating and Ventilation Laboratory	2	..	..	4
M.E. 191	Seminar	1	1	..	..
	Engineering Design‡	2	..	..	6
E.E. 37	Electric Power	3	2	..	2
	*One or more electives.				
	Spring Quarter				
M.E. 149	Advanced Steam Laboratory	2	..	..	4
or					
M.E. 159	Power and Gas Engine Laboratory	2	..	..	4
or					
M.E. 169	Heating and Ventilation Laboratory	2	..	..	4
M.E. 192	Seminar	1	..	1	1
	Engineering Design‡	2	..	..	6
E.E. 38	Electric Power	3	2	..	2
G.E. 193	Engineering Practice	2	..	2	..
	*One or more electives.				

* For list of elective courses in other colleges, see page 58.

‡ The following courses are accepted for this requirement: M.E. 122w-123s, Advanced Engineering Design; M.E. 136w, Design of Steam Machinery; M.E. 137s, Design of Power Plant Units; M.E. 156w, 157s, Design of Internal Combustion Engines; C.E. 37s, Structural Engineering.

In addition to the regular four-year course in Mechanical Engineering, those who are qualified are urged to take a fifth year, that is, a year of graduate study. This year's work may lead to the Master's degree in mechanical engineering and also satisfy the requirement of graduate study towards the professional degree of Mechanical Engineer. (For detailed information as to procedure, the bulletin of the Graduate School should be consulted.)

Graduate work for a degree is divided into a major subject, a minor subject, and a thesis. In this case, the major subject is Mechanical Engineering and the thesis will lie in the same field. If the Master's degree is not sought as a result

of the fifth year's work, the thesis is not required. The student is advised to obtain the Master's degree. The minor should be in another department. A total of 15 to 18 credits per quarter, should be taken.

ENGINEERING PRE-BUSINESS

(Combined Engineering-Business Administration Course)

This course has been arranged for students who wish to prepare for positions in industry for which basic technical training is necessary but must be accompanied by thoro training in business administration. Such positions are found in the fields of purchasing, sales and sales promotion, cost accounting, employment and rate setting, and production control.

Upon the completion of two years of prescribed work in the College of Engineering and Architecture, the student transfers to the School of Business Administration, where the third and fourth years are taken. The combined course leads to the degree of bachelor of business administration.

For freshman year, see page 26.

SOPHOMORE YEAR

Course No.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M.&M. 91§	Calculus	4	4	..	..
Phys. 3	Elements of Mechanics	3	1	3	..
Phys. 4	Elements of Mechanics Laboratory	1	..	..	2
Econ. 8	General Economics	3	..	3	..
M.E. 17§	Machine Shop Practice	2	..	1	4
M.E. 19	Mechanical Technology	1	..	2	..
Mil. Sci. 4	Second Year Basic Course	0	..	..	3
	*Elective.				
	Winter Quarter				
Phys. 23	Heat	3	1	3	..
Phys. 24	Heat Laboratory	1	..	..	2
Econ. 3	The Mechanism of Exchange	5	3	2	..
Econ. 9	General Economics	3	3	..	..
Econ. 20†	Elements of Accounting	3	3	..	..
Mil. Sci. 5	Second Year Basic Course	0	..	..	3
	*Elective.				
	Spring Quarter				
M.&M. 84§	Technical Mechanics	5	5	..	..
Phys. 43	Electricity	3	1	3	..
Phys. 44	Electricity Laboratory	1	..	..	2
Econ. 14	Elements of Statistics	5	5	..	..
Econ. 25	Principles of Accounting	3	3	..	..
Mil. Sci. 6	Second Year Basic Course	0	..	..	3

* For electives in other colleges, see page 58.

† Students who have had a high school course or experience in bookkeeping may be exempt from this course and admitted to Econ. 25 by passing a placement test.

§ For permissible substitutes, see page 57.

JUNIOR YEAR‡
(In the School of Business Administration)

	Credits
Strength of Materials (M. & M. 85f)§	4
Principles of Accounting (Econ. 26)	3
Business Law (Bus. Adm. 51-52-53)	9
Corporation Finance (Bus. Adm. 155)	3
Money and Banking—Advanced Course (Bus. Adm. 142)	3
Traffic Management (Bus. Adm. 71)	3
Survey of Marketing (Bus. Adm. 77)	3
Production Management (Bus. Adm. 89)	3
Advanced General Accounting (Bus. Adm. 139)	3
Report Writing (Bus. Adm. 100)	1
Electives (See list below)	7 to 13

SENIOR YEAR
(In the School of Business Administration)

Cost Accounting (Bus. Adm. 130)	3
Advanced General Economics (Bus. Adm. 101-102)	6
Business Policy (Bus. Adm. 109)	3
Business Cycles (Econ. 140)	3
Labor Problems (Econ. 161)	3
Personnel Administration (Bus. Adm. 167)	3
Public Finance (Bus. Adm. 58)	3
The Economics of Public Utilities (Bus. Adm. 165)	3
Production Topics Course (Bus. Adm. 180-181-182)	9
Electives (See list below)	12 to 18

ELECTIVES

Students may divide the time available for electives between groups A and B.

A. General and Business

	Hours
Economic History (Hist. 80-81)	3 to 6
Finance Management (Bus. Adm. 156)	3
Theory of Statistics (Econ. 113-114)	3
Geography of Commercial Production (Econ. 75)	5
Fire and Marine Insurance (Bus. Adm. 60)	3
Casualty Insurance (Bus. Adm. 61)	3

B. Engineering

	Hours
Auto and Airplane Engines (M.E. 50)	3
Gas Manufacture and Distribution (Ch.E. 41)	3
Civil Engineering Practice (C.E. 53)	3
Contracts and Specifications (G.E. 101)	3
Estimating (G.E. 81)	3
Technical Writing (Engl. 31)	3

‡ In addition to the required courses in the junior and senior years, the student must earn approximately 10 credits per year.

§ For permissible substitute, see page 57.

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 series of electives.

SOPHOMORE YEAR

Course No.	Title	Credits
	Fall Quarter	
Econ. 8	General Economics	3
	Winter Quarter	
Econ. 9	General Economics	3
	Spring Quarter	
Econ. 28	Business Law	3
	JUNIOR YEAR	
	Fall Quarter	
Econ. 29	Principles of Accounting	3
	Winter Quarter	
Bus. Adm. 89	Production Management	3
	Spring Quarter	
Bus. Adm. 155	Corporation Finance	3
	SENIOR YEAR	
	Fall Quarter	
Bus. Adm. 77	Survey of Marketing	3
Econ. 161	Labor Problems and Trade Unionism	3
	Winter Quarter	
Bus. Adm. 71	Traffic Management	3
Bus. Adm. 167	Personnel Administration	3
	Spring Quarter	
Bus. Adm. 130	Cost Accounting	3
Bus. Adm. 165	The Economics of Public Utilities	3

SUBSTITUTIONS

In order that students who are irregular may avoid delays on account of program conflicts or other difficulties, the following substitutions will be approved by petition. Additional credits thus earned may be applied as elective credits.

Course	Cred.	Substitute Course	Cred.
Draw. 4	2	Draw. 1	3
5	2	2	3
6	2	3	3
4 and 5 and 6	6	7 and 8	6
26	2	28	2
28	2	26	2
M.&M. 84	5	M.&M. 26 and 127	10
85	4	128 and 141	7
86	2	129	4
91	4	24 and 25	10
92	4	26 or 84	5
93	4	85 or 128	4 or 5
M.E. 16	2	17	2
16	2	14 and 15	6
17	2	16	2

ELECTIVE COURSES IN OTHER COLLEGES

For detailed schedules of classes see the programs of respective departments.

Course No.	Title	Credits	Prerequisites
Ast. 11f,s	Descriptive Astronomy	5	3rd qtr. fr., soph., jr., sr.; none
Fr. 1f,w,s-2f,w,s	Beginning French	10	None
Fr. 3f,w,s-4f,w,s	Intermediate French	10	French 1-2 or two years' high school French
Geol. 4s	Geology of Minnesota	5	Geol. 2 or 3
Geol. 8f,w,s	Introductory Geology	5	None
Geol. 161w	Crystal Structures	3	Geol. 121, M.&M.13 and Elem. Phys.
Ger. 1f,w,s	Beginning German A	5	None
Ger. 2f,w,s	Beginning German B	5	Ger. 1 or one year preparation
Ger. 3f,w,s	Beginning German C	5	Ger. 2
Ger. 4f,w,s	Intermediate German	5	Ger. 3
Greek 42s	Greek Sculpture	2	None
Hist. 1f,w-2w,s	Modern World History	10	None
Hist. 7f-8w	American History	10	None
Hist. 11f-12w-13s	Medieval History	10	None (Int. Arch. only)
Italian 1f-2w	Beginning Italian	10	None
Jour. 5w,s	The American Newspaper	3	None
Jour. 13f-14w-15s	Reporting	9	Engl. 6
Lib. Meth. 1f,w,s	Use of Books and Libraries	2	None (Fr. and soph. only)
Phil. 2f,w,s	Logic	5	None
Phys. 146w	Advanced Electrical Measurements	3	Phys. 144
Pol. Sci. 1f,w,s	American Government	5	10 cred. in hist. or econ.
Pol. Sci. 2w	State Government	5	Pol. Sci. 1
Pol. Sci. 11f,s	Municipal Government	5	Pol. Sci. 1
Psy. 1f,w,s-2w,s	General Psychology	6	None
Psy. 160f	Psychology in Personnel Work	3	Psy. 1-2, Econ. 8-9
Soc. 1f,w,s	Introduction to Sociology	5	None
Span. 1f,w,s-2f,w,s	Beginning Spanish	10	None
Span. 3f,w,s-4f,w,s	Intermediate Spanish	10	Spanish 1-2 or two years' high school Spanish
Sp. 41f,w-42w,s-43f,s	Fundamentals of Speech	9	Engl. 6

DESCRIPTIONS OF COURSES

AERONAUTICAL ENGINEERING

1f—Aviation. History and nomenclature. Resistance of simple bodies. Theory of flight. The airplane and its parts. Constructional details. Performance. 3 cred.; prereq., M.&M. 12.

(1) I MWF; 254ME (2) I TThS; 202ME

2w—Auto and Airplane Engines. Principles and types. Electrical systems. Lubrication and cooling. Carburetors. Accessories. (Open only to aeronautical engineers or by petition.) 3 cred.; prereq., 1.

(1) I TThS; 202ME (2) III TThS; 202ME

3s—Aviation. Instruments. Metereology. Avigation. 3 cred.; prereq., 1 and 2.

(1) VII MWF; 252ME (2) I MF, II S; 154ME

83s—Stresses in Simple Structures. Statically determinate trusses and beams. Graphic statics. Space frameworks. Combined stresses. Airplane wing bracing. Short and long struts. 3 cred.; prereq., M.&M. 128; III MWF; 107E. Mr. Wise.

100f-101w-102s—Aerodynamics. Atmospheric properties. Fluid mechanics. Stream functions and velocity potential. Motion of body in liquids in three dimensions. Prandtl's wing theory. Dynamic loads, stability, maneuverability, controllability. 3 cred. per qtr.; prereq., 3 and M.&M. 26; I MWF; 215Ex. Mr. Boehnlein.

115f—Airplane Stresses. Deflection of structures. Theory of statically indeterminate structures. Analysis of fuselage trusses, landing gear, wing beams. Structural details and connections. 3 cred.; prereq., 83. Mr. Wise.

Lect. III TS; 21E Lab. III-IV F; 229E

116w—Advanced Airplane Stresses. Theory and design of monocoque fuselages. Multispar and unit construction wings. Vibrations. Wing and control-surface flutter. Analysis and design of seaplane hulls and floats. 3 cred.; prereq., 115. Mr. Wise.

120f-121w-122s—Airplane Design. Stress analysis of wings, fuselages, chassis, control surfaces, etc. Specifications. Performance and design calculations. Propellers. 120f, 2 cred.; 121w, 4 cred.; 122s, 3 cred.; prereq., 83, 102, M.&M. 128. Mr. Akerman.

120f	Lect. IV S; 202ME	Lab. VII-IX T; 251ME
121w	Lect. II T; 202ME	Lab. VII-IX WF; 251ME
122s	Lect. IV T; 202ME	Lab. I-III MF; 151ME

123f,w,s-124f,w,s-125f,w,s—Advanced Airplane Design. Problems in airplane design or development. 2 to 5 cred. per qtr.; prereq., 121. Mr. Akerman.

126f,w,s-127f,w,s-128f,w,s—Advanced Problems in Airscrew Design. Graphical and analytical methods of investigation. 2 to 5 cred. per qtr.; prereq., 122. Mr. Akerman.

140f—Aeronautical Laboratory. Study of airplane parts and their construction. Fittings. Rigging. Inspection and accessories. 2 cred.; prereq., 102; VII-IX WF; Ex. Mr. Akerman.

141w—Aerodynamics Laboratory. Measurement of air flow. Calibration of Pitot tubes and anemometers. Distribution of air pressure on surfaces. Wind tun-

nel tests of wings, propellers and airplane models, 2 cred.; prereq., 102; VI-VIII TTh; Ex. Mr. Boehnlein.

155s—Flight Training for Aeronautical Engineers. Dual and solo flying with various types of aircraft under government regulations. Students may qualify for pilot's license. Open only to senior aeronautical engineers and by special permission. 2 cred.; prereq., junior year in residence at University of Minnesota.

156s—Dual Flight Instruction for Aeronautical Engineers under Government Regulations. Open only to senior aeronautical engineers and by special permission. 1 cred.; prereq., junior year in residence at University of Minnesota.

160s—Airships. Theory and design. Rigid and non-rigid types. Stresses. Performance. 3 cred.; prereq., 83, 102, M.&M. 128. Mr. Akerman.

Lect. II TS; 254ME Lab. I-III W; 151ME

170s—Air Transport. Economics. Airports and airways and their equipment. Air commerce rules and regulations. Communication. 2 cred.; prereq., open to sr.; IV MW; 252ME.

190f-191w-192s—Seminar. Readings, reports, conferences, and discussions. 1 cred. per qtr.; prereq., 102. Mr. Akerman.

190f VI T; 202ME 192s I S; 202ME
191w IV T; 154ME

260s—Advanced Airship Stresses. Coplanar and space rigid frameworks. Secondary stresses. Buckling and elastic instability. Framework of dirigibles, gondolas, and cabins. 3 cred.; prereq., 115. Mr. Wise.

272f-273w-274s—Research in Aeronautical Engineering. 2 to 5 cred. per qtr.; grad. Messrs. Akerman, Boehnlein, and Wise.

AGRICULTURAL BIOCHEMISTRY

111f,su-112w,su. Biochemistry. An advanced course dealing with the colloidal state, and the chemistry of proteins, carbohydrates, glucosides, tannins, fats, plant acids, enzymes and pigments, and their physico-chemical relations to vital processes. 3 cred. per qtr.; prereq., org. chem. and one year of zoology. Messrs. Gortner and Sandstrom.

Lect. III MWF; 113 BCh(UF) Rec. VI Th; 113BCh(UF)

113f,su-114w,su-115s. Biochemical Laboratory Methods. A laboratory course paralleling the lectures in 111-112. 2 cred. per qtr.; prereq., quantitative analysis. regis. in 111-112. VI-VIII T; VII-IX Th; 202-208 BCh(UF). Mr. Sandstrom.

AGRICULTURAL ECONOMICS

102f,w—Farm Management: Organization. Business side of farming is emphasized. Special attention is given to farm organization and equipment. 3 cred.; prereq., Ag.Econ. 2. Mr. Garey.

102f Lect. II MW; 302HH(UF)
Lab. (1) VI-VII T; 312HH(UF) (2) II-III F; ar
102w Lect. I MW; 312HH(UF) Lab. VII-VIII Th; 312HH(UF)

103w,s—Farm Management: Operation. Special attention is given to farm operation. 3 cred.; prereq., 102. Mr. Garey.

103w Lect. II MW; 302HH(UF) Lab. VI-VII T; 312HH(UF)
103s Lect. I MW; 312HH(UF) Lab. VII-VIII Th; 312HH(UF)

AGRICULTURAL ENGINEERING

FARM BUILDINGS

5f—Farm Building Construction. Instruction and practice in framing, construction, and painting of farm buildings. 3 cred.; no prereq. Messrs. White and Berggren.

Lect. VII WF; 41En(UF) Lab. VII-IX M; 48En(UF)

7w—Farm Structures I. Arrangement, planning, and designing of farm buildings. Special attention to convenience, economy, and the durability of farmhouses, barns, cribs, granaries, hog houses, etc. 3 cred.; prereq., Dr. 3 or equiv. Mr. White.

Lect. III MW; 305En(UF) Lab. IV W, III-IV F; 305En(UF)

37w—Rural Sanitation. Wells, pumps, and water supply. Methods of securing sanitary water systems for farmsteads and rural institutions. Sanitary sewage disposal methods for homes, creameries, etc. 3 cred.; no prereq.; V MWF; 101En(UF). Mr. Tyler.

67s—Farm Structures II. Planning, estimating, and construction of farm buildings. Study of materials commonly used. 3 cred.; prereq., 7, M.&M. 128; 305En(UF). Mr. White.

111f-112w-113s—Farm Building Problems. Investigations in building materials, methods of construction, cost and efficiency of farm buildings. 3 to 6 cred. per qtr.; prereq., 67; ar.; 305En(UF). Mr. White.

211f-212w-213s—Farm Structure Research. Studies in farm structures as related to other factors in the farm business. 3 to 6 cred. per qtr.; prereq., 111; ar. Mr. White.

FARM MACHINERY

12s—Field Machinery. Construction, operation, adjustment, and use of soil preparation, seeding and harvesting machinery. 3 cred.; no prereq. Mr. Schwantes.

Lect. I MW; 216En(UF) Lab. II-IV T; 49En(UF)

13f—Gas Engines. Theory, operation, care, and repair of gasoline engines. 3 cred.; no prereq.; VI-VIII MW; 216, 37En(UF). Mr. Torrance.

14s—Tractors. Lecture and laboratory course dealing with the construction, operation, care, adjustment, testing, and use of the tractor. 3 cred.; prereq., 13; VI-VIII TTh; 216, 37En(UF). Mr. Torrance.

15f—Ignition and Carburetion. Lecture and shop study of the construction and action of the various forms of ignition and carburetion systems in use on gas engines of all types. 3 cred.; prereq., 13; III MW, III-IV F; 216En(UF). Mr. Torrance.

40f,s—Mechanical Training I. Instruction and laboratory practice in mechanical trades, embracing rope work; belt lacing and pulleys; cement work; soldering; pipe fitting; electric wiring; harness repair, etc. 3 cred.; no prereq. Mr. Dent.

40f I-II MWF; 20, 106En(UF) 40s V-VI TWF; 20, 106En(UF)

70w—Steam Boilers and Engines. Construction, operation, and care of simple steam engines and boilers. 3 cred.; prereq., Phys. 23, 24; II TThS; 216En(UF). Mr. Boss.

71f—Power Machinery. Study of machines requiring mechanical power for their operation such as feed grinders, corn shredders, ensilage cutters, threshers.

3 cred.; prereq., 12, 13; VI WF; 106En(UF), VII-IX W, 49En(UF). Mr. Schwantes.

72w—Applied Electricity. Laboratory work in direct and alternating current machines as used on farms, including generators, motors, storage batteries, transformers, and complete isolated electric and hydroelectric plants. 3 cred.; prereq., Phys. 43, 44; ar.; 101En(UF). Mr. Romness.

121f-122w-123s—Farm Power and Machinery Problems. Special studies of farm machinery and mechanical power for the farm. Tests, design, and adaptability to various farm conditions. 3 to 6 cred. per qtr.; prereq., 126; ar. Mr. Schwantes.

126s—Selection of Farm Equipment. Field laboratory study of types and construction of machinery and equipment suited to the various farm and farm home operations. 3 cred.; prereq., 14, 71, M.E. 27; III MW; 106En(UF), III-IV F; 49En(UF). Mr. Schwantes.

221f-222w-223s—Farm Power and Machinery Research. Studies involving the design or utilization of power machinery used in connection with farm operation. 3 to 6 cred. per qtr.; prereq., 121; ar. Mr. Schwantes.

RECLAMATION

19f—Elementary Surveying. Use of tape, transit, level, and traverse board in agricultural field problems, e.g., mensuration surveys, traverses, differential and profile leveling; plotting and mapping. Care and adjustment of instruments. 3 cred.; prereq., Dr. 3, M.&M. 12. Messrs. Neal and Howe.

Lect. II T; 105En(UF) Lab. VI-VIII TTh; 305En(UF)

20s—Advanced Surveying. Topographic surveys by stadia and other methods, running simple curves, cross sectioning, plotting the survey, profile building, grade determination, and figuring of quantities in earth work. 3 cred.; prereq., 19. Messrs. Neal and Howe.

Lect. VI M; 105En(UF) Lab. VII-IX MF; 305En(UF)

28w—Land Clearing. Land clearing methods, explosives, and machinery. Farm development in cut over timber district. 3 cred.; no prereq.; I TThS, 103En(UF). Mr. Schoenleber.

31f,w,s—Principles of Drainage. Elementary principles and practice of soil erosion control and of drainage in relation to plant growth, crop and land values, and farm operation and development. 3 cred.; no prereq.; III TThS; 105En(UF). Messrs. Roe and Neal.

42w—Principles of Irrigation. Irrigation and the development of arid and semi-arid lands, irrigation practices; duty of water and water rights; correlation of drainage and irrigation. (Offered only in alternate years, 1930-31, etc. Alternates with Soils 8.) 3 cred.; no prereq.; II MWF; 105En(UF). Mr. Roe.

68f—Drainage Engineering and Works. Design, location, and construction of public and private drainage systems and works; construction estimates, drainage engineering, and public records. 3 cred.; prereq., 31, M.&M. 86; I M, II-IV MF; 105En(UF). Mr. Roe.

69s—Irrigation Engineering and Works. Design, location, and construction of irrigation works; reservoir and transmission losses; general irrigation law; irrigation engineering and public records. 3 cred.; prereq., 42, M.&M. 86; I M, II-IV MW; 105En(UF). Mr. Roe.

101f-102w-103s—Advanced Drainage Problems. Special drainage problems including surface run-off, soil permeability, relation of soil type to drainage, shape and regulation of water table in relation to root growth, etc. 3 to 6 cred. per qtr.; prereq., 68; ar.; 105En(UF). Messrs. Roe and Neal.

201f-202w-203s—Reclamation Research. Studies of design and functioning of reclamation work with special reference to soil types and soil water conditions. 3 to 6 cred. per qtr.; prereq., 101 and one qtr. Mathematical Theory of Statistics; ar. Mr. Roe.

GENERAL

150s—Seminar (Ag.E.). Students will give reports of their investigations on certain assigned problems for research. 2 cred.; prereq., required of all sr. Messrs. Roe, Schwantes, and White.

AGRONOMY AND PLANT GENETICS

1f,s—Farm Crops. 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. 3 cred.; no prereq.; III-IV MWF; 2Ad(UF). Mr. Johnson.

ANIMAL HUSBANDRY

15s—Fundamentals of Livestock Production. Basic principles involved in the breeding, feeding, and management of livestock. 3 cred.; jr., sr.; no prereq.; I TThS; 3St(UF). (For professional agricultural engineering students only.) Mr. Peters.

ARCHITECTURE

HISTORY

14f-15w-16s—Architectural History. Technical study of architecture: (f) Ancient Egypt, Assyria, Persia, and especially Greece; (w) Ancient Rome and beginning of the Renaissance in Italy; (s) Renaissance in Italy and Spain. Illustrated lectures and library research. 2 cred. per qtr.; 22, 32; III WF; 305E. Mr. Mann.

17f-18w-19s—Architectural History. Technical study of architecture: (f) The Middle Ages in Italy, France, and England; (w) Developed Gothic architecture and early Renaissance in France and England; sources and affecting influences; (s) Development from the seventeenth century to the present time, particularly in France, England, and America. Lectures and library research. 2 cred. per qtr.; prereq., 15; III TTh; 320E. Mr. Mann.

219f,w,s—Special Researches in Architectural History. 5 cred. or less per qtr.; prereq., completion of undergraduate architectural history; ar. Mr. Mann.

FINE ARTS

20su—Sketching. Sketching out-of-doors in water color and other media. 1 cred.; prereq., 23 or evidence of intermediate ability. Mr. Young.

(1) I-III MW
(2) I-III TTh
(3) III-V MW
(4) III-V TTh

21f,w,su-22w,s,su-23s,su—Freehand Drawing. Freehand perspective; pencil, charcoal, and wash drawings from geometric solids and architectural details. 2 cred. per qtr.; no prereq. Messrs. Young and Doseff.

21f	(1) VII-IX TTh; 417 E (2) II-IV MF; 417E	(3) VI-VIII MW; 417E (4) II-IV TS; 417E
21w	VII-IX T, VI-VIII Th; 417E	
22w	(1) VII-IX T, VI-VIII Th 417E (2) II-IV WF; 417E	(3) VI-VIII MW; 417E
22s	VII-IX WTh; 417E	
23s	(1) VII-IX T, VI-VIII F; 417E (2) II-IV WF; 417E	(3) VI-VIII M, I-III T; 417E

24f,w,su-25f,w,s,su-26f,w,s,su—Freehand Drawing. Drawing in charcoal and water color from still life, figure details, and the antique. 2 cred. per qtr.; prereq., 23. Messrs. Young and Doseff.

24f,w-25f,w-26f,w II-IV TS; 417E 25s-26s II-IV T, I-III S; 417E

27f,w,s,su-28f,w,s,su-29f,w,s,su—Freehand Drawing. Drawing and painting from architectural detail, from the antique, and from life. 2 cred. per qtr.; prereq., 26; I-III MW; 417E. Mr. Burton.

40su—Painting. Still life, head and figure, landscape. 3 or 6 cred.; prereq., evidence of elementary ability; VI-VII MWF; 405E. Mr. Burton.

41su—Sculpture. Modeling in clay. Head, figure, and composition. 3 or 6 cred.; prereq., evidence of elementary ability; I-III MWF; 405E. Mr. Burton.

68s—Time Studies from Life. Drawing from head life and the costumed figure, in any medium. 1 cred.; no prereq. Mr. Burton.

70f,w,s—Pictorial Composition. Study of the arrangement of the pictorial art of all ages. Original compositions in all mediums. 1 cred.; prereq., 26 or equiv.; VI-VIII T; 405E. Mr. Burton.

74f-75w-76s—Freehand Drawing. Similar to Courses 24, 25, and 26. For students in Interior Architecture. 3 cred. per qtr.; prereq., 23; III-IV M, II-IV TS; 417E. Mr. Young.

84f,w,s-85f,w,s-86f,w,s—Modeling. Elementary course in clay modeling. Ornament, heads, and animals from casts and from life. 2 cred. per qtr.; prereq., 23; VI-VIII MW; 405E. Mr. Burton.

87f,w,s-88f,w,s-89f,w,s—Advanced Modeling. 2 cred. per qtr.; prereq., 86; VI-VIII MW; 405E. Mr. Burton.

90f,w,s-91f,w,s-92f,w,s—Illustration. Design of illustration as applied to the printed page. Magazine illustration, posters and books. 1 cred. per qtr.; prereq., 23; VI-VIII T; 405E. Mr. Young.

93f,w,s-94f,w,s-95f,w,s—Hand Print Processes. Making and printing wood engravings, etchings, dry-points, and lithographs. 1 cred. per qtr.; prereq., 23; VI-VIII T; 405E. Messrs. Burton and Young.

121f,w,s,su-122f,w,s,su-123f,w,s,su—Freehand Drawing. Advanced life drawing, painting, or modeling and decoration. 2 cred. per qtr.; prereq., 29; VI-VIII MW; 405E. Mr. Burton.

163s—History of Sculpture and Painting. Study of ancient Renaissance and modern sculpture, and of the Renaissance and modern schools of painting. 2 cred.; prereq., Arch. 16; IV T; 206E; I F; 320E. Mr. Burton.

220f,w,s—Archeology. 3 cred. or less per qtr.; prereq., completion of undergraduate architectural history; hrs. ar. Mr. Arnal. (Not offered in 1931-32.)

221f,w,s,su-222f,w,s-223f,w,s—Life Drawing and Figure Composition. 2 cred. per qtr.; prereq., completion of undergraduate freehand drawing; hrs. ar. Mr. Burton.

287f,w,s-288f,w,s-289f,w,s—Advanced Modeling. Continuation of Arch. 89. 2 cred. per qtr.; prereq., 89; hrs. ar.; 405E. Mr. Burton.

DESIGN

31f,su-32w,su-33f,s,su—Elements of Architecture. Architectural drawing, and wash rendering. Elements of architectural design; walls, doors, windows, colonnades, arcades, moldings, vaults, etc. Relation of building materials to design. 3 cred. per qtr.; no prereq. Mr. Heath.

31f Lect. IV TS; 305E
Lab. (1) II-IV MW; 309E (3) VI VIII Th, I-III S; 309E
(2) VI-VIII MF; 309E

32w Lect. IV TS; 305E
Lab. (1) II-IV MW; 309E (3) VI-VIII Th, I-III S; 309E
(2) VI-VIII; MF; 309E

33f Lect. IV TS; 305E Lab. VII-IX MF; 309E

33s Lect. IV TS; 305E
Lab. (1) II-IV MW; 309E (3) VII-IX Th, I-III S; 309E
(2) VI-VIII MF; 309E

*34f,w,s,su-35f,w,s,su-36f,w,s,su—Architectural Design, Grade I. Long and short problems under individual criticism dealing in general with the elements of plan and elevation. Sketch problems dealing with composition. 4 cred. per qtr.; prereq., 23, 33, 62. Messrs. Beals and Havens.

(Arch.) (f,w) VII-IX MThF, VI-VIII T; 401E
(s) VI-VIII MWThF; 401E

(Arch.E.) (f) II-IV MTS, II-III Th; 401E
(w) II-IV MTS, I II F; 401E
(s) II-III M, II-V T, II-III Th, I-IV S; 401E

*37f,w,s-38f,w,s-39f,w,s—Architectural Design, Grade II. Long and short problems under individual criticism dealing with simple architectural composition. Sketch problems dealing with large composition or decorative detail. 7 cred. per qtr.; prereq., 36. Mr. R. Robertson.

(f) VI-VIII MWF, VI-IX TTh, I-IV S; 302E
(w,s) VI-IX MTTh, VI-VIII WF, II-IV S; 302E

*131f,w,s-132f,w,s-133f,w,s—Architectural Design, Grade III. Long, short, and sketch problems under individual criticism dealing with complex compositions and with subjects involving special character and a decorative and imaginative interest. 10 cred. per qtr. for 131 and 132, 9 cred. for 133: prereq., 39. Mr. R. C. Jones.

131f-132f-133f I-II MWF, VI-IX MTWThF, I-IV S; 317E
131w-132w-133w I-II M, III-IV TF, VI-IX MTWThF, I-IV S; 317E
131s-132s-133s III-IV WF, VI-IX MTWThF, I-IV S; 317E

* Work in all design courses is carried on simultaneously and students pass from one grade to the next in sequence in varying lengths of time according to their accomplishment and irrespective of university time units. The normal time required to complete the design courses is three years; some students require more time and some less. Advancement is based upon design "points" earned. For graduation, in addition to a passing grade in each quarter's work, the student must earn 192 points in Grade I, 336 points in Grade II, and 480 points in Grade III.

239f,w,s—Advanced Architectural Design. 10 cred. or less per qtr.; prereq., completion of undergraduate design; VI-IX MTWThF, I-IV S; 317E. Mr. R. C. Jones.

CONSTRUCTION

44f-45w-46s—Building Construction. General study of the principles, methods, and materials involved in the design of ordinary masonry and frame construction. 2 cred. per qtr.; prereq., 33. Mr. R. T. Jones.

Lect. I MW; 166Ph
Quiz. (1) III M; 320E (3) III Th; 215E(f), 206E(w,s)
(2) II W; 320E

47f-48w-49s—Building Construction (Arch. E.). Detailed study of the principles, methods, and materials involved in the design of all systems of light and heavy construction. 2 cred. for 47-48, 3 cred. for 49; prereq., 35 and 46. Mr. Deneen.

47f VI-VIII TTh; 225E
48w VI-VIII TTh; 225E
49s VI-VIII TW; 225E

51f-52w-53s—Building Construction (Int. Arch.). Non-technical study of the principles, methods, and materials of ordinary construction, particularly as related to domestic architecture and interior finish. 2 cred. per qtr.; prereq., 33; I TTh; 320E. Mr. R. T. Jones.

141f-142w-143s—Building Construction. Advanced study of the technology of building materials, soils, foundations, systems of framing, and fireproof and mill construction. 2 cred. per qtr.; prereq., C.E. 41 or M.&M. 26; II TTh; 106E(f), 215E(w,s). Mr. R. T. Jones.

240f,w,s. Technology of Building Materials. 3 cred. per qtr.; prereq., 49 or 143; hrs. ar. Mr. R. T. Jones.

INTERIOR ARCHITECTURE

81f,w—Stage Design. Making of original models to solve stage problems in design. Form and color. For students interested in dramatics. 2 cred.; no prereq.; VI-VIII TTh; 405E. Mr. Burton.

82w—Advanced Stage Design. Original models and costumes for actual productions. 2 cred.; prereq., 81; VI-VIII TTh; 405E. Mr. Burton.

*134f,w,s-135f,w,s-136f,w,s—Interior Design (Int. Arch.). Problems done under individual criticism dealing with the decorative treatment, furniture, and accessories of interiors. 7 cred. per qtr.; prereq., 36; VI-VIII WF, VI-IX MTTh, I-III S; 317E. Mr. R. C. Jones.

161f—Decoration and Applied Arts. Historical and technical study of decoration, furniture, etc., together with discussion of the use of color. 2 cred.; prereq., 16, 26; IV TF; 320E. Miss Carter.

* Work in all design courses is carried on simultaneously and students pass from one grade to the next in sequence in varying lengths of time according to their accomplishment and irrespective of university time units. The normal time required to complete the design courses is three years; some students require more time and some less. Advancement is based upon design "points" earned. For graduation, in addition to a passing grade in each quarter's work, the student must earn 192 points in Grade I, 336 points in Grade II, and 480 points in Grade III.

180su. Architecture and Decoration. History and appreciation of interior architecture, furniture, and decoration. Illustrated lectures and research. 2 cred.; no prereq.; IV TWF. Mr. Mann.

182f-183w-184s—Furniture and Decoration (Int. Arch.). Historical and technical study of ornament, decoration, furniture, textiles, etc. Discussion of the use of color in decoration. 3 cred. per qtr.: prereq., 16, 23; II TThF; 320E. Miss Carter.

243f,w,s—Advanced Interior Decoration Design. 10 cred. or less per qtr.; prereq., 136; hrs. ar. Mr. Arnal. (Not offered in 1931-32.)

LANDSCAPE ARCHITECTURE

160f—History of Landscape Architecture. Study of landscape architecture in Italy, France, England, and America. 2 cred.; prereq., 16. Mr. Mann.

162w—Landscape Design. Theory and practice. Lecture and design problems. 2 cred.; prereq., 39; IV MW; 320E. Mr. Nichols.

164s—Landscape Design. Particular attention to the relation of buildings to their sites and surroundings. 2 cred.; prereq., 162. Mr. Mann.

RELATED SUBJECTS

151f—Architectural Seminar. Literature of architecture, special topics, papers, and discussions. 1 cred.; prereq., sr. standing; IV M; 320E. Mr. Mann.

152w—Estimating. Principles of the quantity survey; cost analysis. 1 cred.; prereq., sr. standing; I Th; 215E. Mr. Sault.

153s—Business Relations. Relations of the architect, owner, and builder; professional ethics and practice; office administration. 2 cred.; prereq., sr. standing; II WF; 205E. Mr. Mann.

ART EDUCATION

20f-21w-22s—Principles of Harmony in Form and Color. Color theories of Munsell, Wilson, Sargent, and others discussed and exemplified, with analysis of color harmonies and original work therein. Applications of color harmonies in design with reference to execution in handicraft and by commercial processes. 3 cred. per qtr.; prereq., 9 cred. in design or by permission; I-II MWF; 207J. Mr. Hilpert.

ASTRONOMY

51w—General Astronomy. A survey course covering the fundamental facts and principles of astronomy. 3 cred.; prereq., M.&M.12; IV MWF; 133Ph. Mr. Luyten.

140f—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. 4 cred.; prereq., 11 or 51 and M.&M.12; II MTWF; Ph. Mr. Luyten.

BACTERIOLOGY AND IMMUNOLOGY

41f,w.s,su—General Bacteriology. The principles and technique of general bacteriology; studies in the morphologic and biologic characters of the common bacteria; culture media; principles of sterilization and disinfection; examination of air, water, milk, food; relation of bacteriology to the industries. Lectures and laboratory. 5 cred.; prereq., Zool. 16 or 9 cred. of botany, and Inorg. Chem. 10; VII-IX MWF. Mr. Halvorson and Mrs. Green.

121w—Industrial Bacteriology. A study of the bacteriology of water, milk, canned fruits, vegetables, and meat products. Lectures and laboratory. 3 cred.; prereq., Bact. 41; I-II TTh. Mr. Halvorson.

122s—Industrial Bacteriology (continued). The bacteriology of fermentation industries, manufacture of alcohol, butyl alcohol, acetone, lactic and acetic acids; bacteriology of tanning, flax retting. sugar industries. 3 cred.; prereq., Bact. 41; I-II TTh. Mr. Halvorson.

BOTANY

1f,w,s—General Botany. Structure, physiology, life histories, and evolution of plants. Lectures and quizzes. 4 cred.; no prereq. Mr. Huff.

1f Lect. Bot. Aud. (1) III TThS (2) VI T, VI-VII Th
Quiz Bot. Aud. (1) III M (4) V T
(2) II T (5) VI M
(3) III W (6) VII T

1w,s Lect. III TThS, Bot. Aud.
Quiz Bot. Aud. (1) I T (3) III W
(2) II T

7f,s—Taxonomy of Flowering Plants. A general study of the classification and relationship of flowering plants. 3 cred.; prereq., 1. Mr. Rosendahl.

7f I-II MWF; 1, 4, 5, 8 Bot.
7s (1) I-II MWF; 1, 4, 5, 8 Bot. (2) VI-VIII TTh; 1, 4, 5, 8 Bot.

21f,w,s—Elementary Ecology. An introductory course in the study of plants in relation to their environment. 3 cred.; prereq., 1. Mr. Cooper.

21f III-IV MWF; 1, 4, 5, 8 Bot.
21w,s VI-VIII TTh; 1, 4, 5, 8 Bot.

INORGANIC CHEMISTRY

1f,su-2w-3s—General Inorganic Chemistry. 1. Study of general laws of chemistry and of the non-metals and their compounds. 2. Continuation of Course 1. 3. Metals and their compounds. Continuation of Course 2. 4 cred. per qtr.; no prereq. Messrs. Glockler and Pervier.

(1) (Pre-med., pre-dent.)
Lect. VI MWF; 225C Lab. (1) VII-IX T; 290C
Quiz (1) VI T; ar C (2) VII-IX Th; 290C
(2) VI Th; ar C (Pre-dent)
(2) (Agr., jr. arch. engr.) fall, winter
Lect. VII MWF; 225C Lab. VIII-IX MW; 210C
(2) (Agr., jr. arch. engr.) spring
Lect. VII MF, IV S; 225C Lab. VIII-IX MF; 210C

4f,su-5w,su—General Inorganic Chemistry. Study of the general laws of chemistry and of the non-metals and their compounds. More intensive than

Course 1f-2w-3s. 4 cred. per qtr.; prereq., high school chemistry. Messrs. Stephens, Heisig, and Maynard.

4f (Engrs.)
Lect. (1) VIII M, I ThS; 100C — Lab. (1) V-VII W; 110C
(2) IV T; 225C; VI Th, IV S; 100C — (2) II-IV M; 110C
(3) IV T; 225C; VI Th, IV S; 100C — (3) V-VII M; 110C
(4) VIII M, I ThS; 100C — (4) II-IV W; 110C
Quiz (1) and (4) VII T; 100C
(2) and (3) IX Th; 100C
(Pre-med., pre-dent)
Lect. (5) VI MWF; 100C — Lab. (1) VII-IX T; 210C
Quiz (1) VI T; ar C or — (2) VII-IX Th; 210C
(2) VII Th; ar C

5w (Engrs.)
Lect. (1) I TThS; 100C — Lab. (1) II-IV T; 110C
(2) IV T; 225C; VI Th, IV S; 100C — (2) II-IV M; 110C
(3) I TThS; 100C — (3) I-III W; 110C
Quiz VIII M; 100C
(Pre-med., pre-dent.)
Lect. (4) VI MWF; 100C — Lab. (1) VII-IX T; 210C
Quiz (1) VI T; ar C — (2) VII-IX Th; 210C
(2) VI Th; ar C

6f,su-7w-8s—General Inorganic Chemistry. 6. Includes a study of general laws of chemistry and of non-metals and their compounds. 7. Continuation of Course 6. 8. Study of metals and their compounds. 5 cred. per qtr.; no prereq. Miss Cohen.

Lect. II MWF; 225C — Lab. I-III ThS; 210C

9f,w,su-10w,s,su—General Inorganic Chemistry. Course 9. A study of general laws of chemistry and of non-metals and their compounds. More intensive than Courses 6 and 7. Course 10. The metals and their compounds. 5 cred. per qtr.; prereq., one year of high school chemistry. Messrs. Sneed and Reyerson, Miss Cohen, and Mr. Maynard.

9f-10w Lect. (1) (Agr.) VII MWF; 100C — Lab. (1) VIII-IX MWF; 110C
(2) (Chem., S. L. A) II MWF; 100C — (2) I-III ThS; 290C

9w-10s Lect. (1) III MWF; 225C. (2) III MWF; 100C
Lab. VI-VII MWF; 210C, 290C

11f,s,su—Qualitative Chemical Analysis. Laboratory work in systematic qualitative analysis with lectures on solutions, ionization, chemical and physical equilibria, oxidation and reduction, etc. 4 cred.; prereq., 3 or 5. Miss Cohen, Mr. Stephens.

11f Lect. IV MWF; 225C — Lab. VI-IX F; 210C
11s Lect. VI MWF; 100C — Lab. (1) VI-IX T; 210C
(2) VI-IX Th; 210C

*12f,s,su-13f,w—Qualitative Chemical Analysis. Laboratory work in systematic qualitative analysis with lectures on solutions, ionization, chemical and physical equilibria, oxidation and reduction, etc. 5 cred. per qtr.; prereq., 8 or 10. Messrs. Sneed, Heisig, and Maynard.

12f Lect. I TThS; 225C — Lab. I-III MW; 290C
12s Lect. II MWF; 100C — Lab. I-III ThS; 290C
13f Lect. VI WF; 490C — Lab. VII-IX WF, VI-VIII M; 290C
13w Lect. VI WF; 410C — Lab. VII-IX MWF; 290C

* Course 12f may be taken by students registered in the College of Engineering and Architecture in place of 16s.

14f,su-15w—General Inorganic Chemistry. (Engrs., miners, pharm., and phys. ed.) 14. Includes a study of the general laws of chemistry and of the non-metals, the metals, and their compounds. 15. Continuation of Course 14. 5 cred. per qtr.; no prereq. Messrs. Reyerson and Barber.

(Engrs.)
Lect. II TThS; 100C
14f Lab. (1) VII-IX TTh; 110C
(2) II-IV MW; 110C
15w Lab. (1) VII-IX T, VI-VIII Th; 110C
(2) I-III MW; 110C
Quiz VIII F; 100C
(Miners)
Lect. II TThS; 100C Lab. VII-IX TTh; 110C
(Pharm., phys. ed.)
Lect. I MWF; 225C Lab. VI-VIII TTh; 290C

16s—Qualitative Chemical Analysis. (Engrs., miners, and pharm.) Laboratory work in systematic qualitative analysis with lectures on solutions, ionization, chemical and physical equilibria, oxidation and reduction, and other subjects pertinent to qualitative analysis. 5 cred.; prereq., 5 or 15. Messrs. Barber, Heisig, and Maynard.

(Engrs. who entered with h.s. chem.)
Lect. (1) I TThS; 100C Lab. (1) VI-VIII M, II-IV T; 110C
(2) IV T; 225C; VI Th, IV S; 100C (2) I-III M, VI-VIII F: 110C
(3) I TThS; 100C (3) I-III WF; 110C
(Engrs. who entered without h.s. chem.)
Lect. (4) II TThS; 100C Lab. (4) I-III WF; 110C
(5) II TThS; 100C (5) VII-IX TTh; 110C
(Miners)
Lect. II TThS; 100C Lab. VII-IX TTh; 110C
(Pharm.)
Lect. I MWF; 225C Lab. VI-VIII TTh; 290C

17s,su—Glassblowing. Exercises in the more important operations in building chemical apparatus. 1 cred.; no prereq. Mr. Stephens.

51f,w,s,su—Junior Review Examination in General Inorganic Chemistry. Required of juniors in the School of Chemistry. Prereq., Anal. Chem. 1, 2. Mr. Sneed.

52f,w,s,su—Junior Review Examination in Qualitative Analysis. Required of juniors in the School of Chemistry. Prereq., Anal. Chem. 1, 2. Mr. Sneed.

96f-97w-98s—Senior Thesis. 5 cred. per qtr.; sr.

101s—History of Chemistry. 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. 2 cred.; prereq., Org. Chem. 52. Miss Cohen.

102w,su—Advanced Qualitative Analysis. This course includes an analysis of minerals, alloys, paints, and the methods of detecting some of the rarer elements. 2 or 3 cred.; prereq., Anal. Chem. 1, 2; hrs. ar.; 290C. Mr. Sneed.

103f-104w-105s—Advanced Inorganic Chemistry. Discussion of the periodic system and the chemistry of the elements and their compounds and of special subjects of inorganic chemistry such as valency, oxidation and reduction, complex ions, etc. 3 cred. per qtr.; prereq., Anal. Chem. 1, 2; Org. Chem. 52; I MWF; 215C. Mr. Sneed.

106f-107w-108s—Chemistry of the Rare Elements. History, occurrence, preparation, and properties of the less usual elements and their compounds. Use of the microscope and the spectroscope in following the course of the purification. 3 cred. per qtr.; prereq., Anal. Chem. 1 or 2, or by permission. Mr. Glockler.

134f-135w-136s—Seminar: Modern Problems in Inorganic Chemistry. 1 cred.; prereq., Anal. Chem. 1 and 2 and Phys. Chem. 103. Mr. Sneed.

301f,su-302w-303s—Research in Inorganic Chemistry. Cred. ar. Messrs. Sneed, Reyerson, and Glockler.

ANALYTICAL CHEMISTRY

1w,su-2s,su—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 1, Gravimetric Analysis. Course 2, Volumetric Analysis. 5 cred. per qtr.; prereq., Inorg. Chem. 13. Mr. Geiger.

Lect.	VI M; 325C	Quiz VI W; 490C
Rec.	(1) VII W; 111C	(2) VI F; 111C
Lab.	(1) VII-IX M, VIII-IX W, VI-IX F; 310C	(2) VII-IX MWF; 310C

7f,s,su—Quantitative Analysis. (Pre-med.) Introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems are assigned and attention is given to proper laboratory practice. 4 cred.; prereq., Inorg. Chem. 11 or 13. Messrs. Geiger and Sarver.

7f	Lect.	(1, 2) VI M; 325C	(3) VII T; 325C
	Rec.	(1) VI W; 315C (Limit 35) (2) VI F; 315C (Limit 35)	(3) VI Th; 325C
	Lab.	(1) VII-IX MW, VI-VII F; 310C (2) VII-IX MF, VI-VII W; 310C	(3) VIII-IX T, VII-IX Th, I-III or II-IV S; 310C
7s	Lect.	VI Th; 325C	
	Rec.	VII Th; 325C	
	Lab.	VII-IX T, VIII-IX Th, I-III or II-IV S; 310C	

9w—Quantitative Analysis. (Dentists, engineers, miners.) Short introductory course covering general principles of quantitative analysis, both gravimetric and volumetric. Typical problems are assigned and attention given to proper laboratory practice. 3 cred.; prereq., Inorg. Chem. 11 or 16. Mr. Sarver.

Lect. VI Th; 325C Lab. VII-IX T, VI-IX Th; 310C

53f,w,s,su—Junior Review Examination in Quantitative Analysis. Required of juniors in the School of Chemistry. Prereq., 1, 2. Mr. Geiger.

96f,su-97w-98s—Senior Thesis. 5 cred. per qtr.; sr. Messrs. Kolthoff, Geiger, and Sarver.

101w-102s—Quantitative Analysis. Discussion of the general principles, methods, and procedure of quantitative analysis, both gravimetric and volumetric. Typical problems are assigned and attention is given to proper laboratory practice. 5 cred. per qtr.; prereq., Inorg. Chem. 13. VI-IX MWF; 325, 310C. Mr. Geiger.

123f,su-124w,su-125s—Advanced Analytical Chemistry. Systematic survey by general lectures with typical procedures selected for laboratory practice. Drill

in application of modern chemical theory to analytical problems. 1 lect., 7 lab. hrs. per week; 3 cred.; prereq., 1, 2, or 7. Mr. Sarver.

Lect. VI T; 315C Lab. VII-IX T, VI-IX Th; 310C

131f—Applications of Indicators in Neutralization Reactions and p_h Determinations. 3 cred.; prereq., 1, 2 and Phys. Chem. 103. II MW; 215C. Lab. hrs. ar. Mr. Kolthoff.

132w-133s—Electrometric Measurements and Titrations. Application of potentiometric and conductometric methods in analytical work. 3 cred.; prereq., 1, 2 and Phys. Chem. 103. Mr. Kolthoff.

Lect. II MW; (w) 315C, (s) 215C Lab. ar.

134f-135w-136s—Seminar: Modern Problems in Analytical Chemistry. 1 cred.; prereq., 1, 2 and Phys. Chem. 103. Mr. Kolthoff.

201f-202w-203s—Selected Topics in Analytical Chemistry. 3 cred.; prereq., 1, 2 and 123. Mr. Kolthoff.

301f,su-302w-303s—Research in Quantitative Analysis. Cred. ar. Messrs. Kolthoff, Geiger, and Sarver.

ORGANIC CHEMISTRY

1f,w,su-2w,s,su—Elementary Organic Chemistry. (Pre-med., pre-dent., pharm.) Discussion of the important classes of organic compounds, both aliphatic and aromatic. Laboratory work includes the preparation of typical substances. 4 cred. per qtr.; prereq., Inorg. Chem. 11. Messrs. Smith and Sprung.

1f-2w Lect. I MWF; 100C
Lab. Conference II Th; 225C
Quiz I Th; ar
Lab. (1) I-IV T; 390C (3) VI-IX W; 390C
(2) VI-IX T; 390C

1w-2s Lect. IV MWF; 100C
Lab. Conference IV T; 100C
Quiz V T; ar
Lab. (1) VI-IX W; 390C (Limit 40) (3) I-IV S; 390C
(2) VI-IX Th; 390C (Limit 40)

51f-52w-53s—Organic Chemistry. Introduction to the chemistry of carbon compounds. Laboratory work will include the preparation of characteristic substances. 5 cred. per qtr.; prereq., 15 cred. in chemistry. Messrs. Hunter and Sprung.

Lect. III MWF; 325C
Rec. (f,w,s) III S; 111C
(s) IV T; 111C

51f Lab. (1) II-IV T, I-III Th; 390C (3) II-IV T, VI-VIII F; 390C
(2) VI-VIII TTh; 390C

52w Lab. (1) II-IV T, I-III Th; 390C (3) VI-VIII M, I-III Th; 390C
(2) VII-IX T, VI-VIII Th; 390C

53s Lab. (1) II-IV T, VI-VIII F (2) VI-VIII TTh

96f-97w-98s—Senior Thesis. 5 cred. per qtr.; sr.

101f-102w-103s—Advanced Organic Chemistry. An introduction to the literature of organic chemistry. Structure, reaction, mechanism, and relation of physical properties to constitution. May be accompanied by appropriate laboratory work in Organic Chemistry 137, 139. 3 cred. per qtr.; prereq., 53; III TThS; 325C. Mr. Hunter.

111f—Reagents in Organic Chemistry. 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 Organic Chemistry 137. 3 cred.; prereq., 53; II MWF; 315C. Mr. Smith.

113s—The Aliphatic Compounds. Advanced descriptive course, with special emphasis upon the compounds having more than one functional group. May be accompanied by appropriate laboratory work in Organic Chemistry 139. 3 cred.; prereq., 53. II MWF; 315C. Mr. Smith.

115s—The Heterocyclic Compounds. A discussion of the nomenclature, preparation, properties, and uses of the typical heterocyclic systems. May be accompanied by appropriate laboratory work in 139. 3 cred.; prereq., 53. (Not offered in 1931-32.)

116f—The Cycloparaffins and Their Derivatives. A study of the chemistry of the cycloparaffins and their oxygen derivatives, together with their unsaturated analogs. In the terpene series, attention is also given to related open chain compounds and to the polyterpenes, particularly rubber. 3 cred.; prereq., 53. Mr. Stephens.

122s—The Aromatic Compounds. Chemistry of the aromatic compounds with special reference to dye intermediates and synthetic drugs. 3 cred.; prereq., 53; III MWF; 315C. Mr. Lauer. (Not offered in 1931-32.)

123s—Dyes. Study of the important classes of dyes from the viewpoint of the organic chemist. 3 cred.; prereq., 53; II TThS; 111C. Mr. Lauer. (Not offered in 1931-32.)

137f—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. 2 to 5 cred.; prereq., 53. Mr. Lauer. (Not offered in 1931-32.)

139f,w,s—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. Students may also register for this course who desire appropriate laboratory work for other advanced courses. 2 to 5 cred.; prereq., 53. Mr. Hunter.

201f-202w-203s—Organic Chemistry Seminar. 1 hr. per week. 1 cred. Open only to students taking research in organic chemistry. Mr. Hunter.

301f-302w-303s—Research in Organic Chemistry. Cred. ar. Messrs. Hunter, Smith, Sprung, and Stephens.

PHYSICAL CHEMISTRY

96f-97w-98s—Senior Thesis. 5 cred. per qtr.; ar.

101f-102w-103s—Physical Chemistry. A general survey of the subject. 3 lect. and 1 rec.; lab. work 3 to 6 hrs. per week; 3, 4, or 5 cred., depending on the amount of lab. work; prereq., two years' college chemistry, one year college physics. Messrs. MacDougall and Livingston.

Lect. IV MWF; 325C
Rec. (1) (Chem.) IV S; 111C (2) (others) IV S; 325C
Lab. (1) (Chem.) VI-VIII MW; 190C (2) (others) VI-VIII F; 190C

105w—Application of Higher Mathematics to Chemical Problems. 3 lect.; 3 cred.; prereq., integral calculus and permission of the instructor. Mr. MacDougall.

110f—Physical Chemistry. (Designed chiefly for medical and biological students.) 3 cred. per qtr.; prereq., Org. Chem. 2. VI TTh, 225C, VI F; 325C. Mr. Taylor.

116f-117w-118s—Advanced Physical Chemistry. 3 lect. and 1 rec.; lab. work for one 3-hour period may be taken if desired; 3 cred. per qtr. or 4 with lab.; prereq., 103 and calculus. Mr. Taylor.

129s—Principles of Colloidal Chemistry. 2 cred.; prereq., 101. (Not offered in 1931-32.)

130s—Application of Colloidal Chemistry. 2 cred.; prereq., 101. Mr. Reyerson.

131f-132w-133s—Colloidal Chemistry Laboratory. Cred. and hrs. ar. Must be preceded or accompanied by 129 or 130. Mr. Reyerson.

144s—Magnetochemistry. Course in atomic structure dealing specially with the magnetic properties of substances. Lectures, discussions, and reports. 3 cred.; prereq., 103. Mr. Taylor.

161f-162w—Radioactivity. Discovery; theory of atomic disintegration; properties, transformations, and preparation of radioactive elements; properties and effects of alpha, beta, and gamma rays; radioactive and non-radioactive isotopes. 2 cred. per qtr.; prereq., 103. Mr. Lind.

161f IV T, I Th; 115C
162w Ar; C

164f,w,s—Radioactivity Laboratory. Use and standardization of electroscopes, radioactive measurements, and quantitative determination of radium in ores, minerals, waters, and plant products. 1 or 2 cred. Must be preceded or accompanied by 161. Mr. Lind.

175s—Photochemistry. History, development, and present status of photochemistry. 3 cred.; prereq., optics and 103. Mr. Lind.

201f-202w-203s—Thermodynamics and Chemistry. A detailed study of the principles of thermodynamics and their application to physical and chemical phenomena. 4 cred. per qtr.; prereq., 103 and calculus. II TThS; 115C. Mr. MacDougall.

204f-205w-206s—Kinetic Theory and Atomistics. Kinetic theory of gases and liquids, crystal structure, structure of atom, quantum theory. 4 cred. per qtr.; prereq., 103 and calculus. (Not offered in 1931-32.)

211f-212w-213s—Advanced Physical Chemistry Laboratory. To accompany or follow any of the advanced courses in physical chemistry. Cred. ar.; prereq., 103. Mr. MacDougall.

251f-252w-253s—Physical Chemistry Seminar. 1 hr. a week. For students taking advanced courses in physical chemistry. 1 cred. per qtr. Mr. MacDougall.

271f-272w-273s—Chemical Activation. (Seminar 1 hour per week for graduate students.) Current theories of chemical activation, including photochemical excitation, gaseous ionization, and the kinetics of cluster and of chain reactions. 1 cred. per qtr.; prereq., physics and physical chemistry. Mr. Lind.

301f,su-302w-303s—Research in Physical Chemistry, including work in electrochemistry, photo- and radio-chemistry, and colloids. Cred. ar. Messrs. Lind, MacDougall, Reyerson, Glockler, and Taylor.

TECHNOLOGICAL CHEMISTRY

1f,w,s,su—Power Plant Chemistry. (M.E.) Proximate analysis of coal, determination of calorific power; technical analysis of flue gases and furnace gases. 3 cred.; prereq., Inorg. Chem. 16. Mr. Stoppel.

1f Lect. II T; 215C
Rec. II Th; 215C
Lab. (1) I-III MF; 10C (2) I-III W, II-IV S; 10C

1w Lect. III T; 215C
Rec. III Th; 215C
Lab. II-IV MF; 10C

1s Lect. I M; 115C
Rec. I F; 115C
Lab. II-IV MF; 10C

2w,s—Boiler Water. (Engineers and miners.) 2 or 3 cred.; prereq., 1 or Anal. Chem. 9 or by permission. Mr. Harding.

2w Lect. I T; 215C
Lab. VI-IX TTh; 10C

2s Lect. IV M; 215C
Lab. ar

96f-97w-98s—Senior Thesis. Open to seniors. 5 cred. per qtr.

100f-101w-102s—Food Analysis. Course including the chemical analysis of the various food materials and food products and the detection of food adulterations. Course in methods of analysis. 3 cred. per qtr.; prereq., Anal. Chem. 1, 2. Mr. Stoppel.

Lect. IV T; 215C Lab. VI-VIII TF; 217C

103w—Exact Gas Analysis. 1 or 2 cred.; prereq., Anal. Chem. 1, 2. Mr. Harding.

104s—Microchemistry. Precipitation, examination, and identification of minute quantities of substances and the examination of food materials, fibers, etc., by means of the microscope. 1 or 2 cred.; prereq., Anal. Chem. 1, 2. Mr. Harding.

105f,su—Gas and Fuel Analysis. The chemical analysis of solid gaseous fuels with a determination of their calorific value and methods of testing municipal gas. 3 cred.; prereq., Anal. Chem. 1, 2. Mr. Harding.

Lect. II S; 225C
Rec. (1) IV S; 215C (2) VI W; 215C
Lab. (1) II-IV T, I-III Th; 10C (2) VII-IX W, VI-VIII F; 10C

106w—Petroleum and Petroleum Products. Examination and testing of petroleum products, principally gasoline, illuminating and lubricating oils. 3 cred.; prereq., Anal. Chem. 1, 2. Mr. Harding.

Lect. II S; 225C
Rec. (1) IV S; 215C (2) II W; 215C
Lab. (1) II-IV T, I-III Th; 10C (2) VI-VIII MW; 10C

107f,w,s,su—General Technical Analysis. Includes any one or several of such topics as textiles and paper, paint and varnishes, asphalt and tars, boiler waters, soaps, edible oils and fats, and various other food materials and food products depending on the number of credits.

110s—Special Analytical Apparatus. Problems in the use of refractometers, saccharimeters, and calorimeters. 3 cred.; prereq., Anal. Chem. 1, 2. Mr. Stoppel.

Lect. III Th; 215C Lab. VI-VIII M, W; 10C

130f—Chemistry of Foods. Course in the origin, composition, and manufacture of foods. Systems of food inspection, legal food standards, and adulteration. Lectures and recitations. 3 cred.; jr., sr.; ar. Mr. Stoppel.

140w—Sanitary Chemistry. Discussion of the chemistry of sewage and potable waters. Purification of water supplies, and the treatment of municipal and industrial wastes. May be accompanied by appropriate laboratory work in Tech. Chem. 107-108-109. Lectures and recitations. 3 cred.; jr., sr.; ar. prereq., Bact. 41 or by permission. Mr. Stoppel.

160s—Paints, Oils, Varnishes, Lacquers, and Enamels. Their technical chemistry, properties, and composition. May be accompanied by appropriate laboratory work in Tech. Chem. 107-108-109. Lectures and recitations. 3 cred.; jr., sr.; ar. Mr. Stoppel.

301f,su-302w-303s—Research Work in Technological Chemistry. Cred. ar. Mr. Harding.

CHEMICAL ENGINEERING

31s—Chemistry of Engineering Materials. Application of general chemistry to engineering practice. Consideration of the chemistry and properties of wood, iron and steel, alloys, fuels, water, cements, paints, bitumens, etc. Lectures and recitations. 3 cred.; prereq., Inorg. Chem. 16. For engineers. IV MWF; 115C. Mr. Montonna.

41s—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. Open to sophomores in the College of Engineering and Architecture who have completed one year of chemistry. Lectures and recitations. 3 cred. Mr. Montillon.

76f-77w—Applied Electrochemistry. Application of the electric current to chemical processes. Laws and phenomena of electrochemistry, batteries, electroplating, electric furnace construction and operation, and electrochemical products. Open to engineers. Class and laboratory work. 3 cred. Mr. Ruth.

80s—Chemical Engineering Materials. The technology, physical and chemical properties. and economic considerations of materials used in the construction of chemical engineering equipment and plants. Ferrous and non-ferrous metals and alloys, woods, brick, concrete and ceramic materials, textiles, rubber, protective materials, etc. 1 cred.; prereq., Inorg. Chem. 13; II TS; 325C. Mr. Mann.

96f-97w-98s—Senior Thesis. 5 cred. per qtr.; sr.

101f,su—Unit Processes. Principles and materials of construction, operation, and uses of machinery for the unit processes. Lectures and recitations. Visits to chemical plants. 3 cred.; prereq., Anal. Chem. 1, 2, Chem. Eng. 80. I MTWFS; 325C. Mr. Mann.

102s,su—Unit Process Problems. Problems in combustion, furnaces, and kilns, the application of industrial heating and cooling devices, the study of crystallization on a commercial scale. 3 cred.; prereq., 101. Messrs. Montillon and Ruth.

(1) II MWF; 325C (2) II MWF; 410C

103f—Unit Process Problems. Problems in heat transfer, the use and design of heat exchangers, single and multiple effect evaporators, the applications of the

laws of fluid flow, filtration, filter presses, and centrifugals. 3 cred.; prereq., 101. Messrs. Montillon and Ruth.

(1) II MWF; 325C (2) II MWF; 410C

104w—Unit Process Problems. Problems in leaching and dissolving, countercurrent extraction, gas absorption, and distillation. Drying by air, steam, and direct heat dryers. 3 cred.; prereq., 101. Messrs. Montillon and Ruth.

(1) II MWF; 325C (2) II MWF; 410C

111f-112w-113s—Design of Chemical Engineering Equipment and Plants. Laying out of plants and design of equipment based on collected data for the same. Classroom and laboratory work. 2 cred. per qtr.; prereq., Chem. Eng. 104. Mr. Montillon.

117s—Chemical Engineering Equipment Design. Fundamental principles in the design of simple chemical engineering equipment. Laboratory work. 3 cred.; prereq., Chem. E. 104. Messrs. Montonna and Ruth.

Lect. IV T; 410C

Lab. (1) VI-IX TTh; 410C (2) Arranged

121w—Chemical Engineering Economics. The economic and business considerations controlling chemical engineering industries. Statistical analysis of the characteristics of these industries. Raw and finished products. Principles of plant location, layout, and design. Unit operation costs. Principles of management operation and control. Lectures and recitations. 3 cred.; prereq., Chem. Eng. 132; III MWF; 111C. Mr. Montonna.

131w—Industrial Inorganic Chemistry. Operations common to chemical industries, chemistry involved, apparatus used, marketing of products, utilization of by-products, use of trade journals. Topics: acids and alkalies, salts, chlorine, ammonia, glass, pigments, etc. Lectures and recitations. 4 cred.; prereq. I MTWFS; 325C. Mr. Mann.

132s—Industrial Organic Chemistry. Similar to 131 but covering organic field. Destructive distillation of coal and wood, petroleum oils, paper, unit organic processes, vegetable and animal oils, fats, waxes, soap, sugar, starch, etc. Lectures and recitations. 4 cred.; prereq., 101; I MTWThF; 325C. Mr. Mann.

133f—Chemistry of Explosives. History and development of modern explosives, their manufacture and uses. Lectures, required reading, and reports. 3 cred.; prereq., 132; I MWF; 115C. Mr. Montonna.

134f—Intermediates and Dyestuffs. Their technical chemistry and manufacture. Processes, purification, uses, etc. Lectures and recitations. 3 cred.; prereq., 132 or equiv. (may be accompanied by laboratory work in 160); I TThS; 111C. Mr. Montonna.

136w—Chemistry and Technology of Cellulose. Discussions on processes and industries based on the use of cellulosic materials including the chemical and technological considerations. Pulp and paper, plastics, esters, artificial silks, etc. Lectures and recitations. 3 cred.; prereq., Org. Chem. 52 or equiv.; I TThS; 111C. Mr. Montonna.

141s—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. Open to chemists and chemical engineers. 3 cred.; prereq., Org. Chem. 52. Mr. Montillon.

150s—Unit Process Laboratory. Operation and testing of chemical engineering equipment. Laboratory work and reports. 1 cred.; prereq., Chem. Eng. 101. Mr. Ruth.

Lab. (1) VI-VIII M; 90C (3) I-III S; 90C
(2) VI-VIII W; 90C (4) Arranged

151f,su—Chemical Manufacture (Inorganic). Manufacture of technical products on a scale large enough to afford data for the determination of costs of manufacture. Use of semiplant scale equipment. Technical trade journals used. Laboratory. 3 or more cred.; prereq., 101. Mr. Montonna.

152w,su—Chemical Manufacture (Organic). Similar to 151 but covering the organic field. Laboratory. 3 or more cred.; prereq., 101. Mr. Montonna.

153f-154w-155s-156su—Special Laboratory Problems. Laboratory investigations on equipment and the manufacture of special chemical products on a large scale. 3 or more cred.; prereq., 151, 152. Messrs. Mann, Montillon, and Montonna.

160f—Intermediates and Dyestuffs Laboratory. Manufacture of intermediates and dyestuffs on a large scale using semi-works equipment. Operations on sulphonation, hydroxylation, nitration, reduction, alkylation, diazotization, coupling, etc. Laboratory. 3 or more cred.; prereq., 132 or ar. Mr. Montonna.

176f-177w—Applied Electrochemistry. Application of the electric current to chemical processes. Laws and phenomena of electrochemistry, batteries, electroplating, electric furnace construction and operation, and electrochemical products. Class and laboratory work. 4 cred. per qtr.; prereq., Phys. Chem. 103. Mr. Montillon.

Lect. I MWF; 111C Lab. VI-VIII W or Th; 25C

179s—Advanced Applied Electrochemistry. More recent development in the manufacture of inorganic and organic products. Lectures and recitations. Laboratory optional. 3 cred.; prereq., 176-177; III MWF; 115C. Mr. Mann.

187s—Inspection Trip. Various industrial plants in the middle west are visited by the class on a trip which lasts about ten days, during the spring vacation period. Written reports covering the plants must be submitted. Required of seniors in Chemical Engineering. 2 cred.; prereq., 131, 132. Mr. Mann.

201f-202w-203s—Seminar. Presentation and discussion of papers concerning the newer developments in chemical industries. 1 cred. per qtr. Mr. Mann.

301f,su-302w-303s—Research in Chemical Engineering. Unit processes, applied electrochemistry and electric furnace work, and chemical manufacture. Cred. ar. Messrs. Mann, Montillon, and Montonna.

CIVIL ENGINEERING

SURVEYING

9f—Surveying. Principles of transit and stadia surveying and leveling; field problems, computation and platting of traverses, adjustment of instruments. Open to students in Geology. 3 cred.; prereq., Math. 6; VI-IX WF; 101E. Mr. Cutler.

10s—Surveying. Triangulation, stadia and plane table surveys, computation and platting of topographic surveys. Open to students in Geology. 3 cred.; prereq., 9; VI-IX WF; 7E. Mr. Zelner.

11f—Surveying. Field problems; use of chain, compass, transit. Computation and platting of field surveys. Determination of areas. 3 cred.; prereq., M.&M. 12, Dr. 2 or Arch. 23. Mr. Boon.

Lect. III Th; 21E
Lab. (1) II-IV T, VI-IX Th; 1E (3) VI-VIII W, VI-IX F; 1E
(2) VI-IX T, II-IV S; 1E

12w—Surveying. Lectures and drawing room. Platting of maps, profiles, and cross sections. Computation of earthwork. Public land surveys. Conventional signs. 3 cred.; prereq., 11. Messrs. Cutler, Zelner, and Boon.

Lect. (1) III Th; 104E (2) III W; 21E
Lab. (1) II-IV T, VII-VIII T, VI-VII F; 217E (3) VI-IX W, VI-VIII Th; 217E
(2) VII-IX M, III-IV W, VIII-IX F; 217E

13s—Surveying. Adjustments of instruments, profile and differential leveling, transit surveys, circular curves. 3 cred.; prereq., 12. Messrs. Cutler and Boon.

Lect. III Th; 21E
Lab. (1) II T, S; 21E; III-V T, III-IV S; Field
(2) VII W, I S; 5E; VIII-IX W, II-IV S; Field
(3) VI WTh; 21E; VII-IX W, VII-VIII Th; Field

14f—Surveying. Complete topographical survey, stadia method, is made and platted. 3 cred.; prereq., 13. Mr. Zelner.

(1) VI-IX TW; 229E (3) VI-IX M, I-IV T; 225E
(2) VI-IX F, I-IV S; 217E

15w—Surveying. Purpose and theory of triangulation, meridian determination, base line measurements, computations. Theory and use of the sextant. Hydrographic surveying. Aerial mapping. Applied problems. 2 cred.; prereq., 14. Mr. Zelner.

(1) VI T, III ThFS; 21E (2) VI M, II TThF; 21E

16s—Surveying. Classroom and field. Field problems with the sextant. Triangulation reading and computations. Plane table theory. Various field solutions of the "three point" problem. Plane table survey based on triangulation control. Topographic map. 2 cred.; prereq., 15. Mr. Zelner.

(1) III-IV T, VI M; 21E; VII-IX M; Field (2) I-II F; 21E; I S; 7E; II-IV S; Field

17s—Surveying. (Aero. E.) Short course in the use, care, and adjustment of surveying instruments, including leveling, transit and topographic surveys. 3 cred.; prereq., M.&M. 12, Dr. 2. Mr. Boon.

Lect. I S; 21E
Lab. (1) II T; 22E; I W; 21E; III-IV T; II-IV W; Field
(2) I M; 21E; II F; 7E; II-IV M, III-IV F; Field

18s—Surveying. Short course in the use, care, and adjustment of surveying instruments. Leveling and transit surveys. Open to junior and senior engineers. 3 cred.; VI-IX TTh; 7E. Messrs. Cutler and Zelner.

19f,s—Surveying. (M.E.) Short course including problems in chaining, transit and tape surveys; differential, trigonometric and profile leveling, computations and platting of notes, etc. 3 cred.; prereq., M.&M. 12. Messrs. Cutler and Boon.

19f Lect. (1) I Th; 21E (2) I F; 21E
Lab. (1) I-III M, I-IV W; 229E (2) VI-IX M, VI-VIII Th; 229E
19s Lect. I F; 22E Lab. VI MT; 22E; VII-IX M, VII-VIII T; Field

23su—Summer Camp. Six weeks immediately preceding the beginning of the senior year. Extended railroad, topographic, hydrographic, and triangulation surveys. 9 cred.; prereq., 16, 22. Fee, $25. Messrs. Cutler, Zelner, and Boon.

RAILWAY ENGINEERING

21w—Railway Engineering. General survey of the problems of railway location, including grades, curvature, rise and fall, etc. 2 cred.; prereq., 14. Mr. Boon.

Lect. I Th; 205E
Lab. (1) VI-IX F; 229E (3) I-IV S; 229E
(2) I-IV T; 229E

22s—Railway Engineering. Study of the construction and maintenance of railway track and structures. Simple, compound, and spiral curves, and turnouts. 2 cred.; prereq., 21. Messrs. Cutler and Boon.

Lect. VI W; 22E
Lab. (1) VI-IX F; 229E (2) VI-IX M; 229E

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. 3 cred.; prereq., 23. Mr. Cutler.

Lect. III F; 21E
Lab. (1) II-IV TW; 227E (2) VI-VIII T, I-III Th; 217E

122w—Railway Engineering. Lectures, office work, and field inspection. Design and operation of various types of yards and terminals, and terminal facilities, including the hump, engine house, coal and water station. Signalling and interlocking. 3 cred.; prereq., 23. Mr. Cutler.

123s—Railway Engineering. Design and construction of railroad buildings and structures; culverts, wooden trestles, switches, cross-overs, crossing frogs, etc. Earthwork computation, estimates and reports. Distribution of material by mass diagram. 3 cred.; prereq., 23. Mr. Cutler.

124w—Transportation. Development of railway and inland waterway transport, railway regulation and control with special reference to the 1920 Railway Transportation Act, geographical, financial, and rate grouping of railways, Interstate Commerce Commission method of accounting, cost and value of service, present systems, and organization. 3 cred.; prereq., 121; IV MW, II S; 22E. Mr. Cutler.

125s—Transportation. Specific illustrative problems: Twin City and Mississippi Valley traffic situation, Mississippi River experiment, New York Barge Canal, Great Lakes traffic, Panama Canal status. 3 cred.; prereq., 121. Mr. Cutler.

221f-222w-223s—Railway Administration. Analysis of railway organization and methods of management and operation. Special problems. 3 cred. per qtr.; prereq., 122. Mr. Cutler.

224f—Railway Terminals and Yards. Continuation of Course 123. 3 cred.; prereq., 122. Mr. Cutler.

STRUCTURAL ENGINEERING

31f—Stresses in Structures. Algebraic and graphic analysis of various types of bridge trusses for fixed and moving loads. 2 cred.; prereq., M.&M. 26. Mr. Parcel.

Lect. II Th; 21E
Lab. (1) VIII-IX Th; 201E (2) VIII-IX F; 229E

32w—Stresses in Structures. Analysis of simple span bridge trusses. Standard engine loadings and equivalent uniform loads. Laboratory tests of structural members. 3 cred.; prereq., 31, M.&M. 141. Messrs. Parcel and C. A. Hughes.

Lect. II W: 21E
Lab. (1) II-III M; 101E; I S; 215Ex; II S: Ex
(2) II-III M; 101E; VII Th; 110Ex; VIII Th; Ex

33s—Elementary Structural Design. Designing principles and methods. Complete design and detail drawing of framed mill building bent and railway plate girders. Laboratory tests of structural members and connections. 4 cred.; prereq., 32, M.&M. 128, Dr. 23. Mr. Parcel.

Lect. VI Th; 22E
Lab. (1) VIII-IX WTh; 201E; III M; 110Ex; IV M; Ex
(2) VIII-IX WTh; 201E; VI F; 110Ex; VII F; Ex

35w—Analysis of Buildings. (Arch. E.) Loads on buildings: dead load, live loads and their influence on design. Building code requirements. Loads on footings and foundation. Wind loads on structures. Laboratory tests of structural members, frames and connections. 3 cred.; prereq., 31, M.&M. 141. Mr. Parcel.

Lect. II F; 206E Lab. II-III M; 101E; I-II S; Ex

36s—Design of Steel Frame Buildings. Beams and girders, columns and built-up sections. Design of a typical steel building frame. Laboratory tests of structural members and connections. 4 cred.; prereq., 35. Mr. Parcel.

Lect. I W; 22E Lab. VII-IX Th; 217E; III-IV M; Ex

37s—Structural Engineering. (M.E., E.E.) Analysis of stresses in simple structural frames. Roof trusses, crane girders, mill building bent. 3 cred.; prereq., M.&M. 26 or 84. Mr. Wise.

Lect. VI Th; 107E Lab. VI-IX T, VII-IX Th; 229E

38f—Stresses in Structures. (Arch.) Application of laws of equilibrium to simple structures. Special emphasis is placed on graphic methods. 3 cred.; prereq., M.&M. 93; I TThF; 215E. Mr. C. A. Hughes.

39w—Structural Design. (Arch.) General principles of structural design. Girders, columns, and roof trusses. 3 cred.; prereq., 38; I TThS; 203E. Mr. C. A. Hughes.

41s—Reinforced Concrete. (Arch.) Brief course in theory and designing methods with special reference to building. 3 cred.; prereq., M.&M. 93; I TThS; 215E. Mr. C. A. Hughes.

42s—Structural Engineering. (Ag. E.) Analysis of stresses in simple structures. Design of timber and of structural steel members and connections. Design of wood and steel roof trusses. 3 cred.; prereq., M.&M. 85. Mr. Wise.

Lect. IV TS; 7E Lab. VI-IX T; 217E

131w,su—Bridge Analysis. Stresses in Simple span bridges of the larger type and in cantilevers, arches, and continuous bridges. 3 cred.; prereq., 134; VII M; 205E; VI-VII F; 227E. Mr. Parcel.

132s,su—Bridge Design. Design and detail drawing of railway pin connected truss span. 3 cred.; prereq., 131; VI T; 215E; III-IV, VI-IX M; 227E. Mr. Parcel.

134f,su—Statically Indeterminate Structures. Theory of deflections and statically indeterminate stresses and their application to continuous girder, frames, swinging bridges, and redundant members. 3 cred.; prereq., 33, M.&M. 128. Mr. Parcel.

Lect. VI TF; 205E Lab. I-II S; 227E

135s,su—Reinforced Concrete Design. Analysis of structures as rigid frames. Application to reinforced concrete buildings. Effect of temperature and shrinkage. Effect of settlement of foundations. 4 cred.; prereq., 142 or 142a; II-III M, VI-IX F; 217E. Mr. Wise.

141f,su—Reinforced Concrete. Principles of reinforced concrete. Theory of beams, slabs, and columns and the application to ordinary structures. 3 cred.; prereq., M.&M. 128. VI-VII M; 227E; VI Th; 106E. Mr. Wise.

141(a)f,su—Reinforced Concrete. Similar to 141 with problems of special interest to students in architectural engineering. 3 cred.; prereq., M.&M. 128; VI-VII M, 229E; VI Th; 106E. Mr. Wise.

142w,su—Reinforced Concrete Design. Continuation of 141 with especial emphasis on the practical features of the design of buildings, bridges, retaining walls, etc. 3 cred.; prereq., 141; VI M; 4E; VI-VII T; 227E. Mr. Wise.

142(a)w,su—Reinforced Concrete Design. Similar to 142 with problems of special interest to students in architectural engineering. 3 cred.; prereq., 141(a); VI M; 4E; VI-VII T; 229E. Mr. Wise.

143s—Reinforced Concrete Analysis. Advanced problems in design including reinforced concrete arch. 3 cred.; prereq., 134, 142. Mr. Wise.

144f—Reinforced Concrete. (For students other than civil engineers.) Design of reinforced concrete beams, girders, and columns. Design of footings and foundations. Design of retaining walls. Form work. Mixing and placing concrete. Testing and inspection of concrete work. 3 cred.; prereq., M.&M. 84 and 128, or M.&M. 127 and 128; IV MW; 107E; VIII-IX Th; 101E. Mr. Wise.

146f,w,s—Plain Concrete. Theory of design and control of concrete mixtures. Practice in control tests of concrete and concrete materials. Lectures and laboratory work. 3 cred.; prereq., M.&M. 141. Mr. C. A. Hughes.

146f	Lect III MTh; 209Ex	Lab. VI-IX W; Ex
146w	Lect. II T, III S; 209Ex	Lab. VI-IX W; Ex
146s	Lect. III WTh; 209Ex	Lab. VI-IX Th; Ex

147w—Foundations. Design and construction of footings, cofferdams, and caissons for bridges and buildings. Piers and abutments. Underpinnings of buildings. Exploration and testing of foundation sites. Excavation and removal of materials from foundation site. 2 cred.; prereq., 33, M.&M. 128; VII T, III S; 206E. Mr. Wise.

148f-149w-150s—Advanced Concrete. Short research problems in concrete. 2 cred. per qtr.; prereq., 146; ar. Mr. C. A. Hughes.

234f-235w-236s—Advanced Theory of Structures. Application of the theory of indeterminate stresses to the more complex problems in structural analysis.

Continuous and swing bridges, simple and multiple arch and suspension systems, wind stresses in tall building frames, secondary stresses. 3 to 5 cred. per qtr.; prereq., 132, 142. Messrs. Parcel and Wise.

237w-238s—Structural Laboratory. Experimental problems in structural steel. Strain gauge study of actual stress distribution in beams, columns, and riveted joints. 3 to 5 cred. per qtr.; prereq., 133. Mr. C. A. Hughes.

245f-246w-247s—Seminar. Special topics in the higher Theory of Structures. 3 to 6 cred. per qtr.; prereq., 134, 142. Messrs. Parcel and Wise.

HIGHWAY ENGINEERING

51f—Highways and Pavements. Elementary course with field inspection, relating to the economies, location, construction, and maintenance of highways and pavements. 3 cred.; prereq., 12. Mr. Lang.

Lect. (1) VI M, VII Th; 215Ex (3) VII W, VI Th; 215Ex
(2) VI TW; 215Ex
Lab. (1) VII-IX M; 215Ex (3) VII-IX Th; 215Ex
(2) VII-IX T; 215Ex

52w—Highways and Pavements. Continuation of Course 51, with laboratory practice. 3 cred.; prereq., 51. Mr. Lang.

Lect. VI Th; 110Ex
Lab. (1) VI-IX M, VIII-IX W; 215Ex (3) VI-IX T, VI-VII W; 215Ex
(2) VII-VIII Th, VI-IX F; 215Ex

156w—Highway Transport. Development, economic field, relation to other forms of transportation. Highway transport surveys, economics of location, economics of selection of the type of surface, effect of vehicle on road and road on vehicle. 3 cred.; prereq., 52. Mr. Lang.

157s—Highway Transport. Motor vehicle as a common carrier, analysis of road legislation, taxation. Principles of successful operation. Selling motor transportation. 3 cred.; prereq., 156. Mr. Lang.

251s—Highway Laboratory. Investigations in co-operation with State Highway Department. 3 to 5 cred.; prereq., 52. Mr. Lang.

252s—Highway Design. Preparing of a plan and specification for short sections of highways and city streets, also making estimates of materials and cost. 3 cred.; prereq., 52. Mr. Lang.

HYDRAULIC ENGINEERING

161f—Hydrology. Rainfall, evaporation, transpiration, percolation, run-off. Flood and low water of streams. Storage for use in water supply, water power, irrigation and navigation. Mass curves and frequency curves. 3 cred.; open to sr. only. Mr. Bass.

Lect. II MF; 136E
Lab. (1) VII-IX T; 227E (2) VII-IX Th; 227E

164f,w,s—Water Power. Types of low, medium, and high-head developments. Details of developments. Dams. Turbine settings and characteristics. 3 cred.; prereq., M.&M. 129. Mr. Bass.

164f	Lect. I T; 136E	Lab. III-IV M, VI-IX W; 227E
164w	Lect. II M; 21E	Lab. VI-IX Th, II-III W; 229E
164s	Lect. II M; 107E	Lab. III-IV W, VI-IX F; 227E

263s—Hydraulic Engineering Problems. Special hydraulic problems in laboratory, drafting room, and field. 3 to 5 cred.; prereq., 164.

MUNICIPAL AND SANITARY ENGINEERING

162f,w—Water Supply and Sewerage. Sources of water supply; quality of water. Methods of testing, collection, distribution, and purification of water. Selection of pumping machinery and motive power. Sewer systems and sewage disposal works. 3 cred.; prereq., M.&M. 129. Mr. Bass.

162f Lect. III M; 107E Lab. VIII-IX M, II-III W, VI-VII F; 217E
162w Lect. III W; 5E Lab. II-III M, VIII-IX T, VI-VII Th; 229E

163w,s—Water Supply and Sewerage. 3 cred.; prereq., 162. Mr. Bass.

163w Lect. I WF; 206E Lab. II-III Th, II-IV F; 217E
163s Lect. II TTh; 104E Lab. III-IV F, II-IV S; 227E

171w—Building Sanitation. Location and orientation of buildings; lighting, ventilation, water supply, plumbing, sewage, and refuse disposal. 2 cred.; prereq., sr. arch. only. II WF; 5E. Messrs. Bass and Martenis.

261f-262w—Water and Sewage Purification. Design of water purification and sewage disposal works. 3 to 5 cred. per qtr.; prereq., 163. Mr. Bass.

GENERAL

53s—Civil Engineering Practice. Greater problems of engineering. Interrelations of various branches of engineering in practice. Legal, financial, and business functions of the engineer. Relations of the engineer to government and public affairs. 3 cred.; open to juniors and seniors. Mr. Bass.

(1) I TTh, VII W; 21E (2) I M; 22E; TTh; 21E

172s—City Planning. Physical elements of the city; topography, drainage, geology. Public works and structures. Internal and external transportation. Zoning. Subsurface structures. Esthetic features of the city. 3 to 5 cred.; prereq., 52; III MWF; 21E. Messrs. Bass and Mann.

280f-281w-282s—Civil Engineering Research. Original work in concrete, structural steel, hydraulics, municipal or transportation problems. Investigations, reports, tests, designs. 5 cred. per qtr.; by permission. Messrs. Bass. Cutler, Lang, and Parcel.

DAIRY HUSBANDRY

7f,s—Elements of Dairying. Composition of milk. Causes of variation in composition; milk constituents and their uses in dairy manufacture and as food; Babcock test; sanitary handling of milk and cream on the farm; cream separating and farm buttermaking. 3 cred.; no prereq.; III TWS; 100HH(UF). Mr. Combs.

DRAWING AND DESCRIPTIVE GEOMETRY

1f,w,s,su—Engineering Drawing. Elements of drafting including an introductory course in methods of representation, and constructive geometry. Graphs and formulas. Sketching, lettering, working drawings, conventions, standards, tracing, and blueprinting. 3 cred.; prereq., solid geometry. Messrs. Schuck, Archibald, Potter, Williams, Cruzen, and Quaid.

1f (1) I-II MWF, IV M; 455C
(2) VIII-IX M, VII T, III-IV W, I-II S; 455C
(3) III M, VIII-IX T, I-II Th, III-IV F; 455C
(4) VIII-IX WTh, IV T, III-IV S; 455C
(5) VI-VII MWF, III Th; 455C

1w (1) I-II MWF, VIII Th; 455C
(2) I-II TS, VII T, II-III Th; 455C
(3) VIII-IX MWF, I Th; 455C
(4) III-IV T, VIII-IX T, VI-VII Th, IV S; 455C
(5) VI-VII MWF, III S; 455C

1s VIII-IX MThF, VIII W; 101E

2w,s,su—Engineering Drawing. 3 cred.; prereq., 1. Messrs. Schuck, Archibald, Potter, Williams, Cruzen, and Shultz.

2w (1) I-II MWF, VIII Th; 417C
(2) I-II TS, VII T, II-III Th; 417C
(3) VIII-IX MWF, I Th; 417C
(4) III-IV TS, VIII-IX T, VI-VII Th, IV S; 417C
(5) VI-VII MWF, III S; 417C

2s (1) I-II MW, III-IV F, IV M; 455C
(2) VII Th, I-II ThFS; 455C
(3) VIII-IX MF, I-II T, IX T; 455C
(4) III-IV TS, VI Th, VIII-IX W; 455C
(5) VI-VII MWF, III Th; 455C

3f,w,s,su—Descriptive Geometry. Elementary course in the methods of representation, correlated in part with analytical geometry. Graphical and algebraic solutions. Lectures, demonstrations, and drafting. 3 cred.; prereq., 2, M.&M 11 and 12. Messrs. Eggers, Levens, Williams and Shultz.

3f (1) III MWF; 5E
(2) IV TS, VI Th; 203E
(3) VII MWF; 215E

3w VII MWF; 107E

3s (1) I-II MW, III-IV F, IV M; 417C
(2) VII Th, I-II ThFS; 417C
(3) VIII-IX MF, I-II T, IX T; 417C
(4) III-IV TS, VI Th, VIII-IX W; 417C
(5) VI-VII MWF, III Th; 417C

4f,su-5w,su-6s,su*—Engineering Drawing and Descriptive Geometry. (Chem. and chem. engr.) 2 cred. per qtr.; prereq., solid geometry. Messrs. Williams, Schuck, and Cruzen.

4f II-III T, VI-VII Th, VIII-IX F; 443C
5w III-IV MWF; 443C
6s VII-VIII T, III-IV W, VIII-IX Th; 445C

7w,su-8s,su—Engineering Drawing and Descriptive Geometry. (Chem. and chem. engr.) 3 cred. per qtr.; prereq., solid geometry. Messrs. Eggers and Schuck.

7w III-IV MWF, VIII-IX Th; 455C
8s III-IV MW, VII-VIII T, VIII-IX Th; 455C

9f,w,s—Drafting. (Chem. engr.) 2 to 6 cred.; prereq., 6 or 8. Mr. French.

11f—Engineering Drawing (Mines). 4 cred.; no prereq.; III-IV MTWFS; 101E. Messrs. Potter and Archibald.

12w—Engineering Drawing (Mines). 2 cred.; prereq., 11; III-IV WF; 445C. Messrs. Potter and Archibald.

13s—Engineering Drawing (Mines). 3 cred.; prereq., 12; III-IV TWFS; 443C. Messrs. Potter and Myers.

14f—Descriptive Geometry (Mines). Not an engineering elective. 3 cred.; prereq., 13, Mine Math. 5; I MWF; 7E. Messrs. Eggers and Myers.

* For permissible substitute, see page 57.

15w—Drafting (Mines). 2 cred.; prereq., 14; III-IV WF; 101E. Messrs. Potter and Archibald.

21f,w,s,su—Drafting (C.E.). The application of descriptive geometry to drafting room problems including working drawings. 2 cred.; prereq., 3. Messrs. French, Archibald, Levens, and Myers.

21f (1) III-IV MWF; 201E (2) VI-VII MTTh; 101E
21w III-IV MFS; 201E
21s VI-VII M, I-II TS; 1E

22w,s,su—Drafting (C.E.). Detail, assembly, and construction drawings of steel members and simple structures. Standards, conventions, and graphical methods. 2 cred.; prereq., 21. Messrs. French, Archibald, Levens, and Myers.

22w (1) III-IV MFS; 1E (2) VI-VII MTF; 1E
22s III-IV MWF; 101E

23s,su—Drafting (C.E.). Drafting problems in general construction work including earth work, wood, steel, and concrete. 2 cred.; soph. C.E.; prereq., 22. Mr. French.

23s (1) III-IV MWF; 201E (2) VI-VII M, I-II TS; 101E

26w,s,su*—Drafting (E.E.). Applications of descriptive geometry to drafting room problems. Working drawings and tracing. 2 cred.; prereq., 3. Messrs. Eggers, Cruzen, and Quaid.

26w (1) VIII-IX MWF; 101E (2) VIII-IX TTh, III-IV S; 101E
26s VIII-IX MThF; 101E

27s,su—Drafting (E.E.). Application of elementary formulas in the proportioning of simple machine parts. Detail and assembly drawings, electrical conventions, circuit diagrams, the development of simple formulas, and graphical methods. 2 cred.; prereq., 26. Messrs. Eggers, Schuck, and Shultz.

(1) VI-VII TTh, VIII-IX F; 201E (2) I-II TThS; 201E

28f,w,s,su*—Drafting (Aero.E.). Application of descriptive geometry to drafting room problems. Working drawings and tracing. 2 cred.; prereq., 3. Messrs. Shultz, Potter, and Williams.

28f (1) III-IV TS, II-III Th; 201E (2) VI-VII TWF; 201E
28w VIII-IX MWF; 1E
28s VI-VII TTh, III-IV S; 201E

29w,s,su—Drafting (Aero.E.). Application of elementary formulas in the proportioning of simple machine parts. Detail and assembly drawings. Machine and structural drafting and graphical methods. 2 cred.; prereq., 28. Messrs. Shultz, Potter, and Williams.

29w (1) VIII-IX MWF; 201E (2) III-IV W, VI-VII TTh; 201E
29s VIII-IX MWF; 1E

34f,w,s—Lettering. Study and analysis of single stroke lettering with particular emphasis on the application to engineering drawing. 1 cred.; prereq., 1. Messrs. Levens, Archibald, and Quaid.

(1) IV T; 107E (2) II Th; 7E(f,w); 21E(s)

37f,w,s—Lettering for Engineers. Analysis of the alphabets. Exercises in roman and gothic lettering. Design and composition of the paragraph and the title. 2 cred.; prereq., 2. Messrs. Archibald and Schuck.

37f,w I WF; 238EE
37s I WF; 36EE

41f,w.s-42f,w,s-43f,w,s—Technical Drawing. (a) General course in the theory and practice of drawing. Sketching, lettering. tracing, conventions, render-

* For permissible substitute, see page 57.

ings, and mechanical drawings. (b) Modification of the above course of particular interest to dental and medical students. 2 cred. per qtr.; no prereq. Mr. Kirchner.

(1) I-II MWF; 411C (3) VIII-IX MWF; 411C
(2) III-IV MWF; 411C

44f,w,s—Lettering. Practical course in plain lettering. Not an engineering elective. 1 cred.; no prereq. Messrs. Levens, Archibald, and Schuck.

(1) IV T; 104E(f), 5E(w), 203E(s) (2) II Th; 104E(f), 5E(w), 206E(s)

45f,w,s—Alphabets. Construction and analysis of various types of letters and their arrangement. Exercises, and reference work. Not an engineering elective. 2 cred. per qtr.; soph., jr., sr.; no prereq.; II TTh; 205E. Mr. Kirchner.

50w,s—Diagrams and Charts. Elementary course dealing with the construction of simple diagrams and charts. 2 cred.; no prereq.; I TTh; 22E. Messrs. Eggers and Cruzen.

51w,s—Graphs and Charts. General course in graphical methods of representation and computation, including a study of scales and the construction of various types of charts and diagrams. 3 cred.; prereq., 1, M.&M. 12. Messrs. Eggers, Schuck, and Cruzen.

51w III MWF; 104E
51s (1) III MWF; 203E (2) I MWF; 203E

57f-58w-59s—Graphical Methods. Theory and construction of graphic charts and diagrams. Course can be entered at any quarter. 2 cred. per qtr.; prereq., soph. draw., M.&M. 26. Messrs. Kirchner, Eggers, and Levens.

57f I MW; 206E
58w-59s I MF; 5E

61f,w—Projections. Elementary principles of descriptive geometry and their application to architectural problems of projections and intersections. 2 cred.; no prereq. Messrs. Kirchner and Myers.

61f Lect. III Th; 335EE
Lab. (1) VI-VIII W; 225E (3) VI-VIII F; 225E
(2) II-IV W; 225E (4) II-IV M; 225E
61w* Lect. III T; 104E Lab. I-III S; 225E

62w—Shades and Shadows. Geometrical determination of shades and shadows on architectural forms. 2 cred.; prereq., 61 or registration in 61. Messrs. Kirchner and Myers.

Lect. III Th; 335EE
Lab. (1) VI-VIII W; 225E (3) VI-VIII F; 225E
(2) II-IV M; 217E

63s—Perspective. Principles and methods of perspective as applied to architectural drawing. 2 cred.; prereq., 61. Messrs. Kirchner and Myers.

Lect. III Th; 335EE
Lab. (1) VI-VIII M; 225E (3) VI-VIII F; 225E
(2) VI-VIII Th; 217E (4) I-III S; 225E

64f—The Graphic Arts. Introduction. Field, development, and application in art and industry. Elementary principles of design. Discussion of materials, style, and technique. Exercises including the construction of simple graphs. 2 cred.; jr., sr. in the School of Business Administration; prereq., 15 cred. in econ.; IV MW; 5E. Mr. Kirchner.

65w—The Graphic Arts. Layouts. Printing art, its history and development. Analysis of the standard type faces. Study of specimens of fine printing. Exercises: simple layouts, including lettering associated with type. Open

* Must register also in Draw. 62.

to students in the School of Business Administration. 2 cred.; prereq., 15 cred. in econ.; IV MW; 5E. Mr. Kirchner.

66s—The Graphic Arts. Processes. Design and composition including the use of illustrations in black and white, line, and color. Discussion of the various processes of printing, lithography, and engraving. Exercises in planning for text and display work. Open to students in the School of Business Administration. 2 cred.; prereq., 15 cred. in econ.; IV MW; 5E. Mr. Kirchner.

69f,w,s,su—Exercises in Lettering. (Nurses.) See School of Nursing bulletin. 1 cred. per qtr. Messrs. Myers, Archibald, French, Potter, and Williams.

71f,w,s—Graphics for Electrical Engineers. Representation and computation of complex quantities, rotating vectors, hyperbolic functions, and their application to direct and alternating current circuits. 3 cred.; prereq., 27, E.E. 111. Mr. Eggers.

71f,w I MWF; 139EE
71s I MWF; 209Ex

81f,w,s—Advanced Drawing. 3 cred. per qtr.; prereq., 43 or equivalent. Messrs. Kirchner and Brainard.

86f,w,s—Anatomical Drawing. 3 cred. per qtr.; prereq., 43 or equivalent. Messrs. Kirchner and Brainard.

111f,w,s-112f,w,s-113f,w,s—Advanced Descriptive Geometry. Methods of representation; parallel and central projection. Curves and surfaces, geometrography, axonometry, and photogrammetry. 3 cred. per qtr.; prereq., 3, calculus. Messrs. Kirchner, Eggers, and Levens.

114f,w,s—Perspective. Principles and practice of perspective, including shadows, reflections, distortions, corrections, systems, methods, the practical problem, and inverse construction. 3 cred.; prereq., 63. Mr. Kirchner.

215f-216w-217s—Geometry. Pure and applied. Transformations, perspective, kinematics, stereotomy, graphic statics, graphic calculus, nomography. 3 cred. per qtr.; prereq., calculus. Mr. Kirchner.

218f,w,s-219w-220s—Nomography. Technique and theory of computing charts. Equations of three and more variables. Determination of constants of empirical equations. 3 cred. per qtr.; prereq., 3, M.&M. 128. Messrs. Kirchner, Eggers, and Levens.

ECONOMICS

3w,s—The Mechanism of Exchange. Elementary course in money and banking. Study of financial institutions and their relations as parts of the financial structure. Relation of financial organization to the economic organization. 5 cred.; no prereq. Mr. Stehman.

3w Lect. III TTh; 150Ph
Rec. (1) I TThS
(2) II MWF
(3) III MWF
(4) IV MWF
(5) V MWF; 202B
(6) VI MWF
(7) VII MWF; 301B

3s Lect. III TTh; BuAud
Rec. (1) I MWF; 303B
(2) I TThS; 301B
(3) II MWF; 202B
(4) II TThS
(5) III MWF; 209B
(6) IV MWF
(7) IV MWF
(8) V MWF; 202B
(9) V MWF; 6B
(10) VI MWF
(11) VI MWF
(12) VII MWF; 202B
(13) VII MWF; 6B
(14) VIII MWF; 202B

8f-9w—General Economics. (Eng., Arch., Chem.) 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. 3 cred. per qtr.; no prereq. Messrs. Filipetti and Westbrook.

(1) I MWF; 106E(f), 135E(w)
(2) II MWF; 107E
(3) III MWF; 135E
(4) IV MWF; 135E

14f,w,s—Elements of Statistics. Elementary concepts in statistical method; averages, ratios, errors, sampling, index numbers, graphic representation, collection of material. 5 cred.; prereq., 8, 9. Mr. Mudgett.

14f	(1) I MWThFS	(3) IV MTWFS; 301B
	(2) III MWThFS	(4) VI MTWThF; 202B
14w	(1) III MTWFS	(3) VI MTWThF; 102B
	(2) IV MTWFS	(4) VII MTWThF; 303B
14s	(1) I MWThFS	(4) III MTWFS
	(2) II MWThFS; 202B	(5) IV MTWFS; 102B
	(3) III MTWFS	(6) VI MTWThF

20f,w,s—Elements of Accounting. Fundamental principles underlying bookkeeping and accounting. Sufficient practice in technical processes will be given to serve as a background for more advanced work. Preparation and analysis of statements. Open only to Engineering Pre-Business students. Other engineering students register in 29. 3 cred.; no prereq. Mr. Heilman.

20f	(1) I MWF; 303B	(6) III TThS; 301B
	(2) I TThS; 302B	(7) IV MWF; 302B
	(3) II MWF; 302B	(8) V MWF; 302B
	(4) II TThS; 202B	(9) VI MWF; 303B
	(5) III TThS; 302B	
20w	(1) I TThS; 303B	(3) III MWF; 302B
	(2) III TThS; 302B	(4) VI MWF; 6B
20s	(1) I MWF; 301B	(3) III TThS; 301B
	(2) II MWF; 301B	(4) VI MWF; 302B

25w,s-26f,s—Principles of Accounting. Course following Econ. 20 presenting the principles underlying the accounting statements, the accounts, principles of valuation, depreciation, preparation and analysis of statements. 4 cred. per qtr.; prereq., 20. Mr. Heilman.

25w-26s	(1) I MWF; 302B	(5) III MWF; 303B
	(2) I TThS; 302B	(6) IV MWF; 301B
	(3) II MWF; 302B	(7) VI MWF; 301B
	(4) II TThS; 301B	
25s	(1) II MWF; 303B	(2) III TThS; 303B
26f	II TThS; 302B	

28f,s—Business Law. Business law arranged for engineers, including the law of contracts, suretyship, agency, partnership, corporations, negotiable instruments, conveyance patents, and riparian rights. 3 cred., soph., jr., sr. with 6 cred. in econ. or sr. without econ. cred.; I MWF; 135E. Mr. Palmer.

29f,s—Principles of Accounting. (Eng., Arch., Chem.) Purpose and principles of account classification; capital and revenue; accruals; valuation; depreciation; preparation and interpretation of balance sheets, income accounts, and other statements. 3 hrs. of lect. a week. 3 cred.; no prereq. Mr. Heilman.

29f I MWF; 5E
29s I MWF; 107E

149f,w,s—Business Cycles. Analysis of factors involved in business fluctuations. Comparison of theories of the cause of prosperity and depression. Introduction to the statistical data and methods of business forecasting. 3 cred.; sr., grad.; prereq., 3 and 8, 9. Messrs. Marget and Myers.

149f I TThS; 202B
149w (1) I MWF; 209B (2) VII MWF; 102B
149s III MWF; 102B

161f,w,s—Labor Problems and Trade Unionism. Discussion of employment; hours; wages; extent and strongholds of unionism; open and closed shops; collective bargaining; industrial unrest; government regulation of labor disputes. 3 cred.; prereq., 8, 9. Mr. Hansen.

161f IV MWF; 202B
161w III TThS; 209B
161s III TThS; 102B

BUSINESS ADMINISTRATION

51f,s-52w-53s—Business Law.* 51. Contracts. 52. Agency, Negotiable Instruments. 53. Partnership, Corporation. 3 cred. per qtr.; jr., sr.; prereq., for 51, 8 and 9, for 52 and 53, 51. Messrs. Young and Dalzell.

51f,52w,53s Lect. IV TS; 150J
Rec. (1) I M; ar (5) V M; ar
(2) II M; ar (6) I T; ar
(3) III M; ar (7) II T; ar
(4) IV M; ar (8) III T; ar
51s V MWF; 209B

58f,w,s§—Elements of Public Finance. Public expenditures, revenues, and debts. Special attention is given to tax principles, practices, and burdens. This is a condensed course given especially for business administration students. 3 cred.; jr., sr.; prereq., 8, 9; IV MWF; 209B. Mr. Blakey.

71f,w,s†—Traffic Management. Survey of the rail, water, and highway transportation facilities, services, rates, and laws in their relation to business establishments; the executive's organization and management problems in handling freight, express, and mail shipments. 3 cred.; prereq., 8, 9.

71f I MWF; 6B
71w,s VI MWF; 202B

77f,s—Survey in Marketing. (An introductory course). The principles of production economics and of price as illustrated in marketing. Commodity classifications, market functions, description of market organizations. 3 cred.; jr., sr.; not open to students who have credit for Econ. 16. Mr. Vaile.

77f I TThS; 6B
77s I TThS; 202B

89f,w,s—Production Management. Analysis of the procedure and methods of production in industrial plants, the factors involved in production management, the means of effecting control. 3 cred. Mr. Filipetti.

89f II MWF; 6B
89w II MWF; 6B
89s I MWF; 6B

* No credit will be given for 51, 52 or 53 until all three are completed.
† Students may not receive credit for both Econ. 172 and B.A. 71.
§ Credit may not be received for both Econ. 191-192 and B. A. 58.

100f,w,s—Report Writing. 1 cred.; jr., sr. Mr. Heilman.

100f VI T; 6B
100w IV T; 6B
100s VI T; 6B

101f,w-102w,s†‡—Advanced General Economics. A study of some of the more important theoretical problems of economics: competitive and monopoly prices; equilibrium prices and costs; theories of valuation of producers' goods; capital earnings and interest rates; profits. 3 cred. per qtr.; sr.; prereq., 8, 9. Mr. Garver.

101f-102w (1) III MWF; 102B (2) IV MWF; 102B
101w-102s I TThS; 102B

109f,s—Business Policy. This course is devoted to the study of problems of a general administrative character. Cases involving broad business policies are presented for class discussion and reports. These cases involve questions of valuation, budgetary control, industrial promotions, and combinations and reorganization. 3 cred.; sr., grad.; prereq., 101, 102. Mr. Stevenson.

109f VII MWF; 202B
109s II MWF; 6B

130f,s—Cost Accounting. (General survey.) 3 cred.; prereq., 29; I TThS; 303B. Mr. Ostlund.

132f,w—Cost Accounting. 5 cred.; prereq., 29. II MTWThF; 303B. Mr. Ostlund.

133s—Accounting Systems. 3 cred.; prereq., 131, 132; II TThS; 303B. Mr. Ostlund.

139f,w,s—Advanced General Accounting. A course intended particularly for the general student of business. Interpretation of accounts and statements, statement preparation, and analysis. Utilization of the statements by the executive. The use of budgets in business. Accounting methods and statements in a number of business fields. 3 cred.; jr., sr., grad.; prereq., 25, 26. Mr. Heilman.

139f IV MWF; 303B
139w (1) III MWF; 301B (2) VI MWF; 303B
139s IV MWF; 302B

142f,w,s—Money and Banking. Advanced Course. 3 cred.; jr., sr., grad.; prereq., 3 and 8, 9. Mr. Marget.

142f (1) II MWF; 202B (2) VI MWF; 6B
142w (1) II TThS; 6B (2) IV MWF; 303B
142s II TThS; 209B

155f,w,s—Corporation Finance. 3 cred.; prereq., 8, 9; III MWF; 202B. Mr. Stehman.

165f,w,s—The Economics of Public Utilities. Economic and legal bases of classification. Relative advantages of public ownership and regulation. Central and municipal regulation compared. Basis of rates; relative rates; rates and service. Summary of the theories of valuation. 3 cred.; prereq., 8, 9; III TThS; 202B(f,s), 102B(w). Mr. Garver.

167w—Personnel Administration. Managerial policy for various types of organization of labor. Special attention to job analysis, employment, incen-

† The entire course must be completed before credit is received for any quarter.
‡ Credit may not be received for both B.A. 101-102 and B.A. 107.

tives, and regulation of employment. 3 cred.; prereq., 8, 9; I TThS; 202B. Mr. Stead.

180-181-182G—Senior Topics Course—Production Management. Selected problems in management; studies in the technique of executive control in manufacturing enterprises; field research and surveys in the organization and methods of management of Northwest industrial concerns. 9 cred.; prereq., 89, 130; VI MWF; 209B. Mr. Filipetti.

(See School of Business Administration bulletin, Part II.)

ELECTRICAL ENGINEERING†

11f-13w-15s—Elements of Electrical Engineering. Introduction to the development, principles, materials, safety, and general applications of electrical engineering. 3 cred. per qtr.; prereq., reg. in phys., and not more than 1 qtr. behind in math. Mr. Todd.

11f	Lect.	(1) III TThS; 138EE	(3) I TThS; 238EE
		(2) III TThS; 238EE	(4) I TThS; 138EE
	Lab.	(1) I-II M; 21EE	(5) VI-VII M; 21EE
		(2) VI-VII T; 21EE	(6) VI-VII Th; 21EE
		(3) II-III T; 21EE	(7) I-II W; 21EE
		(4) II-III S; 21EE	(8) I-II F; 21EE
13w	Lect.	(1) III TThS; 139EE	(3) I TThS; 36EE
		(2) III TThS; 36EE	(4) I TThS; 238EE
	Lab.	(1) VI-VII M; 21EE	(5) VIII-IX T; 21EE
		(2) VI-VII W; 21EE	(6) VIII-IX Th; 21EE
		(3) III-IV T; 21EE	(7) VI-VII T; 21EE
		(4) VIII-IX F; 21EE	(8) VI-VII Th; 21EE
15s	Lect.	(1) I TThS; 237EE	(3) III TTh; 237EE; S 139EE
		(2) I TThS; 238EE	(4) III TThS; 238EE
	Lab.	(1) VIII-IX M; 21EE	(5) VI-VII M; 21EE
		(2) II-III S; 21EE	(6) VIII-IX W; 21EE
		(3) I-II M; 21EE	(7) VIII-IX Th; 21EE
		(4) VI-VII Th; 21EE	(8) I-II F; 21EE

111f-113w-115s—Electrical Engineering. Alternating-current circuits and machinery. 4 cred. per qtr.; prereq., 11, 13, 15. Mr. Johnson.

111f	(1) I MWThF; 237EE	(2) II MTWF; 237EE
113w	(1) I MWThF; 237EE	(2) II MWThF; 237EE
115s	(1) I MWF; 237EE; II S; 238EE	(2) II MWFS; 237EE

112f-114w-116s—Electrical Engineering Laboratory. Taken with Courses 111, 113, 115. Experimental study of alternating-current circuits and machinery. 2 cred. per qtr.; prereq., reg. in 111, 113, 115.

112f	(1) VI-IX T; 107EE	(3) VI-IX Th; 107EE
	(2) VI-IX W; 107EE	(4) VI-IX F; 107EE
114w	(1) VI-IX M; 107EE	(3) VI-IX Th; 107EE
	(2) VI-IX T; 107EE	(4) VI-IX F; 107EE
116s	(1) VI-IX M; 107EE	(3) VI-IX T; 107EE
	(2) VI-IX W; 107EE	(4) VI-IX Th; 107EE

121f-123w-125s—Alternating Current Machinery. Theory of alternating and direct current machinery. 3 cred. per qtr.; prereq., 115, 116. Messrs. Bryant and Johnson.

(1) III MWF; 237EE (2) IV MWF; 237EE

† In courses continuing through three quarters, the work of each quarter is prerequisite for following quarters.

122f-124w-126s—Electrical Engineering Laboratory. Operating characteristics of alternating and direct current machinery. 2 cred. per qtr.; prereq., 116 and reg. in 121, 123, 125.

122f	(1) VI-IX M; 107EE	(3) VI-IX W; 107EE
	(2) VI-IX T; 107EE	(4) VI-IX F; 107EE
124w-126s	(1) VI-IX T; 107EE	(3) VI-IX Th; 107EE
	(2) VI-IX W; 107EE	(4) VI-IX F; 107EE

127f-128w-129s—Transient Electrical Phenomena. Mathematical study of electric circuits during sudden changes of conditions. Classical and operational methods of analysis applied to electric circuits and machines, and use of the oscillograph in the analysis of these problems. 3 cred. per qtr.; prereq., reg. in 121, 123, 125; I TTh; 339EE; VI-VIII W; 107EE. Mr. Bryant.

138w-139s—Slow Transients. Short-circuit currents in power networks, unbalanced loads in polyphase circuits, transformers and motors, harmonics, stability of power systems under steady state conditions. 3 cred. per qtr.; prereq., reg. in 123; I MWF; 339EE. Mr. Bryant.

DESIGN

132f-134w-136s—Electrical Design. The design of direct current generators and motors, alternating current transformers, generators and synchronous motors. 2 cred. per qtr.; prereq., for 132, 115; for 134 and 136, 121. Mr. Kuhlmann.

(1) IV TS; 335EE (2) II TS; 335EE

232w-234s-236f—Electrical Design. Special problems. 2 cred. per qtr.; prereq., 132, 134, 136. Mr. Kuhlmann.

237s—Power Transmission Line Design. Preparation of detailed plans and specifications for construction of high voltage transmission lines and distributing systems. 3 cred.; prereq., 134, 142.

ELECTRIC POWER

36f-37w-38s—Electric Power. Similar to 43-44-45. 3 cred. per qtr.; sr. M.E.; prereq., Phys. 43, 44.

36f-37w	Lect. III MW; 238EE	
	Lab. (1) I-II W; 107EE	(2) II-III F; 107EE
38s	Lect. III MF; 238EE	
	Lab (1) II-III W; 107EE	(2) I-II Th; 107EE

40f—Electric Wiring and Equipment. Elements of direct and alternating current circuits. Interior wiring and electrical equipment of buildings. Elements of illumination. 2 cred.; sr. arch. and arch. engr.; prereq., Phys. 43; III MW; 138EE. Mr. Todd.

41f—Electric Power. Elementary principles of continuous and alternating currents, generators, and motors, transmission and distribution. Measurement of power. 3 cred.; sr. mines; prereq., Phys. 43. Mr. Caverley.

Lect. II TTh; 238EE Lab. I-III F; 107EE

42w,s—Electric Power. Similar to 41. Sr. C.E. 4 cred.; prereq., Phys. 43, 44. Mr. Kuhlmann.

Lect. I TThS; 138EE Lab. III-IV T; 107EE

43f-44w-45s—Electric Power. Elementary study of the generation, distribution, measurement, and utilization of electric power. 3 cred. per qtr.; sr. chem. eng.; prereq.. Phys. 43, 44. Mr. Kuhlmann.

43f-44w	Lect.	III TThS; 139EE(f); 138EE(w)	
	Lab.	(1) I-II T; 107EE	(2) I-II S; 107EE
45s	Lect.	III TThS; 138EE	
	Lab.	(1) II-III F; 107EE	(2) I-II S; 107EE

46f-47w-48s—Electric Power. Similar to 43-44-45. 4 cred. per qtr.; sr. Aero.E.; prereq., Phys. 43, 44.

	Lect.	VI MWF; 237EE	
46f	Lab.	(1) I-II Th; 107EE	(2) III-IV M; 107EE
47w		(1) I-II Th; 107EE	(2) II-III M; 107EE
48s		(1) I-II Th; 107EE	(2) III-IV S; 107EE

49w—Electric Motors. Elementary principles of direct and alternating current motors. Applications to elevators and ventilation equipment. 2 cred.; sr. arch. engr.; prereq., 40; III WF; 138EE. 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. 2 cred.; prereq., reg. in 121; III TTh; 237EE. Mr. Ryan.

142w—Electrical Transmission. Consideration involved in the designing and building of transmission lines. Kelvin's law and its limitations. Transmission line as a mechanical structure. Lightning arresters. 2 cred.; prereq., reg. in 123; III TTh; 237EE. Mr. Ryan.

144w—Railway Electrical Engineering. Principles of mechanics applied to electric train movements. 2 cred.; prereq., 42 or 45 or 48 or 115; IV T, III S; 238EE. Mr. Johnson.

145s—Railroad Electrification. Reasons for electrification. Study of European and American systems. Results of electrification. 2 cred.; prereq., 144; IV T, III S; 339EE. Mr. Johnson.

ELECTRIC LIGHTING

151f—Electrical Lighting. Nature of light. Laws of vision. Principles of illumination. Photometry. Sources of light and their characteristics. Lighting equipment. Illumination requirements and calculation for various fields of use. 2 cred.; prereq., Phys. 43; IV T, III S; 237EE. Mr. Johnson.

152f—Photometric Laboratory. Photometer practice. Distribution curves of lamps and reflectors. Measurement of lighting installations. 1 cred.; prereq. reg. in 151; VI-VII Th; ar. Mr. Johnson.

153w-154s—Illumination Problems. Illumination design and specifications applied to problems in street, residence, industrial, commercial, and other kinds of lighting. 2 cred. per qtr.; prereq., 151. (Not offered in 1931-32.)

251w-253s—Illuminating Engineering. Lectures and laboratory work. Methods of determining locations, kind, and quality of lights for obtaining desired illumination. 2 cred. per qtr.; prereq., 151. Mr. Johnson.

TELEPHONE AND TELEGRAPH ENGINEERING

64f-65w-66s—Elements of Communication. Theoretical and laboratory study of communication circuits and apparatus. Simplex, duplex, multiplex telegraph systems. Speed of transmission. Magneto, common battery, manual,

automatic telephone systems. 2 cred. per qtr.; prereq., reg. in 111, 113, 115. Mr. Hartig.

Lect. III T; 238EE
Lab. (1) VI-VII T; 307EE (3) VI-VII W; 307EE
(2) VIII-IX T; 307EE (4) VIII-IX W; 307EE

164f-165w-166s—Electric Communication. Telephone circuits at audio and carrier frequencies. Theoretical and laboratory study of circuits having distributed constants. Use of hyperbolic functions. Wave filters, balancing networks, equalizers, repeaters. 2 or 3 cred. per qtr.; prereq., reg. in 121, 123, 125. Mr. Hartig.

Lect. I MW; 138EE
Lab. (1) VI-VIII Th; 307EE (2) VI-VIII F; 307EE

267f-268w-269s—Telephone Transmission. Advanced transmission theory at communication frequencies. Class and laboratory. 2 or 3 cred.; reg. by permission. Mr. Hartig.

287f-288w-289s—Advanced Communication Laboratory and Seminar. Special problems in communication. Study and discussion of current articles on communication. 2 or 3 cred.; reg. by permission. Mr. Hartig.

RADIO ENGINEERING

161f-162w-163s—Radio Communication. Theoretical and laboratory study of radio transmitting and receiving circuits and apparatus. Amplifiers, detectors, oscillators. Electromagnetic waves in free space and on antenna systems. 3 cred. per qtr.; prereq., reg. in 121, 123, 125. Mr. Webb.

Lect. II MW; 335EE
Lab. (1) VI-VII M; 308EE (4) VIII-IX T; 308EE
(2) VIII-IX M; 308EE (5) VI-VII W; 308EE
(3) VI-VII T; 308EE

261f-263w-265s—Advanced Radio Communication. Theoretical study of the transmission of electromagnetic waves. Design and testing of radio transmitting and receiving apparatus. Theory of electron tubes and their use in radio circuits. High frequency measurements. Taken with 262-264-266. 2 cred. per qtr.; reg. by permission. II TTh; 339EE. Mr. Webb.

262f-264w-266s—Advanced Radio Laboratory. Special problems in radio laboratory and station, usually taken in connection with Course 261-263-265. For students specializing in electrical communication. 1 or more cred. per qtr.; reg. by permission. Mr. Webb.

RESEARCH

171w-172s—Undergraduate Thesis. Investigation of some approved problem in electrical engineering. 3 to 6 cred. per qtr.; prereq., 121.

275f-276w-277s—Electrical Engineering Research. Investigation of special problems in laboratory or library. 2 to 6 cred. per qtr.; grad.

MEASUREMENT

81w—Electrical Engineering Measurements. Principles of electrical measuring instruments, construction, limitations, sources of error, methods of calibration. Methods of measuring voltage, current, watts, watt hours, resistance, inductance, mutual inductance, capacity. 3 cred.; prereq., 111. Mr. Todd.

Lect. IV MW; 339EE Lab. VI-VII M; 107EE

181s—Communication Frequency Measurements. Vector treatment of network. Bridge circuits for measuring of resistance, inductance, and capacity at audio and radio frequencies. 2 cred.; prereq., 126. Mr. Hartig.

183f-184w-185s—Special Electrical Laboratory. Efficiency tests and special problems. 2 cred. per qtr.; 2 to 12 cred. total; prereq., 116. Mr. Springer and others.

186w,s—High Tension Testing. Low-high frequency to several million voltage, applied to study of dielectric phenomena, such as testing high tension transmission cables, transformer oil, transmission line insulators. 2 cred.; prereq., 123, 124, or reg. in 123 or 124, and by permission. Mr. Springer.

187f-188w-189s—Special Communication Laboratory. Special problems in electrical communication. Includes a weekly seminar meeting. 1 to 2 cred. per qtr.; 1 to 12 cred. total; jr., sr., grad. by permission. Mr. Hartig.

281w-282s—Advanced High Frequency Measurements. Vector treatment of circuit networks. Bridge circuits for the measurement of resistance, inductance, and capacity at audio and radio frequencies. 2 cred. per qtr.; prereq., 126.

284w-285s-286f—Precise Electrical Engineering Measurements. Measurements of resistance, voltage, current, self-induction, and capacity; standardization of measuring instruments. 2 cred. per qtr.; prereq., 122.

GENERAL

91s,su—Inspection Trip. Personally conducted inspection of factories, power plants, and other places of engineering interest. During spring recess or in summer, costing about $50 for each person. 1 cred.; prereq., 11.

93s—Seminar. Weekly discussion of current engineering periodicals and reports on assigned topics. 1 cred.; no prereq.; jr. E.E. (Not offered in 1931-32.)

149s—Protection Engineering. The application of relays, circuit breakers, lightning arrestors and other protective equipment to power circuits for apparatus protection and isolation of faults. Calculation of fault currents. Effect of fault condition on system stability. 3 cred.; prereq., reg. in 125. Mr. Johnson.

156s—Vacuum Tube Study. Two, three, four, and five electrode vacuum tubes. Thyration. kenotron, grid glow, photo-electric tubes, etc. Theoretical study of apparatus and circuits with demonstrations. 2 cred.; sr. only; IV MW; 139EE. Mr. Hartig.

191f-192w-193s—Seminar. Weekly discussion of current electrical periodicals. 1 cred. per qtr.; prereq., 111.

211f-212w-213s—Advanced Circuit Analysis. Circuit analysis using Heaviside's *Operational Calculus*. 2 cred. per qtr.; grad.; prereq., M.&M. 151. Mr. Hartig.

291f-292w-293s—Graduate Seminar. Discussion problems and results of research work. 1 cred. per qtr.; prereq., 126. (Not offered in 1931-32.)

294f-295w-296s—Electrical Ignition and Automobile Electrical Accessories. Study of ignition apparatus; characteristics of automobile accessories, such as generators, starters, controllers, electrical transmitting devices, etc. 2 cred. per qtr.; prereq., 124. Mr. Springer.

ENGLISH

4f,w-5w,s-6s—Rhetoric and Composition. Review of grammar; principles of composition; constant practice in writing. Studies in literature. 3 cred. per qtr.; no prereq. Messrs. Richardson, Becklund, Guthrie, Haga, Mahon, and Rusinko.

4f	(1) II TThS; 107E	(10) VI MWF; 136EE
	(2) II TThS; 135E	(11) VI MWF; 215E
	(3) II TThS; 22E	(12) II W, I ThS; 135E
	(4) III TThS; 107E	(13) II W, I ThS; 136E
	(5) III TThS; 135E	(14) VII MF, VI Th; 107E
	(6) I MWF; 107E	(15) VII MF, VI Th; 136E
	(7) I MWF; 203E	(16) III MWF; 107E
	(8) I MWF; 136E	(17) III MWF; 203E
	(9) VI MWF; 107E	(18) III MWF; 215E
4w	(1) IX MWF; 107E	(2) IV MWF; 136E
5w	(1) VI MWTh; 107E	(9) I TWS; 107E
	(2) VI MWTh; 205E	(10) I TWS; 215E
	(3) VI MWTh; 215E	(11) II TThS; 107E
	(4) I MThF; 107E	(12) II TThS; 135E
	(5) I MThF; 215E	(13) VIII MWF; 107E
	(6) IV MWF; 203E	(14) VIII MWF; 136E
	(7) IV MWF; 138EE	(15) VIII MWF; 205E
	(8) VII T, III ThS; 107E	
5s	(1) IV MWF; 320E	(2) VIII MWF; 106E
6s	(1) VIII TWF; 107E	(8) VI MWF; 203E
	(2) VIII TWF; 136E	(9) I TThS; 107E
	(3) III TThS; 107E	(10) I TThS; 203E
	(4) III TTh; 203E; S; 205E	(11) II TThS; 107E
	(5) IV MWF; 135E	(12) II TThS; 7E
	(6) IV MWF; 21E	(13) VII MWTh; 107E
	(7) VI MWF; 107E	(14) VII MWTh; 203E

7w,8s—Explorations in Literature. An attempt to introduce world literature to the student through a study of books and their authors. 3 cred. per qtr.; prereq., 6 or equiv.; IV MWF; 107E. Mr. Richardson.

31s—Technical Writing. Quarter course in business letters, reports, etc., planned to meet the professional needs of engineering students. 3 cred.; prereq., 6. I MWF; 215E. Mr. Haga.

FORESTRY

1f—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. 3 cred.; no prereq.; III TThS; 102Hr(UF). Mr. Cheyney.

27w—Farm Woodlots and Windbreaks. Trees and their relation to the farm. Planning and planting farm windbreaks and shelter belts. Utilization and marketing of farm grove, or woodlot products. 3 cred.; no prereq.; IV MWF; 301Hr(UF). Mr. Cheyney.

GENERAL ENGINEERING

11f-12w—Orientation. General lectures for vocational guidance covering the various phases of engineering and allied professions. Introduction to the University. Illustrated by lantern slides and moving pictures. Given by various members of the university staff. No cred.; no prereq.; required of freshmen in Engineering and Architecture. Mr. Zelner.

11f I T; NM Aud first six weeks, then 100C.
12w IX Th; 305E

81f,w,s—Estimating. Plan reading and quantity surveying. Study of costs of concrete, brick, timber, and steel construction. Analysis of material and labor costs. 3 cred.; jr., sr., only. Mr. French.

81f I MW; 2 hr ar; 36EE
81w IV MW; 2 hr ar; 36EE
81s I MW; 2 hr ar; 13EE

101w—Contracts and Specifications. Engineering specifications. Classes of specifications; essential features; clauses, details. Bids and bidders, engineering contracts. 3 cred.; jr. and sr. only; IV MWF; 139EE. Mr. Kibbey.

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. 2 cred.; sr. and grad. only; III TTh; 339EE. Mr. Ryan.

112f-113w-114s—Rates for Public Utility Properties. Determination of the rate base and depreciation amount for transportation, gas, water, electric power and telephone utilities operating expenses, the rate structure for particular utilities, service and discrimination. 3 cred. per qtr.; senior and graduate students in engineering only. Mr. Bryant.

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. 2 cred.; sr. only. Mr. Martenis.

(1) II M, III Th; 254ME (2) III ThS; 254ME

GEOLOGY AND MINERALOGY

1f,su-3w—General Geology (Dynamic and Economic). A synoptical treatment of the materials of the earth and the origin, distribution, and occurrence of metals, non-metals, coal, and petroleum. 10 cred.; no prereq. Mr. Emmons.

Lect. III TThFS; 110P
Lab. III-IV MW; or VI-VII TTh; 212P (f), 100P (w)

5f—Engineering Geology. Materials of the earth and geologic processes. Application of geology to engineering problems. Lectures, rock study, and reference work. 3 cred.; no prereq.; I MWF; 110P. Mr. Schwartz.

6w—Applied Geology for Engineers. Occurrence, properties, production, and uses of building stones, cements, clay, fuels, and road materials. Lectures and reference work. 3 cred.; prereq., 5; I MWF; 110P. Mr. Schwartz.

7s—Applied Geology for Engineers. Includes a brief survey of the occurrence of the important metals. Lecture and reference work; 3 cred.; prereq., 6; I MWF; 110P. Mr. Schwartz.

23w-24s—Elements of Mineralogy. The crystal systems; morphological, physical, and chemical characters of minerals; occurrence, genesis, and use of minerals·

classification and description of common minerals, rock minerals, and common rocks. Determinative work in laboratory, blowpipe analysis, sight identification. 8 cred.; prereq., Inorg. Chem. 10. Mr. Gruner.

23w Lect. II WF; 206P Lab. (1) VII-VIII WF; 100P
Rec. VII T; 210P (2) III-IV TS; 100P
24s Lect. II MWF; 206P
Rec. IX T
Lab. (1) VII-VIII M; VI-VII T; 100P (2) III-IV M; VII-VIII F; 100P

67f—Mineralogy of Chemical Materials. Lectures on special laboratory methods of mineralogy, nature and identification of the chief commercial minerals, and the world's supply and market for the same. Laboratory work in identification and tests of the value of minerals. 3 cred.; prereq., 6 qtr. cred. of chemistry at University. Mr. Gruner.

121f—Crystallography. Study of crystal models and space groups. Crystal drawings and measurements. Projections and mathematical calculations. 3 cred.; prereq.. M.&M. 11, and Inorg. Chem. 10. Mr. Gruner.

GERMAN

24f-25w-26s—Chemical German. Pronunciation, reading, sentence analysis, and translation. 4 cred. per qtr.; no prereq.

(1) IV MTWF; 209½F (3) V MTWF; 207F
(2) IV MTWF; 209F

HORTICULTURE

6f—Fruit Growing. 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. 3 cred.; no prereq. Messrs. Alderman and Brierley.

Lect. II MW; 102Hr(UF)
Lab. (1) I-II F; 8Hr(UF) (2) VII-VIII M; 8Hr(UF)

70su—Plant Materials.* Garden flowers, identification, classification, and landscape uses. Lectures and field trips. 3 cred.; prereq., 10 cred. Bot.; 3Hr(UF).

71f—Elementary Landscape Design and Plant Materials. A study of the elementary principles of landscape design; the identification of evergreen and deciduous trees and shrubs and vines, with special emphasis on their fall and winter characters and their uses in landscape design. Lectures, outdoor and indoor laboratories, special field trips. 3 cred.; prereq., Bot. 9; II Th, I-II TS; 107Hr(UF). Mr. Longley.

72s—Woody Plants and Garden Flowers. Deciduous and evergreen trees, shrubs and vines from their winter and spring characters, with special emphasis on their flower characters; herbaceous annuals, biennials, perennials, including bulbs and their uses in landscape planting. Lectures, indoor and outdoor laboratories, with special field trips. 2 cred.; prereq., Bot. 9; IV T, III-IV S; 107Hr(UF). Mr. Longley.

74w—Principles of Landscape Design. The composition of the various elements used in landscape gardening, methods of presentation. Lectures and prob-

* Given by special arrangement.

lems. 3 cred.; prereq., Arch. 21 or Ag.E. 3 and Hort. 71; VIII T, VI-VII TTh; 107Hr(UF). Mr. Longley.

75w—Landscape Problems. Continuation of Course 74. 3 cred.; ar.; 305En(UF). Mr. Longley.

76s—Landscape Construction. Construction and maintenance of turf for lawns, golf courses, and other play areas; garden architecture, grading, planting and care, costs of construction. Lectures, field trips and resorts. 3 cred.; prereq., 71; III T, VI-VII TTh; 107Hr(UF). Mr. Longley.

MATHEMATICS AND MECHANICS

MATHEMATICS

Entering freshmen will register for Course 11 if they have had high school higher algebra; otherwise for Course 9.

9f,w,s,su—Higher Algebra. (High school.) Fundamental rules, fractions, linear simultaneous equations, graphs, theory of exponents, surds, complex quantities, quadratic equations, numerical exercises. No cred.; no prereq. *(Given in the Extension Division. Fee $12.50.)*

9f Quiz (all sections) VI T; BuAud
Rec.:
(1) III MWThF; 3E
(2) VI MW, VIII Th, V S; 3E
(3) II MTFS; 3E
(4) VII MWThF; 3E
(5) IV TWF, VI Th; 3E
(6) I MWThF; 3E
(7) V MWF, IV S; 3E

9w Quiz (all sections) VI T; BuAud
Rec.:
(1) III MWThF; 4E
(2) V MWF, VIII Th; 4E
(3) II MWThF; 4E
(4) IV TWFS; 4E

9s (1) V MTWFS; 205E
(2) VIII MTWThF; 104E

M.&M.10f,w,su—Solid Geometry. Lines and planes in space, dihedral and polyhedral angles, polyhedrons, surfaces, cylinders, cones, spheres. Numerical exercises in area, volumes, weights. 3 hrs. per wk.; no cred.; no prereq. *(Given in Extension Division. Fee $7.50.)*

10f (1) II MWF; 5E
(2) VII MWTh; 203E
(3) VIII MWF; 203E
(4) IX MWF; 203E
(5) VI MWF; 203E
(6) IV MTF; 215E

10w IX MWF; 106E

11f,w,s,su—College Algebra. Theory of quadratic equations, interpretation of complex results, graphical representation, indeterminate equations, ratio, proportion, variation, progressions, series, undetermined coefficients, binominal theorem, logarithms, theory of equations, Horner's method. 5 cred.; prereq., higher algebra.

11f Quiz (all sections) VI T; BuAud
Rec.:
(1) III MWThF; 22E
(2) III MWThF; 4E
(3) VI MW, VIII Th, V S; 22E
(4) VI MW, VIII Th, V S; 4E
(5) II MTFS; 4E
(6) II MTFS; 21E
(7) VII MWThF; 21E
(8) VII MWThF; 4E
(9) IV TWF, VI Th; 4E
(10) I MWThF; 4E
(11) V MWF, IV S; 21E
(12) V MWF, IV S; 136E
(13) V MWF, IV S; 4E

11w Quiz (all sections) VI T; BuAud
Rec.:
(1) III MWThF; 3E
(2) V MWF, III S; 3E
(3) V MWF, III S; 136E
(4) II MWThF; 3E
(5) VI MWF, VIII Th; 3E
(6) IV TWFS; 3E
(7) I MWThF; 4E
(8) VII MWF, V S; 4E

11s Quiz (all sections) VI T; BuAud
Rec.:
(1) III MWTh, II S; 3E
(2) V MWF, VIII Th; 3E
(3) II MWThF; 3E
(4) VII MWThF; 3E
(5) IV MTW, III S; 3E
(6) VI MWTh, IV S; 3E

12f,w,s,su—Trigonometry. Graphical representation of functions, computation by logarithms and slide rule. Trigonometric functions, 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. 5 cred.; prereq., 11 or equiv. **Mr. McClintock.**

12f V MTWFS; 335EE

12w Quiz (all sections) VI T; BuAud
Rec.:
(1) III MWThF; 22E
(2) V MWF, III S; 21E
(3) II MWThF; 104E
(4) VI MWF, VIII Th; 22E
(5) IV TWFS; 21E
(6) I MWThF; 3E
(7) VII MWF, V S; 3E

12s Quiz (all sections) VI T; BuAud
Rec.:
(1) III MWTh, II S; 4E
(2) V MWF, VIII Th; 4E
(3) II MWThF; 4E
(4) VII MWThF; 205E
(5) IV MTW, III S; 4E
(6) I MWThF; 4E
(7) VI MWTh, IV S; 4E

13f,w,s,su—Analytical Geometry. Co-ordinate systems, locus and equation, straight line, circle, parabola, ellipse, hyperbola. Transformation of co-ordinates and simplification of equations. Polar co-ordinates, higher plane curves, tangents, normals. Empirical equations, solid analytic geometry. 5 cred.; prereq., 11 and 12.

13f Quiz (all sections) IX T; 305E
Rec.:
(1) V MTWF; 106E
(2) VIII MWF, VII Th; 205E
(3) III MTThF; 136E
(4) VII MWF, VIII Th; 205E

13w Quiz (all sections) IX T; 305E
Rec.:
(1) II MWThF; 136E
(2) VI MWThF; 136E
(3) VII MWThF; 136E

13s Quiz (all sections) VI T; 305E
Rec.:
(1) III MWTh; II S; 5E
(2) V MWF, VIII Th; 106E
(3) II MWThF; 22E
(4) VII MWThF; 22E
(5) IV MTW, III S; 22E
(6) I MWThF; 106E
(7) VI MWTh, IV S; 136E

24f,w,s,su—Differential Calculus. Limit, derivative, simple applications of derivative, maxima and minima, differentials, rates, change of variables, radius of curvature, mean value, indeterminate forms, partial differentiation, series. 5 cred.; prereq., 13. Mr. Siler.

24f	(1) II MTWThF; 106E	(4) III MTWThF; 106E
	(2) IV MTWFS; 106E	(5) VII MTWF, VIII Th; 106E
	(3) VIII MTWF, VII Th; 106E	
24w	(1) VI MTWF, II S; 104E	(4) VII MTWThF; 106E
	(2) IV MTWFS; 104E	(5) III MTWThF; 106E
	(3) I MTWThF; 104E	
24s	(1) I MTWThF; 104E	(2) V MTWFS; 136E

25f,w,s,su—Integral Calculus. Expansion of functions, Taylor's theorem. Standard elementary forms, definite integral, rational fractions, integration by substitution, by parts, reduction formulas, integration a process of summation, successive and partial integration, elementary ordinary differential equations. 5 cred.; prereq., 24. Mr. Dalaker.

25f	V MTWFS; 205E	
25w	(1) VI MTWF, II S; 106E	(4) VII MTWThF; 104E
	(2) IV MTWFS; 205E	(5) III MTWThF; 136E
	(3) I MTWThF; 106E	
25s	(1) VII MTWF, V S; 106E	(4) VIII MTWThF; 215E
	(2) II MTWThF; 203E	(5) IV MTWFS; 104E
	(3) III MTWFS; 104E	

91f,w*—Calculus (Arch., Pre-bus.). Short course, derivatives, maxima and minima, integration of simple forms, definite integrals, areas. 4 cred.; prereq., 13. Mr. Wilcox.

91f	VI MF, V TW; 206E
91w	II MWThF; 36EE

151f—Differential Equations. Differential equations and their solutions. First order and first degree, first order and higher degree, singular solutions; total differential equations, linear differential equations, miscellaneous methods, system of simultaneous equations, integration in series. Partial differential equations. 3 cred.; prereq., 25; IV MWF; 7E.

152w-153s—Advanced Calculus and Applications. 3 cred. per qtr.; prereq., 151; IV MWF; 7E.

157f-158w-159s—Determinants and Solid Analytical Geometry. An advanced course. 3 cred. per qtr.; prereq., 151. (Not offered in 1931-32.)

254f-255w-256s—Modern Analysis. Based on Whittaker and Watson's text. 3 cred. per qtr.; prereq., 153. (Not offered in 1931-32.)

261f-262w-263s—Functions of a Complex Variable. Elliptic functions and integrals with applications. 3 cred. per qtr.; prereq., 153. Mr. Dalaker.

264f-265w-266s—Advanced Topics in Functions of Complex Variable. 3 cred. per qtr.; prereq., 263. (Not offered in 1931-32.)

MECHANICS

26f,w,s,su—Technical Mechanics: Statics. Characteristics of a force, parallelogram law, moments, couples, resultant of a force system, equilibrium of a force system, frictions, centroids, moments of inertia, catenary. 5 cred.; prereq., 25. Messrs. Herrick and Doeringsfeld.

26f	(1) V MTWFS; 215E	(2) II MTWThF; 215E
26w	II MTWThF; 106E	
26s	(1) VII MTWF, V S; 104E	(4) VIII MTWThF; 203E
	(2) II MTWThF; 106E	(5) IV MTWFS; 106E
	(3) III MTWFS; 136E	

* For permissible substitute, see page 57.

84f,s*—Technical Mechanics. (Chem., Ch.E., Agr.E., and Pre-bus.) 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. 5 cred.; prereq., 25 or 91. Mr. Doeringsfeld.

84f II MWF, VI TTh; 7E
84s III MTWThF; 215E

92w*—Mechanics for Architects. Statics, resolution of forces, conditions of equilibrium, center of gravity, moment of inertia of plane sections, stresses in framed structures. 4 cred.; prereq., 91; VI MWThF; 203E. Mr. Wilcox.

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. 5 cred.; prereq., 26. Messrs. Wilcox and Doeringsfeld.

127f (1) III MTWThF; 104E (3) II MTWThF; 203E
(2) I MTWThF; 205E
127w (1) II MWThF; 22E, II S; 136E (3) IV MTWFS; 106E
(2) III MTWThF; 205E (4) V MTWFS; 205E
127s (1) II MTWThF; 136E (2) III MTWThF; 106E

161f-162w-163s—Advanced Technical Mechanics. Special problems in the dynamics of machinery; vibration, balancing, whirling shafts, rapidly rotating disks, dynamical stability, gyroscope. 3 cred. per qtr.; prereq., 127. Mr. Wilcox.

161f IV MWF; 36EE
162w I MWF; 36EE
163s IV MWF; 36EE

267f-268w-269s—Advanced Dynamics. Text, Routh's *Rigid Dynamics*, Vol. I. 3 cred. per qtr.; prereq., 153. Mr. Brooke.

274f-275w-276s—Advanced Dynamics of a Particle. 3 cred. per qtr.; prereq., 127. Mr. Brooke.

277f-278w-279s—Advanced Statics. Text, Routh's *Analytical Statics*. 3 cred. per qtr.; prereq., 127. (Not offered in 1931-32.)

MATERIALS

85f*—Strength of Materials with Laboratory. (Ch.E. and Pre-bus.) Mechanical and elastic properties of materials of construction, beams, shafts, columns, combined stresses, dynamic stresses. 4 cred.; prereq., 84. Mr. Miller.

Lect. II MWF; 206E Lab. VI-VII M; Ex

93s*—Strength of Materials. (Arch.) Mechanical and elastic properties of materials of construction, design of riveted joints, beam theory, columns, arches. 4 cred.; prereq., 91; IV MWFS; 203E. Mr. Wilcox.

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. 5 cred.; prereq., 26. Messrs. Priester and Miller.

128f (1) II MTWFS; 104E (3) III MWThFS; 206E
(2) I MTWThF; 104E
128w (1) I MTWThF; 136E (3) II MTWThF; 203E
(2) III MTWThF; 215E
128s (1) II MTWThF; 110Ex (3) IV MTWFS; 205E
(2) V MTWF, III S; 203E (4) III MTWThF; 205E

* For permissible substitute, see page 57.

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. 2 cred.; prereq., 128 or reg. in 128. Messrs. Priester and Miller.

141f	Lect.	(1) VI F; 110Ex	(2) VI M; 110Ex
	Lab.	(1) VII-IX F; Ex	(3) VII-IX T; Ex
		(2) II-IV T; Ex	(4) I-III S; Ex
141w	Lect.	(1) VI W; 110Ex	(2) VI F; 110Ex
	Lab.	(1) I-III S; Ex	(3) VII-IX T; Ex
		(2) VII-IX M; Ex	(4) VII-IX F; Ex
141s	Lect.	(1) VI T; 110Ex	(2) VI W; 110Ex
	Lab.	(1) VI-VIII F; Ex	(3) VII-IX W; Ex
		(2) VII-IX Th; Ex	(4) VII-IX M; Ex

144w—Materials Testing Laboratory. (Mines.) Four laboratory hours accompanying Mine Mech. 110. VI-IX Th; Ex. Mr. Priester.

180f-181w-182s—Advanced Strength of Materials. Special problems in applied elasticity. 3 cred. per qtr.; prereq., 128; IV MWF; 206E. Mr. Priester.

184f-185w-186s—Advanced Testing Materials Laboratory. Special problems relating to the physical properties of engineering materials. 2 cred. per qtr.; prereq., 141. Mr. Priester.

294f-295w-296s—Mathematical Theory of Elasticity. 3 cred. per qtr.; prereq., 128, 153. (Not offered in 1931-32.)

HYDRAULICS

86w*—Hydraulics. (Ch.E. and Agr.E.) Hydrostatics, Bernoulli's theorem, flow through orifices, pipes, and over weirs, dynamic action of jets and streams, flow of gases through pipes. 2 cred.; prereq., 84. II MF; 7E. Mr. Doeringsfeld.

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. 4 cred.; prereq., 26. Mr. Straub.

129f	Lect. (all sections) VII M; 110Ex		
	Rec.	(1) II WFS; 205E	(3) IV WFS; 209Ex
		(2) III WFS; 205E	
129w	Lect. (all sections) III W; 110Ex		
	Rec.	(1) MTF; 205E	(2) IV MFS; 215E
129s	Lect. (all sections) VI Th; 110Ex		
	Rec.	(1) MTF; 206E	(2) IV MWF; 215E

130w—Open Channel Flow. Theory of uniform and varied flow in open channels, with practical applications to the design of hydraulic structures; hydraulic similitude; computations for drawdown curves, backwater curves, hydraulic jump, measuring flumes, submerged weirs, etc. 3 cred.; prereq., 129 and 143; I MWF; 203E. Mr. Straub.

132w-133s-134f—Advanced Hydraulic Problems. Special problems in hydraulic design. 2 cred. per qtr.; prereq., 130 or reg. in 130. Mr. Straub.

143f,w,s—Hydraulics Laboratory. Experimental and demonstrational work. Pressure head, Piezometer tubes, gages, stability of flotation, Bernoulli's

* For permissible substitute, see page 57.

theorem. Venturi meter, flow through orifices, over weirs, and through pipes. Open channels, gaging, impact on vanes, pumps, and hydraulic machines. 1 cred.; prereq., 86 or 129 or reg. in 86 or 129. Mr. Straub.

143f	(1) III-IV S; Ex (2) VI-VII T; Ex	(3) I-II S; Ex
143w	(1) I-II S; Ex (2) VIII-IX T; Ex (3) VIII-IX F; Ex	(4) I-II Th; Ex (5) VI-VII M; Ex
143s	(1) VIII-IX M; Ex (2) VIII-IX Th; Ex	(3) I-II Th; Ex (4) VI-VII W; Ex

191w—Hydraulic Motors and Pumps. Study of the hydraulic theory of the ram, impulse wheel, reaction turbine, and centrifugal pump. 3 cred.; prereq., 129; III TThS; 5E. Mr. Straub.

192s—Natural and Artificial Waterways. Wave motion, tides, ship resistance, transportation of sediment. Control and regulation of rivers, design of ship canals, locks, dry docks, movable dams, harbors. 3 cred.; prereq., 129 and preferably 130; I MWF; 206E. Mr. Straub.

193f—Hydraulic Measurements. Detailed study of the current meter. Venturi meter, weir, orifice, Parshall flume, traveling screen, chemical method of gaging, etc. 3 cred.; prereq., 129; I MWF; 209Ex. Mr. Straub.

194f-195w-196s—Advanced Hydraulics Laboratory. Special experimental studies concerning the characteristic of turbines, pumps, etc. Hydraulic models. 2 cred. per qtr.; prereq., 129 and 143; ar. Mr. Straub.

281f-282w-283s—Hydrodynamics. 3 cred. per qtr.; prereq., 129, 153. Mr. Brooke

284f-285w-286s—Advanced Hydrodynamics. 3 cred. per qtr.; prereq., 283. Mr. Brooke.

MECHANICAL ENGINEERING

MACHINE CONSTRUCTION

1su—Machine Woodworking. Operation and setting up of woodworking machinery; care and manipulation of adjustable parts. Layout and plan of course and equipment for high school or junior college, including problems in cabinet making and wood construction. 2 to 4 cred.; no prereq.; I-IX M, I-IV TWFS, I-II Th; ME. Mr. Richards.

2su—Bench Work. Bench and vise work in metal chipping, filing, scraping, fitting, polishing, and layout practice; planning of courses of study for school work. 2 cred.; no prereq.; I-IX M, I-IV TWFS, I-II Th; ME. Mr. Rogers.

3su—Elementary Machine Shop Practice. Lathe, shaper, planer, and drill press manipulation; the grinding, care, and kinds of cutting tools. Layout of courses and exercises for high school courses. This course can be arranged to include part of 2su. 2 to 4 cred.; no prereq.; I-IX M, I-IV TWFS, I-II Th; ME. Mr. Rogers.

4su—Wood Turning. Operation and adjustment of the lathe; care and manipulation of wood turning hand tools. Turning between centers, face plate, and check work. Plan and arrangement of projects suitable for a high school course. 2 to 4 cred.; no prereq.; I-IX M, I-IV TWFS, I-II Th; ME. Mr. Richards.

5su—Wood Finishing. Preparatory treatment of wood surfaces, color mixing, application of oil and acid stains, shellacking, varnishing, enameling, rubbing, and finishing. Polychrome projects, layout, building up of design, application and blending of colors. 2 to 4 cred.; no prereq.; I-IX M, I-IV TWFS, I-II Th; ME. Mr. Richards.

6su—Pattern Practice. Pattern layout. Partings, draft, shrinkage and finish allowance. Building and assembly of materials, core prints and core boxes, color symbols. The relation of pattern and foundry practice. Industrial problems and methods, lectures and notes. 2 to 4 cred.; no prereq.; I-IX M, I-IV TWFS, I-II Th; ME. Mr. Richards.

7su—Advanced Machine Shop. Advanced lathe work, milling machine operation. Production work. Gear calculation, and cutting. Precision grinding. Layout of typical course. 2 to 4 cred.; prereq., 3; I-IX M, I-IV TWFS, I-II Th; ME. Mr. Rogers.

9su—General Metal Work. Special arrangements for individual needs. Care and use of metal working tools. Arrangements may be made for precision grinding, gear cutting, tool making, heat treatment, and acetylene welding. Planning equipment and projects for a high school course. 2 to 4 cred.; no prereq.; ar. Mr. Rogers.

10su—Furniture Making. Details of designs and construction. Doweling, mortise, and tenon work. Bending and setting of shapers. Value and materials used in built-up work. Laying of veneers. Layout of a course in high school furniture making. 2 to 4 cred.; no prereq.; I-IX M, I-IV TWFS, I-II Th; ME. Mr. Richards.

11f,w,s,su—Pattern Practice. Study and application of methods and principles used in constructing and using patterns and core boxes in the production of castings. Shop drawings and materials used. Manipulation and care of woodworking tools and machinery. Inspection trips and reports. 2 cred.; no prereq. Mr. Richards.

11f	Lect.	(1) VI M; 202ME	(Pre-dent.) VII M; 202ME
		(2) III T; 202ME	
	Lab.	(1) VI-IX Th	(Pre-dent.) VI-IX T
		(2) II-V F	
11w	Lect.	(1) II Th; 202ME	(3) VIII W; 202ME
		(2) VII T; 202ME	(Pre-dent.) VII M; 202ME
	Lab.	(1) V-VIII F	(3) I-IV F
		(2) I-IV S	(Pre-dent.) VI-IX T
11s	Lect.	(1) II Th; 202ME	(3) IV F; 202ME
		(2) VIII T; 202ME	(Pre-dent.) VII M; 202ME
	Lab.	(1) VI-IX Th	(3) I-IV M
		(2) I-IV S	(Pre-dent.) VI-IX T

12f,w,s—Foundry Practice. Theory and practice in mixing, molding, and casting of ferrous and non-ferrous metals. Preparation of materials used in making cores and molds. Bench, floor, and machine molding. Inspection trips and reports. 2 cred.; no prereq. Mr. Moffett.

12f	Lect.	(1) IV S; 153ME	(Chem. 1) VII F; 153ME
		(2) III T; 153ME	(Chem. 2) VIII T; 153ME
			(Pre-dent.) VII M; 153ME
	Lab.	(1) VI-IX Th	(Chem. 1) VI-IX M
		(2) II-V F	(Chem. 2) VI-IX W
			(Pre-dent.) VI-IX T

12w	Lect. (1) III Th; 153ME	(Chem. 1) VI W; 153ME
	(2) IX F; 153ME	(Chem. 2) VI M; 153ME
		(Pre-dent.) VII M; 153ME
	Lab. (1) I-IV S	(Chem. 1) VI-IX Th
	(2) I-IV F	(Chem. 2) I-IV T
		(Pre-dent.) VI-IX T
12s	Lect. (1) II Th; 153ME	(Chem. 1) IX M; 153ME
	(2) I Th; 153ME	(Chem. 2) VIII W; 153ME
	(3) IV F; 153ME	(Pre-dent.) VII M; ar
	Lab. (1) VI-IX Th	(Chem. 1) I-IV T
	(2) I-IV S	(Chem. 2) V-VIII F
	(3) I-IV M	(Pre-dent.) VI-IX T

13f,w,s—Forge Practice. Lectures and discussions on modern forge and drop forge practices, industrial welding methods, steels and their treatment. Practice in welding, hardening, tempering, and die forging. Plants inspection and reports. 2 cred.; no prereq. Mr. Hughes.

13f	Lect. (1) IV T; 153ME	(Chem. 1) VIII Th; 153ME
	(2) IX T; 153ME	(Chem. 2) VII T; 153ME
		(Pre-dent.) VII M; ar
	Lab. (1) VI-IX Th	(Chem. 1) VI-IX M
	(2) II-V F	(Chem. 2) VI-IX W
		(Pre-dent.) VI-IX T
13w	Lect. (1) VII T; 153ME	(Chem. 1) IX M; 153ME
	(2) VIII W; 153ME	(Chem. 2) IX T; 153ME
		(Pre-dent.) VII M; ar
	Lab. (1) I-IV S	(Chem. 1) VI-IX Th
	(2) I-IV F	(Chem. 2) I-IV T
		(Pre-dent.) VI-IX T
13s	Lect. (1) I F; 153ME	(Chem. 1) IX T; 153ME
	(2) VIII T; 153ME	(Chem. 2) II T; 153ME
	(3) III Th; 153ME	(Pre-dent.) VII M; 153ME
	Lab. (1) VI-IX Th	(Chem. 1) I-IV T
	(2) I-IV S	(Chem. 2) V-VIII F
	(3) I-IV M	(Pre-dent) VI-IX T

14w,su—Machine Shop Practice. Care and operation of machine tools; screw cutting, taper turning, and gear cutting, including spur, helical, worm, and bevel gears. 3 cred.; prereq., 11, 12, 13. Mr. Rogers.

Lect. (1) IV T; 202ME	(3) VI T; 202ME
(2) VI M; 202ME	(4) IV F; 202ME
Lab. (1) I-IV W, III-V S	(3) VII-IX T, VI-IX F
(2) VII-IX M, VI-IX W	(4) I-IV M, II-IV F

15s,su—Advanced Machine Practice. Manufacturing methods, quantity production; also carbonizing and heat treatment of steel, autogenous welding and brazing. 3 cred.; prereq., 14. Mr. Rogers.

Lect. (1) I Th; 202ME	(3) III W; 202ME
(2) III Th; 202ME	(4) IV M; 202ME
Lab. (1) VI-IX M, VI-VII T	(3) VI-IX W, I-III S
(2) II-IV W, VI-IX Th	(4) I-III M, I-IV F

16f,su*—Machine Shop Practice. Elementary course in machine work arranged especially for students in electrical engineering. 2 cred.; prereq., 11, 12, 13. Mr. Rogers.

Lect. (1) VIII Th; 202ME	(3) IX F; 202ME
(2) III M; 202ME	(4) VIII T; 202ME
Lab. (1) I-II T, I-III W	(3) I-II Th, VI-VIII F
(2) I-II M, I-III F	(4) VI-VII T, II-IV S

* For permissible substitute, see page 57.

17f,w,s,su*—Machine Shop Practice. (Chem., chem. engr., and pre-bus.) 2 cred.; no prereq. Mr. Rogers.

17f	Lect. (1) VII W; 202ME	(2) VII F; 202ME
	Lab. (1) VI-IX M	(2) VI-IX W
17w	Lect. (1) IX T; 202ME	Lab. (2) I-IV T
17s	Lect. (1) VI F; 202ME	(2) I T; 202ME
	Lab. (1) I-IV T	(2) V-VIII F

18f,w,s—General Woodworking. For teachers desiring elementary or advanced practice in manual training, wood turning, and pattern making. Planning and layout of projects, materials used, care and operation of woodworking tools and machinery; selection and installation of equipment. 3 cred.; no prereq. Mr. Richards.

19f—Mechanical Technology. Study of mechanical processes involved in various manufacturing industries and in the development and utilization of power. Lectures by various specialists. 1 cred.; open only to soph., jr., and sr.; IV MF; 305E. Mr. Richards.

MACHINE DESIGN

20s—Kinematics. Instant centers, centroids, point paths, gear tooth profiles, cam construction, velocity diagrams. Lectures and drafting. 2 cred.; prereq., Dr. 3. Messrs. Martenis and Palmer.

(1) VI-VII WThF; 251ME (3) II-III TTh, VIII-IX F; 251ME
(2) VIII-IX MW, I-II S; 251ME

21f—Elementary Machine Design. Screws, rivets, machine keys, cottered joints and connections, hubs and rims of rotating parts. Factors of safety, drawing room systems and conventions. Lectures and drafting. 2 cred.; prereq., Dr. 3. Messrs. Martenis and Palmer.

(1) VIII-IX M, III-IV TS; 151ME (3) I-IV W, VI-VII Th; 151ME
(2) VI-VIII T, VII-IX W; 151ME

22f—Mechanism. Motion studies. Revolving and oscillating bodies, linkages, chains, flexible connectors, gearing, wheels in trains, epicyclic gear trains, worm and wheel, screws, straight line motions, hoists, pulley blocks, ratchets, intermittent motions. Recitations and problems. 3 cred.; prereq., 20 and M.&M. 24. Mr. Martenis.

(1) I TThS; 252ME (2) III MWF; 252ME

23w—Machine Design. Riveted joints, screwed fastenings, shafts and couplings, strength of gear teeth, flywheels, engine details, machine frames, steam piping, bearings. Lectures and drafting. 3 cred.; prereq., 22. Messrs. Martenis and Palmer.

Lect. (1) II MW; 254ME (2) I TTh; 254ME
Lab. (1) II-IV T, VII-IX W; 255ME (2) VI-VII T, I-III S; 255ME

24s—Machine Design. Design of machines and hoisting equipment with reference to complex stresses. Lectures and recitations. 3 cred.; prereq., 22 and M.&M. 128.

(1) III MWF; 252ME (2) II WThS; 252ME

26w—Mechanism and Kinematics. (E.E., Aero.E., and Ag.E.) Transmission of motion. Levers, linkwork, flexible connections, gearing, screws, cams, epicyclic trains, parallel motions, quick return motions, graphical studies of

* For permissible substitute, see page 57.

velocities. Intermittent motion, escapements. Recitations and problems. 3 cred.; prereq., M.&M. 24. Mr. Martenis.

(1) IV TS, VI Th; 252ME
(2) I TThS; 252ME
(3) III TThS; 252ME
(4) II MWF; 252ME
(5) IV MWF; 252ME

27s—Machine Design. (Aero.E. and Ag.E.) Calculation of machine parts, riveted joints, screwed fastenings, rotating pieces, belted connections, gearing, bearings. Lectures and drafting. 3 cred.; prereq., 26. Mr. Martenis.

Lect. (1) I T; 254ME (2) VI M; 254ME
Lab. (1) VI-VIII T, I-III S; 255ME (2) VI-VIII Th, VII-IX F; 255ME

28s—Machine Design. (Chem.E.) Screw fastenings, riveted joints, belting, shafting, bearings, machine frames, pulleys, etc. Lectures, drafting, and problems. 3 cred.; prereq., M.&M. 85.

Lect. II T; 252ME
Lab. (1) VI-VIII WF; 151ME (2) VI-VIII M, II-IV S; 151ME

121f-122w-123s—Advanced Engineering Design. Problems selected to suit the student's special interest. Automatic machines; machines for quantity production; materials handling and heavy plant equipment. Drafting and problems. 2 cred. per qtr.; prereq., 24.

121f (1) VI-VIII Th, I-III S; 255ME (2) VII-IX M, I-III Th; 255ME
122w VII-IX MTh; 255ME
123s VII-IX MW; 255ME

STEAM ENGINEERING

30f—Steam Engineering. Elementary study of the steam power plant, including boilers, stokers, furnaces, fuels, combustion, steam generation, and prime movers. 3 cred.; prereq., Phys. 23. Messrs. DuPriest and Easton.

(1) IV MWF; 154ME
(2) II MWF; 154ME
(3) III MWF; 154ME
(4) III TThS; 154ME

31w-32s—Thermodynamics. Heat and mechanical energy and the laws governing the operation of machines used to convert heat energy into mechanical energy. Steam, gas, and oil engines, air compressors, refrigeration machines, and turbines. 3 cred. per qtr.; prereq., 30. Messrs. DuPriest and Easton.

31w (1) III WF, VI-VIII F; 154ME (3) III TTh, VI-VIII M; 154ME
(2) II WF, VI-VIII Th; 154ME (4) I TTh, VI-VIII T; 154ME
32s (1) III T, II Th, VII-IX Th; 154ME (3) II MW, VI-VIII F; 154ME
(2) III MW, VI-VIII W; 154ME (4) III ThS, VI-VIII T; 154ME

33f—Elementary Mechanical Laboratory. Calibration of pressure gages, anemometers, indicator springs. Use of steam calorimeters, planimeters, indicators. Calculations from indicator cards. Tests of mechanical appliances, lubricating oils. 2 cred.; prereq., reg. in 30.

(1) VI-IX F; Ex
(2) VI-IX Th; Ex
(3) I-IV S; Ex
(4) VI-IX M; Ex
(5) VI-IX W; Ex
(6) VI-IX T; Ex

34w—Mechanical Laboratory. Calibration of tachometers, pyrometers, steam flowmeters. Valve setting. Flow of steam through orifices. Test of steam trap, surface condenser, simple steam engine. Inspection trip. 2 cred.; prereq., 33.

(1) VI-IX M; Ex
(2) VI-IX F; Ex
(3) VI-IX W; Ex
(4) I-IV S; Ex

35s—Elementary Steam and Power Laboratory. Friction test of oils. Test of hot air engine, centrifugal fan, injector, steam pump, steam boiler. Calibration of transmission dynamometer. Power study of industrial machines. Approximate analysis of fuels. Use of Mahler, Bomb, and Junkers calorimeters. 2 cred.; prereq., 34.

(1) VI-IX W; Ex (3) VI-IX M; Ex
(2) VI-IX F; Ex (4) VI-IX T; Ex

36f—Elementary General Laboratory. (Mines.) Calibration of pressure gages, anemometers. Use of steam calorimeters, planimeters. Steam indicator practice, card calculation, valve setting. Tests of oils, simple steam engine and steam pump. 4 hours; prereq., accompanying Mine Mech. 112; VI-IX Th. Mr. Shoop.

38w-39s—Heat Engines. (Chem. E.) Study of steam properties, steam calorimetry, elementary thermodynamics, fuels, and combustion; calibration and use of instruments; valve setting; operation and testing of steam engines, boilers, compressors, stage evaporators, water heaters, and purifiers, gas engines, etc. Selection of equipment for power plants. 4 cred. for 38w; 3 cred. for 39s; prereq., Phys. 23.

38w Rec. IV MWF; 215Ex
Lab. (1) II-V T; Ex (2) VI-IX F; Ex
39s Rec. IV WF; 215Ex
Lab. (1) VI-IX M; Ex (2) VI-IX F; Ex

136w—Design of Steam Machinery. Piping systems, furnace and gas passage dimensions, stokers, oil, gas, and pulverized fuel burners, superheaters, feed water heaters, and pumps, air pre-heaters, automatic controls, chimneys, etc. 2 cred.; prereq., 144; VI-VIII MTh; 151 ME. Mr. Shoop.

137s—Design of Power Plant Units. Treatment of condensers, air pumps, cooling towers, stage evaporators, reheaters, etc. 2 cred.; prereq., 136; II-IV TW; 255ME. Mr. Shoop.

138f-139w—Heat Engines. (E.E.) Properties of steam; principle of operation of steam machinery; fuels, combustion, and smoke prevention; construction, operation and testing of engines, turbines, boilers, condensers, pumps, and power plant equipment. Selection of equipment for different types of plants. 3 cred. per qtr.; prereq., Phys. 23.

Rec. (1) II TS; 110Ex (2) III WF; 209Ex
Lab. (1) VI-VIII F; Ex (3) I-III Th; Ex
(2) VI-VIII Th; Ex (4) VI-VIII M; Ex

140f,w,s—Heat Engines. (C.E. and Arch.) Steam generation and properties. Fuels and combustion. Construction and operation of boilers and auxiliaries. Elementary thermodynamics. Use and calibration of engine-room instruments. Types, details, and tests of steam engines, steam turbines, gas engines, and air compressors. Performance and adaptability of power equipment. 4 cred.; prereq., Phys. 23.

140f Rec. IV MWF; 215Ex
Lab. (1) VI-IX W; Ex (2) I-IV S; Ex
140w Rec. I TThS; 209Ex Lab. VI-IX W; Ex
140s Rec. I TThS; 209Ex
Lab. (1) VI-IX W; Ex (2) II-V S; Ex

142w—Steam Turbines. Theory and practice applied to various types. Thermodynamics and mechanical analysis of problems involved in the design of nozzles, blades, rotors, etc. Condition of operation; systems of transmission;

lubrication; economy; field of service. Laboratory investigation. 3 cred.; prereq., 32; IV MWF; 209Ex. Mr. Shoop.

144f—Power Plant Engineering. Theory, practice, and economics relating to prime movers and steam generating equipment of the modern power plant, including auxiliary units such as condensers, heaters, purifiers, pumps, fans, piping, etc. 3 cred.; prereq., 32. Mr. Shoop.

(1) II MThF; 254ME (2) IV MWF; 254ME

145w—Applied Thermodynamics. Laws of heat transmission, mean temperature difference, in condensers, boilers, brine coils, feed water heaters. Treatment of cooling towers, accumulators, multiple stills, stage evaporators, vapor refrigeration; air compressors, multi staging, intercooling, etc. 3 cred.; prereq., 32; II MWF; 209Ex. Mr. Shoop.

146s—Fuels and Combustion. Fuels: classification and analyses. Hand and stoker treatment; regulation. Pulverized and liquid fuels. Types of burners, controls. Combustion: generation of heat; furnace gases; stratification; flame way; smoke prevention. Furnaces. Lectures and recitations. 3 cred.; prereq., 30; IV MWF; 209Ex. Mr. Shoop.

147w—Advanced General Laboratory. (Mines.) (a) Tests of air compressor, steam turbine, compound steam engine, centrifugal fan, gas engine. (b) The use of hydraulic measuring devices, weirs, differential gages, etc., in tests of centrifugal pumps, hydraulic turbines and rams. 4 hours; prereq., 36; VI-IX Th; Ex. Messrs. Shoop and Straub.

149f,w,s—Advanced Steam Laboratory. Tests of steam turbines, uniflow and compound steam engines, condensers, evaporators, and vacuum pumps. Tests of compound steam pump. Air compressor, boiler, superheater, and power plant. Studies of fluid flow meters and air-conditioning apparatus. 2 cred.; prereq., 32 and 35. Mr. Shoop.

(1) I-IV T; Ex (2) (f,w) VI-IX T; Ex
(2) (s) VI-IX Th; Ex

241f—Advanced Thermodynamics. Reversible changes of state and efflux of wet and superheated vapors. Flow of compressible fluids in mains, moving channels, into receivers, and communicating vessels. Gas mixtures, critical points, liquefaction. Power plant cycles: regenerative, reheating, and bleeding. 2 cred.; prereq., 32. Mr. Shoop.

242f-243w—Power Plant Design. Problems, designs, and estimates for power plants and central stations. Selection of motive powers, relative advantages of steam, producers, and gas plants. Choice of engines and boilers; pumps, piping, and accessories. 2 cred. per qtr.; prereq., 137. Mr. Shoop.

244s—Power Plant Management. Operation and maintenance of boilers, engines, steam turbines, and accessory apparatus. Smoke prevention, lubricants and lubrication. Power plant finance. Daily logs and power costs. Study of recent power researches. 3 cred.; prereq., 144. Mr. Shoop.

INTERNAL COMBUSTION ENGINES

50f,w,s—Auto and Airplane Engines. Principles and types. Electrical systems. Lubrication and cooling. Carburetors. Accessories. 3 cred.; soph. Messrs. Robertson and Ford.

50f	(1) I TThS; 209Ex (M.E. only) (2) III MThF; 110Ex (M.E. only)	(3) I MWF; 110Ex
50w	(1) I TThS; 110Ex (M.E. only)	(2) I MWF; 110Ex
50s	(1) I MWF; 110Ex	(2) IV MWF; 110Ex

150f—Internal Combustion Engines. Laws of gases; gas cycles. Otto, semi-Diesel, and Diesel engines. Mechanism of various types. Carburetion, governing, cooling, lubrication. Combustion. Gas producers. 3 cred.; prereq., 30, 31. Mr. Robertson.

(1) I MF, III Th; 254ME (2) II MWS; 254ME

151w—Advanced Internal Combustion Engines. Special reference to automobile, truck, and airplane engines. Theoretical consideration of fuels, combustion, detonation, lubrication, etc. 3 cred.; prereq., 150; I MWF; 209Ex. Mr. Robertson.

152s—Aero Engine Testing. Use of modern research instruments and methods for testing. Experiments showing effect of fuel mixture, distribution, spark timing, etc., upon general engine performance. 2 cred.; prereq., 151; VI-VIII TF; Ex. Mr. Robertson.

153s—Automobile Fleet Maintenance. Study of available types of motor coaches and trucks, their design features from a maintenance viewpoint, a survey of service depot requirements with a study of fleet service methods and maintenance practice. Lectures and recitations. 3 cred.; seniors only; prereq., 150. Mr. Robertson.

155s—Internal Combustion Engines. (E.E.) Laws of gases; gas cycles, Otto, semi-Diesel, and Diesel engines. Carburetion, cooling, lubrication, and governing. Gas producers and power plants. 3 cred.; prereq., 139. Mr. Robertson.

Rec. (1) II TTh; 215Ex (2) III WF; 110Ex
Lab. (1) VI-VIII M; Ex (3) VI-VIII T; Ex
(2) I-III S; Ex (4) I-III Th; Ex

156w-157s—Design of Internal Combustion Engines. Calculations of inertia forces and size of cylinders for automobile, aircraft, and stationary service. Theoretical diagrams and details of parts. 2 cred.; prereq., 150. Mr. Robertson.

156w VII-IX W, I-III S; 251ME
157s VI-VIII T, II-IV W; 251ME

159f,w,s—Internal Combustion Engine Laboratory. Tests of gasoline, semi-Diesel, and Diesel engines. Power plant units and automotive engines. 2 cred.; prereq., 150 or reg. in 150. Messrs. Robertson and Ford.

(1) I-IV T; Ex (2) (f,w) VI-IX T; Ex
(2) (s) VI-IX Th; Ex

251f-252w-253s—Automobile and Motor Truck Design. Theory and design of the automobile, motor truck engine and chassis, complete design of engine, transmission, and chassis. Lecture and drawing room. 2 cred. per qtr.; grad. Mr. Robertson.

254s—Gas Tractor Design. Selection of wheel sizes; horse power weight and drawbar pull. Bearing pressures; ratios and strength of gearing. Details of principal parts. Senior option. 2 cred.; prereq., 156. Mr. Robertson.

255f-256w-257s—Automobile Testing and Research. Dynamometer and road tests including over-all efficiency of cars at various speeds, fuel consumption, effect of road surface on traction, efficiencies, and general performances. Special research problems. 2 cred. per qtr.; prereq., 155 or 159. Mr. Robertson.

258s—Motor Truck and Bus Transportation. Problems involving motor truck transportation, capacity of trucks, trailers, drawbar pull. Efficiencies. Effect

of road surface. Freight handling. Analysis of costs of truck operation and maintenance. Relative costs of transportation. 3 cred.; prereq., 152. Mr. Robertson.

HEATING, VENTILATION, AND REFRIGERATION

63s—Heating and Ventilation. Principles of heating and ventilation. Warm air, steam, hot water, vapor, vacuum, and fan systems of heating; pipe systems; heat regulation. Ventilation, synthetic air chart, humidification, central station heating. Recitations, lectures. 3 cred.; prereq., M.&M. 127, 128, and reg. in 129. Mr. Rowley.

Lect. III ThS; 110Ex
Rec. (1) II W; 209Ex (2) II M; 209Ex

163f—Heating and Ventilation. (Arch. E.) Principles of heating and ventilation including the design and layout of warm air, steam, hot water, vapor, vacuum, and fan systems of heating. Requirements and design of ventilating systems. General principles of central station heating. Recitations, lectures, and designs. 4 cred.; prereq., M.&M. 127, 128, 129; II MWF; 22E; VI-IX W; 217E. Mr. Rowley.

164s—Heating and Ventilation. (Arch.) Principles of heating and ventilation. Heating systems; furnaces, steam, hot water, vapor, vacuum and fan blast. Piping systems. Ventilation; humidification, synthetic air chart. Temperature regulation. 2 cred.; prereq., M.&M. 92; I TTh; 215Ex. Mr. Rowley.

165f,w—Advanced Heating and Ventilation. Special selected problems. 3 cred.; prereq., 63; I MWF; 209Ex(f), 252ME(w). Mr. Rowley.

166s—Compressed Air and Refrigeration 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. 3 cred.; prereq., 141; I MWF; 252ME.

167w—Advanced Heating and Ventilation. 3 cred.; prereq., 165; IV MWF; 154ME. Mr. Rowley.

169f,w,s—Heating and Ventilation Laboratory. Tests of heating, ventilating, and air conditioning equipment. The determination of air qualities as required for comfort and for specific industries. Tests and studies of complete installation. 2 cred.; prereq., 32. Mr. Algren.

(1) I-IV T; Ex (2) (f,w) VI-IX T; Ex
(2) (s) VI-IX Th; Ex

265f,w,s—Advanced Heating and Ventilation. Taken in connection with research work in the laboratory. Cred. ar.; grad. only; prereq., 63. Mr. Rowley.

267w—Mechanical Equipment of Buildings. Selection of heating, ventilating, and plumbing systems for various types of buildings. Piping layouts, for fire protection, air, gas, and vacuum cleaning systems, elevators. Designs and layout of equipment. Lectures and drafting. 3 cred.; prereq., 63, Phys. 43. Mr. Martenis.

INDUSTRIAL ENGINEERING

71s—Safety Engineering. Safety of the worker; fire and other hazards; prevention of industrial accidents. Compensation laws. Fire prevention; construction; automatic sprinkler systems. Effect of safety on production.

Factory sanitation. Safety organization. Lectures, assigned reading, factory inspections, and reports. 3 cred.; prereq., 171. Mr. Koepke.

76s—Tool Design and Construction. Tools, jigs, dies, and fixtures for manufacturing interchangeable parts. 3 cred. per qtr.; prereq., 15. Mr. Rogers.

171f—Production Factors. Principles and practice involved in economical production. Standardization. Requirements for uniformity and interchangeability. Jigs, fixtures, and special equipment; gases and inspection systems. Divisions of labor. Conveying, handling, and stores control. Fatigue elimination. 3 cred.; prereq., sr. with 15. Mr. Koepke.

(1) VI MWF; 252ME (2) IV MWF; 202ME

172w—Industrial Plants. Factory organization and construction for economical manufacture. Organization of the industry. Location and type of buildings, power development. Layout of plant. Routing systems and machine layout. Heating and ventilating requirements. Lighting. Sanitation. Distribution of power. Welfare features. Lectures, recitations, and drawing room practice. 3 cred.; prereq., 171; IV MWF; 202ME. Mr. Koepke.

173s—Industrial Management. General principles. Taylor system; wage, bonus, and profit sharing systems. Maintenance and depreciation. Purchasing. Allocation of cost, overhead, and machine burden. Graphical representation. 3 cred.; prereq., 171; I MWF; 202ME. Mr. Koepke.

174w—Industrial Management Laboratory. Planning department. Time and motion studies; rate setting. Instruction cards. Production control. Shop practice with investigations in local factories. Lectures, assigned reading practice, and reports. 3 cred.; prereq., 173; I MWF; 202ME. Mr. Koepke.

179s—Industrial Management. Labor administration. Foreman training. Training the worker; job analysis. Employment and turnover; the human element, service departments. Stabilization of labor. Lectures, reading, shop visits, and reports. 3 cred.; prereq., 274; I MFS; 202ME. Mr. Koepke.

277f-278w-279s—Industrial Engineering Problems. Special investigations of practical problems and suggested methods of procedure. Lectures, assigned reading, shop visits, and reports. 3 cred. per qtr.; grad.; prereq., 173, 274, 275, or reg. in 274, 275. Mr. Koepke.

NAVAL ARCHITECTURE

85f,w,s—Ships and Shipping. Types and sizes of ships, tonnage and classification requirements, factors governing choice of size and type of ship. Introductory course touching on the commercial side of ship design. 1 cred.; soph., jr., sr.

185f,w,s—Theoretical Naval Architecture. Ship measurement; stability and trim; resistance, coefficients, speed, and powering. 2 cred.; jr., sr., preferably preceded by 85.

185f,w VII-IX MTh; 251ME
185s VI-VIII MW; 251ME

186f,w,s—Theoretical Naval Architecture. Strength of ship as a whole, and of various parts of the ship under local stresses; effect of rolling, pitching, and vibration. 2 cred.; jr., sr.

186f,w VII-IX MTh; 251ME
186s VI-VIII MW; 251ME

187f,w,s—Ship Drawing. Preliminary design of commercial ships, including consideration of mechanical equipment, with special emphasis on river and lake transportation. 2 cred.; prereq., 185, 186.

HYDRAULIC MACHINERY

189s—Hydraulic Machinery. Theory of operation, design, construction, and regulation of water turbines. Turbine testing; characteristics, selection of type. Cost of turbines and water power. 3 cred.; sr.; prereq., M.&M. 129; IV MWF; 154ME.

RAILWAY MECHANICAL ENGINEERING

281f—Railway Technology. Systematic course of visits to the various railroad shops in the vicinity to study locomotive details and classifications. Locomotive practice. Lectures and reports. 1 cred.; prereq., M.&M. 127, 128, 129. Mr. Martenis.

282f-283w-284s—Locomotive Design and Construction. Locomotive details. Design of boiler, cylinders, frame, springs, trucks, axles, wheels, running gear, equalizing arrangements, valve gears, lubrication. Lectures, assigned reading, and drafting. 3 cred. per qtr.; prereq., 271. Mr. Martenis.

SEMINAR AND RESEARCH

190f-191w-192s—Seminar. Reading of assigned articles in current technical press. Classroom presentation of principal features of assigned articles. 1 cred. per qtr.; jr., sr. Messrs. DuPriest and Robertson.

(1) IV S; 154ME (2) IV S; 110Ex

290f-291w-292s—Mechanical Engineering Research. Courses may be elected which involve investigations in connection with lubrication, fuels, furnaces, boilers, steam engines, turbines, gas engines, heating and ventilation, industrial and other engineering problems. Reports, special problems, and related tests. Cred. as ar. per qtr.; prereq., 194 or reg. in 194. Messrs. DuPriest, Rowley, Shoop, Martenis, Koepke, and Robertson.

METALLOGRAPHY

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. 3 cred.; jr., sr. E.E. Mr. Forsyth.

Lect. I MW; 315M Lab. VI-VIII M; 307M

151w—Advanced Metallography for Electrical Engineers. 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. 3 cred.; prereq., 150. Mr. Forsyth.

Lect. I MW; 315M Lab. VI-VIII M; 307M

152f—Metallography for Aeronautical Engineers. Principles; metallography of iron and steel with special references to alloy steels, and light alloys used in airplane construction. Laboratory work and demonstrations. 3 cred.; prereq., sr. Aero.E. Messrs. Dowdell and Jerabek.

Lect. I TS; 315M Lab. VII-IX M; 307M

156w—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. 3 cred.; prereq., jr., sr. M.E. Mr. Dowdell.

Lect. III ThS; 315M
Lab. (1) VII-IX W; 307M (2) VII-IX F; 307M

157s—Advanced Metallography for Mechanical Engineers. 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. 3 cred.; prereq., 156. Mr. Dowdell.

Lect. III ThS; 315M
Lab. (1) VII-IX W; 307M (2) VII-IX F; 307M

160f—Metallography. (Chem.) Principles of metallography, including constitution diagrams, preparation and standardization of thermocouples, preparation and thermal analysis of alloys, their microscopic examination and photomicrographs; typical alloy systems such as iron carbon (steel, cast iron), and some non-ferrous alloys. Lab. work; 3 cred.; prereq., Anal. Chem. 1, 2. Mr. Jerabek.

Lect. III MF
Lab. (1) VI-VIII Th; 306M (2) Ar

161w—Advanced Metallography. (Chem.) Metallography and heat treatment of iron and steel, including alloy steels, commercial uses of various steels, and engineering specifications. Lab. work; 3 cred.; prereq., 160. Mr. Jerabek.

Lect. I MF
Lab. (1) VI-VIII Th; 306M (2) Ar

162s—Advanced Metallography. (Chem.) Metallography of the non-ferrous metals with a study of the constitution diagrams, properties, and uses of important commercial alloys. Lab. work; 3 cred.; prereq., 160. Mr. Jerabek.

Lect. III MF
Lab. (1) VI-VIII Th; 306M (2) Ar

163f—Advanced Metallography. Seminar work on recent advances in metallography. Lectures and recitations, with outside reading and special reports. May be accompanied by laboratory work. 3 cred.; prereq., 6 cred. in metallography. Mr. Dowdell.

164w—Advanced Metallography. Advanced consideration of the structures, properties, and uses of metals and alloys. May be accompanied by laboratory work. 3 cred.; prereq., 6 cred. in metallography. Mr. Dowdell.

165s—Advanced Metallography. Technical metallography as applied to the automotive industry. Lectures and special reports. May be accompanied by laboratory work. 3 cred.; prereq., 6 cred. in metallography. Mr. Dowdell.

201f-202w-203s—Advanced Metallography for Graduate Students. Intended primarily for research work. Mr. Dowdell.

METALLURGY

3f—General Metallurgy. Combustion, fuels, refractory materials, furnaces, and fluxes. Lectures and recitations. 3 cred.; prereq., Inorg. Chem. 8 or equiv.; I TThS; 108M. Mr. Christianson.

4w—Metallurgy of Pig Iron. General principles of iron blast furnace practice. Construction of furnace, handling of stock and products, principles of regu-

lations. Lect. and rec.; 3 cred.; prereq., 3; I TThS; 108M. Mr. Christianson.

5s—Metallurgy of Wrought Iron and Steel. General principles involved in the production of wrought iron and steel. Lect. and rec.; 3 cred.; prereq., 4; I TThS; 108M. Mr. Christianson.

106f—Metallurgy of the Base Metals. Lead, copper, zinc, and mercury. Consideration of smelting methods and principles involved in refining. Lect. and rec.; 4 cred.; prereq., 3; I F, III TThS; 108M. Mr. Pease.

107w—Metallurgy of the Base Metals. 4 cred.; prereq., 106; I F, III TThS; 108M. Mr. Pease.

108s—Metallurgy of the Precious Metals. Principles involved and methods used in the extraction of gold. silver, and other precious metals. Lect. and rec.; 4 cred.; prereq., 107; I F, III TThS; 108M. Mr. Pease.

109f—Metallurgy of Base Metals. (Ch.E., M.E.) Special consideration is given to mechanical appliances. Lect. and rec.; 3 cred.; prereq., Inorg. Chem. 8, 16 or equivalent; IV MWF; 108M. Messrs. Christianson and Pease.

109w—Metallurgy of Base Metals. (Chem. and elect. engr.) Special consideration is given to electrical appliances. Lect. and rec.; 3 cred.; prereq., Inorg. Chem. 8, 16 or equiv.; IV MWF; 108M. Messrs. Christianson and Pease.

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, R.O.T.C. Students registered in Electrical Engineering are assigned to the Signal Corps, all others are assigned to the Coast Artillery. No credits are allowed for this work.

ELECTIVE WORK

Students who have completed the Basic Course, R.O.T.C., may be selected for advanced work by the professor of military science and tactics. Those who pursue the Advanced Course are required to sign an agreement with the government to continue the two years' course to completion. This includes attendance at a training camp, held normally during the summer following the first year's advanced work. The camp is conducted free of cost to the student, and in addition, while actually in camp, the student receives the pay prescribed for the seventh grade in the army. Students pursuing the Advanced Course are also furnished a special uniform and receive a fixed allowance per day. The total government compensation for the two years' advanced work amounts to something over $200. Students who satisfactorily complete the Advanced Course will be commissioned in the Officers' Reserve Corps of the United States Army.

The University allows 18 credits for the two years' Advanced Course, R.O.T.C., in all units except the Signal Corps, in which a total of 21 credits is allowed. These credits may be applied towards graduation.

The Advanced Course for the students of this college embraces three departments: Infantry, Coast (Anti-aircraft) Artillery, and Signal Corps. The Signal Corps is open to electrical engineers only.

1f-2w-3s—First Year Basic Course, R.O.T.C.

Infantry. Practical and theoretical instruction in infantry drill, rifle marksmanship, hygiene and first aid, physical training, military courtesy, infantry equipment and ceremonies. No cred.; no prereq.

Coast Artillery. Duties of the Coast Artillery soldier, military customs and methods. Practical study of one anti-aircraft gun and carriage. Instruction for second class gunner, Coast Artillery, with particular reference to anti-aircraft artillery. No cred.; no prereq.

1f	(1) I MWF; A	(2) IX MWF; A
2w	(1) I MWF; A (2) VIII MWF; A	(3) IX MWF; A
3s	(1) I MF, IX W; A (2) IX MTF; A	(3) II TTh, IX T; A

Signal Corps. The National Defense Act and the R.O.T.C., military courtesy and discipline, military hygiene and first aid, military wire system, drill and command, army organization. No cred.; no prereq.

1f	(1) I MWF; A	(2) IX MWF; A
2w	(1) I MWF; 321EE (2) VII MWF; 321EE	(3) IX MWF; 321EE
3s	(1) I MF, IX W; A	(2) IX MTF; A

4f-5w-6s—Second Year Basic Course, R.O.T.C.

Infantry. Practical instruction in school of the platoon and company; command and leadership; scouting and patrolling; and automatic rifle; musketry; and interior guard duty. No cred.; prereq., 1-2-3.

Coast Artillery. Duties of non-commissioned officer of Coast Artillery; instruction for first class gunner, Coast Artillery Corps, with particular reference to anti-aircraft artillery. No cred.; prereq., 1-2-3.

4f-5w	(1) I TThS; A	(2) II TThS; A
6s	(1) I MF, IX W; A (2) I TTh, IX T; A (3) I TTh, IX W; A	(4) II TTh, IX T; A (5) IV MW, IX W; A (Agr. Engr. only)

Signal Corps. Drill and command, radio code and radio procedure. Crytography, message centers. No cred.; prereq., 1-2-3.

4f-5w	(1) III MWF; 321EE (2) VII MWF; 321EE	(3) IX MWF; 321EE
6s	(1) VII MW, IX T; A	(2) III MW, IX W; A

51f-52w-53s—First Year Advanced Course, R.O.T.C.

Infantry. Field engineering and combat principles; military sketching and map reading; machine gun; and command and leadership. 3 cred. per qtr.; prereq., 4-5-6.

Coast Artillery. Duties of the Coast Artillery officer; guns; carriages and gunnery, analysis, instruction for expert gunner, with particular reference to anti-aircraft artillery. 3 cred. per qtr.; prereq., 4-5-6. Major Shippam.

51f-52w Rec. (1) IV MWF; A (2) II MWF; A
Lab. (1) VIII-IX W; A (2) VIII-IX M; A
53s Rec. (1) IV MWF; A (2) II MWF; A
Lab. (1) IX W, I M or F; A (4) IX W, I T or Th; A
(2) IX T, IX M or F; A (5) IX T, II T or Th; A
(3) IX T, I T or Th; A

Signal Corps. Map reading and sketching, Signal Corps tactics, drill and command, pistol and personal equipment, radio, etc. 3 cred. per qtr.; prereq., 4-5-6. Lieut. Minckler.

51f IV MWF, I-II T; 321EE
52w VI MWF, I-II T; 321EE
53s Rec. VI-VII F
Lab. (1) I MF; IX W; A (3) VII MW, IX T; A
(2) IX MTF; A (4) III MW, IX W; A

54f-55w-56s—Second Year Advanced Course, R.O.T.C.

Infantry. 37 mm. gun; 3″ trench mortar; administration; military history and National Defense Act; combat principles; military law; rules of land warfare; command and leadership. 3 cred. per qtr.; prereq., 51-52-53.

Coast Artillery. Duties of Coast Artillery officer; command and leadership. Military history, military law, orientation, field engineering. Motor transport, completion of student's military education in preparation for his duties as a second lieutenant. 3 cred. per qtr.; prereq., 51-52-53.

54f-55w Rec. (1) I MWF; A (2) III MWF; A
Lab. (1) VIII-IX F; A (2) VIII-IX W; A
56s Rec. (1) I MWF; A (2) III MWF; A
Lab. (1) VIII-IX W; A (4) IX W, I T or Th; A
(2) IX T, IX M or F; A (5) IX T, II T or Th; A
(3) IX T, I T or Th; A

Signal Corps. Military history and policy, administration and supply, military law, field engineering, drill and command, communication engineering (Electrical Communication, E.E. 64-65-66 or 161-162-163). 1 cred. per qtr.; prereq., 51-52-53 and reg. E.E. 64-65-66 or 161-162-163.

54f-55w II ThF; 321EE
56s Rec. II Th; 321EE
Lab. (1) I MF, IX W; A (3) VII MW, IX T; A
(2) IX MTF; A (4) III MW, IX W; A

PHYSICAL EDUCATION FOR MEN

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.

1f†-2w-3s*—Freshman Physical Education. Mass activities, corrective exercise, apparatus work, swimming, games, and efficiency test. Cred.‡; no prereq. Messrs. MacMillan, McKusick, Penwell, and Piper.

(1) I MWF; 202S (6) III TThS; 202S
(2) I TThS; 202S (7) IV MWF; 202S
(3) II MWF; 202S (8) VI MWF; 202S
(4) II TThS; 202S (9) VII MWF; 202S
(5) III MWF; 202S (10) VIII MWF; 202S

Note.—Sections limited to 60 men.

* A maximum gymnasium fee of $1.50 is charged each quarter to students pursuing one or more of these courses.

† Course 1 may be offered as a substitute for Preventive Medicine 12s.

‡ See ‡ footnote, page 120.

7f-8w-9s—Advanced Leaders. One hour of instruction; two hours leading squads in Physical Education 1-2-3 or 16-17-18 under supervision. 1 cred. per qtr.; prereq., 1-2-3 or instructor's permission. Mr. Keller.

Lect. IV T; A Lab. Ar

10f-11w-12s*—Minor Sports. Study of nature and function of play; use of leisure time; rules, theory, technique, and values of different sports. Fall: advanced swimming, indoor baseball. Winter: winter sports, wrestling, squash racquets. Spring: soccer, golf, handball. Lecture one hour, practice three hours. 2 cred. per qtr.; prereq., 1-2-3 or permission. Mr. Keller.

Lect. IV S; A Lab. IV MWF; A

16f-17w-18s*—Drill Substitution. By petition in substitution for military science. Examiner, Dr. L. J. Cooke. No cred.; no prereq.

(1) I MWF; A
(2) II MWF; A
(3) III MWF; A
(4) IV MWF; A
(5) VI MWF; A
(6) VII MWF; A
(7) VIII MWF; A

30s*—Athletic Training and First Aid. Principles governing conditioning of men for various sports; diet, sleep, exercise, bathing, massage. Overtraining; its cause, diagnosis, prevention, and cure. Prevention and first aid treatment of common athletic injuries. 2 cred.; no prereq.; I MWF; A. Dr. Cooke.

PHYSICAL EDUCATION FOR WOMEN

This department aims to promote the physical efficiency 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 of residence; conducts yearly consultations with, and examines when necessary, all upper-class students; gives courses in hygiene; organizes neuro-muscular activity leading toward organic strength, nervous stability, conscious motor control, correct bodily mechanics, skill in handling the body in physical recreation, and the development of that valuable social quality known as good sportsmanship; cooperates 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 of all sophomores, who are permitted as free a choice among the sophomore courses as their physical condition permits (see "sophomore" courses; students who cannot swim must register for Course 22-23 during sophomore years). Physical examination or consultations are required annually of all students.

Women students in the College of Engineering and Architecture and the School of Chemistry take physical education instead of military science and tactics in the freshman and sophomore years and without numerical credit.

* A maximum gymnasium fee of $1.50 is charged each quarter to students pursuing one or more of these courses.

‡ Course 1-2-3 carries a total of three credits. The entire course must be completed before credit is received for any quarter.

Course 1f-2w-3s carries no credit when taken in place of military science and tactics by foreign students and others in the College of Engineering and Architecture.

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.

1f-2w-3s—Freshman Physical Education. Apparatus and floor work, hygiene, orthopedic exercise, folk dancing, sports. Individual health consultations. ½ cred. per qtr.; no prereq. Required of all new students.

1f	Lect.	(1) I W; 201WGm	(5) IV M; 201WGm
		(2) II T; 201WGm	(6) IV T; 201WGm
		(3) II Th; 201WGm	(7) VI W; 201WGm
		(4) III Th; 201WGm	(8) VI Th; 201WGm
	Lab.	(1) II MWF; 3,151,153WGm	(4) IV MWF; 3,151,153WGm
		(2) III MWF; 3,151,153WGm	(5) VI MWF; 3,151,153WGm
		(3) III TThS; 3,151,153WGm	(6) VIII MWF; 3,151,153WGm
2w	Lab.	(1) II MWF; 3,151,153WGm	(4) IV MWF; 3,151,153WGm
		(2) III MWF; 3,151,153WGm	(5) VI MWF; 3,151,153WGm
		(3) III TThS; 3,151,153WGm	(6) VIII MWF; 3,151,153WGm
3s	Lab.	(1) II MWF; 3,151,153WGm	(4) IV MWF; 3,151,153WGm
		(2) III MWF; 3,151,153WGm	(5) VI MWF; 3,151,153WGm
		(3) III TThS; 3,151,153WGm	(6) VIII MWF; 3,151,153WGm

4s*—Preliminary Hygiene. For nurses and transfer students. No cred.; no prereq.; II T; 206Pt.

7f,8w‡—Sophomore Gymnastics. Fundamental gymnastics based on the German, Swedish, and Danish systems. The exercises include work for flexibility, strength, and co-ordination. Apparatus work. No cred.; prereq., 1-2-3; IV TS; 153WGm.

9s—Sophomore Archery. Suitable in strength for girls in Individual Gymnastics. No cred.; prereq., 1-2-3.

(1) II MW; 151WGm
(2) IV TS; 151WGm
(3) VII WF; 151WGm

10f-11w-12s‡—Sophomore Orthopedic and Individual Gymnastics. For those who need more individual supervision than is possible in other classes. No cred.; prereq., 1-2-3. Dr. Tolg.

10f-11w	(1) I WF; 3WGm	(3) VI TTh; 3WGm
	(2) IV TS; 3WGm	
12s	IV TS; 3WGm	

13f,s-14w-15s—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. No cred.; prereq., 1-2-3 for 13, 13 for 14, 14 for 15. Miss Timberman.

13f	(1) VI TTh; 151WGm	(2) II TTh; 151WGm
13s	VI TTh; 151WGm	
14w	VI TTh; 151WGm	
15s	VI TTh; 151WGm	

16f,17w—Sophomore Games and Folk Dancing. Suitable in strength for C-D girls. Conducted outdoors when weather permits. No cred.; prereq., 1-2-3; I WF; 151WGm. Miss Dickson.

18s—Tennis. No cred.; prereq., 1-2-3.

(1) I TTh; 151WGm
(2) IV TS; 151WGm
(3) VI TTh; 151WGm
(4) VII WF; 151WGm
(5) VIII TTh; 151WGm

* No fee is charged for this course.
‡ Students may enter course any quarter.

19f-20w-21s—Sophomore Major Sports. Hockey in autumn, basket-ball in winter, baseball in spring. Suitable in strength for A-B girls. No cred.; prereq., 1-2-3.

19f	(1) V MW; 151WGm	(3) VIII TTh; 151WGm
	(2) VII WF; 151WGm	
20w	(1) V MW; 151WGm	(3) VIII TTh; 151WGm
	(2) VII WF; 151WGm	
21s	(1) V MW; 151WGm	(2) VII WF; 151WGm

22f,w,s-23w§—Sophomore Elementary Swimming. 22, elementary; 23, low intermediate. No cred.; prereq., 1-2-3.

22f,s-23w	(1) II TTh; 51WGm	(5) VII TTh; 51WGm
	(2) III MW; 51WGm	(6) VIII (3:30) TTh; 51WGm
	(3) IV TS; 51WGm	(7) VIII (4:00) TTh; 51WGm
	(4) IV MW; 51WGm	
22f,w,s	VII WF; 51WGm	

24f,s†—Sophomore Horseback Riding. Lessons for beginning and advanced classes under competent instruction, supervised by a member of the Department of Physical Education for Women. Miss Starr.

(1) VIII TTh; ar (2) IX TTh; ar

25f,s-26w§—Sophomore Intermediate Swimming. Wide range of strokes, elementary diving. No cred.; prereq., 1-2-3, elementary swimming test.

(1) III TTh; 51WGm (3) VI MW; 51WGm
(2) VIII (4:00) MW; 51WGm

27f,s¶—Sophomore Golf. The fall quarter is open to students who know the rudiments of golf, and the spring quarter is open only to beginners in golf. Miss Kissock.

27f	VI TTh; ar	
27s	(1) I TTh; ar	(3) II MW; ar
	(2) II TTh; ar	

28f,s-29w§—Sophomore Advanced Swimming. Advanced strokes and diving, life saving. No cred.; prereq., 1-2-3, intermediate swimming test; VIII (3:30) MW; 51WGm. Miss Starr.

30s—Sophomore Life Saving and Water Sports. Red Cross life saving leading to membership in the Life Saving division of the American Red Cross. No cred.; soph., jr., sr.; prereq., 1-2-3, and adv. swimming test; IX MW; 51WGm. Miss Starr.

31w‖—Sophomore Skating. Practice and technique of fundamental strokes. No cred.; prereq., 1-2-3.

(1) II TTh; ar (2) VII WF; ar

† Students registering for this course will pay for riding lessons at about $1 per lesson, but not the regular physical education fee. Attendance at class hour is required for credit.

§ The winter quarter is not open to students who have not had the fall or spring quarters. No student may register for more than two quarters of swimming without permission. Course 22 is never closed to senior registration.

¶ Students must supply their own golf equipment. Golf course at University. Recreation field will be used for 27f. Student tickets 10 for $4.50. No gymnasium fee is charged for this course.

‖ Class meetings will be fifty minutes in length, since weather and ice conditions will cause omission at times.

PHYSICS

3f,w,s,su—Elements of Mechanics. Mechanics of solids and fluids. Study of the simpler fundamental principles. First part of a general course 3, 9, 23, 33, 43. Course 4 should be taken in conjunction with this course. 3 cred.; prereq., M.&M. 12 or equiv. Mr. Erikson.

3f	Lect. (1) II MWF; 150Ph	(2) VI MWF; 150Ph
	Quiz (1) II Th; 150Ph	(2) IX Th; 150Ph
3w,s	Lect. VIII MWF; 150Ph	Quiz IX F or ar; 150Ph

4f,w,s,su*—Elements of Mechanics Laboratory. The laboratory part supplementing Course 3. 1 cred.; prereq., 3 or reg. in 3. Mr. Erikson.

4f	(1) VIII-IX, F; 153Ph	(8) III-IV T; 153Ph
	(2) VI-VII Th; 153Ph	(9) VI-VII, F; 153Ph
	(3) VIII-IX, M; 153Ph	(10) VI-VII, W; 153Ph
	(4) I-II, S; 153Ph	(11) VI-VII, M; 153Ph
	(5) I-II, W; 153Ph	(12) I-II, F; 153Ph
	(6) I-II, T; 153Ph	(13) III-IV, S; 153Ph
	(7) I-II, M; 153Ph	
4w,s	(1) VI-VII, M; 153Ph	(3) I-II, T; 153Ph
	(2) VIII-IX F; 153Ph	(4) VIII-IX M; 153Ph

9s—Acoustics. Study of the principles and application of sound. 3 cred.; no prereq.; III TThS; 133Ph. Mr. Buchta.

23f,w—Heat. Study of the principles underlying heat phenomena. Course 24 should be taken in conjunction with this course. 3 cred.; prereq., 3. Mr. Miller.

23f	Lect. III TThS; 150Ph	Quiz IX T; 150Ph
23w	Lect. (1) II MWF; 150Ph	(3) IV MWF; 150Ph
	(2) VI MWF; 150Ph	
	Quiz (1) II Th; 150Ph	(2) IX Th; 150Ph

24f,w*—Heat Laboratory. Laboratory part supplementing Course 23. 1 cred.; prereq., 4, 23, or reg. in 23. Mr. Miller.

24f	(1) VI-VII, M; 244Ph	(3) VI-VII, T; 244Ph
	(2) VIII-IX, M; 244Ph	(4) VIII-IX, T; 244Ph
24w	(1) VIII-IX M; 244Ph	(8) VIII-IX, F; 244Ph
	(2) III-IV, T; 244Ph	(9) VI-VII, Th; 244Ph
	(3) VIII-IX, T; 244Ph	(10) VI-VII, W; 244Ph
	(4) I-II, S; 244Ph	(11) I-II W; 244Ph
	(5) I-II M; 244Ph	(12) VI-VII F; 244Ph
	(6) I-II, T; 244Ph	(13) III-IV S; 244Ph
	(7) VI-VII, M; 244Ph	

33f,w,s—Optics. Experimental demonstrations of optical phenomena and a study of the fundamental optical principles. Course 34 should be taken in conjunction with this course. 3 cred.; prereq., 3.

33f	Lect. (1) I TThS; 133Ph	Quiz IX F; 133Ph
	(2) IV MWF; 133Ph	
33w	Lect. I TThS; 133Ph	Quiz VIII Th; 133Ph
33s	Lect. I TThS; 133Ph	Quiz IX F; 133Ph

34f,w,s*—Optics Laboratory. Laboratory part supplementing Course 33. 1 cred.; prereq., 33 or reg. in 33. Mr. Valasek and others.

(1) VI-VII Th; 236Ph	(2) VI-VII F; 236Ph

* A laboratory fee of $2 is charged for each of these courses.

43w,s—Electricity. Study of the principles underlying electric phenomena. Course 44 should be taken in conjunction with this course. 3 cred.; prereq., 3. Mr. Zeleny.

43w Lect. III TThS; 150Ph
Quiz IX T; 150Ph

43s Lect. (1) II MWF; 150Ph
(2) VI MWF; 150Ph
(3) IV MWF; 150Ph
Quiz (1) II Th; 150Ph
(2) IX Th; 150Ph

44w,s*—Electricity Laboratory. Laboratory part supplementing Course 43. 1 cred.; prereq., 4, 43, or reg. in 43. Mr. Zeleny.

44w (1) VI-VII, T; 231Ph
(2) VIII-IX, T; 231Ph
(3) VI-VII, W; 231Ph

44s (1) VIII-IX F; 231Ph
(2) III-IV T; 231Ph
(3) VI-VII F; 231Ph
(4) III-IV M; 231Ph
(5) I-II W; 231Ph
(6) VIII-IX M; 231Ph
(7) I-II M; 231Ph
(8) III-IV S; 231Ph
(9) I-II S; 231Ph
(10) II-III Th; 231Ph
(11) VIII-IX Th; 231Ph
(12) VI-VII W; 231Ph
(13) VI-VII Th; 231Ph
(14) III-IV W; 231Ph
(15) I-II F; 231Ph
(16) III-IV F; 231Ph

123s—Pyrometry and Heat. Experimental study of pyrometry, heat transfer, hygrometry, and gas liquefaction. One lecture, two three-hour sessions in the laboratory a week. 3 cred.; prereq., 23, 24; VI-IX MW; 245Ph. Mr. Miller.

144f*—Electricity Measurements. Devoted mainly to the study of potentiometer methods, capacity, inductance, magnetic flux. One lecture, one quiz hour and two two-hour laboratory periods a week. 3 cred.; prereq., 43, 44. Mr. Zeleny.

Lect. II Th; 166Ph
Quiz V M; 166Ph

Lab. (1) VI-VII TTh; 231Ph
(2) VIII-IX T, III-IV S; 231Ph
(3) III-IV T, VIII-IX Th; 231Ph
(4) VI-VII W, I-II S; 231Ph
(5) VIII-IX M, VI-VII F; 231Ph

For other electives in the Department of Physics see the bulletin of the College of Science, Literature, and the Arts.

PHYSIOLOGIC CHEMISTRY

100w,su—Physiologic Chemistry. Metabolism of proteins, fats, carbohydrates in health and disease. 5 cred.; prereq., physics and Organic Chemistry 53. Messrs. McClendon, Hemmingway, and Cavett.

Lect. IV MWF; 214MH

Lab. (1) I-III TTh; 310MH
(2) I-III FS; 310MH
(3) VI-VIII TTh; 310MH

101s,su—Physiologic Chemistry. Application of physical chemistry to physiology. 5 cred.; prereq., Physiology 100 and physical chemistry. IV MWF; 214MH. Mr. McClendon.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

3f,w,s—Personal Hygiene and Elementary Sanitation. 2 cred.; no prereq. Dr. Lees.

(1) IV TS
(2) IX TTh

12s—Hygiene and First Aid. Required of all male freshmen in Engineering Architecture, and Chemistry. No cred.; no prereq. Dr. Boardman.

(1) VII T; 305E
(2) IX F; 305E

* A laboratory fee of $2 is charged for each of these courses.

50f,w,s—Public and Personal Health. 3 cred.; prereq., jr., sr.; V MWF. Dr. O'Brien.

53f,s,su—Elements of Preventive Medicine. 3 cred.; prereq., Psy. 1-2, Bact. 51 or equiv., or by permission; II MWF. Dr. Diehl.

73w—Occupational Hygiene and Disease. 2 cred.; prereq., 53; IV MW. Dr. Myers.

NOTE.—Classroom schedule for courses in Preventive Medicine and Public Health will be posted on bulletin board in Millard Hall and published in the *Minnesota Daily* at the beginning of each quarter.

RHETORIC

(College of Agriculture)

22f,w,s—Public Speaking. Practical course in fundamentals of speech making. 3 cred.; prereq., 6. Mr. Routledge.

22f,s III MWF; 311En(UF)
22w (1) I MWF; 311En(UF) (2) II MWF; 311En(UF)

23f,w,s—Public Speaking. 5 cred.; prereq., 6; IV MTWFS; 311En(UF).

SOILS

4f—Soils. Origin, formation, composition, and classification of soils; physical properties, moisture relations; principles of tillage. Lecture, laboratory, and field work. 3 cred.; no prereq. Mr. Rost.

Lect. III TTh; 251Ch(UF)
Lab. (1) III-IV S; 253Ch(UF) (2) VIII-IX T; 253Ch(UF)

8w—Physical Properties of Soils. Determination of physical constants of soils, including mechanical composition, moisture equivalent, and hygroscopic coefficient. 3 cred.; prereq., 4. Mr. McMiller.

SPEECH

35w,s—Fundamentals of Speech. Study of speech as applied in the social adaptation of the individual and in his control of his environment. Emotional problems. Technique of thought. Oral reading and original speeches. 3 cred.; prereq., Engl. 6; I MWF; 335EE. Mr. Ramsland.

ZOOLOGY

14f-15w-16s*†—General Zoology. Structure, physiology, embryology, classification, and evolution of animals. Textbook, lectures, laboratory, and quizzes. 9 cred.; no prereq.; VI-VIII TTh; 101Z, 313Z. Mr. Dawson.

* A laboratory fee of $1 is charged each quarter.
† The entire course must be completed before credit is received for any quarter.

The Bulletin *of the* University *of* Minnesota

The College of Agriculture, Forestry, and Home Economics

Part I

Announcement of Courses for the Years 1930-1932

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CURRICULA

THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

FACULTY

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Edward E. Nicholson, M.A., Dean of Student Affairs
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Assistant Professors Robert C. Lansing, M.A., William J. Routledge, B.A.; Instructors Helen Thompson, M.A., Marjorie H. Thurston, M.A.

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PSYCHOLOGY

Professor Richard M. Elliott, Ph.D.

SOCIOLOGY AND SOCIAL WORK

Assistant Professor Gustave A. Lundquist, Ph.D.

ZOOLOGY

Assistant Professors Ralph W. Dawson, Ph.D., Samuel Eddy, Ph.D.

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 registrar's office, University Farm, St. Paul.

Admission is either by certificate (in the case of graduates of accredited schools) or by examination.

For details of admission requirements see the bulletin of general information.

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.

Applicants for admission are urged to present physics (1 unit) and chemistry (1 unit), for entrance. If not completed in the high school, additional work in these subjects will have to be taken in the University, thus postponing some of the technical 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 or in a well-organized dairy manufacturing plant.

ADVANCED STANDING

Advanced standing credit is allowed provisionally subject to one year satisfactory work in residence. Credits in courses from any recognized institution of college grade are accepted so far as such courses are equivalent in subject-matter to required or elective work of the curriculum. Students desiring to transfer to this college after completing two years or less in a junior college or an institution in which the technical courses are not available may do so with little or no loss of credit by so arranging their work as to correspond as closely as possible with the following suggestions:

Pre-Agriculture and Pre-Forestry Courses in Junior Colleges

Students from accredited junior colleges who have completed the general requirements described below will be admitted to the junior class in the agricultural and forestry courses. The amount of additional time required to complete the work for the degree of bachelor of science will depend (1) upon the quality and quantity of work which such students can do and (2) upon the special curriculum which they elect. Many of these

curricula may be completed in two years by students who maintain at least the average quality and quantity of work. Additional work in summer sessions or regular quarters may be necessary in some of the special curricula. Since a large number of fields of specialization are open to students, and since these curricula vary so greatly in the subject-matter courses required, it is impossible to make any more specific statement. The requirements given below can be satisfied in the average junior college which offers a fundamental arts and science curriculum. Students in some junior colleges can select additional subjects which may be directly applicable and very helpful in the field of specialization to be followed later. Students who have not completely met the requirements will be given proportional credit.

1. A total of 90 quarter credits (1 semester credit = 1.5 quarter credits)
2. Required courses:
   (a) Botany 9-15 cred.; Gen. Chem. 10-15 cred.; Zool. 9-15 cred.; Rhetoric and English 9-15 cred.
   (b) At least two of the following: Mathematics 9-15 cred.; Economics 9-15 cred.; Modern Language 15 cred.
   (c) Electives. Sufficient to bring total credits to a minimum of 90.

The following is a general list of electives applicable in one or more of the specialization fields. These subjects are, of course, not equally applicable in all fields. Sociology, psychology, economics, physics, history, advanced mathematics, technical business, agriculture, and engineering subjects, advanced English, public speaking, mechanical drawing, freehand drawing, surveying, qualitative, quantitative, and organic chemistry, advanced courses in zoology and botany, bacteriology, modern language (especially French and German). For prospective forestry students, physics and especially surveying are recommended.

Home Economics in Junior Colleges

In planning the work in the junior college with the idea of transferring to one of the home economics curricula the prospective transfer student should keep these facts in mind.

Physical and biological science courses such as general and inorganic chemistry, bacteriology, biology, and physiology are required. A student may receive exemption from physics if she has had one year of physics in high school.

Color and design, textiles, clothing, and foods courses are required in the freshman and sophomore years.

English including public speaking, psychology, and sociology are junior college requirements.

Credit may be allowed for such courses as listed above and for elective credits not listed.

PSYCHOLOGICAL EXAMINATION

All new students are required to take a psychological examination on entrance as a part of the matriculation procedure. Admission, however, does not depend upon the results of the examination.

EXAMINATION IN ENGLISH COMPOSITION

All freshman students are required to take the placement test in English. Those failing to pass the test will be required to do extra work in composition until their disability is removed. Students with exceptionally high scores may be exempted from part or all of the courses in freshman rhetoric.

PLACEMENT TESTS

The college desires to bring about the best correlation possible between the technical courses in the fields of agriculture, forestry, and home economics, as taught in the schools of agriculture, in the high schools, and in other institutions. Where students have taken considerable work in these technical courses, it may be desirable for them not to be required to repeat a part or all of this work in the elementary courses in the college. The amount of work taken in the preparatory school and the quality of that work, and, finally, the question as to whether or not the subject-matter course has been used for entrance to the University, must be taken into consideration In general, two possibilities for placement tests are offered:

1. For subjects not used for entrance to the University and in which the student has had adequate training, examinations may be taken for full credit in the elementary technical course in the college. These examinations may be taken during the first six weeks of residence without fee. After that time, a five-dollar fee is required.

2. For subjects which the student has used for entrance to the University, the student may, by satisfactory examination or by the presentation of other satisfactory evidence, be given permission to omit the elementary subject in the college course, substituting therefor credits in other subjects and taking immediately the more advanced courses in this field.

FEES

Tuition fee, per quarter	
Residents of Minnesota	$20.00
Non-residents	30.00
Credit hour tuition fee (for students registered for less than full work)	
Residents of Minnesota	1.50
Non-residents	2.25
Students in Agricultural Business Administration will pay the fees of the School of Business Administration in their junior and senior years.	
Incidental fee, per quarter	6.00
Military deposit (for all students registered for military drill)	10.00
Deposit (first quarter only)	5.00
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 Men, per quarter course	1.50
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 see general information bulletin for special fees	
Practice teaching laboratory, per credit hour	1.00
Examination for removal of condition	1.00
Examination for credit (after the first six weeks in residence)	5.00
Special examination	5.00
Change of registration	2.00
Graduation fee	10.00

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 curriculum including all of the required work and the requisite amount of elective work to make the total given below, candidates will be recommended for graduation with the degree indicated.

The number of free elective credits required for graduation will be decreased by one for each five honor points in excess of one honor point per credit. This provision does not apply to candidates in the professional curriculum in Agricultural Engineering.

Course of Study	Credit Requirement	Honor Point Requirement	Degree Conferred
Technical Agricultural courses	204	204	Bachelor of science
Agricultural Science courses	192	192	Bachelor of science
Forestry courses	204	204	Bachelor of science
Home Economics courses	193	193	Bachelor of science
Agricultural Engineering (professional course)	210	None	Bachelor of agricultural engineering
Agricultural Business Administration	192	192	Bachelor of business administration in agriculture
Agricultural Journalism	192	192	Bachelor of science

Degrees with distinction.—The degree of bachelor of science with distinction is granted to graduates of this college who have attained excellence in scholarship as evidenced by an average grade of two honor points per credit for the entire four-year curriculum. Transfer students with less than two years of work in this college shall not be eligible. Recommendations to the faculty for the degree with distinction shall be made through the Students' Work Committee on the basis of scholarship and other evidence of satisfactory achievement and advancement in the courses pursued.

Degrees with high distinction.—The degree of bachelor of science with high distinction is granted to graduates of this college who have attained special excellence in scholarship as evidenced by an average of two and one-half honor points per credit for the entire curriculum. The same con-

ditions for residence and recommendation apply as for the degree with distinction.

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.

TEACHER'S CERTIFICATES

Students expecting to receive certificates to teach 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 a 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 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. Applications should be sent to the director of Sanford Hall, University of Minnesota.

Private houses.—For information concerning approved boarding and rooming houses, address The Housing Bureau, University of Minnesota, Minneapolis.

STUDENTS' BOOKSTORE

The University owns and operates a bookstore for the convenience of students and faculty. Books and supplies are handled on a profit sharing basis, rebate checks being given on all purchases with the exception of candy, special bulletins, class material, and books obtained on individual orders.

CURRICULA

AGRICULTURE

(See pages 15 to 32.)

A. Technical Agricultural Curriculum. This curriculum 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[1]
3. Animal Industry
4. Agricultural Sciences and Plant Industry
5. Agricultural Engineering

Several suggested curricula have been arranged which students are advised to follow. These curricula are:

1. General Agriculture
2. Agricultural Education[1]
3. Agricultural Engineering
4. Animal Husbandry
5. Dairy Husbandry
6. Dairy Products
7. Farm Management
8. Fur Farming
9. Horticulture
10. Landscape Gardening

Students desiring to specialize in one of the agricultural sciences with a view to further study in the Graduate School may arrange majors in the following fields:

1. Agricultural Biochemistry
2. Agricultural Economics and Farm Management
3. Agronomy
4. Animal Husbandry
5. Dairy Husbandry
6. Entomology and Economic Zoology
7. Horticulture
8. Plant Pathology and Botany
9. Soils
10. Veterinary Medicine

B. Agricultural Science Curriculum. This curriculum provides opportunities for specializing in the following fields of work:

1. Agricultural Biochemistry
2. Agronomy
3. Entomology and Economic Zoology
4. Horticulture
5. Nutrition
6. Plant Breeding
7. Plant Pathology
8. Soils

C. Agricultural Engineering Professional Curriculum. The professional curriculum in Agricultural Engineering is offered jointly with the College of Engineering and Architecture. In addition to the outlined curriculum, electives may be selected in order to major in one of the following fields of work:

1. Farm Buildings
2. Farm Machinery
3. Reclamation

[1] Offered jointly with the College of Education.

D. Agricultural Business Administration Curriculum. Students desiring to prepare for admission to the School of Business Administration may complete the Agriculture-Pre-Business Curriculum in the College of Agriculture, Forestry, and Home Economics. The work of the junior and senior years is offered jointly with the School of Business Administration.

E. Agricultural Journalism. This curriculum is offered jointly with the College of Science, Literature, and the Arts.

FORESTRY

(See pages 33 to 38.)

The curriculum in Forestry provides an opportunity in the junior and senior years to major in one of the following fields:

1. General Forestry
2. Commercial Lumbering
3. Forest Technology
4. Grazing
5. Forest Sciences

HOME ECONOMICS

(See pages 39 to 47.)

In home economics opportunity is provided in the junior and senior years to major in 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

The following teacher's curricula are also offered jointly with the College of Education:

6. General Home Economics
7. Home Economics Extension
8. Foods and Nutrition
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 48 to 80. The program of classes is printed in Part II. 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 points.—See page 11 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.

REGISTRATION

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 (numbered 1 to 49) open to freshmen and sophomores, and senior college courses (numbered 50 to 199) open to juniors and seniors. In addition to satisfying other prerequisites a minimum of 90 credits and 90 honor points must be earned before registering for a senior college elective.

CURRICULA IN AGRICULTURE

A. TECHNICAL AGRICULTURAL CURRICULUM

This curriculum requires 204 credit hours for graduation and is made up of (1) required courses which every student must complete and (2) elective courses distributed according to several methods described below (pages 17 to 26.

Required Courses

These courses are required of every student before graduation. They constitute approximately half of the curriculum and are considered fundamental and necessary to any curriculum in technical agriculture. Every student must complete these courses, if possible, before the end of the sophomore year. Modifications in the requirements may be permitted upon approval by the Students' Work Committee where students have a very definite objective in their college curriculum in which substitutions for certain of the listed freshman and sophomore required courses may profitably be made. Approval of the adviser by special letter must be presented with the petitions to the Students' Work Committee.

For some students the outline of 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 cannot be taken in the freshman and sophomore years must take precedence the following year. Phys. Ed. 1-2-3, Gymnasium, 3 (credit is allowed only when the three quarters together with Course 4 are completed) may be taken in addition to the regular schedule if desired. Care should be taken in registration to give precedence to courses offered only one quarter.

Not more than one half of the listed credit will be allowed for the courses listed under the freshman and sophomore years, below, unless completed prior to classification as a senior year except in the case of students transferring with at least one full year of advanced standing from a college where these courses are not available.

FRESHMAN YEAR

1. *Non-credit courses* required for graduation in addition to the 204 credit hours.

Freshman Assembly. A course of lectures offered only in the fall quarter.

Mil. Sci. 1f-2w-3s, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.

Phys. Ed. 4f. Freshman Hygiene or Prev. Med. 3, Personal Hygiene and Elementary Sanitation, 2.

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.

Agr. Eng. 3 credits elected from the following: 5f, Farm Building Construction, 3; 13f,s, Gas Engines, 3; 28w, Land Clearing, 3; 31w,s, Principles of Drainage, 3; 37f,s, Rural Sanitation, 3. One or more of these courses are required in the junior and senior years of several of the outlined curricula. If completed in meeting this requirement some other of the above courses must be substituted in the junior or senior year.

Agr. Eng. 9f,w-10w,s, or 11f,w, Applied Mathematics, 5. Students found unable to pursue Course 11 to advantage will be transferred to Course 9-10 which covers the same work and carries the same credit but is extended through two quarters with additional scheduled time for class exercises. Not required of those who complete Math. 5 or 8.

[1]Agron. 1f,w. General Farm Crops, 3

[1,4]An. Husb. 10f,w-11w,s, Types and Market Classes of Livestock, 6

Bot. 1f,s, General Botany, 4 and 6 credits selected from the following: Bot. 2, 5, 7, 12, 13, 21, 22.

[1,4]Dy. Husb. 1f,s, Elements of Dairying, 5

[1]Hort. 6f, Fruit Growing, 3; or Hort. 32s, Vegetable Growing, 3

Inorg. Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high school chemistry may omit this course and register for Inorg. Chem. 9-10. Those required to take this course because of inability to carry successfully Inorg. Chem. 9-10 will be allowed not more than 10 credits.

Inorg. Chem. 9f-10w, Advanced General Inorganic Chemistry, 10. (1 yr. h. s. chem.) Those required to take Inorg. Chem 1-2-3 may omit this course.

Math. 5f,w,s, Higher Algebra, 5 (1 yr. Elem. Algebra) or Math. 8f,w,s, Commerce Algebra, 5 (Math. 5 or h. s. higher algebra). Not required of those who complete Agr. Eng. 9-10 or 11.

[2]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)

SOPHOMORE YEAR

1. *Non-credit courses* required for graduation in addition to the 204 credit hours.

Mil. Sci. 4f-5w-6s, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.

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.

[3]Agr. Biochem. 7f,w-8w,s, General Agricultural Biochemistry, 10 (Inorg. Chem. 10 cred.)

Agr. Econ. 1f,w, Principles of Economics I, 3

Agr. Econ. 2w,s, Agricultural Economics II, 5 (Agr. Econ. 1)

[1]Agr. Eng. 3f,s, Mechanical Drawing, 2

Agr. 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 curriculum.

Bact. 41f,w,s, General Bacteriology, 5 (Chem., zool.)

Zool. 14f-15w-16s, General Zoology, 9

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[1] Students presenting acceptable high school work in this course may substitute an elective.

[2] Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 77.

[3] Students who expect to major in Agricultural Education may substitute 10 credits elective for this course with the approval of the chief of the Division of Agricultural Education.

[4] Students who expect to major in landscape gardening may substitute for these courses 11 credits in freehand drawing and architectural design with the approval of the chief of the Division of Horticulture.

JUNIOR YEAR

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 (Inorg. Chem. 10 cred.)
Soils 5s, Soil Fertility, 3 (Inorg. Chem. 10 cred.)

ELECTIVE COURSES

Elective courses may be distributed according to one of the following methods: I (below) or II (page 18). Every student is required to file in the registrar's office by the end of his sophomore year a statement of the curriculum 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 curriculum at the end of the sophomore year. A change from one curriculum 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 curriculum 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 curricula.

Method I—*Open Elective Curricula*

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 curriculum 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 18 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
2. Agricultural Education
3. Animal Industry, including
   Animal Husbandry
   Dairy Husbandry
   Poultry Husbandry
   Veterinary Medicine

4. Agricultural Sciences and Plant Industry, including
   - Agricultural Biochemistry
   - Agronomy and Plant Genetics
   - Entomology and Economic Zoology
   - Horticulture
   - Plant Pathology and Botany
   - Soils
5. Agricultural Engineering

B. Groups from which electives only may be chosen

1. Forestry
2. Home Economics
3. Military Science and Tactics
4. Physical Education
5. Rural Publications and Journalism
6. Courses in departments of other schools and colleges of the University

Method II—*Suggested Elective Curricula*

The following curricula 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 curricula so that students will have an opportunity of getting courses in their proper sequence and without conflict. These specified curricula are offered in the hope that they will also be of value to the students in vocational guidance. Students who desire to select any of these curricula with modifications should study the changes involved to see whether or not the desired modifications admit of a possible program.

I. General Agriculture

Recommended for those students who desire a general curriculum 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 emphasizes 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 curriculum is completely included in the curricula in agricultural education and agricultural extension. It is included, with only a few substitutions, in the curricula in animal husbandry, dairy husbandry, and in horticulture.

JUNIOR YEAR	SENIOR YEAR
Fall Quarter	
Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)	Agr. Econ. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
Agron. 121f, Grain Crops, 3 (Agron. 1, Bot. 9 cred.)	Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 10-11)
Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)	Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 10-11)	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)	Soc. 14f,w,s, Rural Sociology, 3 (sr. class. or Sociol. 1)
Electives, 2 or 5	
Winter Quarter	
Agron. 132w, Farm Crops Plant Breeding, 3 (Agron. 131)	Agr. Econ. 141w,[1] Marketing Organization: Dairy and Poultry Products, 3 (Agr. Econ. 40)
An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)	Agr. Econ. 103w,s, Farm Management Operation, 3 (Agr. Econ. 102)
Ent. 3f,w, Economic Entomology, 3 (Zool. 16)	Agr. Eng. 7w, Farm Structures I, 3 (Agr. Eng. 3)
Electives, 8	An. Husb. 112w, Animal Breeding, 3 (Agron. 131)
	Vet. 9w, Veterinary Studies, 3 (Bact. 41)
	Electives, 2
Spring Quarter	
Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)	Vet. 10s, Veterinary Studies, 3 (Vet. 9)
Agr. Eng. 12s, Field Machinery, 3	Electives, 14
Agron. 123s, Forage Crops, 3 (Agron. 1, Bot. 9 cred.)	
An. Husb. 8s, Fundamentals of Feeding and Management, 5	
Hort. 32s, Vegetable Growing, 3 (May be omitted if completed as a part of the general requirements)	
Electives, 0 to 3	

2. Agricultural Education

PREPARATION FOR TEACHING AGRICULTURE

Students who have completed the required work of the freshman and sophomore years of the College of Agriculture, or equivalent, may prepare to teach agriculture in the public schools by completing the junior and senior years in a combined curriculum of the College of Education and the College of Agriculture.

The agricultural requirements can be fulfilled by the major, minor, and elective plan (Method I) as shown on page 17, or by completing the suggested curriculum below.

The education requirements can be fulfilled by completing satisfactorily 24 quarter credits in Agricultural Education courses some of which are required courses. The courses now required are 11, 42, 181, 182, 183.

[1] Agr. Econ. 110f, Economics of Agricultural Production I, 3 (Agr. Econ. 2) may be substituted for this course.

It is recommended that electives be chosen from the courses in Agricultural Education or from such of the subject-matter courses as will best complete a well-balanced and well-distributed preparation. In addition to those found in the suggested curriculum below may be mentioned Agr. Eng. 12; Agron. 122, 132; For. 27; Pl. Path. 9; Poult. 1; Pub. and Rur. Journ. 19. Recommended electives in Agr. Ed.: Agr. Ed. 141, 154, 161; Ed. Ad. 65T.

Graduates of the University of Minnesota completing these agriculture and education requirements will be eligible for the Minnesota "high school standard special" certificate for teaching agriculture and the sciences in high schools or elementary schools of this state.

The following curriculum may serve as a guide to students desiring a well-balanced preparation for teaching agriculture and the agricultural sciences, for serving as county agent, or for practical farming.

JUNIOR YEAR	SENIOR YEAR
Fall Quarter	
Agron. 121f, Grain Crops, 3 (Agron. 1, Bot. 9 cred.)	Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 10-11)	Agr. Ed. 181f, Teaching Agriculture, 5 (See Part II)
Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)	Agr. Econ. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
Hort. 6f, Fruit Growing, 3 (May be omitted if completed as a part of the general requirements)	Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 10-11)
Electives, 3 or 6*	Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
Winter Quarter	
Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)	Agr. Ed. 182w, Teaching Agriculture, 5 (See Part II)
An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)	Agr. Econ. 103w,s, Farm Management Operation, 3 (Agr. Econ. 102)
Ent. 3f,w, Economic Entomology, 3 (Zool. 16)	Sociol. 14f,w,s, Rural Sociology, 3 (Sociol. 1 or sr. class.)
Vet. 9w, Veterinary Studies, 3 (Bact. 41)	Electives, 6*
Electives, 5	
Spring Quarter	
Agr. Ed. 11f,w,s, Principles of Vocational Education, 3	Agr. Ed. 42f,w,s, Supervised Teaching Experience, 3 (See Part II)
Agr. Eng. 40f,s, Mechanical Training I, 3	Agr. Ed. 183s, Teaching Agriculture, 5 (See Part II)
Agron. 123s, Forage Crops, 3 (Agron. 1, Bot. 9 cred.)	Electives, 9*
An. Husb. 8s, Fundamentals of Feeding and Management, 5	
Vet. 10s, Veterinary Studies, 3 (Vet. 9)	

3. General Curriculum in Agricultural Engineering

Suggested for those who intend to prepare for general farming, with emphasis on engineering. Students desiring a professional curriculum in Agricultural Engineering are referred to the outline on pages 28 and 29.

* At least 3 of the elective credits listed in the junior and senior years must be chosen in Agricultural Education.

JUNIOR YEAR	SENIOR YEAR
Fall Quarter	
Agr. Eng. 5f, Farm Building Construction, 3	Agr. Eng. 19f, Elementary Surveying, 3 (Agr. Eng. 3, 11 or equiv.)
Agron. 121f, Grain Crops, 3 (Agron. 1, Bot. 9 cred.)	Agr. Eng. 24f, Agricultural Physics I, 4 (Agr. Eng. 11, 23 or equiv.)
An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 10-11)	Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)	Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 10-11)
Electives, 3	Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
	Elective, 1
Winter Quarter	
Agr. Eng. 7w, Farm Structures I, 3 (Agr. Eng. 3)	Agr. Econ. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
Agr. Eng. 31w,s, Principles of Drainage, 3	Agr. Eng. 25w, Agricultural Physics II, 4 (Agr. Eng. 24)
Agron. 122w, Grain and Hay Grading, 3 (Agron. 1, Bot. 9 cred.)	An. Husb. 112w, Animal Breeding, 3 (Agron. 131)
An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)	Sociol. 14f,w, Rural Sociology, 3 (Sociol. 1 or sr. class.)
Ent. 3f,w, Economic Entomology, 3 (Zool. 16)	Electives, 4
Electives, 2	
Spring Quarter	
Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)	Agr. Econ. 103w,s, Farm Management Operation, 3 (Agr. Econ. 102)
Agr. Eng. 12s, Field Machinery, 3	Agr. Econ. 142s, Marketing Organization: Fruits and Vegetables, 3 (Agr. Econ. 40)
Agr. Eng. 13f,s, Gas Engines, 3	Agr. Eng. 14s, Elementary Farm Power, 3 (Agr. Eng. 13)
Agr. Eng. 37f,s, Rural Sanitation, 3	Electives, 8
An. Husb. 8s, Fundamentals of Feeding and Management, 5	

4. General Curriculum in Animal Husbandry

For those who aim to make a special study of livestock as a preparation for (a) various phases of livestock farming, 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.

JUNIOR YEAR	SENIOR YEAR
Fall Quarter	
Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)	Agr. Econ. 40f,s, Principles of Marketing Organizations, 3 (Agr. Econ. 2)
Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)	Agr. Econ. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 10-11)	An. Husb. 7f, Meats, 3 (An. Husb. 2-3)
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)	An. Husb. 101f, Advanced Stock Judging, 3 (An. Husb. 4)
Vet. 2f, Comparative Anatomy and Physiology of Domestic Animals, 3	Vet. 6f, Physiology of Reproduction 4 (Vet. 2-3-4)
	Elective, 1

Winter Quarter

Agron. 122w, Grain and Hay Grading, 3 (Agron. 1, Bot. 9 cred.)
An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)
An. Husb. 112w, Animal Breeding, 3 (Agron. 131)
Ent. 3f,w, Economic Entomology 3 (Zool. 16)
Vet. 3w, Comparative Anatomy and Physiology of Domestic Animals, 3 (Vet. 2)
Electives, 2

Agr. Econ. 103w,s, Farm Management Operation, 3 (Agr. Econ. 102)
Agr. Econ. 143,[1] Marketing Organization: Livestock and Meats, 2 (Agr. Econ. 40)
Agr. Eng. 7w, Farm Structures I, 3 (Agr. Eng. 3)
An. Husb. 6w, Livestock Feeding, 5 (Agr. Biochem. 15)
Electives, 4

Spring Quarter

Agron. 123s, Forage Crops, 3 (Agron. 1, Bot. 9 cred.)
Agr. Eng. 12s, Field Machinery, 3
An. Husb. 4s, Livestock Judging, 3 (An. Husb. 2-3)
Vet. 4s, Comparative Anatomy and Physiology of Domestic Animals, 3 (Vet. 3)
Electives, 5

An. Husb. 102s, Horse Husbandry, 3 (An. Husb. 2-3) or
An. Husb. 103s, Beef Cattle Husbandry, 3 (An. Husb. 2-3) or
An. Husb. 104s, Sheep Husbandry, 3 (An. Husb. 2-3) or
An. Husb. 105s, Swine Husbandry, 3 (An. Husb. 2-3) or
An. Husb. 113s, Livestock Management, 3 (An. Husb. 2-3)
Electives, 14

5. General Curriculum 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, Principles of Animal Nutrition 3 (Agr. Biochem. 7-8)
Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)
An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 10-11)
Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 10-11)
Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
Vet. 2f, Comparative Anatomy and Physiology of Domestic Animals, 3

Winter Quarter

An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)
Dy. Husb. 3w, Dairy Bacteriology, 3 (Bact. 41)
Geol. 8f,w,s, Introductory Geology, 5
Vet. 3w, Comparative Anatomy and Physiology of Domestic Animals, 3 (Vet. 2)
Electives, 2

SENIOR YEAR

Fall Quarter

Agr. Econ. 40f, Principles of Marketing, 3 (Agr. Econ. 2)
Agr. Econ. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
Agron. 121f, Grain Crops, 3 (Agron. 1, Bot. 9 cred.)
Dy. Husb. 105f, Seminar I, 1 (3 courses in dy. husb.)
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
Electives, 2

Winter Quarter

Agr. Econ. 103w,s, Farm Management Operation, 3 (Agr. Econ. 102)
An. Husb. 112w, Animal Breeding, 3 (Agron. 131)
Dy. Husb. 103w, Dairy Stock Feeding, 3 (Dy. Husb. 101. Agr. Biochem. 15)
Dy. Husb. 106w, Seminar II, 1 (3 courses in dy. husb.)
Ent. 3f,w, Economic Entomology, 3 (Zool. 16)
Poult. 1f,w, Poultry, 3

[1] **Agr. Econ. 110f, Economics of Agricultural Production I, 3 (Agr. Econ. 2) may be substituted for this course.**

Spring Quarter

Agr. Econ. 101s, Farm Management, 3 (Agron. 1, Agr. Econ. 2)
Agron. 123s, Forage Crops, 3 (Agron. 1, Bot. 9 cred.)
Dy. Husb. 104s, Dairy Stock Selection, 3 (Dy. Husb. 6, 101)
Sociol. 1f,w,s, Introduction to Sociology, 3
Vet. 4s, Comparative Anatomy and Physiology of Domestic Animals, 3 (Vet. 3)
Electives, 2

Agr. Econ. 104s, Types of Farming, 3 (Agr. Econ. 103)
Agr. Eng. 40f,s, Mechanical Training I, 3
Animal Husbandry 105s, Swine Husbandry, 3 (An. Husb. 2-3)
Dy. Husb. 107s, Seminar III, 1 (3 courses in dy. husb.)
Electives, 6

6. General Curriculum in Dairy Products

Those desiring to specialize in dairy products may enter the Agricultural Science curriculum beginning with the freshman year or pursue the general requirements for the Technical Agricultural curriculum. In either case specialization will begin with the junior year. Major groups will be arranged to include suitable courses from the general curriculum in Dairy Husbandry and from the following of special importance to the dairy products field:

Agr. Biochem. 15, 101, 102, 103
Agr. Econ. 25, 40, 102, 103, 131, 140, 141, 142
Agr. Eng. 24, 25, 40, 121
Dy. Husb. 2, 4, 101, 102, 105, 107, 110, 111, 112, 113, 115
The minor may be in Agricultural Economics or Agricultural Biochemistry.

7. General Curriculum in Farm Management and Agricultural Economics

Opportunities for majoring in farm management and agricultural economics are offered in various lines. The best selection and sequence of courses depend upon the particular line which the student intends to follow. Students interested in majoring in this field are requested to consult with the division in working out a program of courses suited to their needs.

8. Curriculum in Fur Farming

Fur farming has recently developed into an established type of farming industry in Minnesota. The growth has been so rapid that it has not been possible to assemble and classify the experiences of successful and unsuccessful farms or to obtain by careful experimental investigations the same kind of scientific information which long established types of farming, such as dairy husbandry, enjoy. There is, nevertheless, an insistent demand for college training in this field, and within the colleges of the University many courses of study are available which contribute valuable information or basic principles of use to prospective fur farmers.

The Minnesota Agricultural Experiment Station is using every available opportunity to develop experiments and to collect information on this new type of agricultural industry. The following curriculum is offered as the best available at present in the University of Minnesota. While only a limited number of subject-matter courses deal directly with the practical phases of fur farming, all of the suggested courses have at least an indirect bearing on this type of farming. A completely detailed curriculum cannot

be suggested at present and the student must build his course by the open elective method under the guidance of an adviser. The subject matter courses of the junior-senior years have been carefully selected from all university departments offering information and training applicable or basic to fur farming.

FRESHMAN-SOPHOMORE YEARS

Same as for Technical Agricultural curriculum. Substitutions may be made for one or more of the following courses upon the approval of the adviser: Agron. 1, Hort. 6, An. Husb. 10-11, Dy. Husb. 1.

Major, minor, and elective courses may be selected from the following:

JUNIOR YEAR

Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
Agr. Econ. 7s, Natural Resources, 3
Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)
Ent. 3f,w, Economic Entomology 3 (Zool. 16)
Ent. 4s, Economic Vertebrate Zoology, 3 (Zool. 14-15)
Ent. 8f, Varieties and Habits of Fur Bearing Animals, 3 (Zool. 9 cred.)
Vet. 2f-3w-4s, Comparative Anatomy and Physiology of Domestic Animals, 9
Vet. 6f, Physiology of Reproduction, 4 (Vet. 2-3-4)
Vet. 12w, Infectious Diseases, 3 (Vet. 2-3-4, Bact 41)
Zool. 24f, Introduction to Animal Parasitology, 5 (Zool. 14-15-16)

SENIOR YEAR

Agr. Biochem. 116w, Advanced Animal Nutrition, 3 (Agr. Biochem. 15, and 111 or physiologic chem.)
Agr. Biochem. 117f,w,s, Laboratory Problems in Animal Nutrition, 3 (Agr. Biochem. 116, instructor's permission)
Agr. Econ. 101s, Farm Management, 3 (Agr. Econ. 2, Agron. 1)
Agr. Econ. 102f,w, Farm Management: Organization, 3 (Agr. Econ. 2, Agron. 1, Soils 4)
An. Husb. 112w, Animal Breeding, 3 (Agron. 131)
Zool. 144f,s-145w-146s, Animal Parasites and Parasitism, 9 (15 cred. in zool. or Zool. 1-2 and 1 yr. chem.)
Special lectures on fur farming will be arranged if possible.

Electives are suggested from the following departments:

Agricultural Economics, Agricultural Engineering, Bacteriology, Economics, Entomology and Economic Zoology, Horticulture, Plant Pathology and Botany, Poultry Husbandry, Soils, and Zoology

9. General Curriculum in Horticulture

A foundation curriculum suggested for those who purpose to engage in the production of horticultural crops or to enter into some horticultural business.

JUNIOR YEAR	SENIOR YEAR
Fall Quarter	
Agron. 121f[1], Grain Crops, 3 (Agron. 1, Bot. 9 cred.)	Agr. Econ. 13f,s, Gas Engines 3, or Agr. Eng. 40f,s, Mechanical Training. 3
Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)	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.)
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)	Hort. 135f, Truck Crops and Potatoes I, 3 (Hort. 32, Bot. 9 cred.)
Electives, 3 or 6	Hort. 193f, Horticultural Seminar, 1 (Hort. 9 cred.)
	Electives, 5

[1] Agronomy 123s, Forage Crops, 3 (Agron. 1, Bot. 9 cred.) may be substituted for this course.

Winter Quarter

Ent. 3f,w, Economic Entomology, 3 (Zool. 16)
Hort. 121w, Small Fruit Culture, 3 (Hort. 6 or 32, Bot. 9 cred.)
Hort. 56w, Plant Propagation and Nursery Practice, 3 (Bot. 9 cred.)
Electives, 8

Agr. Econ. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
Hort. 110w, Horticultural Crop Breeding, 3 (Agron. 131)
Hort. 137w, Truck Crops and Potatoes II, 3 (Hort. 32, Bot. 9 cred.)
Hort. 194w, Horticultural Seminar, 1 (Hort. 193)
Electives, 7

Spring Quarter

Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
Bot. 22f,w,s, Elementary Plant Physiology, 3 (Bot. 1)
Hort. 32s, Vegetable Growing, 3 (May be omitted if completed as a part of the general requirements.)
Hort. 72s, Woody Plants and Garden Flowers, 2 (Bot. 9 cred.)
Pl. Path. 112s, Diseases of Fruit Crops, 3 (Pl. Path. 1 or 10) or
Pl. Path. 113s, Diseases of Vegetable Crops, 3 (Pl. Path. 1 or 10)
Electives, 3 or 6

Agr. Econ. 142s[1], Marketing Organization: Fruits and Vegetables, 3 (Agr. Econ. 40)
Agr. Eng. 12s, Field Machinery, 3 or
Agron. 132w, Farm Crops Plant Breeding, 3 (Agron. 131)
Sociol. 14f,w,s, Rural Sociology, 3 (Sociol. 1 or sr. class.)
Electives, 8

10. Landscape Gardening

A suggested curriculum for students majoring in landscape gardening. Slight deviations may be allowed on recommendation of adviser.

JUNIOR YEAR

Fall Quarter

Agr. Eng. 19f, Elementary Surveying, 3 (Agr. Eng. 3, 11, or equiv.)
Arch. 31f,w,s, Elements of Architecture, 5
Hort. 6f, Fruit Growing, 3 (May be omitted if completed as a part of general requirements.)
Hort. 71f, Plant Materials I, 2 (Bot. 9 cred.)
Hort. 93f, Judging Horticultural Crops, 2 (Hort. 6 or 32)
Electives, 2 or 5

Winter Quarter

Arch. 32w,s, Elements of Architecture, 5 (Arch. 31)
Ent. 3f,w, Economic Entomology, 3 (Zool. 16)
Hort. 56, Plant Propagation and Nursery Practice, 3 (Bot. 9 cred.)
Hort. 74w, Landscape Design, 3 (Hort. 71, Arch. 21 or Agr. Eng. 3)
Electives, 3

SENIOR YEAR

Fall Quarter

Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)
Arch. 14f, History of Architecture, 2 (Arch. 33)
Hort. 193f, Horticultural Seminar, 1 (Hort. 9 cred.)
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
Electives, 6

Winter Quarter

Arch. 15w, History of Architecture, 2 (Arch. 14)
Hort. 110w, Horticultural Crop Breeding, 3 (Agron. 131)
Hort. 191w, Special Problems, 3 (Hort 190)
Hort. 194, Horticultural Seminar, 1 (Hort. 9 cred.)
Electives, 8

[1] Agr. Econ. 110f, Economics of Agricultural Production I, 3 (Agr. Econ. 2) may be substituted for this course.

Spring Quarter

Arch. 33s, Elements of Architecture, 5 (Arch. 32)
Hort. 32s, Vegetable Growing, 3 (May be omitted if completed as a part of general requirements.)
Hort. 50s, Floriculture, 3
Hort. 72s, Woody Plants and Garden Flowers, 2 (Bot. 9 cred.)
Electives, 4 or 7

Arch. 16s, History of Architecture, 2 (Arch. 15)
Hort. 76s, Landscape Construction, 3 (Hort. 71)
Hort. 192s, Special Problems, 3 (Hort. 191)
Hort. 195s, Horticultural Seminar, 1 (Hort. 9 cred.)
Pl. Path. 112s, Diseases of Fruit Crops, 3 (Pl. Path. 1 or 10) or
Pl. Path. 114s, Advanced Forest Pathology, 3 (Pl. Path. 1 or 10)
Electives, 5

AGRICULTURAL SCIENCES

Opportunity is offered to students who have completed the required courses of the Technical Agricultural curriculum and who desire to specialize in the various branches of agriculture and agricultural sciences. Students who desire such specialization are advised, however, to follow the requirements of the Agricultural Science curriculum from the beginning of the freshman year. 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 curriculum 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 curricula. Since a comparatively small number of students will enter these special curricula and since the specialization may vary considerably even in one field with the individual student, complete curricula are not suggested in all lines.

Students in these curricula 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.

Students are advised to construct a curriculum in accordance with the open elective system (Method I, page 17) including as many of the subjects listed under the General Curriculum in Agriculture as are consistent with their special curriculum. 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.

The divisions offering such opportunities for specialization are listed below. In each case the student should consult with the division in the selection of his major, minor, and electives.

1. Agricultural Biochemistry
2. Agronomy and Plant Genetics
3. Animal Husbandry
4. Dairy Husbandry
5. Entomology and Economic Zoology
6. Farm Management and Agricultural Economics
7. Horticulture
8. Plant Pathology and Botany
9. Soils
10. Veterinary Medicine

B. AGRICULTURAL SCIENCE CURRICULUM

This curriculum requires 192 credit hours for graduation and is made up of (1) required courses with such options as are indicated in the freshman and sophomore years, and (2) a major and electives in the junior and senior years.

FRESHMAN YEAR

1. *Non-credit courses* required for graduation in addition to the 192 credit hours.

Freshman Assembly. A course of lectures offered only in the fall quarter.

Mil. Sci. 1f-2w-3s, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.

Phys. Ed. 4f, Freshman Hygiene or Prev. Med. 3, Personal Hygiene and Elementary Sanitation, 2

2. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and the prerequisites must be observed.

Bot. 1f,s, General Botany, 4 and 6 cred. selected from the following: Bot. 2, 5, 7, 12, 13, 21, 22; or Zool. 14f-15w-16s, General Zoology, 9

Inorg. Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high school chemistry may omit this course and register for Inorg. Chem. 9-10. Those required to take this course because of inability to carry successfully Inorg. Chem. 9-10 will be allowed not more than 10 credits.

Inorg. Chem. 9f-10w, Advanced General Inorganic Chemistry, 10 (1 yr. h. s. chem.). Those required to take Inorg. Chem. 1-2-3 may omit this course.

Math. 5f,w,s, Higher Algebra, 5; Math. 6f,w,s, Trigonometry, 5 (Math. 5 or equiv.); and Math. 7f,w,s, College Algebra, 5 (Math. 6) or modern language, 15

Rhetoric 1f,w,s-2w,s,f-3s,f,w, Rhetoric, 9

SOPHOMORE YEAR

1. *Non-credit courses* required for graduation in addition to the 192 credit hours.

Mil. Sci. 4f-5w-6s, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.

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.

Agr. Biochem. 7f,w-8w,s, General Agricultural Biochemistry, 10 (Inorg. Chem., 10 cred.)

Bot. 1f,s, General Botany, 4 and 6 cred. selected from the following: Bot. 2, 5, 7, 12, 13, 21, 22; or Zool. 14f-15w-16s, General Zoology, 9

Bact. 41f,w,s, General Bacteriology, 5 (Chem., zool.)

Math. 5f,w,s, Higher Algebra, 5; Math. 6f,w,s, Trigonometry, 5 (Math. 5 or equiv.); and Math. 7f,w,s, College Algebra, 5 (Math. 6) or modern language, 15

Rhet. 11f,w,s, Argumentation, 3 (Rhet. 3, Rhet. 22 advised)

Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)

JUNIOR AND SENIOR YEARS

1. A major sequence of 24 to 36 credits from one of the following fields:
   a. Agricultural Biochemistry
   b. Agronomy
   c. Entomology and Economic Zoology
   d. Horticulture
   e. Nutrition
   f. Plant Breeding
   g. Plant Pathology
   h. Soils
2. A minor sequence of 18 credits to be chosen outside the major field of work.
3. Electives sufficient to make a total of 192 credit hours for the four years of work of which at least 21 credit hours must be in technical agriculture or in sciences fundamental thereto.

C. AGRICULTURAL ENGINEERING

(Professional Curriculum)

This curriculum leads to the degree of bachelor of agricultural engineering and is offered jointly by the College of Agriculture, Forestry, and Home Economics, and the College of Engineering and Architecture. Three distinct lines of specialization are provided, namely, Farm Buildings, Farm Machinery, and Reclamation. (See also general curriculum in Agricultural Engineering for students in Agriculture who desire to major in this field, page 20.

FRESHMAN YEAR

During the freshman year those following this curriculum will register in the College of Engineering and Architecture and follow the work of the freshman year as outlined in the bulletin of that college.

SOPHOMORE YEAR

The following courses should be scheduled for the quarter as indicated below. For the last three years of the curriculum students are registrants both of the College of Agriculture, Forestry, and Home Economics, and the College of Engineering and Architecture.

1. *Non-credit courses* required for graduation.

Mil. Sci. 4f-5w-6s, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.

2. *General courses.*

Agr. Eng. 12s, Field Machinery, 3
Agr. Eng. 13f,s, Gas Engines, 3
Agr. Eng. 19f-20s, Surveying, 6 (Draw. 3 or M. & M. 12, or equiv.)
Agr. Eng. 31w,s, Principles of Drainage, 3
Agr. Eng. 40f,s, Mechanical Training I, 3
Agron. 1f,w, General Farm Crops, 3
Hort. 6f, Fruit Growing, 3
M. & M. 24f,w,s, Differential Calculus, 5 (M. & M. 13)
M. & M. 25f,w,s, Integral Calculus, 5 (M. & M. 24)
M. & M. 84f,s, Technical Mechanics, 5 (M. & M. 25)
Phys. 3f,w,s, Elements of Mechanics, 3 (M. & M. 12 or equiv.)
Phys. 4f,w,s, Elements of Mechanics Laboratory, 1 (3 or parallel)
Phys. 23f,w, Heat, 3 (Phys. 3)
Phys. 24f,w, Heat Laboratory, 1 (Phys. 23 or parallel)
Phys. 43f,w,s, Electricity, 3 (Phys. 3)
Phys. 44f,w,s, Electricity Laboratory, 1 (Phys. 43 or parallel)
Soils 4f, Soils, 3 (Inorg. Chem. 10 cred.)
Soils 8w, Physical Properties of Soils, 3 (Soils 4) or Agr. Eng. 42w, Principles of Irrigation, 3

JUNIOR YEAR	SENIOR YEAR
Fall Quarter	
Agr. Eng. 37f,s, Rural Sanitation, 3	Agr. Econ. 102f,w, Farm Management Organization, 3 (Agr. Econ. 2, Soils 4)
Agr. Eng. 122f, Power Machinery, 3 (Agr. Eng. 12, 13)	C. E. 51f, Highways and Pavements, 3 (Agr. Eng. 20)
Econ. 8f, General Economics, 3	C. E. 144f, Reinforced Concrete, 3 (M. & M. 85)
Geol. 5f, Engineering Geology, 3	Electives, 8
M. & M. 128f, Strength of Materials, 4 (M. & M. 84)	
Electives, 2	
Winter Quarter	
Econ. 9w, General Economics 3 (Econ. 8)	Agr. Econ. 103w,s, Farm Management Operation, 3 (Agr. Econ. 102)
Agr. Eng. 7w, Farm Structures I, 3 (Draw. 3 or equiv.)	Agr. Eng. 121w, Steam Boilers and Engines, 3 (Phys. 23, 24)
Agr. Eng. 42w, Principles of Irrigation, 3	Agr. Eng. 133w, Applied Electricity, 3 (Phys. 43, 44 or equiv.)
M. & M. 86w, Hydraulics with Laboratory, 3 (M. & M. 84)	Electives, 8
M. E. 23w, Mechanism and Kinematics, 3 (Draw. 27, M. & M. 24)	
Electives, 2	
Spring Quarter	
An. Husb. 15s, Fundamentals of Livestock Production, 3	Agr. Eng. 150s, Seminar, 2 (Agr. Eng. 102, 112, 125)
C. E. 42s, Structural Engineering, 3 (M. & M. 85)	B. A. 67s, Market Administration, 3 (Econ. 8-9)
Dy. Husb. 7s, Elements of Dairying, 3	G. E. 193s, Engineering Practice, 2 (sr. class.)
Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)	Pol. Sci., 28s, Business Law, 3
M. E. 27s, Machine Design, 3 (M. E. 23)	Electives, 9
Electives, 2	

RECOMMENDED ELECTIVES

1. *Farm Structures*
Agr. Eng. 5, 67, 112; For. 27; Rhet. 22; M.E. 164
2. *Farm Mechanics*
Agr. Eng. 14, 15, 28, 40, 101, 123, 125, 126; Rhet. 22
3. *Reclamation*
Agr. Eng. 28, 40, 101, 102, 103, 104; C.E. 161; Rhet. 22

D. AGRICULTURAL BUSINESS ADMINISTRATION CURRICULUM

This curriculum 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 prescribed and include introductory courses in agriculture, economics, and the fundamental sciences necessary for further work in agriculture and economics. During the freshman and sophomore years, students will register in the College of Agriculture, Forestry, and Home Economics. In the junior and senior years the student will register in both the School of Business Administration and the College of Agriculture, Forestry, and Home Economics. At least 90 credits and honor points equal to the number of credits are required for admission to the junior class. For definition of "honor point" see page 11. Approximately one third of the last two years is elective and may include

approved courses in any college as well as advanced courses in agriculture and economics. The fees for the first two years are those for the College of Agriculture, Forestry, and Home Economics. For the last two years the fees are those of the School of Business Administration.

FRESHMAN YEAR

The freshman year consists of the regular freshman courses outlined on pages 15 and 16, except that students are advised to take Math. 8 rather than Agr. Eng. 9-10, or 11; or Math. 5 if they do not have the prerequisites for Math. 8. If any course of the freshman year is deferred, it should be An. Husb. 10-11, to the sophomore year.

SOPHOMORE YEAR

The following courses should be scheduled for the quarters as indicated below.

1. *Non-credit courses* required for graduation.

Mil. Sci. 4f-5w-6s, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.

2. *Freshman courses* which were not completed during the freshman year.

3. *General courses*

Agr. Econ. 1f, Principles of Economics I, 3
Agr. Econ. 2w, Principles of Economics II, 5 (Agr. Econ. 1)
Agr. Econ. 8s, Rural Economics, 3 (Agr. Econ. 1)
Agr. Econ. 50s, Farm Finance, 5 (Agr. Econ. 2)
[1]Econ. 20, Elements of Accounting, 3
Econ. 25w-26s, Principles of Accounting, 6
Psychology 1f-2w, General Psychology for Business Students, 6
Zool. 14f-15w-16s, General Zoology, 9

4. *Electives.*—Enough elective credits should be selected to make with the required work of the freshman and sophomore years a total of 101 credit hours.

JUNIOR YEAR

1. *General Requirements*

Bus. Adm. 100f,w,s, Report Writing, 1 (To be taken in connection with Econ. 141)
Econ. 51f-52w-53s, Business Law, 9 (10 cred. in pol. sci. or 10 cred. in econ. or 5 cred. in each)
Econ. 141f,w,s, Monetary and Banking Policies, 3 (Econ. 3 and 4 or 6-7)

2. *Special Requirements*

Agr. Econ. 30f, Prices of Farm Products, 3 (Agr. Econ. 2)
Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
Agr. Econ. 90f, Agricultural Statistics, 5 (Agr. Econ. 2)
Agr. Econ. 110f-111w, Economics of Agricultural Production, 6 (Agr. Econ. 2)
Agr. Econ. 131w, Market Prices, 3 (Agr. Econ. 40)
Agr. Econ. 141w, Marketing Organization: Dairy and Poultry Products, 3 (Agr. Econ. 40)
Agr. Econ. 142s, Marketing Organization: Fruits and Vegetables, 3 (Agr. Econ. 40)

SENIOR YEAR

1. *General Requirements*

Bus. Adm. 58, Public Finance, 3
Bus. Adm. 71, Traffic Management, 3
Bus. Adm. 101f,w-102w,s, Advanced General Economics, 6 (Econ. 4 or 6-7)
Bus. Adm. 139s, Advanced General Accounting, 3 (Econ. 25-26)
Econ. 149f,w,s, Business Cycles, 3 (Econ. 3 and 4 or 6-7)

[1] Students who have had a high school course or experience in bookkeeping may be exempted from this course and admitted to Econ. 25-26 by passing a placement test.

2. Special Requirements
Agr. Econ. 135s, Methods of Price Analysis, 3 (Agr. Econ. 30, 191)
Agr. Econ. 150s, Advanced Farm Finance, 3 (Agr. Econ. 50 or Econ. 3)
Agr. Econ. 170s, Land Economics, 3 (Agr. Econ. 110)

E. AGRICULTURAL JOURNALISM CURRICULUM

This curriculum is intended for those who wish to prepare for some branch of journalism which relates to agriculture: such as staff positions on agricultural magazines, writing on agricultural questions, editing of bulletins for state and federal departments of agricultural and experimental stations, editing of special farm pages or departments for newspapers, and editing of publications for farm organizations. The first two years are prescribed and include introductory courses in agriculture, journalism, and economics. During the freshman and sophomore years, students will register in the College of Agriculture, Forestry, and Home Economics, and during the junior and senior years, will become registrants in both the College of Agriculture, Forestry, and Home Economics and the College of Science, Literature, and the Arts.

FRESHMAN YEAR

The freshman year consists of the regular freshman courses outlined on pages 15 and 16 except that English A-B-C should be substituted for Rhetoric 1-2-3.

SOPHOMORE YEAR

Mil. Sci. 4-5-6, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.
Agr. Econ. 1f,w-2w,s, Principles of Economics I-II, 8
Agr. Econ. 8s, Rural Economics, 3 (Agr. Econ. 1)
Engl. 11f,w,s-12w,s, Description and Narration, 6 (A-B-C, or 4-5-6 or exemption from req.)
Jour. 13f, Introduction to Reporting, 3 (Engl. A-B-C, Comp. 4-5-6 or exemption)
Jour. 14w-15s, Newspaper Reporting and Correspondence, 6 (13 or practical experience, and Comp. 11-12 or 18-19)
Psy. 1f-2w, General Psychology (for business students) 6
Zool. 14f-15w-16s, General Zoology, 9

JUNIOR YEAR

Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
Agr. Econ. 90f, Agricultural Statistics, 3 (Agr. Econ. 2)
Agr. Econ. 110f-111w, Economics of Agricultural Production, 6 (Agr. Econ. 2)
Jour. 51f-52w, Newspaper Copyreading and Make-Up, 6 (Jour. 15)
Jour. 57s, Magazine Typography, 2 (Jour. 51)
Jour. 69s, The Writing of Special Articles, 3
Sociol. 1f,w,s, Introduction to Sociology, 5
Sociol. 14f,w,s, Rural Sociology, 3 (Sociol. 1 or sr. class.)

SENIOR YEAR

Agr. Econ. 30f, Prices of Farm Products, 3 (Agr. Econ. 2)
Agr. Econ. 135s, Methods of Price Analysis, 3 (Agr. Econ. 30, 191)
Econ. 149f, Business Cycles, 3 (Econ. 3 and 4 or 6-7)
Jour. 75s, Law of the Press, 3 (Jour. 51)
Jour. 104f, Editorial Writing, 3 (Jour. 73 and 25 cred. in soc. sci.)
Jour. 191w-192s. Topics, 6 (Jour. 104, 110)
Pub. and Rur. Jour. 10f-11w-12s, Agricultural Journalism, 9 (Jour. 13-14-15, 51-52)
Psy. 56w, Psychology of Advertising, 3 (Psy. 1-2 and Prin. of Econ.)

RECOMMENDED ELECTIVES

Agr. Econ. 25, 126, 170; Agr. Ed. 11, 75; Engl. 44-45; For. 1; Geog. 51; Jour. 60-61, 70-71; Pol. Sci. 1, 2; Sociol. 110, 112.

MINOR IN JOURNALISM

For students in the various divisions of the College of Agriculture, Forestry, and Home Economics wishing a short course in journalistic writing, elections from the following program are recommended:

Engl. Comp. 11-12; Jour. 13, 41, 69, 70-71.

For students majoring in home economics, Jour. 65 is recommended.

CURRICULA IN FORESTRY

The curriculum is made up of 204 credit hours of work including:

1. Required courses, 137 to 154 credit hours, which every student must complete.

2. Elective courses, 50 to 67 credit hours, distributed according to several methods described below (pages 35 to 38).

(For explanation of terms and course numbers, see page 13.)

REQUIRED COURSES

Required courses, 137 to 154 credit hours, are required of every student before graduation. These are considered fundamental and necessary to any curriculum 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 cannot be taken in the freshman and sophomore years must take precedence the following year. Phys. Ed. 1-2-3, Gymnasium, 3 (credit is allowed only when the three quarters together with Course 4 are completed), may be taken in addition to the regular schedule if desired. Care should be taken in registration to give precedence to courses offered only one quarter.

Students selecting a major in commercial lumbering, forest technology, grazing, and forest sciences will be permitted to make certain substitutions in the forestry courses included in these requirements.

Not more than one half of the listed credit will be allowed for the courses listed under the freshman and sophomore years, below, unless completed prior to classification as a senior except in the case of students transferring with at least one full year of advanced standing from a college where these courses are not available.

FRESHMAN YEAR

1. *Non-credit courses* required for graduation in addition to the 204 credit hours.

Freshman Assembly. A course of lectures offered only in the fall quarter.

Mil. Sci. 1f-2w-3s, Basic Course. Students found to be physically unfit may be required to substitute corrective exercises in physical education.

Phys. Ed. 4f, Freshman Hygiene or Prev. Med. 3, Personal Hygiene and Elementary Sanitation, 2

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.

Agr. Eng. 3f,s, Mechanical Drawing, 2

Bot. 1f,s, General Botany, 4, and 6 credits selected from the following: Bot. 2, 5, 7, 12, 13, 21, 22

For. 1f, General Forestry, 3

For. 3w, Dendrology, 3

For. 4s, Dendrology, 4

Inorg. Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high school chemistry may omit this course and register for Inorg. Chem. 9-10. Those required to take this course because of inability to carry successfully Inorg. Chem. 9-10 will be allowed not more than 10 credits.

Inorg. Chem. 9f-10w, Advanced General Inorganic Chemistry, 10 (1 yr. h. s. chem.). Those required to take Chem. 1-2-3 are exempt.
Math. 3f,w, Higher Algebra, 4. Students presenting higher algebra for entrance may omit this course and substitute 4 credits elective.
Math. 4f,w, Trigonometry, 4 (Math. 3 or equiv.)
[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)

Itasca Park (Summer Session)

Transfer students who enter the University as juniors may substitute electives for this requirement. All others must complete the Itasca Park work before the beginning of the sophomore year unless given permission on petition to defer it one year. In no case will such students be permitted to register for junior work before completing the summer camp requirement.
Bot. 3su, Forest Botany, 1
Ent. 13su, Field Zoology, 1
For. 2su, Field Dendrology, 1
For. 5su, Field Silviculture, 2
For. 6su, Field Mensuration, 1

SOPHOMORE YEAR

1. *Non-credit courses* required for graduation in addition to the 204 credit hours.
Mil. Sci. 4f-5w-6s, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.
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. Econ. 1f,w, Principles of Economics I, 3
Agr. Econ. 2w,s, Principles of Economics II, 5 (Agr. Econ. 1)
Agr. Eng. 19f-20s, Surveying, 6 (Math. 4)
Agr. 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 curriculum.
For. 7f-8w, Forest Mensuration, 10 (For. 6)
Geol. 1f,w,s, General Geology, 5 or Geol. 29f, General Physiography, 5
Pl. Path. 10f,s, Forest Pathology, 5 (Bot. 9 cred.)
Rhet. 11f,w,s, Argumentation, 3 (Rhet. 3, and 22 recommended) or Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3) or Rhet. 31f,w,s, Survey of English Literature I, 5 (Rhet. 3)
Zool. 14f-15w, General Zoology, 6

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.
Agr. Eng. 24f-25w, Agricultural Physics, 8 (Math. 4 or Agr. Eng. 11, 23 or equiv.)
Ent. 6w, Forest Protection against Insects, 4 (Zool. 16 or Ent. 13)
For. 28w, Logging, 3
For. 33f-34w, Wood Structure and Identification, 6 (For. 3-4)
For. 126f, Silvics, 3
For. 127w, Silviculture, 3 (For. 126)
For. 130f, Forest Valuation, 5
For. 131w, Forest Policy and Administration, 5
3. *Special courses* selected from one of the major groups (page 35 to 38) and electives to make from 15 to 18 credit hours per quarter. Full work for the year consists of 51 credit hours.

[1] Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 77.

SENIOR YEAR

1. *Junior courses* which were not completed during the junior 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.

For. 134f-135w, Forest Problems, 4 (sr. class.)
For. 140f, Forest Working Plans, 3 (For. 128, 132)

ELECTIVE COURSES

Elective courses, 50 to 67 credits, may be distributed as described below. Every student is required to file in the registrar's office by the end of his sophomore year a statement of the curriculum 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 curriculum at the end of the sophomore year. A change from one curriculum 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 curriculum which he finally selects. Such changes usually involve inconvenience and sometimes loss of time to the student. All students are invited to consult with the dean of the college concerning the selection of a curriculum.

The student, with the approval of his adviser, may select any curriculum which complies with the following requirements:

a. A major of from 24 to 36 credit hours chosen from one of the following groups.

b. Electives, sufficient to meet the number of credit hours required for graduation chosen from any of the courses offered in the University except those included in the group from which the major is chosen.

1. General 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. Students majoring in this field are required to spend the spring quarter of the junior year in the field at the Cloquet Forest Experiment Station pursuing the following courses:

For. 31s, Logging Laboratory, 1
For. 37s, Forest Protection, 3 (For. 127)
For. 128s, Silviculture Laboratory, 7 (For. 127)
For. 132s, Forest Regulation Laboratory, 7 (For. 130)

The major will be selected from the following:

Agr. Biochem. 7f,w-8w,s, General Agricultural Biochemistry, 10
Agr. Econ. 25f,w, Principles of Accounting, 4
Agron. 131f,w, Principles of Genetics, 3
Bact. 41f,w,s, General Bacteriology, 5
Bot. 7s, Taxonomy of Flowering Plants, 3

Bot. 22f,w,s, Elementary Plant Physiology, 3
Bot. 101f,w, Elementary Biometry, 3
Bot. 131f, Field Ecology, 5
Bot. 132w, Ecological Anatomy, 5
Bot. 133s, Plant Geography of North America, 5
Bot. 141f-142w-143s, Advanced Plant Physiology, 15
Bus. Adm. 72f, Transportation Services, 3
Bus. Adm. 73w, Transportation Charges, 3
Econ. 26f,w,s, Principles of Accounting, 4
For. 20w, Grazing, 3
For. 101w, Advanced Dendrology, 3
For. 111f-112w, Advanced Forest Mensuration, 6
For. 122f-123w, Forestry Seminar, 2
For. 125s, Wood Preservation, 3
For. 129f, American Silvicultural Practice, 3
For. 136f, Forest Economics, 3
Geog. 11f,w,s, Human Geography, 5
Geog. 33, Climatology, 3
Geog. 41f,w,s, Geography of Commercial Production, 5
Geog. 71f, Geography of North America, 3
Geol. 2w-3s, General Geology, 10
Math. 7f,w,s, College Algebra, 5
Math. 30f,w,s, Analytical Geometry, 6
Math. 50f, Calculus I, 5
Math. 51f, Calculus II, 5
Math. 52s, Calculus III, 5
Org. Chem. 51f-52w-53s, Organic Chemistry, 15
Pl. Path. 110w, Principles of Pathology, 3
Pl. Path. 114w, Advanced Forest Pathology, 3
Soils 4f, Soils, 3
Soils 5s, Soil Fertility, 3

2. 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 use of wood. The major will be chosen from the courses listed below.

Agr. Econ. 25f,w, Principles of Accounting, 4
Agr. Econ. 40f,s, Principles of Marketing Organization, 3
Agr. Econ. 90f, Agricultural Statistics, 5
Agr. Eng. 5f, Farm Building Construction, 3
Bus. Adm. 73w, Transportation Charges, 3
Bus. Adm. 89f,w,s, Production Management, 3
Bus. Adm. 155w,s, Corporation Finance, 3
Econ. 26f,w,s, Principles of Accounting, 4
Econ. 141f,w,s, Monetary and Banking Policy, 3
Econ. 149f,w,s, Business Cycles, 3
Econ. 154f,w,s, Public Utilities, 3
Econ. 161f,w, Labor Problems and Trade Unionism, 3
For. 23s, Factory Experience, 3-5
For. 30s, Wood Seasoning, 3
For. 31s, Logging Laboratory, 1 (Cloquet)
For. 107f-108w, Uses of Wood, 6
For. 111f-112w, Advanced Forest Mensuration, 6
For. 114f-115w-116s, Mechanical and Physical Properties of Woods, 9
For. 136f, Forest Economics, 3
Geog. 11f,w,s, Human Geography, 5

3. Forest Technology

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 mathematics and a thoro training in the structure, properties, and uses of wood. The major will be chosen from the following courses:

Agr. Biochem. 2f, Quantitative Methods, 5
Agr. Biochem. 3f,w-4w,s, Introduction to Organic and Biochemistry, 6
Agr. Biochem. 7f,w-8w,s, General Agricultural Biochemistry, 10
Agr. Biochem. 101f-102w, Agricultural Quantitative Analysis, 6
Agr. Biochem. 111f-112w, Biochemistry, 6
Agr. Biochem. 113f-114w-115s, Biochemical Laboratory Methods, 6
Anal. Chem. 7f,w,s, Quantitative Chemistry, 4
For. 23s, Factory Experience, 3 to 5
For. 29f, Sawmill and Woodworking Machinery, 3
For. 30s, Wood Seasoning, 3
For. 107f-108w-109s, Uses of Wood, 9
For. 113f, Wood Pulp and Paper, 3
For. 114f-115w-116s, Mechanical and Physical Properties of Wood, 9
For. 119w-120s, Advanced Wood Structure, 6
For. 125s, Wood Preservation, 3
Inorg. Chem. 11f,s, Qualitative Chemical Analysis, 4
Math. 7f,w,s, College Algebra, 5
Math. 30f, Analytical Geometry, 5
Math. 50-51-52f,w,s, Calculus, 15
M. & M. 26f,s, Technical Mechanics, 5
M. & M. 128f,w,s, Strength of Materials, 5
Org. Chem. 51f-52w-53s, Organic Chemistry, 15
Phys. 23f,w,s, Heat, 3
Phys. 124s, Pyrometry and Heat, 3

4. Grazing

Suggested for those who wish to prepare themselves for range and management work. It is important that these men should be well prepared in plant physiology, systematic botany, plant ecology, as well as in the underlying principles of forestry. In addition, they should have some knowledge of the feeding and breeding of livestock. Students selecting a grazing major will be permitted to make certain substitutions in the general forestry requirements. The major, however, must include the following courses:

Agr. Biochem. 3f,w-4w,s, Introduction to Organic and Biochemistry, 6
Agr. Econ. 90f, Agricultural Statistics, 5
An. Husb. 10f,w-11w,s, Types and Market Classes of Livestock, 6
An. Husb. 112w, Animal Breeding, 3
An. Husb. 6w, Livestock Feeding, 5
Bot. 7s, Elementary Taxonomy, 3
Bot. 21f,s, Elementary Ecology, 3
Bot. 22f,w, Elementary Plant Physiology, 3
Bot. 113f-114w-115s, Advanced Taxonomy, 9
Bot. 134s, Research Methods in Ecology, 5
Bot. 140f,w, General Plant Physiology, 5
Soils 4f, Soils, 3
Soils 5s, Soil Fertility, 3

5. Forest Sciences

Suggested for those who wish to specialize in the various branches of forestry or the forest sciences. It is assumed that students who follow this curriculum will spend one or more years in graduate study. Attention is therefore called to the language requirements for advanced degrees. Only those students who have maintained high scholarship records and who appreciate the true spirit of research should contemplate following this specialization. Students selecting a forest science major will be permitted to make certain substitutions in the general forestry requirements.

The major may be selected from any courses offered in the following fields:

Botany	Entomology and Economic Zoology	Plant Pathology
Chemistry	Genetics	Soils
Economics	Geography	

CURRICULA IN HOME ECONOMICS

The curricula in home economics are designed to train young women for homemaking and for a payroll job in which all or most of them engage for at least a short period. Throughout the training period there are a certain number and kind of courses required to safeguard the preparation for homemaking. The first two years are essentially the same for all students irrespective of later specialization for the payroll job. At the close of the sophomore year each student signifies her interest in some special field and prepares for it, e.g., resident or extension teaching along one of several possible lines, dietetics, institution management, etc. By choosing electives wisely it is possible to extend one's training in fields other than home economics, e.g., economics, sociology, journalism, history, literature, etc.

The required courses for the various specializations are outlined on the following pages.

The College of Agriculture, Forestry, and Home Economics and the College of Education co-operate in the preparation of teachers of home economics. At the beginning of the junior year when a student has acquired 90 credits and 90 honor points and indicates her specialization as the teachers' or the extension curriculum she becomes also a registrant in the College of Education. The teachers' curricula are arranged in accordance with the provisions of the Smith-Hughes Act.

(For explanation of terms and course numbers, see page 13.)

HOME EXPERIENCE

Clothing.—Home experience in the construction of garments is required of all students who have completed H.E. 11, as a prerequisite to H.E. 13. The character and amount of home experience will be arranged by a member of the faculty of the textile and clothing section.

Foods.—Home experience in cooking following H.E. 83, is a prerequisite for H.E. 35 and H.E. 49. A conference with a member of the faculty of the foods and cookery section should precede this work. An examination covering this work must be passed. For the schedule of these examinations consult the office of the division.

PLACEMENT EXAMINATIONS

Examinations are given during Freshman Week covering the content of H.E. 11, 70, and 80. Students who have had previous courses in home economics in high school or elsewhere are urged to take these examinations. Those who make sufficiently high scores will be permitted to substitute electives for a part of this work.

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 cannot be taken in the freshman year must take precedence in the following year. Care should be taken in registration to give precedence to courses offered only one quarter.

Not more than one half of the listed credit will be allowed for the courses listed under the freshman and sophomore years, below, unless completed prior to classification as a senior except in the case of students transferring with at least one full year of advanced standing from a college where these courses are not available.

Freshman Assembly. A course of lectures offered only in the fall quarter.
H. E. 3f,w,s, Textiles, 5
H. E. 50f,w,s,51w,s,f, Color and Design, 6
H. E. 70f,w,s, Nutrition Survey, 2
Inorg. Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high school chemistry may omit this course and register for Inorg. Chem. 9-10. Those required to take this course because of inability to carry Inorg. Chem. 9-10 successfully will be allowed not more than 10 credits.
Inorg. Chem. 9f-10w, Advanced General Inorganic Chemistry, 10 (1 yr. h. s. chem.) Those required to take Inorg. Chem. 1-2-3 are exempt from this course.
Phys. Ed. 1f-2w-3s, Elementary Physical Training, 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)
Sociol. 1f,w,s, Introduction to Sociology, 3
Zool. 17f-18w, General Zoology, 6

SOPHOMORE YEAR

Phys. Ed. 22f, Sophomore Elementary Swimming. Not required of those who can pass the swimming test in their freshman year.
Agr. Biochem. 3f,w-4w,s, Introduction to Organic and Biochemistry, 6 (Inorg. Chem. 10 cred.)
Agr. 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 curriculum.
Bact. 41f,w,s, Elementary Bacteriology, 5 (chem., biol.)
H. E. 15f,w,s, Clothing Problems, 3 (H. E. 3, 51)
H. E. 53f,w,s, Advanced Design, 3 (H. E. 51 or 56)
H. E. 80f,w,s, Foods and Cookery, 5 (Agr. Biochem. 3, 4 parallel). Not required of those who qualify for H. E. 81.
H. E. 81w, Foods and Cookery, 3 (Agr. Biochem. 3, 4 parallel). Students who have had high school training in foods work and who satisfactorily pass the test for admission to this course may substitute H. E. 81 for H. E. 80.
Psy. 1f,w-2w,s, General Psychology, 6
Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)
Electives.—Enough elective credits should be selected to make, with the required work of the freshman and sophomore years, a total of 96 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.

[1] Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 77.

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.

Agr. Econ. 3f,w,s, Principles of Economics, 5
H. E. 83f,w,s, Food Management, 3 (H. E. 70, 80 or 81, 85 or parallel)
H. E. 85f,w,s, Food Marketing, 2 (Agr. Econ. 3 or parallel H. E. 80 or 81)
H. E. 131f,w,s, Home Management: House Planning and Equipment, 5 (H. E. 53)
Physiol. 4f,w,s, Human Physiology, 4 (Inorg. Chem., 4 cred., Zool., 3 cred.)
H. E. Ed. 40f,w,s, Child Training, 3 (Psy. 1-2)
Prev. Med. 52f,w,s, Health Care of the Family, 3 (Bact. 41, Physiol. 4)
Rhet. 11f,w,s, Argumentation, 3 (Rhet. 3, 22 advised) or Rhet. 31f,w,s, Survey of English Literature I, 5 (Rhet. 3)

2. *Additional courses* as prescribed by the curriculum of the line of specialization selected. See special requirements on pages 41 to 47.
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, Home Management: Operation and Maintenance, Lectures, 3 (H. E. 83, Agr. Econ. 1 or 3 or parallel, H. E. Ed. 40 or parallel)
H. E. 35f,w,s, Home Management: Operation and Maintenance, Laboratory, 6 (H. E. 34 or parallel, 83, H. E. Ed. 40, Prev. Med. 52, home exp. in foods and cookery). Students may be required to substitute other work for this course at the discretion of the division.
H. E. 170f,w,s, Nutrition of the Family, 3 (Agr. Biochem. 4; H. E. 70, 80 or 81, Physiol. 4)
H. E. 171f,w,s, Child Nutrition, 3 (H. E. 170, H. E. Ed. 40)

2. *Additional courses* are prescribed by the curriculum of the line of specialization lected. See special requirements on pages 41 to 47.
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 advisers with reference to the required and elective courses which must be chosen to complete a specialization and to make up the 193 credit hours required for graduation exclusive of physical education.

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 (numbered 1 to 49), open to freshmen and sophomores, and senior college courses (numbered 50 to 199), open to juniors and seniors. In addition to satisfying other prerequisites a

minimum of 90 credits and 90 honor points must be earned before registering for a senior college elective.

1. General Curriculum in Home Economics

a. *General requirements* as listed above, and

b. *Elective courses* of which the major portion should be chosen from fields other than home economics, e.g., agricultural biochemistry, history, journalism, physics, preventive medicine, sociology, etc.

2. Curriculum in Foods and Nutrition

a. *General requirements* as listed above with the following additional courses:

Agr. Econ. 126s, Economics of Consumption, 3 (Agr. Econ. 1 or 3)
An. Husb. 111w, Utilization of Meats, 3 or
H. E. 75f,w, Dietetics Laboratory, 2 (H. E. 170 or equivalent or parallel) and
H. E. 179w,s, Readings in Nutrition, 2 (H. E. 170)
H. E. 73f,s, Nutrition I, 4 (Agr. Biochem. 4, H. E. 80 or 81, Physiol. 4)
H. E. 173s, Nutrition in Disease, 3 (H. E. 170, 175)
H. E. 175f,w, Nutrition II, 4 (H. E. 73)
H. E. 182f,w,s, Experimental Cookery, 3 (H. E. 80)
H. E. 186f,s, Special Food Problems, 3 (H. E. 182) or
H. E. 187f,s, Special Food Problems, 5 (H. E. 182, Agr. Biochem. 2)

b. *Elective courses.*—Sixteen additional credits must be chosen from the following courses:

Agr. Biochem. 2, 106, 108; Agr. Eng. 34, 35; Bus. Adm. 88, 180, 181, 182; Eng. 31, 32, 33, 73, 74; German 1-2-3, 4, 24, 25, 26, 27, 28, 29; Hist. 1-2; H. E. 60, 61, 63, 163; Jour. 13, 41, 65, 69; Lib. Meth. 1; Math. 3, 4, 5, 6, 7; Phys. Chem. 110; Phys. 3, 4, 23, 24, 43, 44; Pol. Sci. 1; Psy. 56; Rom. Lang., French 1-2-3, 8-9-10.

3. Curriculum in Textiles and Clothing

a. *General requirements* as listed above with the following additional courses:

Agr. Econ. 126s, Economics of Consumption, 3 (Agr. Econ. 1 or 3)
H. E. 11f,w,s, Clothing Planning and Construction, A, 3
H. E. 13f,w,s, Clothing Planning and Construction, B, 3 (H. E. 3, 11, 51, home exp. in garment making)
H. E. 17w,s, Advanced Clothing, 3 (H. E. 13, 53) or
H. E. 18f,s, Commercial Clothing Manufacture, 3 (H. E. 13, 53)
H. E. 102f,s, Advanced Textiles, 3 (H. E. 3, Agr. Biochem. 3-4, Agr. Econ. 1 or 3 or parallel)
H. E. 115f,w, Clothing Economics, 2 (H. E. 15 or equiv., Agr. Econ. 1 or 3)

b. *Elective courses.*—One of the following groups must be completed

Group A

H. E. 17w,s, Advanced Clothing, 3 (H. E. 13, 53) or
H. E. 18f,s, Commercial Clothing Manufacture, 3 (H. E. 13, 53)
H. E. 55f, Decorative Needlework and Other Crafts, 3 (H. E. 53 or parallel)
H. E. 150f,w,s, Art History and Appreciation, 3 (H. E. 51)
H. E. 154s, Advanced Costume Design, 3 (H. E. 13, 53, 55 recommended)
Bus. Adm. 69s, Retail Store Management, 3 (Agr. Econ. 1 or 3)
Psy. 56w, Psychology of Advertising, 3 (Psy. 1-2 and Agr. Econ. 1 or 3)

Group B

Agr. Biochem. 2f, Quantitative Methods, 5 (Inorg. Chem. 10 cred.)
Bot. 1f,s, General Botany, 4
H. E. 107w, Textile Analysis and Related Problems, 3 (H. E. 102, Agr. Biochem. 2)

4. Curriculum for Dietitians

a. *General requirements* as listed above with the following additional courses:

Agr. Biochem. 2f, Quantitative Methods, 5 (Inorg. Chem. 10 cred.)
Agr. Econ. 25f,w, Principles of Accounting, 4
H. E. 60s, Institution Marketing, 2 (H. E. 61 or parallel, 85)
H. E. 61f,w,s, Quantity Cookery, 4 (H. E. 83)
H. E. 63f,w,s, Institution Experience, 3 (H. E. 83)
H. E. 65w, Institution Equipment, 2 (H. E. 61, 63, or parallel)
H. E. 73f,s, Nutrition I, 4 (Agr. Biochem. 4, H. E. 80 or 81, Physiol. 4)
H. E. 75f,w, Dietetics Laboratory, 2 (H. E. 170 or equiv. or parallel)
H. E. 79s, Selected Problems for Dietitians, 3 (H. E. 170 or equiv.)
H. E. 156f,w,s, Hospital Social Service, 3 (H. E. 170 or parallel, 175)
H. E. 163s, Institution Management Problems, 3 (H. E. 61, 63)
H. E. 173s, Nutrition in Disease, 3 (H. E. 170, 175)
H. E. 175f,w, Nutrition II, 4 (H. E. 73)
H. E. 176w, Advanced Nutrition, 4 (H. E. 73, Agr. Biochem. 2)
H. E. 179w,s, Readings in Nutrition, 2 (H. E. 170)
H. E. 182f,w,s, Experimental Cookery, 3 (H. E. 80)

b. *Elective courses.*

5. Curriculum in Institution Management

a. *General requirements* as listed above with the following additional courses:

Agr. Econ. 25f,w, Principles of Accounting, 4
Agr. Econ. 126s, Economics of Consumption, 3 (Agr. Econ. 1 or 3)
Econ. 1f,w,s, Business Organization: Marketing, 3
Econ. 161f,w, Labor Problems and Trade Unionism, 3 (Econ. 4 or 6-7)
H. E. 60s, Institution Marketing, 2 (H. E. 61 or parallel, 85)
H. E. 61f,w,s, Quantity Cookery, 4 (H. E. 83)
H. E. 63f,w,s, Institution Experience, 3 (H. E. 83)
H. E. 65w, Institution Equipment, 2 (H. E. 61, 63, or parallel)
H. E. 163s, Institution Management Problems, 3 (H. E. 61, 63)
H. E. 182f,w,s, Experimental Cookery, 3 (H. E. 80)

b. *Elective courses.*—Six credits from Group A and nine credits from Group B must be completed.

Group A.—An. Husb. 111; Bus. Adm. 67, 130, 167; Econ. 51.

Group B.—Agr. Eng. 34, 35; Child Wel. 60; Econ. 3, 149; Eng. 31-32-33, 73-74; H. E. 73 or 75 or 173, 150; Jour. 13, 41, 65, 69; Phys. 3, 4, 23, 24, 43, 44; Psy. 56; Rhet. 28, 32, 33.

CURRICULA FOR TEACHERS

(College of Education)[1]

For the junior and senior years the following curricula have been approved by the College of Agriculture, Forestry, and Home Economics and by the College of Education and all students who are candidates for a teacher's certificate are required to pursue one of the following curricula.

Such students become registrants in both colleges during the junior and senior years but register for their freshman and sophomore work in the College of Agriculture, Forestry, and Home Economics. Every student

[1] See scholarship requirements for admission to the College of Education, page 11

who expects to teach home economics and who expects to obtain the university endorsement for a certificate must sign a specialization card at the beginning of the junior year and meet the following requirements:

6. Teachers' Curricula in General Home Economics

General requirements as listed above with the following additional courses:

Agr. Econ. 126s, Economics of Consumption, 3 (Agr. Econ. 1 or 3)
Ed. Psy. 55f,w,s, Educational Psychology, 3 (Psy. 6 cred.) or
Agr. Ed. 11f,w,s, Educational Psychology, 3
Hist. Ed. 1f,w,s, Brief Course in the History of Education, 5 (6 cred. in psy.) or
Hist. Ed. 5s, Public Education in the United States, 3 (6 cred. in psy.) or
Hist. Ed. 101f, Foundations of Modern Education, 3 (6 cred. in psy. and 6 cred. in history) or
Ed. Ad. 65f,w,s, The High School, 3 (Ed. Psy. 55)
H. E. 11f,w,s, Clothing Planning and Construction, A, 3
H. E. 13f,w,s, Clothing Planning and Construction, B, 3 (H. E. 3, 11, 51, home practice in garment making)
H. E. 17w,s, Advanced Clothing, 3 (H. E. 13, 53) or
H. E. 18f,s, Commercial Clothing Manufacture, 3 (H. E. 13, 53)
H. E. 150f,w,s, Art History and Appreciation, 3 (H. E. 51)
H. E. Ed. 42f,s, Special Methods of Teaching Home Economics, 3 (H. E. 13, 83, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)
H. E. Ed. 49f,w,s, Observation and Teaching: General Home Economics, 8 (H. E. Ed. 42. In addition to other prerequisites a student registering for this course must have received a grade of C or higher in each of the following courses: H. E. 3, 11, 50, 51, 53, 80 or 81, and 83)
H. E. Ed. 142f,w, Educational Measurement in Home Economics, 2 (H. E. Ed. 42, Ed. Psy. 55 or Agr. Ed. 11)
H. E. Ed. 143f,w,s, Home Economics Curricula, 2 (H. E. Ed. 42 or parallel)

b. *Elective courses.*—Five to ten credits must be elected from Group A and enough credits from Group B to make a total of fourteen credits.

Group A.—Anthropol. 41; Hist. 1-2 or 2-3, Pol. Sci. 1.

Group B.—Astron. 11; Bot. 1; Child Wel. 60, 80, 90, 120; Ed. Psy. 60; Eng. 31-32-33, 73-74; Geog. 11; H. E. 55, 57, 61, 102, 136, 175, 182, 186, 195, 154, 73, 75, 179, 173; H. E. Ed. 147; Jour. 13, 41, 65, 69, 73-74, 82; Lib. Methods 1; Psy. 3, 56 or 60; Rhet. 28, 32, 33, 34; Zool. 183.

7. Teachers' Curricula in Home Economics Extension

a. *General requirements* as listed above with the following additional courses:

Ed. Psy. 55f,w,s, Educational Psychology, 3 (Psy. 6 cred.) or
Agr. Ed. 11f,w,s, Educational Psychology, 3
Hist. Ed. 1f,w,s, Brief Course in the History of Education, 5 (6 cred. in psy.) or
Hist. Ed. 5s, Public Education in the United States, 3 (6 cred. in psy.) or
Hist. Ed. 101f, Foundations of Modern Education, 3 (6 cred. in psy. and 6 cred. in hist.) or
Ed. Ad. 65f,w,s, The High School, 3 (Ed. Psy. 55)
H. E. 11f,w,s, Clothing Planning and Construction, A, 3
H. E. 13f,w,s, Clothing Planning and Construction, B, 3 (H. E. 3, 11, 51, home practice in garment making)

H. E. 17w,s, Advanced Clothing, 3 (H. E. 13, 53) or
H. E. 18f,s, Commercial Clothing Manufacture, 3 (H. E. 13, 53)
H. E. 44w, Home Economics Extension Work, 3 (H. E. Ed. 42, 49 or parallel)
H. E. 150f,w,s, Art History and Appreciation, 3 (H. E. 51)
H. E. Ed. 42f,s, Special Methods of Teaching Home Economics, 3 (H. E. 13, 83, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)
H. E. Ed. 49f,w,s, Observation and Teaching: General Home Economics, 8 (H. E. Ed. 42. In addition to other prerequisites a student registering for this course must have received a grade of C or higher in each of the following courses: H. E. 3, 11, 50, 51, 53, 80 or 81, and 83)
H. E. Ed. 143f,w,s, Home Economics Curricula, 2 (H. E. Ed. 42 or parallel)

b. *Elective courses.*—Ten credits from the following courses must be completed.

Agr. Ed. 75 Agr. Eng. 34; Anthropol. 41; Child Wel. 60; Agr. Econ. 25; Hist. 1-2; H. E. 57, 61, 75, 173, 179, 182, 195; Jour. 13, 41, 65, 69; Pol. Sci. 1; Psy. 56; Rhet. 24; Sociol. 110.

8. Teachers' Curriculum in Foods and Nutrition

a. *General requirements* as listed above with the following additional courses:

Agr. Econ. 126s, Economics of Consumption, 3 (Agr. Econ. 1 or 3)
Ed. Psy. 55f,w,s, Educational Psychology, 3 (Psy. 6 cred.) or
Agr. Ed. 11f,w,s, Educational Psychology, 3
Hist. of Ed. 1f,w,s, Brief Course in the History of Education, 5 (6 cred. in psy.) or
Hist. of Ed. 5s, Public Education in the United States, 3 (6 cred. in psy.) or
Hist. of Ed. 101f, Foundations of Modern Education, 3 (6 cred. in psy. and 6 cred. in hist.) or
Ed. Ad. 65f,w,s, The High School, 3 (Ed. Psy. 55)
H. E. 73f,s, Nutrition I, 4 (Agr. Biochem. 4, H. E. 80 or 81, Physiol. 4)
H. E. 173s, Nutrition in Disease, 3 (H. E. 170, 175) or
H. E. 175f,w, Nutrition II 4 (H. E. 73) or
H. E. 75f,w, Dietetics Laboratory, 2 (H. E. 170 or equivalent or parallel) and
H. E. 179w,s, Readings in Nutrition, 2 (H. E. 170)
H. E. 182f,w,s, Experimental Cookery, 3 (H. E. 80)
H. E. 186f,s, Special Food Problems, 3 (H. E. 182) or
H. E. 187f,s, Special Food Problems, 5 (H. E. 182, Agr. Biochem. 2)
H. E. Ed. 42f,s, Special Methods of Teaching Home Economics, 3 (H. E. 13, 83, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)
H. E. Ed. 49f,w,s, Observation and Teaching: General Home Economics, 8 (H. E. Ed. 42. In addition to other prerequisites a student registering for this course must have received a grade of C or higher in each of the following courses: H. E. 3, 11, 50, 51, 53, 80 or 81, and 83)
H. E. Ed. 142f,w, Educational Measurements in Home Economics, 2 (H. E. Ed. 42, Ed. Psy. 55 or Agr. Ed. 11)
H. E. Ed. 143f,w,s, Home Economics Curricula, 2 (H. E. Ed. 42 or parallel)

b. *Elective courses.*—Thirteen additional credits from the following courses must be completed.

Agr. Biochem. 2, 106, 108; Agr. Eng. 34, 35; Eng. 31-32-33, 73-74; German 1, 2, 3, 4, 24-25-26, 27, 28-29; Hist. 1-2 or 2-3; H. E. 11, 13, 17, 18, 60, 61, 63, 65, 136, 150, 163; Jour. 13, 41, 65, 69; Lib. Meth. 1; Math. 3, 4, 5, 6, 7; Phys. Chem. 110; Phys. 3, 4, 23, 24, 43, 44; Pol. Sci. 1; Rhet. 28, 32, 33, 34; Rom. Lang., French 1-2-3, 8-9-10.

9. Teachers' Curriculum in Textiles and Clothing

a. *General requirements* as listed above with the following additional courses:

Agr. Econ. 126s, Economics and Consumption, 3 (Agr. Econ. 1 or 3)
Ed. Psy. 55f,w,s, Educational Psychology, 3 (Psy. 6 cred.) or
Agr. Ed. 11f,w,s, Educational Psychology, 3
Hist. of Ed. 1f,w,s, Brief Course in the History of Education, 5 (6 cred. in psy.) or
Hist. Ed. 5s, Public Education in the United States, 3 (6 cred. in psy.) or
Hist. Ed. 101f, Foundations of Modern Education, 3 (6 cred. in psy. and 6 cred. in hist.) or
Ed. Ad. 65f,w,s, The High School, 3 (Ed. Psy. 55)
H. E. 11f,w,s, Clothing Planning and Construction, A, 3
H. E. 13f,w,s, Clothing Planning and Construction, B, 3 (H. E. 3, 11, 51, home experience in garment making)
H. E. 17w,s, Advanced Clothing, 3 (H. E. 13, 53) or
H. E. 18f,s, Commercial Clothing Manufacture, 3 (H. E. 13, 53)
H. E. 102f,s, Advanced Textiles, 3 (H. E. 3, Agr. Biochem. 3-4, Agr. Econ. 1 or 3 or parallel)
H. E. 115f,w, Clothing Economics, 2 (H. E. 15 or equiv., Agr. Econ. 1 or 3)
H. E. 150f,w,s, Art History and Appreciation, 3 (H. E. 51)
H. E. Ed. 42f,s, Special Methods of Teaching Home Economics, 3 (H. E. 13, 83, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)
H. E. Ed. 49f,w,s, Observation and Teaching: General Home Economics, 8 (H. E. Ed. 42. In addition to other prerequisites a student registering for this course must have received a grade of C or higher in each of the following courses: H. E. 3, 11, 50, 51, 53, 80 or 81, and 83)
H. E. Ed. 142f,w, Educational Measurements in Home Economics, 2 (H. E. Ed. 42, Ed. Psy. 55 or Agr. Ed. 11)
H. E. Ed. 143f,w,s, Home Economics Curricula, 2 (H. E. Ed. 42 or parallel)

b. *Elective courses.*—Nine additional credits from the following courses must be completed:

Agr. Biochem. 2; Botany 1; H. E. 17 or 18, 55, 57, 107, 154, 195.

10. Teachers' Curriculum in Related Art

a. *General requirements* as listed above with the following additional courses:

Art Ed. 4f-5w-6s, Still Life, 3
Art Ed. 7f-8w-9s, Sketch, 3
Art Ed. 29f-30w-31s, Sketch, Course II, 3 (Art Ed. 7-8-9)
Ed. Psy. 55f,w,s, Educational Psychology, 3 (Psy. 6 cred.) or
Agr. Ed. 11f,w,s, Educational Psychology, 3
Hist. of Ed. 1f,w,s, Brief Course in the History of Education, 5 (6 cred. in psy.) or
Hist. of Ed. 5s, Public Education in the United States, 3 (6 cred. in psy.) or
Hist. of Ed. 101f, Foundations of Modern Education, 3 (6 cred. in psy. and 6 cred. in hist.) or
Ed. Ad. 65f,w,s, The High School, 3 (Ed. Psy. 55)
H. E. 11f,w,s, Clothing Planning and Construction, A, 3
H. E. 13f,w,s, Clothing Planning and Construction, B, 3 (H. E. 3, 11, 51, home experience in garment making)
H. E. 55f, Decorative Needlework and Other Crafts, 3 (H. E. 53 or parallel)
H. E. 57s, Batik and Other Crafts, 3 (H. E. 3, 53 or parallel)
H. E. 150f,w,s, Art History and Appreciation, 3 (H. E. 51)
H. E. 152w, Advanced Interior Design, 3 (H. E. 53, 131, 150)
H. E. 154s, Advanced Costume Design, 3 (H. E. 13, 53, 55 recommended)

H. E. Ed. 42f,s, Special Methods of Teaching Home Economics, 3 (H. E. 13, 83, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)

H. E. Ed. 49f,w,s, Observation and Teaching: General Home Economics, 8 (H. E. Ed. 42. In addition to other prerequisites a student registering for this course must have received a grade of C or higher in each of the following courses: H. E. 3, 11, 50, 51, 53, 80 or 81, and 83)

H. E. Ed. 147w, Organization and Methods for Related Art Teaching, 3 (H. E. Ed. 42 or parallel, H. E. 53, 131 or parallel)

b. *Elective courses.*

II. Research in the Field of Home Economics

In the undergraduate curricula there is not sufficient opportunity to prepare prospective research workers adequately except in so far as electives may be used in that direction, with the expectation of continuing with graduate study after graduation. Persons interested in research in textiles, nutrition, home management, home economics education, related art, home equipment, etc., should choose all electives following consultation with a faculty member interested in that particular field.

DESCRIPTION OF COURSES

AGRICULTURAL BIOCHEMISTRY

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.

2. Quantitative Methods. Principles of quantitative analysis, including stoichiometric problems, practice in the use of the balance and in typical gravimetric and volumetric manipulations.

3-4. Introduction to Organic and Biochemistry. The groups of carbon compounds, with special reference to their relationships and their occurrence in plant and animal materials used as food.

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.

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, vitamin hypothesis, and deficiency diseases.

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.

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.

106. Biochemistry in Industry. A seminar course.

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.

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.

111-112. Biochemistry. Advanced course dealing with the colloidal state, and the chemistry of proteins, carbohydrates, glucosides, tannins, fats, plant acids, enzymes, and pigments and their physiochemical relations to the vital processes involved in growth and nutrition.

113-114-115. Biochemical Laboratory Methods. A laboratory course paralleling the lectures in 111-112, using recent methods for the investigation of biologically important compounds.

116. Advanced Animal Nutrition. Recent developments in animal nutrition, covering the field of proteins, mineral metabolism, and vitamins.

117. Laboratory Problems in Animal Nutrition. A laboratory course on methods used in nutrition studies.

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.

AGRICULTURAL ECONOMICS

See Farm Management and Agricultural Economics.

AGRICULTURAL EDUCATION

COLLEGE OF EDUCATION

11. Educational Psychology. The main facts and principles of educational psychology and the fundamental principles upon which education is based. Emphasis is placed on those phases which are most closely related to vocational education.

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.

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. (Not offered in 1930-31.)

42. Supervised Teaching Experience. 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.

64. Survey of Agriculture. A course in general agriculture designed to give students practical familiarity with fundamental principles and basic facts, best procedures, literature, and important problems of agriculture in this region.

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.

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.

82. Agricultural Extension Field Course. 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.

135. The Curriculum in Vocational Agriculture. A study of curriculum organization, determination of subject-matter, organization of subject-matter, job analysis, course construction, texts, and references.

141. Supervised Practice in Vocational Agriculture. A special methods course dealing with the selection, planning, supervising, and summarizing of the practical work in agriculture. Special emphasis on the problem method of teaching, and the use of the farm and community for teaching purposes.

144. Course Organization and Instruction for the Individual in Vocational Agriculture. Subject-matter content for the individual should be based on farm activities. Individuals should progress according to abilities and needs. Accepting these principles, this course includes selection and organization of content, administration, and teaching technique.

154. Rural Education and Community Leadership. The school as a community center, and organizing educational, social, and recreational activities, clubs, festivals, fairs, and other desirable features of rural community life, such as future farmers of America.

161. Vocational Education in Agriculture. A study of the principles developed and established in agricultural education. The principles developed in other vocational education and their relation to agricultural education.

162. The Basis of Vocational Teaching Technique. A course which includes an analysis of the philosophical, psychological, and other bases of teaching technique from the viewpoint of the teacher of vocational agriculture.

164. Fundamentals of Agriculture. Emphasis on current problems in meats, milk, poultry, plant pathology, mechanical training, and other essentials for teachers of agriculture.

171. Problems in Procedure. For agriculture teachers. Emphasizes working out problems in detail in order that the processes as formulated can be used in teaching the following year by those enrolled. Discussions, readings, papers, laboratory.

176. Problems in Visual Presentation. Special attention to use of visual aids in teaching agriculture. The development of proper visual methods by means of research.

181. Teaching Agriculture. Special methods course dealing with conducting a high school agriculture department. Observations of class work, apprentice teaching, curriculum organization, supervised farm practice and use of the farm and community for teaching purposes.

182. Teaching Agriculture. Special methods course dealing with conducting a high school agriculture department. Fundamentals of method in teaching as related to teaching agriculture in high school. Organizing subject-matter. Selection and manipulation of devices.

183. Teaching Agriculture. Organization and administration of agriculture in secondary schools including all day, part time, and evening school instruction. Special emphasis on equipment, text and reference books, extension work, and organizations.

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.

AGRICULTURAL ENGINEERING

3. Mechanical Drawing. Materials, instruments, and their uses. Lettering, scale reading, conventional symbols, and blue printing. Orthographic projection, pictorial drawing, and planning farm buildings (Agriculture); or records and plots of surveys, contour and profile map tracing (Forestry).

5. Farm Building Construction. Instruction and practice in estimating, framing, construction, and painting of farm buildings.

7. Farm Structures I. The arrangement, planning, and designing of farm buildings giving special attention to convenience, economy, and the durability of farmhouses, barns, cribs, granaries, hog houses, etc.

9-10. Applied Mathematics. Same as Course 11 extended over two quarters.

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, progressions, statistics, averages, proportions, variations, investments, cost problems.

12. Field Machinery. Construction, operation, adjustment, and use of soil preparation, seeding and harvesting machinery.

13. Gas Engines. Theory, operation, care, and repair of gasoline engines.

14. Elementary Farm Power. Construction, operation, care, adjustment, testing, and use of the tractor and other sources of farm power. Lectures and laboratory.

15. Ignition and Carburetion. Lecture and shop study of the construction and action of the various forms of ignition and carburetion systems in use on gas engines of all types.

19. Elementary Surveying. Use of tape, level, transit, and traverse board in agricultural field problems, e.g., mensuration surveys, traverses, differential and profile leveling; plotting and mapping. Care and adjustment of instruments.

20. Advanced Surveying. Topographic surveys by stadia and other methods, running simple curves, cross sectioning, plotting the survey, profile building, grade determination, and figuring of quantities in earth work.

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.

24. Agricultural Physics I. An applied course involving lectures and laboratory work in mechanics and heat.

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.
28. Land Clearing. Land clearing methods, explosives, and machinery. Farm development in cut-over timber districts.
31. Principles of Drainage. Elementary principles and practice of soil erosion control and of drainage in relation to plant growth, crop and land values, and farm operation and development.
34. Household Mechanics. Lectures and recitations on household appliances and methods of operation, such as water supply, plumbing, sewage disposal, washing, cooking, refrigeration, heating, and electrical appliances.
35. Household Physics. A course of lectures and laboratory work on the principles of physics that apply to cooking, cleaning, plant and animal growth, dyeing, and other subjects of household importance. Molecular physics, heat, light, and color.
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.
40. Mechanical Training I. Instruction and laboratory practice in mechanical trades, embracing rope work; belt lacing and pulleys; cement work; soldering; electric wiring; harness repair; etc.
41. Mechanical Training II. Instruction and laboratory practice in mechanical trades embracing metal work, tool sharpening, painting, wood finishing, machinery repairs. Special attention given to practical applications and features of special interest to teachers.
42. Principles of Irrigation. Irrigation and the development of arid and semi-arid lands, a study of irrigation practices; duty of water and water rights; correlation of drainage and irrigation.
67. Farm Structures II. Planning, estimating, and construction of farm buildings including a study of materials commonly used.
101. Drainage Engineering and Works. Design, location, and construction of public and private drainage systems and works; construction estimates, drainage engineering, and public records.
102. Advanced Drainage Problems. Special drainage problems including surface run-off, soil permeability, relation of soil type to drainage, shape and regulation of water table in relation to root growth, etc.
103. Irrigation Engineering and Works. Design, location, and construction of irrigation works; reservoir and transmission losses; general irrigation law; irrigation engineering and public records.
104. Drainage Administration and Law. Organizing, financing, problems in legal development and administration of drainage and flood control districts, fiduciary duties of the engineer, etc.
112. Farm Building Problems. Investigations in the utility and durability of building materials. Methods of construction, costs and efficiency of farm buildings.

121. Steam Boilers and Engines. Study of the construction, operation, and care of simple steam engines and boilers.

122. Power Machinery. Study of machines requiring mechanical power for their operation, such as feed grinders, corn shredders, ensilage cutters, threshers.

123. Farm Power. Comparative study of the application and cost of the different sources of power to farm machinery and operations.

125. Farm Machinery Design. Drafting room study of design of farm machine parts, e.g., gearing, cams, shafts, flexible connections, etc.; laboratory tests of strength coupled with efficiency of machine parts. Recitation and lecture.

126. Selection of Farm Equipment. Study of types and construction of machinery and equipment suited to various farm operations.

133. Applied Electricity. Laboratory work in direct and alternating current machines as used on farms, including generators, motors, storage batteries, transformers, and complete isolated electric and hydroelectric plants.

141. Land Clearing II. Special problems in stump removal under different conditions of soil and vegetation; stone removal; dirt blasting in construction of silos, temporary ditches, and building excavations. Breaking virgin soils of varying composition and texture. Technique in use and manufacture of explosives and land clearing equipment.

150. Seminar. Students will give reports of their investigations on certain assigned problems for research.

AGRONOMY, FARM MANAGEMENT, AND PLANT GENETICS

1. General Farm Crops. A study of the important field crops of the United States.

121. Grain Crops. Structure, function, culture, improvement, and uses of corn, wheat, oats, barley, rye, flax, and buckwheat.

122. Grain and Hay Grading. Development of grades, study of grading methods, and actual practice in grading grain and hay samples according to federal standards. Training in judging grain and hay on quality basis.

123. Forage Crops. A study of the structure, function, culture, and improvements and uses of forage crops including meadow and pasture management.

124. Problems in Farm Crops. Through the use of the problem method, the student is given opportunity to deal with important phases of agronomy.

131. Principles of Genetics. Fundamental principles of breeding, heredity, variation, biometry, and evolution.

132. Farm Crops Plant Breeding. Applied genetics. Methods of breeding each of the important agricultural crops.

134. Laboratory Problems in Genetics. Methods of taking and arranging genetics data. Special inheritance problems with *Drosophila*. Construction of chromosome map.

ANALYTICAL CHEMISTRY

SCHOOL OF CHEMISTRY

1-2. Analytical Chemistry.

For additional courses and course descriptions see the bulletin of the School of Chemistry.

ANIMAL HUSBANDRY

2-3. Types and Breeds of Livestock. The types as related to performance and production in horses, beef cattle, sheep, and swine, and the origin, history, characteristics, and economic importance of the breeds, classified according to type.

4. Livestock Judging. Practice in judging horses, cattle, sheep, and hogs from both the market and breed standpoint.

6. Livestock Feeding. Feeding livestock under farm conditions; efficiency and economy in feeding, growing, and fattening meat animals; feeding draft horses and colts. Consideration of experimental work and present practice. Practical feeding problems.

7. Meats. Dressing of animals and the cutting of carcasses. Lectures and laboratory work.

8. Fundamentals of Feeding and Management. A study 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.

9. Pedigrees and Herd Books. Pedigree registration; laboratory practice in the use of the stud, herd, and flock records; tracing and tabulating pedigrees.

10-11. Types and 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.

12. Meat Selection and Utilization. Lectures on the characteristics and peculiarities of meat as secured from different food animals. A comparative study of carcass value and utilization of parts. Score card and meat judging practice.

15. Fundamentals of Livestock Production. Basic principles involved in the breeding, feeding, and management of livestock.

101. Advanced Stock Judging. Competitive judging of all types, breeds, and classes of livestock supplemented by visits to nearby stock farms.

102. Horse Husbandry. Stud farm management; the selection of foundation stock and the breeding, feeding, and marketing of horses; factors determining a horse's efficiency for work. Practice in decorating horses for the show ring.

103. Beef Cattle Husbandry. Lectures and laboratory work in feeding and management of purebred and grade herds; selection of foundation stock and sires; buildings and equipment; keeping records; recording; advertising; fitting for show and sale; showing; buying; selling; labor.

104. Sheep Husbandry. The care and management of sheep. The fitting of sheep for show and sale. Practice in feeding, shearing, and blocking sheep. The care of young lambs.

105. Swine Husbandry. Hog barn equipment. Building up the breeding herd, private herd records, herd management, fitting and showing. Marketing breeding stock. Barn work and feeding practice.
106. Advanced Meats. Practice work in dressing animals and cutting carcasses, giving particular attention to conformation as related to dressing percentage and the carcass; a study of the physical and chemical composition of meat.
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.
108-109-110. Seminar. Special problems and research assignments on investigations pertaining to the livestock industry.
111. The Utilization of Meats. A detailed study of the different cuts of pork, beef, veal, mutton, and lamb, with reference to prices, relative economy, uses, nutritive value, chemical composition, ripening, curing, palatability. (For Home Economics students.)
112. Animal 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.
113. Livestock Management. Management problems in market stock and in purebred livestock production. Buildings and equipment, keeping herd records, buying and selling, sanitation and health problems. A general course covering horses, beef cattle, sheep, and hogs.

ANTHROPOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

41. Introduction to Anthropology.
54. Cultural Anthropology.
62. Ethnology.
80. The American Indian.
110. Physical Anthropology.
112. The American Negro.
113. The Peoples of Europe.
114. The American People.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

ARCHITECTURE

COLLEGE OF ENGINEERING AND ARCHITECTURE

21-22-23. Elementary Freehand Drawing.

For additional courses and course descriptions see the bulletin of the College of Engineering and Architecture.

ART EDUCATION

COLLEGE OF EDUCATION

1-2-3. Fundamental Principles of Design.
4-5-6. Still Life.

7-8-9. Sketch.
10-11-12. Composition.
20-21-22. Principles of Harmony in Form and Color.

For additional courses and course descriptions see the bulletin of the College of Education.

BACTERIOLOGY AND IMMUNOLOGY

MEDICAL SCHOOL

41. General Bacteriology.
103. Soil Microbiology. Studies of the microscopic inhabitants of the soil, their interrelationships and rôle in the transformations of soil constituents with particular emphasis on the cycles of carbon, nitrogen, and sulphur in nature.
105. Food Bacteriology. The decay, fermentation, and putrefaction of foods; molds; canning; bacterial food poisoning.

For additional courses and course descriptions see the bulletin of the Medical School.

BOTANY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

1. General Botany.
2. Elementary General Morphology of Plants.
3. Forest Botany. Field work in the classification and recognition of the herbaceous and shrubby undergrowth of the different forest types, together with quadrat and statistical studies.
5. Elementary Plant Histology.
7. Taxonomy of Flowering Plants.
12. Morphology of Algae.
13. General Morphology of Fungi.
21. Elementary Ecology.
22. Elementary Plant Physiology.
51. Histological Methods.
63. General Morphology of Angiosperms and Gymnosperms.
101. Elementary Biometry.
113-114-115. Advanced Taxonomy.
118. Cytology.
127. Anatomy of Vascular Plants.
131. Field Ecology.
132. Ecological Anatomy.
133. Plant Geography of North America.
134. Research Methods in Ecology.
141. Physico-chemical Principles in Plant Physiology.
142. Photosynthesis.
143. Plant Metabolism and Growth.
144. Plant Microchemistry.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

CHILD WELFARE INSTITUTE

40. Child Training. A study of the physical and mental development of the child followed by a discussion of the problems of training young children. Observations in the Nursery School, lectures, and reports.

60. Modern Aspects of Child Study. A survey of the background and present scope of modern child study in its various aspects, such as nursery schools and parental education, child health and mental hygiene, the kindergarten and Montessori movements, and the development of research organizations.

80. Child Psychology. A survey of child development with special reference to nursery school and kindergarten education.

90. Physical Development of the Young Child. The physical growth and development of the young child in its anatomical, physiological, and functional aspects.

120. Health Care of the Young Child. A course in the physical care, illnesses, prevention of disease, and health problems of the young child. Primarily for those who have charge of groups of children, and for workers in parental education. Opportunities for observation in the Nursery School and in clinics. In co-operation with the Department of Pediatrics.

130. The Development of the Young Child. An advanced course dealing with the development of the pre-school child from the anatomical, physiological, psychological, educational, and social aspects. Lectures, readings in the experimental literature, and reports.

133-134-135. Observational and Experimental Methods in the Study of the Development of the Young Child. A study of various methods and techniques such as growth records, mental tests, ratings, controlled observations, used in the experimental study of the young child. Practical exercises and problems on institute records and data.

170. Parental Education in Child Care and Training. A consideration of the content and methods used in courses and study groups for parents in the care and training of young children. Lectures, discussions, and reports.

173-174. Technique and Practice of Parental Education. Field work in the technique of organizing and conducting parental study groups and courses for the study of the young child.

190-191. Mental Examination of Pre-School Children. A study of the methods used in testing young children together with practice in such testing.

DAIRY HUSBANDRY

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.

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.
3. Dairy Bacteriology. Same as Course 2, without laboratory.
4. Dairy Products Practice. A study of factory methods. Includes a minimum of one month's practical experience in a plant handling dairy products in a factory way. Reports and records of work done required.
6. Judging Dairy Cattle. Comparative judging of dairy cattle and study of breed types. Should parallel 101.
7. Elements of Dairying. Same as Course 1, without laboratory. For graduates of the School of Agriculture.
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.
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.
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; formulation of rations.
104. Dairy Stock Selection. For students interested in breeding pure bred dairy cattle. Selection by type, pedigree, production records. Evaluation of breeding animals and formulation of breeding plans. The application of genetics to practical breeding. Visits to pure bred herds.
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.
106. Seminar II. Continuation of 105.
107. Seminar III. Continuation of 106.
110. Dairy Products III. The manufacture of ice cream with special reference to the chemical and physical processes involved. Organization, construction, equipment, and operation of such factories. Laboratory exercises and lectures.
111. Dairy Products I. The manufacture of butter with special reference to the chemical and bacteriological processes involved. Organization, construction, equipment, and operation, in such factories. Laboratory exercises to illustrate these processes.
112. Dairy Products II. The manufacture of cheese, condensed and powdered milks with special reference to the chemical, bacteriological, and physical processes involved. Organization, construction, equipment, operation of such factories. Laboratory exercises and lectures.
113. Technical Control. Lectures and laboratory. Chemical and bacteriological laboratory methods used in technical control of milk and its products. Use of Mojonnier tester, cryoscope, and bacteriological control methods.

114. Problems in Dairy Husbandry. A study of special problems in dairy feeding, selection, and management for the teacher and extension worker.
115. Advanced Dairy Bacteriology. Investigations of specific problems on the bacteriology of milk and dairy products.

ECONOMICS

SCHOOL OF BUSINESS ADMINISTRATION

For courses and course descriptions see the bulletin of the School of Business Administration.

See also courses in Agricultural Economics.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

COLLEGE OF EDUCATION

119. The Elementary School Curriculum.

For additional courses and course descriptions see the bulletin of the College of Education.

EDUCATIONAL PSYCHOLOGY

COLLEGE OF EDUCATION

55. Educational Psychology.
111. Educational Measurements in the Elementary School.

For additional courses and course descriptions see the bulletin of the College of Education.

ENGLISH

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

21-22-23. Introduction to English Literature.
31-32. Development of the English Novel.
33. The Later English Novel.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Courses in this department are closely correlated with those offered by the Department of Zoology of the College of Science, Literature, and the Arts. Courses 37-38-39, 117-118-119, 125-126-127, 139-140, 144-145-146, and 197 of this division are also offered under these numbers by the Department of Zoology.

For introductory course in general entomology see Zoology 16.

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.

4. Economic Vertebrate Zoology. Deals with the various kinds of vertebrate animals (except birds) of Minnesota, the habits and economic status of each, and means by which their numbers may be controlled.
5. Economic Entomology. Same as Course 3 only more inclusive.
6. Forest Protection against Insects. Lectures and laboratory work, dealing with the principles of controlling insects that attack trees and forest products, together with a consideration of the life-history and habits of important representative species.
8. Varieties and Habits of Fur Bearing Animals. Distinguishing characters and life-histories of the various mammal groups, particularly those represented in the state. Consideration is given to the possibilities of fur farming in case of certain species.
9. Elementary Bee Science. Classification, structure of *Apis mellifica*. Development and life-history of the queen, worker, and drone. Organization of the colony. Colony instincts and activities. Breeding, swarming, hibernation.
10. Industrial Beekeeping. Bees as honey producers and pollinators. Beehives, tools, and appliances. Bee shop. Location. Handling bees; spring management, swarm control. Production of comb and extracted honey. Food sources. Increase. Wintering. Diseases and enemies.
11. Advanced Beekeeping I. Problems of the commercial beekeeper. Out apiaries. Management. Marketing. Organization of the industry. Grading of bee products. Bee disease control.
12. Advanced Beekeeping II. Queen breeding, races of bees, package bees, nuclei, increase.
13. Field Zoology. For Forestry freshmen at Itasca Park.
23. Introductory Entomology. General characters, classification, and habits of insects.
24. Introductory Parasitology. An elementary course dealing with parasitic Protozoa, worms and arthropods and their relation to diseases of man and animals.
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.
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.
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.
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.
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 animals.

175. 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.

176-177. Advanced Economic Entomology. A critical consideration of the principles of insect control and the history of their development.

195. Introduction to Research. Preparation for investigational work in lines of entomology, parasitology, ecology, economic zoology, or bee-keeping. Advanced laboratory, field, and library work; training in preparation of bibliographies and manuscripts; special problems. Summer work should be planned when possible.

FARM MANAGEMENT AND AGRICULTURAL ECONOMICS

1. Principles of Economics I. For students in Agriculture and Forestry.

2. Principles of Economics II. For students in Agriculture and Forestry.

3. Principles of Economics. For students in Home Economics.

7. Natural Resources. A study of the natural resources of the United States and other countries in their relation to agriculture. Attention is given to the importance of these resources and to their wise utilization. Lectures, reference work, and discussions.

8. Rural Economics. An economic analysis of a number of the important social problems of agriculture, including rural organization, tenancy, farm incomes, rural population and standards of living, agricultural policy.

25. Principles of Accounting. Same as Economics 25 but credit is allowed without the completion of Economics 26.

30. Prices of Farm Products. Past and probable future trends in prices of important farm products. Adjustment of production to price changes, foreign competition. Price stabilization.

40. Principles of Marketing Organization. The principles of the organization of the market and of marketing enterprises, both proprietary and co-operative.

47. Marketing Accounting.

50. Farm Finance. The mechanism of exchange with special reference to the financing of the production and marketing of farm products.

90. Agricultural Statistics. Statistical method applied to the analysis of agricultural data; collection, tabulation, and graphical presentation; averages; measures of dispersion; index numbers; time series.

101. Farm Management. 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.

102. Farm Management: Organization. The business side of farming is emphasized. Special attention is given to farm organization and equipment.

103. Farm Management: Operation. Continuation of 102. Special attention is given to farm operation.

104. Types of Farming. A study of types of farming and of prevailing farm practices in the principal agricultural production areas.

110-111. Economics of Agricultural Production. The principles of production economics applied to agriculture, special emphasis being placed upon comparative advantage and localization of production.

126. Economics of Consumption. Nature of human wants; standards of living; costs of living; income, administration of income; nature of demand; demand and price; relation of consumption to the population problem.

131. Market Prices. Manner in which prices are determined in the market place. Local, wholesale, and retail prices. Price fluctuation and speculation. Prices and market grades. Market quotations.

135. Methods of Price Analysis. Statistical methods for the study of the forces determining prices, forecasting price changes, and determining "established prices." Survey of research work in the field.

140. Marketing Organization: Staples. Principles of production economics applied to the organization of markets and marketing organization for the grains, tobacco, cotton, and wool. Special attention to co-operative organization.

141. Marketing Organization: Dairy and Poultry Products.

142. Marketing Organization: Fruits and Vegetables.

143. Marketing Organization: Livestock and Meats.

144. Co-operative Organization. Development of co-operation in agriculture in the United States and foreign countries. Analysis of economic problems peculiar to co-operative organization, especially of marketing agencies.

150. Advanced Farm Finance.

170. Land Economics. Land as a factor of production; rural and urban utilization; rents and land values; land classification; land exchange.

191. Advanced Agricultural Statistics. Analysis of agricultural data by methods of correlation, partial and multiple correlation.

See also courses in Economics and Business Administration.

FORESTRY

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.

2. Field Dendrology. Trees and shrubs found in Itasca Park, with special reference to identification by means of gross characters.

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.

5. Field Silviculture. Largely field work designed to give the student a working knowledge of the forest. Includes silvicultural study of the species found in the north woods and the general principles underlying silvicultural reconnaissance.

6. Field 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; use of compass, pacing and mapping.

7-8. 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 and yield tables, and growth of trees and stands.

20. Grazing. History of grazing in the West. Kind of stock used. Forage plants. Regulations and methods of handling stock. Range management and protection. Lectures, recitations, and reading.

23. Factory Experience. Time actually spent in work and study in an approved wood using industry. Complete detailed report is required.

27. Farm Wood Lots 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.

28. Logging. The principles and general methods of operation in the United States, and the modifications required by forest management.

29. Sawmill, and Woodworking Machinery. Sawmills, woodworking machinery, and the processes in the primary manufacture of lumber products.

30. Wood Seasoning. The theory and practice of air seasoning and kiln drying of wood.

31. Logging Laboratory. The student will spend at least one week in an approved logging camp and make a complete report of the operation.

32. Forest Reports. This course is intended to assist the forester in the collection, selection, arrangement, and presentation of scientific data in the form of reports through practice writing and individual conferences.

33-34. Wood Structure and Identification. Structure, classification, and identification of the domestic commercial woods. Lectures, laboratory.

37. Forest Protection. The protection of forest from fire—fire prevention, and fire suppression. The causes of forest fires and their elimination, climate and fires, fire fighting and fire legislation.

48. Forest Products. An introductory survey of the products of forests other than wood as naval stores, tannins, wood pulp, paper, etc. Lectures, reading, reports.

50. House and Furniture Woods. The woods used in house construction and finish, furniture, etc. Their identification and properties. Lectures and laboratory.

101. Advanced Dendrology. A continuation of Course 3-4 with special studies in classification and distribution of some important timber species of the world.

107. Uses of Wood I. The economic hard and soft woods, both foreign and domestic from standpoint of production, distribution, qualities, amounts, and prices in relation to the wood using industries. Lectures, reading, reports.

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.

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.

111-112. Advanced Forest Mensuration. Continuation of Course 8 with special emphasis on the construction of alinement charts, and correlation as applied to problems in forest mensuration.

113. Wood Pulp and Paper. Cellulose and its properties. Methods of production of wood pulp and paper products. Lectures, reading, reports.

114. Mechanical and Physical Properties of Wood I. Study of moisture in relation to hardness, strength, stiffness, density, shrinkage, swelling, absorption, humidity, etc. Lecture.

115-116. Mechanical and Physical Properties of Wood II. Study of strength in relation to grain, density, structure, etc. Calculation of stresses, strains, etc. Lecture and laboratory.

119-120. Advanced Wood Structure. A detailed study of the elements and structure of native and foreign economic woods. Preparation, sectioning, and mounting of typical sections. Classification of woods based on structure. Reference reading and reports.

122-123. Forestry Seminar. Research problems in silviculture and forest management with special reference to the questions involved in the program of the Lake States Forest Experiment Station.

125. Wood Preservation. Lectures and collateral reading upon the history, development, and methods of wood preservation. Different systems now in use and preservatives used.

126. Silvics. The fundamentals forming the basis of silviculture with special attention to the sylvics of the important tree species. Lectures, readings, and required papers.

127. Silviculture. A study of the general principles underlying the art of silviculture, and a brief study of European methods as applied to American conditions.

128. Silviculture Laboratory. Nursery practice and field planting. Preparation of a silvicultural plan for a small tract of timber and the application of that plan.

129. American Silvicultural Practice. A study of the silvicultural methods now being employed in the United States and the probable results of the application of other European methods. Lectures, references, and discussion.

130. Forest Valuation. The business of forest management. A study of the different factors entering into the valuation of forest property.

131. Forest 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.

132. 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.

134-135. Forest Problems. The preparation of a report on some phase of forestry work. This report may include the results of some original investigation, or it may consist in collecting and arranging facts and the drawing of proper conclusions from these facts.

136. Forest Economics. The place of the forest in the productive utilization of land; past and present markets and source of supply of timber and timber products, particularly with reference to the present situation in North America.

140. Forest Working Plans. A study of methods of regulating and allotting the cut from a forest under management. Preparation of a working plan. Lectures and reports.

GEOLOGY AND MINERALOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

1. General Geology.
2. Historical Geology.
3. Economic Geology.
8. Introductory Geology.

23-24-25. Elements of Mineralogy.

29. General Physiography.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

GERMAN

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

1. Beginning A.
2. Beginning B.
3. Beginning C.
4. Intermediate German.

24-25-26. Chemical German.

30-31-32. Medical German.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

HISTORY AND PHILOSOPHY OF EDUCATION

COLLEGE OF EDUCATION

1. A Brief Course in the History of Education.
3. Educational Sociology.
5. Public Education in the United States. A survey of factors determining public education in the United States followed by a study of the development of educational theory and the rise of state systems.

For additional courses and course descriptions see the bulletin of the College of Education.

HOME ECONOMICS

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.
4. Textiles. See bulletins of the College of Science, Literature, and the Arts and Education.
11. Clothing Planning and Construction, A. Provides instruction and practice in planning, buying, cutting, fitting, and making garments of washable materials; sewing machines, care and use; commercial patterns, interpretation and adaptation.
13. Clothing Planning and Construction, B. Laboratory practice in costume modeling; preparation of dress form; adaptation of textile and art principles in selection of materials and design; instruction and practice in construction of a semi-tailored wool garment and of infant's or children's garments.
15. Clothing Problems. A consideration of the individual clothing budget; care of clothing; clothing in relation to health; the selection of ready-to-wear clothing; children's clothing. Talks by store people and trips to stores and clothing factories are arranged for.
17. Advanced Clothing. Laboratory course in the designing, modeling, and construction of silk or wool costume, including millinery; one problem to test acquired speed.
18. Commercial Clothing Manufacture. Laboratory practice upon commercial basis. Shop organization, with problems involving clothing design and construction.
33. Home Management Problems for Social Workers. The management of the home in relation to the economic and social status of the family, special consideration being given to the dependent family.
34. Home Management: Operation and Maintenance, Lectures. Discussion of the managerial aspects of homemaking with special emphasis upon problems involved in the use of time, energy, and money.
35. Home Management: Operation and Maintenance, Laboratory. Actual experience in a home management house with various household management problems including the care and behavior of a child of preschool age.
44. 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.
50-51. Color and Design. The principles of color and design related to such problems as selecting and designing costumes, and selecting, arranging, and designing house furnishings.
53. Advanced Design. Principles discussed and problems worked out relating to costume and house furnishing design.
55. Decorative Needlework and Other Crafts. Applied design in needlework the major interest. Other crafts given consideration such as block

printing, to be worked out in such problems as book ends, blotter pads, folios.

56. Applications of Color and Design. See Course 50-51.

57. Batik and Other Crafts. Principles of design and color harmony applied to batik and such other crafts as leather tooling, tie dyeing, and lamp shade making. Articles are planned to relate to definite dress and home furnishing problems.

60. Institution Marketing. Problems involved in the purchasing of foods on a large quantity basis. Factors in the production, distribution, and sale of commodities which affect the wholesale buyer.

61. Quantity Cookery. Application of the principles of cookery to large quantity preparation; planning of meals for dining hall, cafeteria, and tea room; a study of standardized formulae and production costs.

63. Institution Experience. Experience in the minor problems of cafeteria, dining hall, and tea room administration.

65. Institution Equipment. Equipment for the institution food department; materials, construction, operation. Placing of equipment in relation to the routing of work within the unit, and in relation to the work of other departments.

70. Nutrition Survey. Selection of food from a nutritional standpoint and the relation of food to health and efficiency.

73. Nutrition I. (1) The nature and properties of groups of compounds occurring in the cell and in food, (2) digestion, and (3) absorption.

75. Dietetics Laboratory. (1) Food values, (2) problems relating to the selection of food under conditions of health and under such pathological conditions as are chiefly dependent upon diet.

79. Selected Problems for Dietitians. A selected group of problems related to the work of the dietitian involving discussions, assigned readings, and field trips.

80. Foods and Cookery. The development of technique and the application of fundamental science principles to cookery processes. The establishment of good standards for food products.

81. Foods and Cookery. A three-credit course open by examination to a limited number of students. See 80.

83. Food Management. Determination and study of the management factors involved in the food problems of the homemaker.

85. Food Marketing. Food problems of the consumer. A study of the quality and cost of foods on the market. Laboratory and field work.

89. Camp Cookery. Simple cookery processes with adaptations to out-of-door cookery. Laboratory and field work. Not open to home economics students. For prospective foresters, engineers, and others. (Given alternate years. Offered in 1930-31.)

102. Advanced Textiles. An intensive study of textile materials with special reference to the following: nature of the raw materials; economic, chemical, and physical applications involved in their manufacture and use; methods and significance of physical testing.

107. Textile Analysis and Related Problems. Problems and application of quantitative methods in textile analysis with special reference to establishing standards for fabrics.
115. Clothing Economics. A study of the economic aspects of clothing which directly or indirectly affect the consumer.
131. Home Management: House Planning and Equipment. Study of the small house which aims at more intelligent planning in building and furnishing. House plans, kitchen arrangements, and equipment of house studied from homemaker's point of view of economy, convenience, and beauty.
136. Problems in Income Management. An intensive study of problems relating to management of individual and family incomes. Readings, discussions, and field work.
150. Art History and Appreciation. The historical development of painting, sculpture, architecture, decoration, furniture, and costumes, studied with special emphasis on design and influence upon modern styles.
152. Advanced Interior Design. Special problems of small house decoration will be studied. Elevation drawings made. Actual materials will be used as far as possible.
154. Advanced 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.
156. Hospital Social Service.
163. Institution Management Problems. Problems affecting the efficient administration of the institution; departmental organization, operation, maintenance; employment problems; business policies. Field trips to various types of institutions.
170. Nutrition of the Family. 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.
171. Child Nutrition. Lectures, discussions, and field work dealing with the principles of child nutrition and with the formation of desired food habits.
173. Nutrition in Disease. A study of the fundamental principles involved in using diet in the treatment of certain diseases.
175. Nutrition II. Metabolism including work on tissues, blood, milk, and urine.
176. Advanced Nutrition. Selected quantitative methods applicable to investigations relating to digestion and metabolism.
177. Digestion and Metabolism. An intensive study of problems relating to digestion and metabolism involving lectures, readings, demonstrations, and laboratory work.
179. Readings in Nutrition. A course designed to give intensive experience in the use of nutrition books and periodicals, involving assigned readings, oral and written reports.

182. Experimental Cookery. An intensive study of problems in foods and food preparation with individual laboratory problems.

186. Special Food Problems. A continuation of experimental cookery involving advanced individual problems. Reading and discussions of recent experimental work in food preparation.

187. Special Food Problems. The same as Course 186 with additional problems.

195. Home Economics Survey. A discussion of the historical development of home economics with special emphasis upon current problems.

HOME ECONOMICS EDUCATION

COLLEGE OF EDUCATION

Students expecting to receive a teacher's certificate upon graduation shall be registrants in the College of Education from the beginning of the junior year. No formal application is necessary to register in the College of Education if specialization in one of the teachers' courses is desired at the beginning of the junior year. However, no student may transfer who has not earned 90 credits and 90 honor points.

40. Child Training. A brief study of the physical and mental development of the child is followed by a discussion of the problems of training small children. Emphasis is placed on the pre-school child. Lectures, observations in the Nursery School, and reports.

42. Special Methods of Teaching Home Economics. The psychological bases for teaching; methods of teaching applied to home economics. Required of all students preparing to teach.

49. Observation and Teaching: General Home Economics. Observation of classes in day schools and evening schools; teaching under supervision of at least two phases of home economics; individual and group conferences on teaching problems.

141. Vocational Education in Home Economics. The place and development of home economics in the vocational education program. Study of the problems of the all day, evening, and part time schools.

142. Educational Measurement in Home Economics. Problems of measurement in home economics; home economics tests and scales; construction and evaluation of objective tests.

143. Home Economics Curricula. The objectives of home economics in the junior and senior high schools; recent surveys and other investigations used in determining curricular content; home economics courses of study.

147. 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.

149. Research Problems. A study of the methods used in collection, treatment, and interpretation of data in the field of home economics.

HORTICULTURE

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.

32. Vegetable Growing. The fundamental principles of vegetable growing. Scope of the industry and its place in agriculture. Varieties, seed production, regional adaptation, soils, fertilizers, equipment, storage, systems of production, and marketing.

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.

56. Plant 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.

71. Elementary Landscape Design and Plant Materials. The elementary principles of landscape design; identification of evergreen and deciduous trees, shrubs, and vines, with special emphasis on their fall and winter characters and their uses in landscape design. Lectures, outdoor and indoor laboratories, field trips.

72. Woody Plants and Garden Flowers. Deciduous and evergreen trees, shrubs and vines, from their winter and spring characters; with special emphasis on their flower characters; herbaceous annuals, biennials, perennials, including bulbs and their uses in landscape planting; spring and summer characteristics; use in landscape gardening. Lectures, indoor and outdoor laboratories, field trips.

74. Principles of Landscape Design. The composition of the various elements used in landscape gardening, methods of presentation. Lectures and problems.

75. Landscape Problems. The planning and planting of home properties for the city and country. Lectures, field trips, and reports.

76. Landscape Construction. Construction and maintenance of turf for lawns, golf courses, and other play areas; garden architecture, grading, planting and care, costs of construction. Lectures, field trips, and reports.

93. Judging Horticultural Crops. The principles and practice of judging and exhibiting fruits, vegetables, and flowers.

107. Orchard Management. A detailed study of the various operations in orchards and berry fields. Operating costs and profits. Lectures, laboratory, and individual problems.

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.

111. Systematic Pomology. Fruit varieties. Classification, description, identification, and elements of judging. Lectures, laboratory, and a survey of the literature.

121. 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.

135. Truck Crops and Potatoes I. Truck crop production as an applied science. The crop or the plant is used as the unit of consideration and the sciences used to explain cultural practices and plant behavior.

137. Truck Crops and Potatoes II. Continuation of Course 135.

190-191-192. Special Problems. Problems based upon the work given in the preceding courses.

193-194-195. Horticultural Seminar. Reports and discussions of problems and investigational work.

INORGANIC CHEMISTRY

SCHOOL OF CHEMISTRY

1-2-3. General Inorganic Chemistry.

9-10. General Inorganic Chemistry.

11. Qualitative Chemical Analysis.

For additional courses and course descriptions see the bulletin of the School of Chemistry.

MATHEMATICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Placement tests.—In each of Courses 3, 4, 5, 6, and 8, students who fail to pass certain tests will be dropped from the course during the first two weeks. A student who is dropped from Course 4 or 6 or 8 must complete Course 3 or 5 before taking any other course in mathematics. A student dropped from Course 3 or 5 must pass Subfreshman Mathematics in the Extension Division before returning to Course 3 or 5.

3. Higher Algebra, Short Course.
4. Trigonometry, Short Course.
5. Higher Algebra.
6. Trigonometry.
7. College Algebra.
8. Commerce Algebra.

For additional courses, consult the bulletin of the College of Science, Literature, and the Arts.

MILITARY SCIENCE AND TACTICS

Students who have completed the Basic Course, R.O.T.C., may be selected for advanced work by the professor of military science and tactics. Those who pursue the Advanced Course are required to sign an agreement

with the government to continue the two years' course to completion. This includes attendance at a training camp, held normally during the summer following the first year's advanced work. The camp is conducted free of cost to the student, and in addition, while actually in camp, the student receives the pay prescribed for the seventh grade in the army. Students pursuing the Advanced Course are also furnished a special uniform and receive a fixed allowance per day. The total government compensation for the two years' advanced work amounts to something over $200. Students who satisfactorily complete the Advanced Course will be commissioned in the Officers' Reserve Corps of the United States Army. The University allows 18 credits for the two years advanced R.O.T.C. work.

1-2-3. First Year Basic Course R.O.T.C. Practical instruction in schools of soldier, squad, platoon, company, and battalion; ceremonies, rifle marksmanship, military courtesy, military hygiene and first aid, physical drill.

4-5-6. Second Year Basic Course R.O.T.C. Practical and theoretical instruction in schools of company and battalion; scouting and patrolling, musketry, interior guard duty, automatic rifle.

51-52-53. First Year Advanced Course R.O.T.C. Military sketching, military field engineering, machine guns, military law, rules of land warfare, command and leadership.

54-55-56. Second Year Advanced Course R.O.T.C. Command and leadership, infantry weapons (37-mm. gun, 3-inch trench mortar) administration, military history and National Defense Act, combat principles.

MUSIC

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

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.

1-2-3. Harmony.
10-11-12. Organ.[1]
16-17-18. First Year Pianoforte.[1]
22-23-24. Violin.[1]
28-29-30. Voice.[1]
34-35-36. Other Orchestral Instruments.[1]
40-41-42. Orchestra.
43-44-45. University Choir.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

ORGANIC CHEMISTRY

SCHOOL OF CHEMISTRY

51-52-53. Organic Chemistry.

For additional courses and course descriptions see the bulletin of the School of Chemistry.

[1] For special and practice fees for these courses see bulletin of general information.

PHYSICAL CHEMISTRY

SCHOOL OF CHEMISTRY

101-102-103. Physical Chemistry.
110. Physical Chemistry.

For additional courses and course descriptions see the bulletin of the School of Chemistry.

PHYSICAL EDUCATION FOR MEN

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.

For a special four-year professional course in physical education and athletic coaching, see bulletin of the College of Education. Students interested in this course should consult the department before registering.

Not more than nine credits in courses in physical activities may be counted toward graduation.

1-2-3. Freshman Physical Education.
4. Freshman Hygiene. Required of all freshmen.
7-8-9. Advanced Leaders.
10-11-12. Minor Sports.
16-17-18. Drill Substitution. (By petition only.)
30. Athletic Training and First Aid.

For additional courses and course descriptions see the bulletin of the College of Education.

PHYSICAL EDUCATION FOR WOMEN

This department aims to promote the physical efficiency 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 of residence; conducts yearly consultations with, and examines when necessary, all upper-class students; gives courses in hygiene; organizes neuromuscular activity leading toward organic strength, nervous stability, conscious motor control, correct body mechanics, skill in handling the body and in physical recreation, and the development of that valuable social quality known as good sportsmanship; co-operates 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 of all sophomores who cannot pass the swimming examination (see Courses 22-23). Physical examinations or consultations required annually of all students.

Six credits is the maximum number that can be gained toward the degree by taking courses in exercises (Courses 41, 42, 43, 45, 66-67-68, 69-70-71).

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.

1-2-3. Elementary Physical Training. Gymnastics, apparatus work, orthopedic exercise, folk dancing, indoor and outdoor games. Individual health consultations.
4. Preliminary Hygiene. One lecture a week. The most essential aspects of the care of the personal health.
7-8. Sophomore Gymnastics.
9. Sophomore Archery.
10-11-12. Sophomore Orthopedic and Individual Gymnastics.
13-14-15. Sophomore Natural Dancing.
16-17. Sophomore Games and Folk Dancing.
18. Tennis.
19. Sophomore Hockey.
20. Sophomore Basket-Ball.
21. Sophomore Baseball.
22-23. Sophomore Elementary Swimming.
24. Sophomore Horseback Riding.
25-26. Sophomore Intermediate Swimming.
27. Sophomore Golf.
28-29. Sophomore Advanced Swimming.
30. Sophomore Life Saving and Water Sports.
31. Sophomore Skating.

For additional courses and course descriptions see the bulletin of the College of Education.

PHYSICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

3. Elements of Mechanics and Sound.
4. Elements of Mechanics Laboratory.
9. Acoustics.
23. Heat.
24. Heat Laboratory.
33. Optics.
34. Optics Laboratory.
43. Magnetism and Electricity.
44. Electrical Laboratory.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

PHYSIOLOGY

MEDICAL SCHOOL

4. Human Physiology. Elementary course. For academic, home economics, pharmacy, and other students. Lectures and demonstrations.
57. Physiologic Chemistry. Intermediate course.
59. Human Physiology. Intermediate course.

60. Physiology of Exercise. Intermediate course.
100-101. Physiologic Chemistry.
103. Physiology of Muscle, Nerve, Blood, Circulation, and Digestion.
104. Physiology of the Nervous System and Special Senses.

For additional courses and course description see the bulletin of the Medical School.

PLANT PATHOLOGY AND BOTANY

1. Plant Pathology. An introductory course in plant diseases. Lectures, laboratory, and reference. Not open to those who have completed 10.
7-8. Weeds and Grasses. Agricultural and applied botanical study of weeds and grasses with special reference to agricultural importance.
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.
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.
12. Seed Problems. Special seed problems are assigned. Advanced work in seed testing methods.
105-106-107. Mycology. Morphology and taxonomy of fungi. Lectures, laboratory, and field work.
110. Principles of Pathology. Physiology of plant pathogens; parasitism, physiological specialization, host reactions, predisposition, resistance, and immunity.
111. Diseases of Cereal Crops. Detailed study of diseases of cereal crops, including symptomatology, etiology, and practical methods of control Laboratory, lecture, and field work.
112. 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 1930-31.)
113. Diseases of Vegetable Crops. A detailed study of diseases of potatoes and other vegetable crops. Lectures, reference, laboratory, and greenhouse work. (Given in alternate years. Not offered in 1930-31.)
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. (Given in alternate years. Not offered in 1930-31.)
116. Pathologic Histology. A study of the histological changes in diseased plants. Lectures, laboratory, and reference work. (Given in alternate years. Offered in 1930-31.)
117. Diseases of Forage and Fiber Crops. Symptomatology, etiology, and methods of control. Lectures, laboratory, and field work. (Given in alternate years. Not offered in 1930-31.)
118. Bacterial Diseases of Plants. Bacteria as plant pathogens; representative types with particular reference to technique used in studying bacterial diseases of plants. Lectures, laboratory, and greenhouse work. (Given in alternate years. Not offered in 1930-31.)

119. Principles of Plant Disease Control. Methods of plant disease control by means of exclusion, eradication, protection, and immunization. Lectures, laboratory, and reference work. (Given in alternate years. Offered in 1930-31.)

160. Plant Microchemistry. The localization, identification, and function of plant constituents. Lectures, demonstrations, and laboratory.

161. Transport, Storage, and Ripening of Fruits and Vegetables. The effects of temperature, respiration, packing, etc., on storage life.

POLITICAL SCIENCE

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

1. American Government.

2. State Government.

51-52-53. Business Law. (See bulletin of the School of Business Administration.)

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

POULTRY HUSBANDRY

1. Poultry. The importance and extent of the poultry industry, market products, principles of house construction, methods of care and management, feeding for egg production.

2. Poultry Judging. The origin, standard requirements, and common defects of the leading commercial standard breeds and varieties and determination of standard values by the score card and comparison methods.

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.

5. Advanced Poultry Judging. Practice in close selection for high egg production; for standard values of different color patterns and principal standard types; mating to produce high standard quality.

6. Poultry Problems. Special problems and research in the field of poultry industry.

101. Advanced Poultry Breeding. Principles of genetics applied to poultry breeding; a survey of inheritance in the fowl; fecundity, physiology of reproduction in the fowl.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

MEDICAL SCHOOL

3. Personal Hygiene and Elementary Sanitation.

52. Health Care of the Family. 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. Arranged for students of home economics

57. Health of Infant and Pre-school Child.
58. Maternal and Child Hygiene.
60. Tuberculosis and Its Control.
61. Mental Hygiene.
73. Occupational Hygiene and Disease.
80. Health Supervision of School Child.
102. Sanitation.
103. Public Health Bacteriology.

For additional courses and course descriptions see the bulletin of the Medical School.

PSYCHOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

1-2. General Psychology.
3. Psychology Applied to Daily Life.
4-5. Introductory Laboratory Psychology.
7. Introductory Laboratory Psychology.
9. Introduction to Animal Psychology.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

PUBLICATIONS AND RURAL JOURNALISM

10-11-12. Agricultural Journalism. Intended for students who may wish to enter the field of agricultural journalism as a profession.

19. Publicity. For students planning careers in agriculture or some allied industry, in which the co-operation of the press will be needed.

For additional courses see the Department of Journalism, in the bulletin of the College of Science, Literature, and the Arts.

RHETORIC

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 enter a class in elementary rhetoric.

1. Rhetoric I. Note taking, gathering and organizing material, oral and written exposition, paragraph structure, supplementary reading.
2. Rhetoric II. Sentence structure, diction, exposition, news articles, supplementary reading.
3. Rhetoric III. Description, narration, news articles, supplementary reading.

11. Argumentation. Gathering evidence, reasoning, briefing, formal and informal argument, persuasion, debating.
22. Public Speaking. (3-hour course.) A practical course in fundamentals of speech making.
23. Public Speaking. (5-hour course.)
24. Advanced Public Speaking. Types of audiences, persuasion, voice, extemporaneous speeches for special occasions.
28. Play Production. History of the theater, theories of acting, staging, etc. A survey of the problems confronting the producer of amateur plays.
29. Advanced Play Production. Continuation of 28. Problems of directing, staging, and make-up. Study of representative one-act plays. Each student is required to produce one one-act play. A practical course for teachers.
31. Survey of English Literature I. Survey of English literature of the sixteenth, seventeenth, and eighteenth centuries.
32. Survey of English Literature II. Survey of English literature of the nineteenth century.
33. Modern Literature. Contemporary English and American writers.
34. Books and Reading. The selection of books and periodicals for the home library.

ROMANCE LANGUAGES

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

French

1-2. Beginning French.
3-4. Intermediate French.
20. Oral and Written French.
21-22-23. Survey of French Literature.
53. Elementary French Composition.
54-55. Elementary French Conversation.

Spanish

1-2. Beginning Spanish.
3-4. Intermediate Spanish.
20. Oral and Written Spanish.
53. Spanish Composition.
54-55. Spanish Conversation.
68-69. Survey of Spanish Literature.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

SOCIOLOGY AND SOCIAL WORK

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

1. Introduction to Sociology.
6. Social Interaction.
14. Rural Sociology.
45. Social Statistics.

55. Housing Problems.
60. Child Welfare.
100. Social Psychology.
110. Rural Organization.
112. The Rural Social Survey.
114. Rural Social Institutions.
116. The Newspaper As a Social Institution.
119. The Family.
120. Social Progress.
134. Legal Protection of the Child.
135. Rural Social Case Work.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

SOILS

4. Soils. Origin, formation, composition, and classification of soils; physical properties, moisture relations; principles of tillage. Lectures, laboratory and field work.
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.
8. Physical Properties of Soils. See Course 108 for description.
101. Chemical Analysis of Soils. A laboratory course on the chemical examination of soils, including both fusion and extraction methods for mineral nutrients.
102. Special Problems in Soils. Individual laboratory or field work upon some special problem in soil physics, soil chemistry, or soil management. Arrangement must be made in advance.
104. Soil Surveying. Field practice in surveying soils and the preparation of soil maps.
107. Fertilizers and Manures. Sources, composition, and uses of the various fertilizers, manures, and soil amendments. Lectures and laboratory work.
108. Physical Properties of Soils. The determination of physical constants of soils, including mechanical composition.

VETERINARY MEDICINE

2-3-4. Comparative Anatomy and Physiology of Domestic Animals. A course in anatomy and physiology with special reference to the structures involved in conformation, circulation, respiration, digestion, and excretion. Recitation and lectures.
6. Physiology of Reproduction. A study of embryology, obstetrics, sterility; the common diseases associated with breeding animals; non-infectious diseases associated with digestion.
8. Veterinary Studies.[1] Includes studies in anatomy, physiology, and the

[1] Full credit will not be allowed for this course when other courses in this division are completed. Students pursuing other courses in veterinary medicine should apply to the division for adjustment of credit.

causes, prevention and treatment of common diseases of domestic animals. Designed especially for students desiring a brief course in animal diseases.

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.

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.

103-104. Advanced Comparative Physiology. An advanced course in physiology of the domestic animals, including laboratory work with special emphasis on animal nutrition.

ZOOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

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 59.

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

14-15-16. Generol Zoology. Structure, physiology, embryology, classification, and evolution of animals. Third quarter is devoted to the Arthropoda, principally the Insecta.

17-18. General Zoology. A six-hour course for students in home economics.

21. Introduction to General Physiology.

22. General Ecology.

23. Introductory Entomology.

24. Introductory Animal Parasitology.

25. Introductory Histology.

26. Comparative Anatomy

27. Technique.

46-47. Ornithology.

107. Protozoology.

117-118-119. Ecology of Insects.

125-126-127. Advanced Entomology.

139-140. Histology and Development of Insects.

144-145-146. Animal Parasites and Parasitism.

148-149-150. Histology and Organology.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

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The College of Agriculture, Forestry, and Home Economics

Part II

Announcement of Program for the Year 1931-1932

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1931

JULY

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AUGUST

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SEPTEMBER

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OCTOBER

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JANUARY

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FEBRUARY

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MARCH

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MAY

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JUNE

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JULY

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AUGUST

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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
..	..	..	..	..	..	..

UNIVERSITY CALENDAR

1931-32

Fall Quarter

1931			
September	17	Thursday	Payment of fees closes, except for new students
September	21	Monday	Entrance tests
September	21-22		Registration for Freshman Week of all new students entering the freshman class
September	21-25		Examinations for removal of conditions Physical examinations
September	23-26		Freshman Week
September	24-25		Registration days[1] for students with advanced standing and old students not previously registered.
September	25	Friday	Payment of fees for new students closes
September	28	Monday	Fall quarter classes begin, 8:15 a.m.[2] First term School of Agriculture begins
October	5-10		Advanced Creamery Operators' Short Course
October	15	Thursday	Senate meeting, 4:30 p.m.
October	31	Saturday	Homecoming Day
November	4	Wednesday	Mid-quarter grades due
November	11	Wednesday	Armistice Day Convocation
November	26	Thursday	Thanksgiving Day; a holiday
December	3	Thursday	State Day Convocation
December	3-12		Ice Cream Makers' Short Course
December	14-19		Final examination period
December	17	Thursday	Commencement Convocation Senate meeting, 4:30 p.m.
December	18	Friday	First term School of Agriculture closes
December	19	Saturday	Fall quarter ends, 5:20 p.m.
December	26	Saturday	Payment of fees closes for all students in residence fall quarter[3]

[1] Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, page 49 (bulletin of general information). No student will be allowed to register in the University after one week from the beginning of the quarter excepting in unusual cases wherein special circumstances shall justify the appropriate committee of the college concerned permitting registration at a later date.

[2] First hour classes begin at 8:30 a.m. on Minneapolis campus.

[3] New students must pay fees on dates announced for registration.

Winter Quarter

1932			
January	2	Saturday	Entrance tests Registration day[1] for new students Payment of fees for new students closes Registration and payment of fees close at 3:00 p.m.
January	4	Monday	Winter quarter classes begin, 8:15 a.m.[2] Second term School of Agriculture begins
Jan. 6-Feb. 17			Six weeks Creamery Short Course
January	18-23		Farmers' and Homemakers' Week Short Course
February	9	Tuesday	Mid-quarter grades due
February	12	Friday	Lincoln's Birthday; a holiday (except for extension)
February	18	Thursday	Charter Day Convocation Senate meeting, 4:30 p.m.
February	22	Monday	Washington's Birthday; a holiday (except for extension)
March	14-19		Final examination period
March	17	Thursday	Commencement Convocation Payment of fees closes for all students[3] in residence winter quarter
March	19	Saturday	Winter quarter ends, 5:20 p.m. Second term School of Agriculture closes

Spring Quarter

March	26	Saturday	Entrance tests Registration day[1] for new students Payment of fees for new students closes Registration and payment of fees close at 3:00 p.m.
March	28	Monday	Spring quarter classes begin, 8:15 a.m.[2]
May	4	Wednesday	Mid-quarter grades due
May	7-9		Editors' Short Course
May	12	Thursday	Cap and Gown Day Convocation
May	19	Thursday	Senate meeting, 4:30 p.m.
May	30	Monday	Memorial Day; a holiday

[1] Registration subject to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, page 49 (bulletin of general information). No student will be allowed to register in the University after one week from the beginning of the quarter excepting in unusual cases wherein special circumstances shall justify the appropriate committee of the college concerned permitting registration at a later date.

[2] First hour classes begin at 8:30 a.m. on Minneapolis campus.

[3] New students must pay fees on dates announced for registration.

June	4 & 7-11		Final examination period
June	5	Sunday	Baccalaureate service
June	6	Monday	Sixtieth annual commencement
June	11	Saturday	Spring quarter closes, 5:20 p.m.

Summer Quarter

June	13-14		Registration, first term
June	15	Wednesday	Summer quarter classes begin, 8:00 a.m.
July	4	Monday	Independence Day; a holiday
July	21	Thursday	Commencement Convocation
July	23	Saturday	Registration and payment of fees for second term closes at 12 m.
			First term closes
July	25	Monday	Second term classes begin, 8:00 a.m.
July 27-Aug. 1			Forestry, Woodcraft, Scouting, and Camping Leadership Short Course
August	27	Saturday	Second term closes

Entrance Examinations

Entrance examinations for admission to the various colleges of the University will be conducted for students whose credentials do not meet the requirements.

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

For further information concerning these examinations see under "Admission by Examination," page 30, bulletin of general information.

CURRICULA

Following is a summarized statement of the curriculum requirements for use in arranging registration. Detailed statements of the various curricula will be found in Part I of the bulletin.

A. TECHNICAL AGRICULTURAL CURRICULA

REQUIRED COURSES

Freshman year.—Freshman Assembly; Mil. Sci. 1-2-3; Agr. Eng. 13, 28, 31, or 37; Agron. 1; An. Husb. 10-11; Bot. 1 and 6 credits from the following: Bot. 2, 5, 7, 12, 13, 21, 22; Inorg. Chem. 1-2-3 or 9-10; Dy. Husb. 1; Hort. 6 or 32; Math. 5 cred.; Rhet. 1, 2, 3.

Sophomore year.—Mil. Sci. 4-5-6; Agr. Biochem. 7-8; Agr. Econ. 1, 2; Agr. Eng. 3, 23; Bact. 41; Zool. 14-15-16.

Junior year.—Rhetoric 11 or 24 or 31, 22; Soils 4, 5.

ELECTIVE COURSES

METHOD I—OPEN ELECTIVE CURRICULA

In addition to the required subject courses a major of 24 to 36 credits may be chosen from one of the following groups: (a) Farm Management and Agricultural Economics, (b) Agricultural Education, (c) Animal Industry, (d) Agricultural Sciences, and Plant Industry, (e) Agricultural Engineering; together with a minor of 18 credits from any group except that chosen for the major. Eighteen credit hours of the remaining electives must be chosen from groups other than major and minor.

METHOD II—SUGGESTED ELECTIVE CURRICULA

General Curriculum in Agriculture

Junior year.—Agr. Biochem. 15; Agr. Econ. 40; Agr. Eng. 12; Agron. 121, 123, 131, 132; An. Husb. 2-3, 8; Ent. 3; Hort. 6 or 32.

Senior year.—Agr. Econ. 102, 103, 141; Agr. Eng. 7; An. Husb. 112; Dy. Husb. 6, 101; Pl. Path. 1; Sociol. 14; Vet. 9-10.

Agricultural Education

Junior year.—Agr. Educ. 11; Agr. Eng. 40; Agron. 121, 123, 131; An. Husb. 2-3, 8; Dy. Husb. 101; Ent. 3; Hort. 6; Vet. 9-10.

Senior year.—Agr. Econ. 40, 102, 103; Agr. Ed. 42, 181, 182, 183 and 3 additional credits; Dy. Husb. 6; Pl. Path. 1; Sociol. 14.

General Curriculum in Agricultural Economics

Arrange with adviser on major-minor plan.

General Curriculum in Agricultural Engineering

Junior year.—Agr. Econ. 40; Agr. Eng. 5, 7, 12, 13, 31, 37; Agron. 121, 122; An. Husb. 2-3, 8; Ent. 3; Pl. Path. 1.

Senior year.—Agr. Econ. 102, 103, 142; Agr. Eng. 14, 19, 24, 25; Agron. 131; An. Husb. 112; Dy. Husb. 6, 101; Sociol. 14.

General Curriculum in Animal Husbandry

Junior year.—Agr. Biochem. 15; Agr. Eng. 12; Agron. 122, 123, 131; An. Husb. 2-3; 4, 112; Ent. 3; Pl. Path. 1; Vet. 2-3-4.

Senior year.—Agr. Econ. 40, 102, 103, 143; Agr. Eng. 7; An. Husb. 6, 7, 101, and one of the following: 102, 103, 104, 105 or 113; Vet. 6.

General Curriculum in Dairy Husbandry

Junior year.—Agr. Biochem. 15; Agr. Econ. 101; Agron. 123, 131; An. Husb. 2-3; Dy. Husb. 3, 6, 101, 104; Geol. 8; Vet. 2-3-4.

Senior year.—Agr. Econ. 40, 102, 103, 104; Agron. 121; An. Husb. 105. 112; Dy. Husb. 103, 105, 106, 107; Ent. 3; Pl. Path. 1; Poult. 1; Sociol. 14.

General Curriculum in Dairy Products

Arrange with adviser on major-minor plan.

Curriculum in Fur Farming

Major and minor to be selected from the following:

Junior year.—Agr. Biochem. 15; Agr. Econ. 7; Agron. 131; Ent. 3, 4, 8; Vet. 2-3-4, 6, 12; Zool. 24.

Senior year.—Agr. Biochem. 116, 117; Agr. Econ. 101, 102; An. Husb. 112; Zool. 144-145-146.

General Curriculum in Horticulture

Junior year.—Agr. Econ. 40; Agron. 121, 131; Bot. 22; Ent. 3; Hort. 6, 32, 56, 72, 121; Pl. Path. 1, 112 or 113.

Senior year.—Agr. Econ. 102, 142; Agr. Eng. 12, or Agron. 132; Agr. Eng. 13 or 40; Hort. 93, 107, 110, 135, 137, 193-194; Sociol. 14.

Landscape Gardening

Junior year.—Agr. Eng. 19; Arch. 31-32-33; Ent. 3; Hort. 6, 32, 50, 56, 71, 72, 74, 93.

Senior year—Agron. 131; Arch. 14-15-16; Hort. 76, 110, 191-192, 193-194-195; Pl. Path. 1, 112 or 114.

B. AGRICULTURAL SCIENCE

Freshman year.—Freshman assembly; Mil. Sci. 1-2-3; Zool. 14-15-16 or Bot. 1 and 6 cred. from the following: Bot. 2, 5, 7, 12, 13, 21, 22; Inorg. Chem. 1-2-3 or 9-10; Math. 5, 6, 7, or Modern Language 15 cred.; Rhet. 1-2-3.

Sophomore year.—Mil. Sci. 4-5-6; Agr. Biochem. 7-8; Zool. 14-15-16 or Bot. 1 and 6 cred. from the following: Bot. 2, 5, 7, 12, 13, 21, 22; Bact. 41; Math. 5, 6, 7, or Modern Language 15 cred.; Rhet. 11, 22.

Junior and senior years.—Major sequence 24-36 cred.; minor sequence 18 cred. Minimum of 21 credits elective in applied or technical agriculture or in sciences fundamental thereto.

C. AGRICULTURAL ENGINEERING

Professional Curriculum

Freshman year.—See bulletin of the College of Engineering and Architecture.

Sophomore year.—Mil. Sci. 4-5-6; Agr. Eng. 7, 12, 13, 14, 19-20, 31; M.&M. 24, 25, 84; Phys. 3, 4, 23, 24, 43, 44; Soils 4, 8.

Junior year.—Econ. 8, 9; Agr. Eng. 37, 42, 71; An. Husb. 15; C.E. 42, 51; Dy. Husb. 7; Hort. 6; M. & M. 86, 128; M.E. 26, 27.

Senior year.—Agr. Eng. 70, 72, 150; Agr. Econ. 102, 103; Agron. 1; C.E. 144; G.E. 101, 193; Geol. 5; Econ. 28; Rhet. 22.

D. AGRICULTURAL BUSINESS ADMINISTRATION

Freshman year.—Same as for Agriculture except that Math. 5 or 8 should be substituted for Agr. En. 9-10 or 11.

Sophomore year.—Mil. Sci. 4-5-6; Agr. Econ. 1, 2, 8, 50; Econ. 20, 25-26; Psy. 1-2; Zool. 14-15-16.

Junior year.—Agr. Econ. 30, 40, 90, 110-111, 131, 141, 142; Bus. Adm. 51-52-53, 100, 142.

Senior year.—Agr. Econ. 135, 150, 170, 191; Bus. Adm. 58, 71, 101-102, 139; Econ. 149.

E. AGRICULTURAL JOURNALISM

Freshman year.—Same as for Technical Agriculture curriculum substituting Engl. A-B-C for Rhet. 1-2-3.

Sophomore year.—Mil. Sci. 4-5-6; Agr. Econ. 1, 2, 8; Engl. 11-12; Jour. 13, 14-15; Psy. 1-2; Zool. 14-15-16.

Junior year.—Agr. Econ. 40, 90, 110-111; Jour. 51-52, 57, 69; Sociol. 1, 14.

Senior year.—Agr. Econ. 30, 135; Econ. 149; Jour. 75, 104, 191-192; Pub. and Rur. Jour. 10-11-12; Psy. 56.

FORESTRY

REQUIRED COURSES

Freshman year.—Freshman assembly; Mil. Sci. 1-2-3; Agr. Eng. 3; Bot. 1 and 6 credits from the following: Bot. 2, 5, 7, 12, 13, 21, 22; Inorg. Chem. 1-2-3 or 9-10; For. 1, 3-4; Rhet. 1-2-3; Math. 3, 4; (summer at Itasca Park).

Sophomore year.—Mil. Sci. 4-5-6; Agr. Econ. 1, 2; Agr. Eng. 19-20, 23; For. 7-8; Geol. 1 or 29; Pl. Path. 10; Rhet. 11 or 22 or 31; Zool. 14-15.

Junior year.—Agr. Eng. 24-25; Ent. 6; For. 28, 33-34, 126, 127, 130, 131.

Senior year.—For. 134-135.

ELECTIVE COURSES

See elective groups in Part I of the bulletin.

HOME ECONOMICS

Group I—General Requirements

Freshman year.—Freshman assembly; Phys. Ed. 1-2-3; Inorg. Chem. 1-2-3 or 9-10; H.E. 3,* 50-51, 70; Rhet. 1, 2, 3; Sociol. 1; Zool. 17-18.

Sophomore year.—Phys. Ed. 22; Agr. Biochem. 3-4; Agr. Eng. 23; Bact. 41; H.E. 15, 53, 80 or 81; Psy. 1-2; Rhet. 22.

Junior and senior years.—Agr. Econ. 3; H.E. 34, 35, 83, 85, 131, 170, 171; H.E. Ed. 40; Physiol. 4; Prev. Med. 52; Rhet. 11 or 24 or 31.

Group II—Special Requirements

General Curriculum in Home Economics

Junior and senior years.—To those listed as required courses under Group I for freshman, sophomore, junior, and senior years add additional elective credits to total 193 quarter credit hours.

Curriculum in Foods and Nutrition

The same as those listed under Group I adding the following:

Junior and senior years.—Agr. Econ. 126, An. Husb. 111 or H.E. 75 and 179, 72, 173, 175, 182, 186 or 187.

* Transfer students presenting the equivalent of 3 credits in Textiles should register for H.E. 102 to complete textile requirement.

Curriculum in Textiles and Clothing

The same as those listed under Group I adding the following:
Junior and senior years.—Agr. Econ. 126; H.E. 11, 13, 17 or 18, 102, 115.

Curriculum for Dietitians

The same as those listed under Group I adding the following:
Junior and senior years.—Agr. Biochem. 2; Agr. Econ. 25; H.E. 60, 61, 63, 65, 71, 73, 75, 79, 163, 173, 175, 176, or 177, 178, 179, 182.

Curriculum in Institution Management

The same as those listed under Group I adding the following:
Junior and senior years.—Agr. Econ. 25, 126; An. Husb. 111; Econ. 1B, 161; H.E. 60, 61, 63, 65, 163, 182 or 183.

Teachers' Curriculum in Home Economics

Professional requirements: Ed. Psy. 55 or Agr. Ed. 11; Hist. of Ed. 1 or 5 or 101 or Ed. Ad. 65; H.E.Ed. 42,[1] 49, 142, 143.

Teachers' Curriculum in General Home Economics

To the professional requirements listed above and the courses listed under Group I add the following:
Junior and senior years.—Agr. Econ. 126; H.E. 11, 13, 16 or 17, 150.

Teachers' Curriculum in Home Economics Extension

To the professional requirements listed above and the courses listed under Group I add the following:
Junior and senior years.—Agr. Econ. 126; H.E. 11, 13, 16 or 17, 44, 150.

Teachers' Curriculum in Foods and Nutrition

To the professional requirements listed above and the courses listed under Group I add the following:
Junior and senior years.—Agr. Econ. 126; H.E. 73, 173 or 175 or 75 and 179, 182, 186 or 187.

Teachers' Curriculum in Textiles and Clothing

To the professional requirements listed above and the courses listed under Group I add the following:
Junior and senior years.—Agr. Econ. 126; H.E. 11, 13, 16 or 17, 102, 115, 150.

Teachers' Curriculum in Related Art

To the professional requirements listed above and the courses listed under Group I add the following:
Junior and senior years.—H.E.Ed. 147 instead of H.E.Ed. 143; Art Ed. 4-5-6, 7-8-9, 29-30-31; H.E. 11, 13, 55, 57, 150, 152, 154.

[1] Offered jointly with the College of Education and leads to qualification for state teacher's certificate.

TABULAR STATEMENT OF 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—Thursday, IV hour.

Freshman Assembly—Tuesdays, I hour (fall quarter).

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 on the University Farm.

A, *Armory
Ad, Administration
Ag, Agronomy
B, *School of Business Administration
BB, Beef Barn
BCh, Biochemistry
Bo, *Botany
C, *Chemistry
CWI, *Child Welfare Institute
Da, Old Dairy Hall
DB, Dairy Barn
DiH, Dining Hall
E, *Main Engineering
Ed, *Education
En, Agricultural Engineering
F, *Folwell Hall
G, *Greenhouse
Gy, Gymnasium
HE, Home Economics
HH, Haecker Hall
Hr, Horticulture
IA, *Institute of Anatomy
J, *Jones Hall
Lib, *Library
MH, *Millard Hall
MS, Meat Shop
Mu, *Music
OL, *Old Library
P, *Pillsbury Hall
Ph, *Physics
PP, Plant Pathology
Psy, *Psychology
Pt, *Pattee Hall
S, *Stadium
So, Soils
St, Stock Pavilion
Ve, Veterinary
WGm, *Women's Gymnasium
WH, Women's Hall
Z, *Zoology

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.

Limit to 64 students
Bailey
4-19-31

PROGRAM

1931-32

AGRICULTURAL BIOCHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
2f,s	Quantitative Methods ..... (5 cred.;* jr., sr.; prereq., Inorg. Chem. 10 cred.) (Limited to 24)	VI, VII, VIII, IX	MWF	(f)102BCh (s)108BCh	Mr. Rogers
3f-4w	Introduction to Organic and Biochemistry ..... (6 cred.;*† soph., jr., sr.; prereq., Inorg. Chem. 10 cred.)	II	TThS	203HE	Mr. Bailey
3w-4s	Introduction to Organic and Biochemistry ..... (Same as 3f-4w)	I	TThS	203HE	Mr. Sandstrom
7f-8w	General Agricultural Biochemistry.... (10 cred.; soph., jr., sr.; prereq., Inorg. Chem. 10 cred.) (Limited to 30)				
	Lect.	II	TThS	113BCh	Mr. Rogers
	Lab.	VII, VIII, IX	MW	108BCh	Mr. Wiles
7w-8s	General Agricultural Biochemistry.... (Same as 7f-8w) (Limited to 30)				
	Lect.	III	TThS	113BCh	Mr. Rogers
	Lab.	VII, VIII, IX	MF	102BCh	Mr. Wiles
15f	Principles of Animal Nutrition..... (3 cred.; jr., sr.; prereq., 7-8)	III	TThS	116BCh	Mr. Palmer
101f-102w	Agricultural Quantitative Analysis.... (6 cred.; jr., sr.; prereq., 7-8)	VI, VII, VIII	MWF	208BCh	Mr. Bull
103s	Dairy Chemistry ..... (5 cred.; jr., sr.; prereq., 7-8)				
	Lect.	VI	MWF	116BCh	Mr. Palmer
	Lab.	VII, VIII, IX	MWF	208BCh	Mr. Palmer
108s	Chemistry of Wheat and Wheat Products ..... (3 cred.; jr., sr.; prereq., 3-4 or 7-8)	I	MWF	211BCh	Mr. Bailey
110s	Flour Laboratory Methods..... (3-5 cred.; jr., sr.; prereq., 101-102 or Technolog. Chem. 100-101-102)	VI, VII, VIII, IX	MWF	202BCh	Mr. Bailey
111f-112w	Biochemistry ..... (6 cred.; sr.; prereq., Zool. or Bot., 9 cred., org. chem.)	III	MWF	113BCh	Mr. Gortner
		VI	Th	113BCh	Mr. Sandstrom
113f-114w-115s	Biochemical Laboratory Methods..... (6 cred.; sr.; prereq., quant. anal., parallel 111-112)	VI, VII, VIII	T	202,	
		VII, VIII, IX	Th	208BCh	Mr. Sandstrom
116w	Advanced Animal Nutrition..... (3 cred.; jr., sr.; prereq., 15 and 111 or physiologic chem.)	III	TThS	211BCh	Mr. Palmer, Miss Kennedy

* Not open to students with credit in 7-8.

† The full course must be completed before credit will be given.

No.	Title	Hour	Day	Bldg.	Instructor
117f,w,s	Laboratory Problems in Animal Nutrition ..... (3 cred.; jr., sr.; prereq., 116, instructor's permission)	Ar	Ar	314BCh	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

AGRICULTURAL ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
1f	Principles of Economics I (Agriculture) ..... (3 cred.; soph., jr., sr.; no prereq.)	I	MWF	302HH	Mr. Anderson
1w	Principles of Economics I..... (Same as 1f)				
	Sec. 1 (Agriculture)	I	TThS	108Da	Mr. Lowe
	2 (Forestry)	III	TThS	302HH	Mr. Anderson
2w	Principles of Economics II (Agriculture) ..... (5 cred.; soph., jr., sr.; prereq., 1)	I	MTWThF	302HH	Mr. Anderson
2s	Principles of Economics II..... (Same as 2w)				
	Sec. 1 (Agriculture)	I	MTWThF	302HH	Mr. Anderson
	2 (Forestry)	II	MTWThF	108Da	Mr. Lowe
3f	Principles of Economics (Home Economics) ..... (5 cred.; soph., jr., sr.; no prereq.)				
	Sec. 1	II	MTWThF	108Da	Mr. Lowe
	2	III	MTWThF	108Da	Mr. Lowe
3w,s	Principles of Economics (Home Economics)	II(w)	MTWThF	108Da	Mr. Lowe
		III(s)	MTWThF	108Da	Mr. Lowe
7w	Natural Resources ..... (3 cred.; soph., jr., sr.; no prereq.)	III	MWF	312HH	Mr. Boss
8s	Rural Economics ..... (3 cred.; soph., jr., sr.; prereq., 2 or 3)	III	TThS	302HH	Mr. Jesness
25f,w	Principles of Accounting..... (4 cred.; soph., jr., sr.)				
	Lect.	II(f)	MWF	311HH	Mr. Ullyot
		II(w)	TThS	311HH	
	Lab.	VIII, IX	F	311HH	
30f	Prices of Farm Products..... (3 cred.; jr., sr.; prereq., 2)	II	TThS	302HH	Mr. Cox
40f,s	Principles of Marketing Organization (3 cred.; soph., jr., sr.; prereq., 2)	I(f)	MWF	312HH	Mr. Cox
		II(s)	TThS	312HH	Mr. Cox
47s	Marketing Accounting ..... (4 cred.; soph., jr., sr.; prereq., 25)				
	Lect.	IV	MWF	311HH	Mr. Ullyot
	Lab.	VIII, IX	F	311HH	
50s	Farm Finance ..... (5 cred.; soph., jr., sr.; prereq., 2)	IV	MTWFS	312HH	Mr. Johnson
90f	Agricultural Statistics ..... (5 cred.; soph., jr., sr.; prereq., 2)				
	Lect.	III	TThS	312HH	Mrs. Kittredge
	Lab.	Ar	Ar		

No.	Title	Hour	Day	Bldg.	Instructor
101s	Farm Management	Not offered in 1931-32			
	(3 cred.; jr., sr.; prereq., 2, Agron. 1)				
102f	Farm Management: Organization.....				
	(3 cred.; jr., sr.; prereq. 2)				
	Lect.	II	MW	312HH	Mr. Garey
	Sec. 1 Lab.	VI, VII	T	312HH	
	2	II, III	F	312HH	
102w	Farm Management: Organization.....	I	MW	312HH	Mr. Garey
	(Same as 102)	VII, VIII	Th	312HH	
103w	Farm Management: Operation	II	MW	312HH	Mr. Garey
	(3 cred.; sr.; prereq., 102)	VI, VII	T	312HH	
103s	Farm Management: Operation	I	MW	312HH	Mr. Garey
	(Same as 103w)	VII, VIII	Th	312HH	
104s	Types of Farming.....	III	MWF	312HH	Mr. Boss
	(3 cred.; sr.; prereq., 103)				
110f-111w	Economics of Agricultural Production				
*	I and II	I	TThS	312HH	Mr. Johnson
	(6 cred.; jr., sr.; prereq., 2)				
126s	Economics of Consumption				
	(3 cred.; jr., sr.; prereq., 2 or 3)				
	Sec. 1	I	MWF	109HH	Mr. Waite
	2	II	MWF	109HH	
131w	Market Prices	III	TThS	312HH	Mr. Waite
	(3 cred.; jr., sr.; prereq., 40)				
135s	Methods of Price Analysis.....	III	TThS	312HH	Mr. Waite
	(3 cred.; sr.; prereq., 30, 191)				
140f	Marketing Organization: Staples.....	III	MWF	302HH	Mr. Johnson
	(3 cred.; soph., jr.. sr.; prereq., 40)				
141w	Marketing Organization: Dairy and				
	Poultry Products	II	TThS	312HH	Mr. Jesness
	(3 cred.; jr., sr.; prereq., 40)				
142s	Marketing Organization: Fruits and				
	Vegetables	III	MW	312HH	Mr. Cox
	(2 cred.; jr., sr.; prereq., 40)				
143w	Marketing Organization: Livestock				
	and Meats	III	MWF	302HH	Mr. Johnson
	(3 cred.; jr., sr.; prereq., 40)				
144f	Co-operative Organization	II	TThS	312HH	Mr. Jesness
	(3 cred.; jr., sr.; prereq., 40)				
150s	Advanced Farm Finance.....	VI, VII½	WF	312HH	Mr. Johnson
	(3 cred.; jr., sr.; prereq., 50 or Econ. 3)				
170s	Land Economics	VII, VIII½	TTh	302HH	Mr. Johnson
	(3 cred.; jr., sr.; prereq., 110)				
191w	Advanced Agricultural Statistics.....	IV	MWF	312HH	Mrs. Kittredge
	(3 cred.; jr., sr.; prereq., 90)				

For additional courses see Economics and the bulletin of the School of Business Administration.

AGRICULTURAL EDUCATION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
11f,w,s	Educational Psychology	II	TThS	202Ad	Mr. Field
	(3 cred.; jr., sr.; no prereq.)				
21f,s	Vocational Education	Ar	Ar	202Ad	Mr. Nylin
	(3 cred.; jr., sr.; no prereq.)				

* Both qtrs must be completed before credit is allowed. Econ 111 cannot be taken w/o 110 which is a prereq.

No.	Title	Hour	Day	Bldg.	Instructor
41†	Apprentice Teaching ..... (2 cred.; jr., sr.; prereq., 11)	Not offered in 1931-32			
42f,w,s†	Supervised Teaching Experience..... (3 cred.; sr.; prereq., 181)	Ar	Ar	Ar	Mr. Field, Mr. Nylin
64w,s	Survey of Agriculture..... (3 cred.; no prereq.)	Ar	Ar	Ar	Mr. Field and others
75	Visual Presentation ..... (3 cred.; jr., sr.; prereq., 11)	Not offered in 1931-32			
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. ed.)	VI	MWF	202Ad	Mr. Peck, Mr. Storm
82f,w,s,	Agricultural Extension Field Course.. (3 to 10 cred.; jr., sr.; prereq., 81)	Ar	Ar	Ar	Mr. Peck, Mr. Storm, Mr. Field
135	The Curriculum in Vocational Agriculture ..... (3 cred.; sr.; prereq., 11)	Ar	Ar	Ar	
141w,s	Supervised Practice in Vocational Agriculture ..... (3 cred.; sr.; prereq., 11)	Ar	Ar	Ar	Mr. Field
144w	Course Organization and Instruction for the Individual in Vocational Agriculture ..... (2 cred.; sr.; prereq., 11)	Ar	Ar	Ar	Mr. Field
154f,w	Rural Education and Community Leadership ..... (3 cred.; sr.; prereq., 11)	IV 1 hour	TS Ar	202Ad Ar	Mr. Field
161f,w,s	Vocational Education in Agriculture (3 cred.; jr., sr.; prereq., 11, 181-182-183)	Ar	Ar	Ar	Ar
162f,w,s	The Basis of Vocational Teaching Technique ..... (3 cred.; jr., sr.; prereq., 11, 181-182-183)	Ar	Ar	Ar	Ar
164f,w,s	Fundamentals of Agriculture..... (3 cred.; jr., sr.; prereq., 11 or Ed. Psy. 55)	Ar	Ar	Ar	Ar
171w,s	Problems in Procedure..... (3 cred.; sr.; prereq., 42 or equiv. teaching experience)	Ar	Ar	Ar	Mr. Field
176s	Problems in Visual Presentation..... (3 cred.; jr., sr.; prereq., 75)	Ar	Ar	Ar	Mr. Field
181f	Teaching Agriculture ..... (5 cred.; jr., sr.; prereq., 11)	III	MTWThS	202Ad	Mr. Storm, Mr. Field, Mr. Nylin
182w	Teaching Agriculture ..... (Same as 181f)	III	MTWThF	202Ad	
183s	Teaching Agriculture ..... (Same as 181f)	III	MTWThF	202Ad	
191f-192w-193s	Seminar in Agricultural Education... (6 cred.; sr.; prereq., 11 cred.)	Ar	Ar	Ar	Mr. Storm, Mr. Field

† A special fee of $1 per credit hour is charged for this course.

AGRICULTURAL ENGINEERING

No.	Title	Hour	Day	Bldg.	Instructor
3f,s	Mechanical Drawing	III, IV	MWF	303En	Mr. Neubauer
	(2 cred.; no prereq.)				
5f	Farm Building Construction.....				
	(3 cred.; no prereq.)				
	~~Lect.~~	~~VII~~	~~WF~~	~~41En~~	~~Mr. White~~ Cancel.
	~~Lab.~~	~~VII, VIII, IX~~	~~M~~	~~48En~~	~~Mr. Berggren~~ 10-8-31
7w	Farm Structures I.....				
	(3 cred.; jr., sr.; prereq., 3)				
	Lect.	III	MW	305En	Mr. White
	Lab.	IV	W	305En	Mr. White
		III, IV	F		
11w	Applied Mathematics	III	MTWFS	103En	Mr. Neal
	(5 cred.; no prereq.)				
12s	Field Machinery				
	(3 cred.; jr., sr.; no prereq.)				
	Lect.	I	MW	216En	Mr. Schwantes
	Sec. 1 Lab.	VI, VII, VIII	T		
	2	II, III, IV	T		
13f,s	Gas Engines	VI, VII, VIII	MW(f)	216,37En	Mr. Torrance
	(3 cred.; no prereq.)	VI, VII, VIII	WF(s)		
14s	Tractors	VI, VII, VIII	TTh	216,37En	Mr. Torrance
	(3 cred.; prereq., 13)				
15f	~~Ignition and Carburetion~~.....				
	~~(3 cred.; prereq., 13)~~				
	~~Lect.~~	~~III~~	~~MW~~	~~216En~~	~~Mr. Torrance~~
	Lab.	~~III, IV~~	~~F~~	Cancel	10-8-31
19f	Elementary Surveying				
	(3 cred.; prereq., 3, 11 or trigonometry, or Draw. 3 and M.&M. 12)				
	Lect.	II	T	105En	Mr. Neal
	Lab.	VI, VII, VIII	WF or TTh	305En	Mr. Howe
20s	Advanced Surveying				
	(3 cred.; prereq., 19)				
	Lect.	VI	M	105En	Mr. Neal,
	Lab.	VII, VIII, IX	MF	305En	Mr. Howe
23f	General Physics				
	(5 cred.; no prereq)				
	Lect.	III	TThS	101En	Mr. Romness
	Sec. 1 Lab.	I, II	ThS	102En	Mr. Romness
	2	VI, VII	TTh	102En	Mr. Tyler
23s	General Physics				
	(Same as 23f)				
	Sec. 1 Lect.	III	TThS	101En	Mr. Romness
	2	IV	MWF	101En	Mr. Romness
	Sec. 1 Lab.	I, II	WF	102En	Mr. Romness
	2	I, II	TS	102En	Mr. Romness
	3	VI, VII	TTh	102En	Mr. Tyler
	4	VI, VII, VIII, IX	M	102En	Mr. Tyler
	5	VI, VII, VIII, IX	W	102En	Mr. Tyler
	6	III, IV	MW	102En	Mr. Tyler
	7	III, IV	TS	102En	Mr. Tyler

No.	Title	Hour	Day	Bldg.	Instructor
24f	Agricultural Physics I..... (4 cred.: prereq., 23, Math. 4 or equiv.)				
	Lect.	III	MWF	101En	Mr. Romness
	Lab.	VI, VII, VIII	M or F	102En	
25w	Agricultural Physics II..... (4 cred.; prereq., 24)				
	Lect.	I	TThS	101En	Mr. Romness
	Lab.	VI, VII, VIII	M or W	102En	
28w	Land Clearing ..... (3 cred.; jr., sr.; no prereq.)	I	TThS	103En	Mr. Schoenleber
31w,s	Principles of Drainage..... (3 cred.; no prereq.)	III	TThS	105En	Mr. Roe, Mr. Neal
34w	Household Mechanics ..... (4 cred.; prereq., 23 or equiv.)	I, II	MWF	103En	Mr. Romness
35s	Household Physics ..... (4 cred.; prereq., 23 or equiv.)	I, II	MWF	101,103En	Mr. Romness
37f,w	Rural Sanitation ..... (3 cred.; no prereq.)	I	TThS(f)	101En	Mr. Tyler
		V	MWF(w)	101En	Mr. Tyler
40f,s	Mechanical Training I..... (3 cred.; no prereq.)	I, II	MWF	20,106En	Mr. Dent
41w	Mechanical Training II..... (3 cred.; no prereq.)	I, II	MWF	20,106En	Mr. Dent, Mr. Berggren
42	Principles of Irrigation..... (3 cred.; no prereq.)	Not offered in 1931-32			
67s	Farm Structures II..... (3 cred.; jr., sr.; prereq., 7, M.&M. 128)	Ar	Ar	305En	Mr. White
68f	Drainage Engineering and Works.... (3 cred.; prereq., 31, M.&M. 86)	Ar	Ar	Ar	Mr. Roe
69s	Irrigation Engineering and Works.... (3 cred.; prereq., 42, M.&M. 86)	Ar	Ar	Ar	Mr. Roe
70w	Steam Boilers and Engines..... (3 cred.; prereq., Phys. 23, 24)	II	TThS	~~216En~~ 107 Eng.	Mr. Boss
71f	Power Machinery ..... (3 cred.; prereq., 12, 13)	" 2. III T. Th S.			
	Lect.	VI	WF	106En	Mr. Schwantes
	Lab.	VII, VIII, IX	W	49En	
72w	Applied Electricity ..... (3 cred.; prereq., 25)	Ar	Ar	101En	Mr. Romness
101f-102w-103s	Advanced Drainage Problems..... (3 to 6 cred. per quarter; sr.; prereq., 68)	Ar	Ar	Ar	Mr. Roe, Mr. Neal
111f-112w-113s	Farm Building Problems..... (3 to 6 cred. per quarter; sr.; prereq., 67)	Ar	Ar	305En	Mr. White
121f-122w-123s	Farm Power and Machinery Problems (3 to 6 cred. per quarter; prereq., 126)	Ar	Ar	Ar	Mr. Schwantes
126s	Selection of Farm Equipment..... (3 cred.; prereq., 14, 71, M.E. 27)				
	Lect.	III	MW	106En	Mr. Schwantes
	Lab.	III, IV	F	49En	

No.	Title	Hour	Day	Bldg.	Instructor
141w	Land Clearing II..... (3 cred.; prereq., 28)	Ar	Ar	Ar	Mr. Thompson
201f-202w-203s	Reclamation Research ..... (3 to 6 cred. per quarter; prereq., 101 and one quarter's work in mathematical theory of statistics)	Ar	Ar	Ar	Mr. Roe, Mr. Neal
211f-212w-213s	Farm Structures Research..... (3 to 6 cred. per quarter; prereq., 111)	Ar	Ar	305En	Mr. White
221f-222w-223s	Farm Power and Machinery Research (3 to 6 cred. per quarter; prereq., 121)	Ar	Ar	Ar	Mr. Schwantes

AGRONOMY AND PLANT GENETICS

No.	Title	Hour	Day	Bldg.	Instructor
1f,s	General Farm Crops..... (3 cred.; no prereq.)	III, IV	MWF	100Ad	Mr. Johnson
121f	Grain Crops ..... (3 cred.; jr., sr.; prereq., 1, Bot. 9 cred.)	VI, VII, VIII	TTh	100Ad	Mr. Wilson
122w	Grain and Hay Grading..... (3 cred.; jr., sr.; prereq., 1, Bot. 9 cred.)	VI, VII, VIII	TTh	100Ad	Mr. Wilson
123s	Forage Crops ..... (3 cred.; jr., sr.; prereq., 1, Bot. 9 cred.)	VI, VII, VIII	TTh	100Ad	Mr. Arny
124w,s	Problems in Farm Crops..... (3 cred.; jr., sr.; prereq., 1)	Ar	Ar	Ar	Mr. Wilson
131f,w	Principles of Genetics..... (3 cred.; soph., jr., sr.; prereq., Bot. or Zool. 9 cred.)				
	Lect.	I	ThS	102Ad	Mr. Powers
	Lab.	I, II	T	102Ad	Mr. Powers
132w	Farm Crops Plant Breeding..... (3 cred.; jr., sr.; prereq., 131)	VI, VII, VIII	TTh	102Ad	Mr. Powers
134f,w	Laboratory Problems in Genetics..... (3 cred.; jr., sr.; prereq., 131 or parallel)	Ar	Ar	303Ag	Mr. Doxtator

ANIMAL HUSBANDRY

No.	Title	Hour	Day	Bldg.	Instructor
2f-3w	Types and Breeds of Livestock..... (6 cred.; soph., jr., sr.; prereq., 10-11)	I, II	MWF	WSt	Mr. Winters
4s	Livestock Judging ..... (3 cred.; jr., sr.; prereq., 2-3)	III, IV	MWF	CSt	Mr. Harvey
6w	Livestock Feeding ..... (5 cred.; jr., sr.; prereq., Agr. Biochem. 15)	III	MTWFS	3St	Mr. Ferrin
7f	Meats ..... (3 cred.; jr., sr.; prereq., 2-3)	VI, VII, VIII	TTh	MS	Mr. Anderson
8s	Fundamentals of Feeding and Management ..... (5 cred.; sr.; no prereq.)	I	MTWThF	3St	Mr. Ferrin

open to H-E. students. Not an exact duplic of A. H. 111 but very similar to it. Women stud who have completed A. H. 111 will not be given credit for A. H. 12. will be accepted in lieu of A. H. 111 in that mstg.
OK Miss Hill
OK Mr. Peters.

No.	Title	Hour	Day	Bldg.	Instructor
9s	Pedigrees and Herd Books.....	II	TThS	3St	Mr. Winters
	(3 cred.; jr., sr.; prereq., 112)				
10f-11w	Types and Market Classes of Livestock	I, II	MWF	CSt	Mr. Harvey
	(6 cred.; no prereq.)				
10w-11s	Types and Market Classes of Livestock	I, II	TThS	CSt	Mr. Harvey
	(Same as 10f-11w)				
12s	Meat Selection and Utilization.....	VI, VII, VIII	TTh	MS	Mr. Anderson
	(3 cred.; jr., sr.; no prereq.)				
15s	Fundamentals of Livestock Production	I	TThS	WSt	Mr. Peters
	(3 cred.; jr., sr., in prof. Agr. Eng.; no prereq.)				
101f	Advanced Stock Judging.....	VI, VII	MWF	CSt	Mr. Harvey
	(3 cred.; sr.; prereq., 4)				
102s	Horse Husbandry				
	(3 cred.; jr., sr.; prereq., 2-3)				
	Lect.	II	TTh	WSt	Mr. Harvey
	Lab.	VI, VII, VIII	F	WSt	
103s	Beef Cattle Husbandry.....				
	(3 cred.; jr., sr.; prereq., 2-3)				
	Lect.	III	MW	WSt	Mr. Peters
	Lab.	VI, VII, VIII	T	BB	
104s	Sheep Husbandry				
	(3 cred.; jr., sr.; prereq., 2-3)				
	Lect.	IV	WF	3St	Mr. Anderson
	Lab.	VI, VII, VIII	M	CSt	
105s	Swine Husbandry				
	(3 cred.; jr., sr.; prereq., 2-3)				
	Lect.	III	TS	3St	Mr. Ferrin
	Lab.	VI, VII, VIII	Th	CSt	
106w	Advanced Meats	VI, VII, VIII	WF	MS	Mr. Anderson
	(3 cred.; jr., sr.; prereq., 7)				
107s	Meat Problems				
	(3 cred.; sr.; prereq., 106)				
	Lect.	IV	TS	MS	Mr. Anderson
	Lab.	VI, VII, VIII	W	MS	
108f-109w-110s	Seminar	IX	T	3St	Mr. Peters
	(3 cred.; jr., sr.; prereq., 2-3)				
111w	Utilization of Meats.....	III	ThS	MS	Mr. Anderson
	(3 cred.; Home Econ. students; no prereq.)	III, IV	T	MS	
112w	Animal Breeding	IV	MWF	3St	Mr. Winters
	(3 cred.; jr., sr.; prereq., Agron. 131)				
113s	Livestock Management				
	(3 cred.; jr., sr.; prereq., 2-3)				
	Lect.	II	TTh	ESt	Mr. Peters
	Lab.	VI, VII, VIII	F	CSt	

ARCHITECTURE

COLLEGE OF ENGINEERING AND ARCHITECTURE

No.	Title	Hour	Day	Bldg.	Instructor
21f*	Freehand Drawing				
	(2 cred. per qtr.; no prereq.)				
	Sec. 1	VII-IX	TTh	417E	Mr. Doseff
	2	II-IV	MF	417E	Mr. Young
	3	VI-VIII	MW	417E	Mr. Doseff
	4	II-IV	TS	405E	Mr. Doseff
21w*	Freehand Drawing	VII-IX	T		
	(See 21f)	VI-VIII	Th	417E	Mr. Doseff
	(Limited registration)				
22w*	Freehand Drawing				
	(2 cred.; prereq., 21)				
	Sec. 1	VI-VIII	TTh	417E	Mr. Doseff
	2	II-IV	WF	417E	Mr. Doseff
	3	VI-VIII	MW	417E	Mr. Young
22s*	Freehand Drawing	VII-IX	WTh		
	(See 22w)	VII-VIII	F	417E	Mr. Doseff
	(Limited registration)				
23s*	Freehand Drawing				
	(2 cred.; prereq., 22)				
	Sec. 1	VII-IX	TF	417E	Mr. Doseff
	2	II-IV	WF		
	3	VI-VIII	MW	417E	Mr. Doseff
		II-III	T		

For additional courses see the bulletin of the College of Engineering and Architecture.

ART EDUCATION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s*†	Fundamental Principles of Design....				
	(9 cred.; no prereq.)				
	Sec. 1 Lect.	II	TThS	207BJ	Miss Lutz
	Lab.	III	TThS	207BJ	
	Sec. 2 Lect.	III	TThS	207AJ	Mrs. Lewis
4,5,6f,w,s*	Still Life				
	(3 cred.; no prereq.)				
	Sec. 1	I, II	M	203J	Mr. Harmes
	2	I, II	W	203AJ	Mr. Harmes
	3	II, III	W	203AJ	Mr. Harmes
7,8,9f,w,s*	Sketch				
	(3 cred.; no prereq.)				
	Sec. 1	III, IV	M	203AJ	Mr. Harmes
	2	I, II	F	203J	Mr. Harmes
	3	III, IV	F	203J	Miss Lutz
10f-11w-12s*	Graphic Composition	II, III	M	203AJ	Miss Lutz
	(3 cred.; no prereq.)				

* 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.

No.	Title	Hour	Day	Bldg.	Instructor
20f-21w-22s*	Principles of Harmony in Form and Color				
	(9 cred.; soph., jr., sr.; prereq., 1-2-3 or instructor's permission)				
	Lect.	II	MWF	207J	Mr. Hilpert
	Lab.	I	MWF	207J	
29,30,31, f,w,s*	Sketch, Course II.....				
	(3 cred.; soph., jr., sr.; prereq., 7, 8, 9)				
	Sec. 1	I, II	S	203AJ	Miss Lutz
	2	III, IV	S	203AJ	Miss Lutz

For additional courses see the bulletin of the College of Education.

BACTERIOLOGY AND IMMUNOLOGY

MEDICAL SCHOOL

No.	Title	Hour	Day	Bldg.	Instructor
41f,w,s*	General Bacteriology	VII, VIII, IX	MWF	Ar	Dr. Halvorson
	(5 cred.; soph., jr., sr.; prereq., chem. and biol.)				
103w*	Soil Microbiology	I, II, III	TS	MH	Dr. Skinner
	(5 cred.; jr., sr.; prereq., 41)	I, II	Th	MH	
121w*	Industrial Bacteriology	I, II	TTh	Ar	Ar
	(3 cred.; jr., sr.; prereq., 41)				
122s*	Industrial Bacteriology (cont'd).....	I, II	TTh	MH	Ar
	(Same as 121)				

For additional courses see the bulletin of the Medical School.

BEEKEEPING

See Entomology and Economic Zoology.

BOTANY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f*	General Botany				
	(4 cred.; students in Agr. and For.)				
	Lect.	VI	TTh	BoAud	Mr. Huff
		VII	Th		
	Sec. 1 Quiz	VII	T		
	2	V	T		
1w,s*	General Botany				
	(4 cred.; students in H.E.; no prereq.)				
	Lect.	III	TThS	BoAud	Mr. Huff
	Sec. 1 Quiz	I	T		
	2	II	T		
	3	III	W		
2w,s*	Elementary General Morpho'ogy of Plants	III, IV	MWF	1,4,5,8Bo	Mr. Huff
	(3 cred.; all; prereq., 1)				
3su	Forest Botany	Given at Itasca Park			Mr. Rosendahl
	(1 cred.; no prereq.)				

* Offered on the Minneapolis campus.

not offered

No.	Title	Hour	Day	Bldg.	Instructor
5w*	Elementary Plant Histology..... (3 cred.; all; prereq., 1)	VI, VII, VIII	WF	1,4,5,8Bo	Mr. Butters
7f,w*	Taxonomy of Flowering Plants..... (3 cred.; all; prereq., 1)	I, II	MWF	1,4,5,8Bo	Mr. Rosendahl
7s*	Taxonomy of Flowering Plants..... (Same as 7f,w)				
	Sec. 1	I, II	MWF	1,4,5,8Bo	Mr. Rosendahl
	2	VI, VII, VIII	TTh	1,4,5,8Bo	
12f,w,s*	Morphology of Algae..... (3 cred.; all; prereq., 1)	I, II	TThS	1,4,5,8Bo	Miss Tilden
21f*	Elementary Ecology ..... (3 cred.; all; prereq., 1)	III, IV	MWF	1,4,5,8Bo	Mr. Oosting
21w,s*	Elementary Ecology ..... (Same as 21f)	VI, VII, VIII	TTh	1,4,5,8Bo	Mr. Oosting
22f,w,s*	Elementary Plant Physiology..... (3 cred.; all; prereq., 1)				
	Lect.	VI	TTh	1,4,5,6Bo	Mr. Burr
	Sec. 1 Lab.	III, IV	TS		
	2	VII, VIII	TTh		
	3	IV, V	MW		

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

CHILD WELFARE INSTITUTE

No.	Title	Hour	Day	Bldg.	Instructor
40w*	Child Training (See also H.E.Ed. 40) (3 cred.; jr., sr.; prereq., Psy. 1-2)	IV 1 hr ar	MW	202Pt	Mrs. Foster
60f*	Modern Aspects of Child Study..... (2 cred.; jr., sr.; prereq., 6 cred. in psy. or ed.)	VI	TTh	202Pt	Miss McGinnis
80f*	Child Psychology ..... (3 cred.; jr., sr.; prereq., Psy. 1-2)	V	MWF	202Pt	Mr. Anderson
90w*	Physical Development of the Young Child ..... (2 cred.; jr., sr.; prereq., Psy. 1-2, Zool. 1-2)	V	T and Ar	202Pt	Ar
120s*	Health Care of Young Child..... (2 cred.; sr.; prereq., 50-51 and permission of instructor)	V	T and Ar	202Pt	Ar
130s*	The Development of the Young Child (3 cred.; sr., grad.; prereq., 15 cred. in psy. or equiv. and permission of instructor)	I	MWF	202Pt	Mr. Anderson
133f-134w-133s*	Observation and Experimental Methods in Study of Young Child..... (6 or 9 cred.; sr.; prereq., 10 cred. in psy. or ed. psy., incl. 1 lab. course, or equiv., permission of instructor)	VI VI, VII	M WF	202Pt	Ar
170f*	Parental Education in Child Care and Training ..... (3 cred.; sr., grad.; prereq., 52-53-54 or H.E. 34, 35, and 44, or 15 cred. in ed. or psy., or sociol. or prev. med.)	III	MWF	202Pt	Miss McGinnis

* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
173w-174s*	Technique and Practice of Parental Education ..... (6 cred.; sr., grad.; prereq., 170 and permission of instructor)	Ar	Ar	204Pt	Miss McGinnis
190w-191s*	Mental Examination of Pre-school Children ..... (2 or 4 cred.; sr., grad.; prereq., Ed. Psy. 143-144-145 or 134-135-136 or equiv. and permission of instructor)	III	TTh	202Pt	Ar

DAIRY HUSBANDRY

No.	Title	Hour	Day	Bldg.	Instructor
1f,s	Elements of Dairying..... (5 cred.; prereq., entrance credit in chemistry or Inorg. Chem. 1 or 9) (Limited to 35)				
	Lect.	III	TWS(f)	100HH	Mr. Combs
		III	TThS(s)		
	Lab.	III, IV	MF		Mr. Coulter
2w	Dairy Bacteriology ..... (5 cred.; soph., jr., sr.; prereq., Bact. 41) (Limited to 12)	VI, VII, VIII	MWF	210HH	Mr. Macy
3w	Dairy Bacteriology ..... (3 cred.; soph., jr., sr.; prereq., Bact. 41)	VI	MWF	210HH	Mr. Macy
4s	Dairy Products Practice..... (3 cred.; soph., jr., sr.; prereq., 1)	Ar	Ar	Ar	Mr. Combs
6f	Judging Dairy Cattle..... (1 cred.; jr., sr.; prereq., An. Husb. 10-11)	VI, VII, VIII	Th	DB	Mr. Gullickson
101f	Milk Production ..... (5 cred.; jr., sr.; prereq., 1)	IV	MTWFS	210HH	Mr. Eckles
102s	Market Milk ..... (3 cred.; jr., sr.; prereq., 1, 2)	IV VI, VII, VIII	MW Th	210HH	Mr. Macy
103w	Dairy Stock Feeding..... (3† cred.; sr.; prereq., 101, Agr. Biochem. 15)	III	MWF	210HH	Mr. Eckles
104s	Dairy Stock Selection..... (3 cred.; jr., sr.; prereq., 6, 101)	VI, VII, VIII VI	MW F	210HH 210HH	Mr. Petersen, Mr. Allen
105f	Seminar I ..... (1 cred.; sr.; prereq., 3 courses in dy. husb.)	II	S	214HH	Mr. Eckles
106w	Seminar II ..... (Same as 105f)	II	S	214HH	Mr. Eckles
107s	Seminar III ..... (Same as 105f)	II	S	214HH	Mr. Eckles
110w	Dairy Products III..... (3 cred.; jr., sr.; prereq., 1)	IV VI, VII, VIII	TS T	210HH	Mr. Combs
111f	Dairy Products I..... (3 cred.; jr., sr.; prereq., 1, 2 or 3)	~~IV~~ ~~I-II, III~~	~~TS~~ ~~Th~~	100HH	Mr. Combs, Mr. Anderson

* Offered on the Minneapolis campus.

† Only two credits allowed those who have completed An. Husb. 8.

No.	Title	Hour	Day	Bldg.	Instructor
112s	Dairy Products II..... (3 cred.; jr., sr.; prereq., 1, 2 or 3)	IV	TS	210HH	Mr. Combs, Mr. Baldwin
		VI, VII, VIII	T	210HH	Mr. Combs, Mr. Coulter
113s	Technical Control ..... (3 cred.; sr.; prereq., 2, 111 or 112)	I, II, III	TTh	210HH	Mr. Combs, Mr. Macy, Mr. Coulter
114su	Problems in Dairy Husbandry.....	(See bulletin of summer quarter)			
115s	Advanced Dairy Bacteriology..... (3 cred.; sr.; prereq., 2, 111 or 112)	Ar	Ar	Ar	Mr. Macy

EDUCATIONAL ADMINISTRATION AND SUPERVISION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
119f*	The Elementary School Curriculum... (3 cred.; sr.; prereq., 10 cred. in educ. incl. Educ. Psy. 55 or 56)	III	TThS	PtAud	Mr. Peik
119Tf-120Tw*	The Elementary School Curriculum... (Same as 119f)	Not offered in 1931-32			

For additional courses see the bulletin of the College of Education.

EDUCATIONAL PSYCHOLOGY

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
55f,w,s*	Educational Psychology ..... (3 cred.; jr., sr.; prereq., Psy. 6 cred.)	I	MWF	210OL(f) 115Psy(w) Ar(s)	Mr. Miller
111s*	Educational Measurements in the Elementary School ..... (3 cred.; jr., sr.; prereq., 55 or equiv.)	II	MWF	109Psy	Mr. Van Wagenen

For additional courses see the bulletin of the College of Education.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

No.	Title	Hour	Day	Bldg.	Instructor
3f,w	Economic Entomology ..... (3 cred.; soph., jr., sr.; prereq., Zool. 16 or equiv.)	VI, VII	MWF	302Ad	Mr. Ruggles
~~4w~~	~~Economic Vertebrate Zoology.....~~ ~~(3 cred.; soph., jr., sr.; prereq., Zool. 14,15 or equiv.)~~	~~I~~	~~MWF~~	~~301Ad~~	Can'd off. av Freeman
5f,w	Economic Entomology ..... (5 cred.; soph., jr., sr.; prereq., Zool. 16 or equiv.)	VI, VII, VIII	MWF	302Ad	Mr. Ruggles
6w	Forest Protection Against Insects.... (4 cred.; soph., jr., sr.; prereq., Zool. 16 or equiv.	VI, VII, VIII	TTh	307Ad	Mr. Orr
8f	Methods in Field Zoology..... (3 cred.; soph., jr., sr.; prereq., Zool. 9 cred.)	VI, VII	TTh	307Ad	Mr. King

* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
9f,w,s	Elementary Bee Science ..... (3 cred.; all; no prereq.)	VI	MWF	307Ad	Mr. Tanquary
10f,w	Industrial Beekeeping ..... (3 cred.; all; no prereq.)	V 2 hrs. ar.	TTh	307Ad	Mr. Tanquary
10s	Industrial Beekeeping ..... (Same as 10f,w)	IV 2 hrs. ar.	TS	307Ad	Mr. Tanquary
11w,s	Advanced Beekeeping I..... (3 cred.; all; prereq., 9 or 10)	Ar	Ar	Ar	Mr. Tanquary
12s	Advanced Beekeeping II..... (3 cred.; all; prereq., 11)	Ar	Ar	Ar	Mr. Tanquary
13su	Field Zoology ..... (1 cred.; no prereq.)	Given at Itasca Park			Mr. Dawson
23f*	Introductory Entomology ..... (5 cred.; soph., jr., sr.; prereq., Zool. 14-15 or equiv.)				
	Lect.	VI	MWF	211Z	Mr. Mickel
	Lab.	VI, VII, VIII	TTh	208Z	
24f*	Introductory Parasitology ..... (5 cred.; soph., jr., sr.; prereq., Zool. 14-15 or equiv.)	VI, VII, VIII	MWF	208Z	Mr. Riley
37f-38w-39s*	General Entomology ..... (9 cred.; soph., jr., sr.; prereq., Zool. 9 cred.)	~~VII~~ VII. VII. VII.	~~MWF~~ T. S.	307Ad ~208 good Bldg	Mr. Mickel
117f-118w-119s*	General Ecology of Insects..... (9 cred.; jr., sr.; prereq., 15 cred. Zool. or Ent.)	VI, VII, VIII	TTh	401Z	Mr. Eddy, Mr. Hodson
125f-126w-127s*	Advanced General Entomology..... (9 cred.; jr., sr.; prereq., 15 cred. Zool. or Ent.)	III, IV	TThS	208Z	Mr. Mickel
139f-140w*	Histology and Development of Insects (9 cred.; jr., sr.; prereq., 37-38-39 or equiv.)	Not offered in 1931-32			
141f-142w	Insects in Relation to Plant Diseases.. (6 cred.; prereq., Ent. 8 cred., Plant Path. 8 cred.)	III, IV	TThS	302Ad	Mr. Granovsky, Mr. Leach
144f,s-145w-146s*	Animal Parasites and Parasitism..... (3 to 9 cred.; jr., sr.; prereq., Zool. 9 cred.)	VI, VII, VIII	WF	208Z	Mr. Riley
175f	Insecticides and Their Action..... (3 cred.; sr.; prereq., inorg. and org. chem.)	I	MWF	302Ad	Mr. Shepard
176w-177s	Advanced Economic Entomology..... (6 cred.; sr.; prereq., 3, 5, or 6, Zool. 117-118-119)	I	MWF	302Ad	Mr. Ruggles
195f,w,s,su	Introduction to Research..... (5 or more cred.; sr.; prereq., 37-38-39 and other work as prescribed by the division)	Ar	Ar	Ar	Mr. Granovsky, Mr. Riley, Mr. Ruggles, Mr. Tanquary, Mr. Mickel, Mr. Shepard

FARM MANAGEMENT

See Agricultural Economics.

* Offered on the Minneapolis campus.

FORESTRY

No.	Title	Hour	Day	Bldg.	Instructor
1f	General Forestry ..... (3 cred.; no prereq.)	III	TThS	102Hr	Mr. Cheyney
2su	Field Dendrology ..... (1 cred.; no prereq.)	Given at Itasca Park			
3w	Dendrology ..... (3 cred.; no prereq.)	III	MWF	301Hr	Mr. Schmitz
4s	Dendrology ..... (4 cred.; no prereq.)				
	Lect.	III	MWF	301Hr	Mr. Schmitz
	Lab.	II, III	S	301Hr	Mr. Rees
5su	Field Silviculture ..... (2 cred.; no prereq.)	Given at Itasca Park			Mr. Cheyney
6su	Field Mensuration ..... (1 cred.; no prereq.)	Given at Itasca Park			Mr. Brown
7f-8w	Forest Mensuration ..... (10 cred.; all; prereq., 9)				
	Lect.	II	MWThF	302Hr	Mr. Brown
	Sec. 1 Lab.	VII, VIII, IX	M	302Hr	
	2	I, II, III	S	302Hr	
20w	Grazing ..... (3 cred.; soph., jr., sr.; no prereq.)	II	TThS	301Hr	Mr. Allison
23†	Factory Experience ..... (3 to 5 cred.; jr., sr.; prereq., 33-34)	Ar	Ar	Ar	
~~27w~~	~~Farm Wood Lots and Windbreaks....~~ ~~(3 cred.; no prereq.‡)~~	~~IV~~	~~MWF~~	~~301Hr~~	~~Mr. Cheyney~~
28w	Logging ..... (3 cred.; jr., sr.; no prereq.)	III	MWF	302Hr	Mr. Brown
29f	Sawmill and Woodworking Machinery (3 cred.; soph., jr., sr.)	IV	MWF	302Hr	Mr. Cheyney
30s	Wood Seasoning ..... (3 cred.; jr., sr.; prereq., 33-34)	I	TThS	301Hr	Mr. Rees
31s	Logging Laboratory ..... (1 cred.; jr., sr.; no prereq.)	Given at Cloquet			Mr. Brown
32f,w	Forest Reports ..... (2 cred.; soph., jr., sr.; no prereq.)	Ar	Ar	Ar	Mr. Cheyney
33f-34w	Wood Structure and Identification... (6 cred.; jr., sr.; prereq., 3-4)	VI, VII, VIII	WF	303Hr	
37s	Forest Protection ..... (3 cred.; jr., sr.; prereq., 127)	Given at Cloquet			Mr. Hansen
48w	Forest Products ..... (3 cred.; no prereq.)	I	TThS	301Hr	Mr. Allison
50s	House and Furniture Woods..... (2 cred.;‡ soph., jr., sr.; no prereq.)	III, IV	TS	303Hr	Mr. Rees
101w	Advanced Dendrology ..... (3 cred.; jr., sr.; prereq., 3-4)	I	MWF	301Hr	Mr. Rees
107f	Uses of Wood I..... (3 cred.; sr.; prereq., 33-34)	IV	MWF	301Hr	Mr. Rees
108w	Uses of Wood II..... (3 cred.; sr.; prereq., 33-34)	IV	MWF	303Hr	Mr. Rees
109s	Uses of Wood III..... (3 cred.; sr.;§ prereq., 107, 108)	VI, VII, VIII	TTh	303Hr	Mr. Rees
111f-112w	Advanced Forest Mensuration..... (6 cred; sr.; prereq., 8)	Ar	Ar	Ar	Mr. Brown

† Arrangements for this course must be made in advance.
‡ Not open to students majoring in Forestry.
§ Open only to those majoring in Forest Products.

No.	Title	Hour	Day	Bldg.	Instructor
113f	Wood Pulp and Paper..... (3 cred.; jr., sr.; prereq., 33-34, Chem. 3 or 10)	III	MWF	301Hr	Mr. Allison
114f-115w	Mechanical and Physical Properties of Wood ..... (6 cred.; sr.; prereq., 33-34)	I, II	TTHS	303Hr	Mr. Rees
116s	Mechanical and Physical Properties of Wood ..... (3 cred.; sr.; prereq., 33-34)	I, II	MWF	303Hr	Mr. Rees
119w	Advanced Wood Structure ..... (3 cred.; sr.; prereq., 33-34)	VI, VII, VIII	TTh	303Hr	Mr. Rees
120s	Advanced Wood Structure..... (3 cred.; sr.; prereq., 33-34)	VI, VII, VIII	WF	303Hr	Mr. Rees
122f-123w	Forestry Seminar ..... (2 cred.; sr.; no prereq.)	IX	W	302Hr	Mr. Schmitz, Mr. Allison, Mr. Cheyney
125s	Wood Preservation ..... (3 cred.; jr., sr.; prereq., 33-34)	IV	MWF	301Hr	Mr. Schmitz
126f	Silvics ..... (3 cred.; jr., sr.; no prereq.)	IV	TThS	301Hr	Mr. Cheyney
127w	Silviculture ..... (3 cred.; jr., sr.; prereq., 126)	III	TThS	301Hr	Mr. Cheyney
128s	Silvicu'ture Laboratory ..... (7 cred.; jr., sr.; prereq., 127)	Given at Cloquet			Mr. Cheyney
129f	American Silvicultural Practice ..... (3 cred.; jr., sr.; prereq., 127)	III	MWF	302Hr	Mr. Cheyney
130f	Forest Valuation ..... (5 cred.; jr., sr.; no prereq.)	I	MTWThF	301Hr	Mr. Allison
131w	Forest Policy and Administration.... (5 cred.; jr., sr.; no prereq.)	IV	MTWFS	302Hr	Mr. Allison
132s	Forest Regulation Laboratory ..... (7 cred.; jr., sr.; prereq., 130)	Given at Cloquet			Mr. Allison
134f-135w	Forest Problems ..... (4 cred.; sr. class.)	IV	TS	Ar	Mr. Schmitz
136f	Forest Economics ..... (3 cred.; jr., sr.; prereq., 131, Agr. Econ. 2)	II	MWF	301Hr	Mr. Allison
140f	Forest Working Plans..... (3 cred.; sr.; prereq., 128, 132)	III	TThS	301Hr	Mr. Allison

FRESHMAN ASSEMBLY

During the fall quarter all freshmen are required to attend the assembly first hour on Tuesdays. See *Official Daily Bulletin* for place of meeting and further announcements.

GEOLOGY AND MINERALOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*‡†	General Geology ..... (10 cred.; all; no prereq.)				
	Lect.	I	WThFS	210P	Mr. Thiel
	Sec. 1 Lab.	I, II	M	212P	
		II	WF		
	2	VI, VII	MW	212P	

* Offered on the Minneapolis campus.

† The entire course must be completed before credit is given for any quarter.

‡ Course 2 may be followed by 3, 4, or 11; or 3 by 2, for a three-quarter sequence.

No.	Title	Hour	Day	Bldg.	Instructor
1f-3w*‡†	General Geology ..... (Same as 1f-2w)				
	Lect.	III	TThFS	110P	Mr. Emmons
	Lab.	III, IV or	MW	212P	
		VI, VII	TTh	212P	
1w-2s*‡†	General Geology ..... (Same as 1f-2w)				
	Lect.	IV	MTWF	110P	Mr. Dutton
	Lab.	VI, VII	WF	212P	
1w-3s*‡†	General Geology ..... (Same as 1f-2w)				
	Lect.	II	MWFS	206P	Mr. Dutton
	Lab.	I, II	TTh	212P	Mr. Emmons
1s-2f*‡†	General Geology ..... (Same as 1f-2w)				
	Lect.	III(s)	MWThF	110P	Mr. Emmons
	Lab.	III, IV(s)	TS	212P	
	Lect.	III(f)	MWThF	110P	Mr. Dutton
	Lab.	III, IV(f)	TS	212P	
8f,w,s*§	Introductory Geology ..... (5 cred.; all; no prereq.)				
	Sec. 1	II	MWThFS	210P	Mr. Thiel
	2(w)	IV	MTWFS	210P	
23w-24s*	Elements of Mineralogy ..... (8 cred.; soph., jr., sr.; prereq., course in chem.)				
	Lect.(w)	II	WF	110P	Mr. Gruner
	Rec.	VII	T	110P	
	Sec. 1 Lab.	VII-VIII	WF	100P	
	2	III-IV	TS	100P	
	Lect.(s)	II	MWF	206P	Mr. Gruner
	Rec.	IX	T		
	Sec. 1 Lab.	VII-VIII	M	100P	
		VI-VII	T		
	2	III-IV	M		
		VII-VIII	F		

(For other sections see the bulletin of the School of Mines and Metallurgy.)

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,w,s*	Brief Course in the History of Education ..... (5 cred.; jr., sr.; prereq., 6 cred. in psy.)	IV	MTWFS	210OL	Miss Alexander
3f,w,s*	Educational Sociology ..... (3 cred.; jr., sr.; prereq., 6 cred. in psy.)	III	MWF	Pt	Mr. Finney

* Offered on the Minneapolis campus.

† The entire course must be completed before credit is given for any quarter.

‡ Course 2 may be followed by 3, 4, or 11; or 3 by 2, for a three-quarter sequence.

§ Not open to students with credit in Geol. 1 or 29. Cannot be followed by Geol. 1 for credit.

No.	Title	Hour	Day	Bldg.	Instructor
5s	Public Education in the United States (3 cred.; jr., sr.; prereq., 6 cred. in psy.)	VIII	MWF	Ar	Miss Alexander

For additional courses see the bulletin of the College of Education.

HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
3f	Textiles				
	(5 cred.; no prereq.)				
	Sec. 1	I, II	MWThFS	311,307HE	Miss Weller, Miss Willigar
	(Limited to 24 each) 2	III, IV	MTWFS	311,307HE	Miss Willigar
3w	Textiles				
	(Same as 3f)				
	Sec. 1	I, II	MTWThF	311,307HE	Miss Weller, Miss Willigar
	(Limited to 24 each) 2	III, IV	MTWFS	311,307HE	Miss Willigar
3s	Textiles	I, II	MTWThF	311,307HE	Miss Weller, Miss Willigar
	(Same as 3f)				
	(Limited to 24)				
4f,s	Textiles (S. L. and A., & Ed.).....				
	(3 cred.; no prereq.; not open to students in H.E.)				
	(Limited to 24 each)				
	Sec. 1	VI, VII	MWF	311,307HE	Miss Weller,
	2(s)	VI, VII	MWF	305HE	Miss Willigar
11f,s	Clothing Planning and Construction, A				
	(3 cred.; no prereq.)				
	Sec. 1	I, II	MWF	304HE	Miss Gorham, Miss Willigar, Miss Anderson
	(Limited to 24 each) 2	I, II, III(f)	ThS	304HE	Miss Gorham,
		I, II(s)	TThS		Miss Willigar
	3	VI, VII, VIII	TTh	304HE	Miss Keller
11w	Clothing Planning and Construction, A				
	(Same as 11f,s)				
	Sec. 1	I, II	MWF	304HE	Miss Gorham
	(Limited to 24 each) 2	VI, VII, VIII	TTh	304HE	Miss Gorham
13f,s	Clothing Planning and Construction, B				
	(3 cred.; prereq., 3, 11, 50, home pract. in garment making)				
	Sec. 1	III, IV	MWF	304HE	Miss Willigar
	(Limited to 24 each) 2	I, II	MWF	305HE	Miss Gorham
13w	Clothing Planning and Construction, B				
	(Same as 13f,s)				
	Sec. 1	III, IV	MWF	304HE	Miss Anderson
	(Limited to 24 each) 2	VI, VII, VIII	TTh	305HE	Miss Willigar

No.	Title	Hour	Day	Bldg.	Instructor
15f,w,s	Clothing Problems ..... (3 cred.; 3d qtr. fr., soph., jr.; prereq., 3, 51 or parallel)				
	(Limited to 30) Lect.	VI, VII	Th	313HE	Miss Gorham
	Field trip	VI, VII, VIII, IX	T	313HE	
16f,s	Remodeling Garments and Construction of Children's Clothing..... (3 cred.; jr., sr.; prereq., 13, 53) (Limited to 24)	VI, VII	MWF	304HE	Miss Carlotta Brown, Miss Gorham
17w	Advanced Clothing ..... (3 cred.; jr., sr.; prereq., 13, 53) (Limited to 24)	III, IV	MWF	305HE	Miss Carlotta Brown, Miss Gorham
17s	Advanced Clothing ..... (Same as 17w) (Limited to 24)	III, IV	TS	305HE	Miss Carlotta Brown, Miss Gorham
		and III, IV	W		
		or I, II	Th		
18f,s	Commercial Clothing Manufacture.... (3 cred.; jr., sr.; prereq., 13, 53) (Limited to 15)	Not offered in 1931-32			
34f,w	Home Management: Operation and Maintenance, Lectures ..... (3 cred.; jr., sr.; prereq., 83, H.E.Ed. 40 or parallel)	VIII	MWF	203HE	Miss Studley
35f,w.s	Home Management: Operation and Maintenance, Laboratory ..... (6 cred.; jr., sr.; prereq., 83, home exp. in foods and cookery, Prev. Med. 52 and H.E.Ed. 40, 34 or parallel)	I and other hours	S	213HE	Miss Studley
		(a) I-II	T.S.	Mrs. McNeal 5-18-32.	
44w	Home Economics Extension Work.... (3 cred.; sr.; prereq., H.E.Ed. 42, 49 or parallel)	V 4 consecutive hours to be arranged on T, W, Th, or F p.m.	MW	213HE	Miss Newton
50f	Color and Design..... (3 cred.; no prereq.)				
	Sec. 1 (Limited to 24 each)	I, II	MWF	402HE	Miss Segolson
	2	I, II, III	ThS	402HE	Miss Guttman
	3	III, IV	MWF	402HE	Miss Fowler
50w	Color and Design..... (Same as 50f)				
	Sec. 1 (Limited to 24 each)	III, IV	MWF	402HE	Miss Guttman
	2	I, II	TThS	402HE	Miss Guttman
50s	Color and Design..... (Same as 50f)				
	Sec. 1 (Limited to 24 each)	I, II	MWF	402HE	Miss Guttman
	2	VI, VII	MWF	402HE	Miss Guttman
51f	Color and Design..... (3 cred.; all; prereq., 50)				
	Sec. 1 (Limited to 24 each)	I, II	MWF	401HE	Miss V. Goldstein
	2	I, II	TThS	401HE	Miss V. Goldstein

No.	Title	Hour	Day	Bldg.	Instructor
51w	Color and Design.....				
	(Same as 51f)				
	Sec. 1	III, IV	MWF	401HE	Miss V. Goldstein
	(Limited to 24 each) 2	I, II	TThS	401HE	Miss Fowler
51s	Color and Design.....				
	(Same as 51f)				
	Sec. 1	VI, VII, VIII	TTh	402HE	Miss Segolson
	(Limited to 24 each) 2	I, II	MWF	401HE	Miss Fowler
53f	Related Art Problems.....	VI, VII	MWF	402HE	Miss Fowler
	(3 cred.; soph., jr., sr.; prereq., 51 or 56)				
	(Limited to 24)				
53w	Related Art Problems.....				
	(Same as 53f)				
	Sec. 1	VI, VII	MWF	402HE	Miss Fowler
	(Limited to 24 each) 2	I, II	MWF	402HE	Miss Fowler
53s	Related Art Problems.....				
	(Same as 53f)				
	Sec. 1	I, II	TThS	402HE	Miss Segolson
	2	III, IV	MWF	402HE	Miss Segolson
55f	Decorative Needlework and Other Crafts	VI, VII, VIII	TTh	401HE	Miss Fowler
	(3 cred.; prereq., 53 or parallel)				
	(Limited to 24)				
56f	Applications of Color and Design....	VI, VII, VIII	TTh	402HE	Miss H. Goldstein
	(3 cred.;† no prereq.)				
57s	Batik and Other Crafts.....	VI, VII, VIII	TTh	110HE	Miss Fowler
	(3 cred.; prereq., 3, 53 or parallel)				
	(Limited to 24)				
60s	Institution Marketing	III	W	106HE	Miss King
	(2 cred.; jr., sr.; prereq., 61 or parallel, 85)	III, IV	F		
61f,s	Quantity Cookery				
	(4 cred.; 3d qtr. soph., jr., sr.; prereq. 80 or 81)				
	(Limited to 12) Lect.	I	S	106HE	Miss King
	Sec. 1 Lab.	I, II, III	TTh	DiH	Miss King
	2	I, II, III(f)	MW	DiH	Miss King
61w	Quantity Cookery				
	(Same as 61f,s)				
	Lect.	I	S	106HE	Miss King
	Sec. 1 Lab.	I, II, III	TTh	DiH	
	(Limited to 12) 2	VI, VII, VIII	MW	DiH	
63f,w,s	Institution Experience				
	(3 cred.; 3d qtr. soph., jr., sr.; prereq., 80 or 81)				
	Lect.	III	T(f,s)		
		V	Th(w)		Miss Dunning
	(Limited to 12) Lab.	IV, V	MWF	Ar	
65f,w	Institution Equipment				
	(2 cred.; jr., sr.; prereq., 61 or parallel, 63 or parallel)				
	Lect.	IX	W		Miss Hunt
	(Limited to 20) Lab.	VI, VII, VIII	F		

† Intended for students in Science, Literature, and the Arts. Open to students in Home Economics only by permission of chief of division.

No.	Title	Hour	Day	Bldg.	Instructor
70f	Nutrition Survey ..... (2 cred.; all;¶ no prereq.)				
	(Limited to Sec. 1	IV	WF	203HE	Miss Biester
	45 each) 2	I	ThS		Miss Dinsmore
70w	Nutrition Survey ..... (Same as 70f) (Limited to 45)	III	TTh	213HE	Miss Dinsmore
70s*	Nutrition Survey ..... (Same as 70f) (Limited to 45)	VI	TTh	Ar	Miss Biester
71f*	Social Interpretations for Dietitians.. (1 cred.; jr., sr.; no prereq.)	VIII, IX	T		Miss Gardiner
73f	Nutrition I ..... (4 cred.; soph.,§ jr., sr.,; prereq., Agr. Biochem. 4, Physiol. 4) (Limited to 24)	III, IV	MTWF	211,213HE	Miss Dinsmore
73s	Nutrition I ..... (Same as 73f) (Limited to 24)	I, II	MTWTh	211,213HE	Mrs. Furnas
75f	Dietetics Laboratory ..... (2 cred.; jr., sr.; prereq., 170 or equivalent or parallel) (Limited to 20)	I, II	MW	107HE	Miss Hunt
75w	Dietetics Laboratory ..... (Same as 75f) (Limited to 20)	I, II	MW	107HE	Miss Dinsmore
79s	Selected Problems for Dietitians..... (3 cred.; sr.; prereq., 170 or equiv.)	II	MWF	313HE	Miss Biester
80f	Food Preparation ..... (5 cred.; prereq., Agr. Biochem. 3, parallel 4)	I, II	MTWThF	209HE	Miss Steers
80w	Food Preparation ..... (Same as 80f)				
	(Limited Sec. 1	VI, VII	MTWThF	209HE	Miss Steers
	to 20 each) 2	VIII, IX	MTWThF	209HE	Miss Steers
80s	Food Preparation ..... (Same as 80f)				
	(Limited Sec. 1	III, IV	MTWFS	209HE	Miss Steers
	to 20 each) 2	VI, VII	MTWThF	207HE	Miss Steers
81s	Food Preparation ..... (3 cred.; soph., jr., sr.; by examination; prereq., same as 80f)	VIII, IX	MWF	207HE	Mrs. Niles
83f,s	Food Management ..... (3 cred.: soph., jr., sr.; prereq., 70, 80 or 81, 85 or parallel)				
	(Limited Sec. 1	III, IV	MWF	203,207HE	Mrs. Niles
	to 20 each) 2	VI, VII	MWF	203,207HE	Miss Steers
83w	Food Management ..... (Same as 83f,s)	III, IV	MWF	203,207HE	Mrs. Niles
85f,w	Food Marketing ..... (2 cred.; soph., jr.; no prereq.)	VI, VII	TTh	203,207HE	Miss Larson

* Offered on the Minneapolis campus.

§ Open to sophomores only in their third quarter.

¶ Open to juniors and seniors in home economics only with consent of instructor.

No.	Title	Hour	Day	Bldg.	Instructor
85s	Food Marketing ..... (Same as 85f,w)				
	Sec. 1	VI, VII	TTh	203,207HE	Miss Larson
	2	I, II	TTh	203,207HE	
89s	Camp Cookery ..... (2 cred.; no prereq., not open to students in H.E.) (Limited to 20)	Not offered in 1931-32			
90s*†	Home Management Problems for Social Workers ..... (3 cred.; prereq., Soc. 52)	III	MWF	2J	Miss Studley
102f,s	Advanced Textiles ..... (3 cred.; jr., sr.; prereq., 3, Agr. Biochem. 3-4, Agr. Econ. 3 or parallel) (Limited to 16)	VI, VII, VIII	TTh	307,311HE	Miss Phelps
107w	Textile Analysis and Related Problems (3 cred.; jr., sr.; prereq., 102, Agr. Biochem. 2)	VI, VII, VIII	MWF	311HE	Miss Phelps
115f,w	Clothing Economics ..... (2 cred.; jr., sr.; prereq., 15 or equiv., Ag. Econ. 3)	III	TTh	203HE	Miss Weller
131f	Home Management: House Planning and Equipment ..... (5 cred.; jr., sr.; prereq., 53) (Limited to 24)	III, IV	MTWFS	401HE	Miss H. Goldstein
131w	Home Management: House Planning and Equipment ..... (Same as 131f) (Limited to 24)	VI, VII	MTWThF	401HE	Miss H. Goldstein
131s	Home Management: House Planning and Equipment ..... (Same as 131f)				
	Sec. 1	III, IV	MTWFS	401HE	Miss V. Goldstein
	(Limited to 24 each) 2	VI, VII	MTWThF	401HE	Miss H. Goldstein
136s	Problems in Income Management..... (3 cred.; sr.; prereq., 34, 35, 170, Agr. Econ. 126 or parallel)	~~II~~ I, II,	~~MWF~~ T.S.	112HE	Miss Studley Miss M. 5-8-32
150f,w,s	Art History and Appreciation..... (3 cred.; jr., sr.; prereq., 51)	VIII	MWF	313HE	Miss V. Goldstein
152w	Advanced Interior Design ..... (3 cred.; jr., sr.; prereq., 53, 131 or parallel, 150) (Limited to 20)	I,II	MWF	401HE	Miss Morse
154s	Advanced Costume Design ..... (3 cred.; jr., sr.; prereq., 13, 53, 55 recommended) (Limited to 20)	I, II	TThS	401HE	Miss H. Goldstein
163s	Institution Management Problems.... (3 cred.; sr.; prereq., 61, 63)				
	Lect.	III	TTh	106HE	Miss Dunning
	Lab.	III, IV	S	DiH	

* Offered on the Minneapolis campus.

† Not open to students in Home Economics.

No.	Title	Hour	Day	Bldg.	Instructor
170f,s	Nutrition of the Family..... (3 cred.; jr., sr.; prereq., 70, 80 or 81, Agr. Biochem. 4, Physiol. 4) (Limited to 30 each) Sec. 1	I	MWF	313HE	Miss Dinsmore
	2	III	MWF	313HE	Mrs. Furnas
170w	Nutrition of the Family..... (Same as 170f,s) (Limited to 25)	I	MWF	313HE	Mrs. Furnas
171f,w,s	Child Nutrition ..... (3 cred.; jr., sr.; prereq., 170, H.E. Ed. 40) (Limited to 25)				
	Lect.	III	MW	213HE	Miss Leichsenring, Miss Dinsmore
		III, IV	F	Ar	
	Lab.	IV	Ar before completing registration		
173s	Nutrition in Disease..... (3 cred.; sr.; prereq., 170, 175)	I	MWF	213HE – 203	Miss Hunt
175f	Nutrition II ..... (4 cred.; jr., sr.; prereq., 73) (Limited to 24)	I, II	MTWTh	211,213HE	Mrs. Furnas
175w	Nutrition II ..... (Same as 175f) (Limited to 24)	VI, VII, VIII	MWF	211,213HE	Miss Dinsmore
176w	Advanced Nutrition ..... (4 cred.; jr., sr.; prereq., 73, Agr. Biochem. 2) (Limited to 12)				
	Lect.	I	T	313HE	Miss Biester
	Lab.	II, III, IV	TS	311HE	Mrs. Furnas
		I, II, III	Th	311HE	
177w,s	Digestion and Metabolism..... (3 cred.; sr.; prereq., 175, Agr. Biochem. 2) (Limited to 12)	VI, VII, VIII	TTh	213HE	Miss Leichsenring, Mrs. Furnas
178f,w,s	Clinical Problems in Nutrition..... (2 cred.; jr., sr.; prereq., 71 or parallel, 170 or parallel, 175) (Limited to 8)				Dinsmore
	Lect.	VI	T	Ar	Miss ~~Hunt~~
	Lab.	VI, VII, VIII	TTh	Ar	
179w	Readings in Nutrition..... (2 cred.; jr., sr.; prereq., 170)	IV	MW	213HE	Mrs. Furnas
179s	Readings in Nutrition..... (Same as 179w)	I	TTh	213HE	Miss Dinsmore
182f,w,s	Experimental Cookery ..... (3 cred.; jr., sr.; prereq., 80) (Limited to 12)				
	Sec. 1	I, II, III	TTh	107HE	Miss Child
	2	VI, VII, VIII (f,w)	MW	107HE	Miss Child
186w,s	Special Food Problems..... (3 cred.; sr.; prereq., 182)	VI, VII, VIII	TTh	107HE	Miss Child
187w,s	Special Food Problems..... (5 cred.; sr.; prereq., 182, Agr. Biochem. 2)	VI, VII, VIII	TTh	107HE	Miss Child
		4 hrs. to be arranged			
195s	Home Economics Survey..... (2 cred.; sr.; no prereq.)	Ar	Ar	Ar	Miss McNeal

HOME ECONOMICS EDUCATION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
40f,s	Child Training ..... (3 cred.; jr., sr.; prereq., Psy. 1-2)	IV	MWF	213HE	Mrs. Foster
40w*	Child Training ..... (Same as 40f,s)	IV	MWF	202Pt	Mrs. Foster
42f,s†	Special Methods of Teaching Home Economics ..... (3 cred.; jr., sr.; prereq., H.E. 13, 53, 83, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)	VIII	MWF	213HE	Miss Rose
49f,w,s†	Observation and Teaching: General Home Economics ..... (8 cred.; sr.; prereq.,‡ 42 or parallel)				
	Lect.	IX	TTh	213HE	Miss Rose
	Teaching	Ar	Ar	Ar	Miss Rose and others
141f	Vocational Education in Home Economics ..... (2 cred.; sr.; prereq., 42)	Ar	Ar	Ar	Miss Clara Brown, Miss Rose
142f,w	Educational Measurements in Home Economics ..... (2 cred.; sr.; prereq., 42)	II	TTh	213HE	Miss Clara Brown
143w,s	Home Economics Curricula..... (2 cred.; jr., sr.; prereq., 42 or parallel)	VIII	TTh	213HE	Miss Clara Brown, Miss Rose
147w	Organization and Methods for Related Art Teaching..... (3 cred.; jr., sr.; prereq., 42 or parallel; H.E. 53, 131 or parallel)	III	TThS	402HE	Miss H. Goldstein
149f,w,s	Research Problems ..... (Cred. ar.; sr.; permission of instructor)	Ar	Ar	Ar	Miss McNeal, Miss Clara Brown

HORTICULTURE

No.	Title	Hour	Day	Bldg.	Instructor
6f	Fruit Growing ..... (3 cred.; no prereq.)				
	Lect.	II	MW	102Hr	Mr. Alderman
	(Laboratory sections limited to 20 each) Sec. 1 Lab.	I, II	F	8Hr	Mr. Brierley, Mr. Angelo
	2	VII, VIII	M	8Hr	
32s	Vegetable Growing ..... (3 cred.; no prereq.)				
	Lect.	II	MW	102Hr	Mr. Krantz
	(Limited to 30) Lab.	I, II	F	8Hr	Mr. Hutchins
50s	Floriculture ..... (3 cred.; no prereq.)	III	MWF	8aHr	Mr. Longley, Mr. Sando

* Offered on the Minneapolis campus.

† A special fee of $1 per credit hour is charged for this course.

‡ In addition to other prerequisites a student registering for this course must have received a grade of C or higher in each of the following courses: H.E. 3, 11, 13, 50, 51, 53, 80 or 81, and 83, and must have completed home experience work in foods and clothing.

No.	Title	Hour	Day	Bldg.	Instructor
56w	Plant Propagation and Nursery Practice	I	TTh	8aHr	Mr. Longley
	(3 cred.; jr., sr.; prereq., Bot. 9 cred.)	I, II	S	8Hr	Mr. Longley, Mr. Sando
71f	Elementary Landscape Design and Plant Materials	II	Th	107Hr	Mr. Longley
	(3 cred.; prereq., Bot. 9 cred.)	I, II	TS	107Hr	
72s	Woody Plants and Garden Flowers	IV	T	107Hr	Mr. Longley
	(2 cred.; prereq., Bot. 9 cred.)	III, IV	S	107Hr	
74w	Principles of Landscape Design	VIII	T	107Hr	Mr. Longley
	(3 cred.; jr., sr.; prereq., 71, Arch. 21 or Agr. Eng. 3)	VI, VII	TTh	107Hr	
75f,w,s	Landscape Problems	Ar	Ar	Ar	Mr. Longley
76s	Landscape Construction	III	T	107Hr	Mr. Longley
	(3 cred.; sr.; prereq., 71)	VI, VII	TTh	107Hr	
93f	Judging Horticultural Crops	VI, VII, VIII	M	8aHr	Mr. Currence, Mr. Angelo, Mr. Longley
	(2 cred.; soph., jr., sr.; prereq., 6 or 32)				
107f	Orchard Management	IV	TS	103Hr	Mr. Brierley
	(3 cred.; jr., sr.; prereq., 6, Bot. 9 cred.)	VI, VII	W	8Hr	
110	Horticultural Crop Breeding	III	TThS	106Hr	Mr. Wilcox
	(3 cred.; jr., sr.; prereq., Agron. 131)				
111f	Systematic Pomology	VI, VII, VIII	TTh	8aHr	Mr. Brierley
	(3 cred.; jr., sr.; prereq., 6, Bot. 9 cred.)				
121w	Small Fruit Culture	I	MWF	102Hr	Mr. Brierley
	(3 cred.; soph., jr., sr.; prereq., 6 or 32, Bot. 9 cred.)				
~~135f~~	~~Truck Crops and Potatoes I~~	~~Ar~~	~~Ar~~	~~Ar~~	~~Mr. Currence~~
	~~(3 cred.; jr., sr.; prereq., 32, Bot. 9 cred.)~~				
137w	Truck Crops and Potatoes II	Ar	Ar	Ar	Mr. Krantz
	(3 cred.; jr., sr.; prereq., 32, Bot. 9 cred.)				
190f-191w-192s	Special Problems	Ar	Ar	Ar	Mr. Alderman and staff
	(6-12 cred.; jr., sr.; prereq., instructor's permission)				
193f-194w-195s	Horticultural Seminar	Ar	Ar	Ar	Horticultural staff
	(3 cred.; jr., sr.; prereq., 9 cred.)				

INORGANIC CHEMISTRY

SCHOOL OF CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	General Inorganic Chemistry				
	(8 cred.; no prereq.)				
	Lect.	VII	MWF	225C	Mr. Pervier
	Lab.	VIII, IX	MW	210C	
3s*	General Inorganic Chemistry				
	(4 cred.; prereq., 1-2)				
	Lect.	VII	MF	325C	Mr. Pervier
		IV	S	325C	
	Lab.	VIII, IX	MF	210C	

* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
9f-10w*	General Inorganic Chemistry.....				
	(10 cred.; prereq., 1 yr. h. s. chem.)				
	Lect.	VII	MWF	100C	Mr. Reyerson
	Lab.	VIII, IX	MWF	110C	

For additional courses see the bulletin of the School of Chemistry.

MATHEMATICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
3f*	Higher Algebra, Short Course.....	III	MWThF	133Ph	Ar
	(4 cred.; all; prereq., 1 yr. elem. alg.)				
3w*	Higher Algebra, Short Course.....	IV	MTWF	206Pt	Ar
	(Same as 3f)				
4f*	Trigonometry, Short Course.....	II	MTWF	133Ph	Ar
	(4 cred.; all; prereq., 3 or 5, or prep. higher alg.)				
4w*	Trigonometry, Short Course.....	III	MWThF	206Pt	Ar
	(Same as 4f)				
4s*	Trigonometry, Short Course.....	IV	MTWF	206Pt	Ar
	(Same as 4f)				
5f*	Higher Algebra				
	(5 cred.; all; prereq., 1 yr. elem. alg.)				
	Sec. 1	II	MWThFS	206Pt	Ar
	2	VI	MTWThF	166Ph	Ar
5w*	Higher Algebra	VI	MTWThF	133Ph	Ar
	(Same as 5f)				
5s*	Higher Algebra.....	I	MWThFS	206Pt	Ar
	(Same as 5f)				
6f*	Trigonometry	II	MWThFS	104F	Ar
	(5 cred.; all; prereq., 3 or 5 or prep. higher alg.)				
6w*	Trigonometry	VI	MTWThF	105F	Ar
	(Same as 6f)				
6s*	Trigonometry	IV	MTWFS	105F	Ar
	(Same as 6f)				
7f*	College Algebra	I	MWThFS	105F	Ar
	(5 cred.; all; prereq., 5 or prep. higher algebra, and 6)				
7w*	College Algebra	II	MWThFS	104F	Ar
	(Same as 7f)				
7s*	College Algebra	VI	MTWThF	105F	Ar
	(Same as 7f)				
8f*	Commerce Algebra	I	MWThFS	206J	Ar
	(5 cred.; pre-bus. stud.; prereq., 5 or prep. high. alg.)				
8w*	Commerce Algebra	II	MWThFS	206Pt	Ar
	(Same as 8f)				
8s*	Commerce Algebra	VI	MTWThF	104F	Ar
	(Same as 8f)				

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

* Offered on the Minneapolis campus.

MILITARY SCIENCE AND TACTICS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	First Year Basic Course.....				
	(No cred.; fr.; no prereq.)				
	Sec. 1	II	MWF	A	Ar
	2	III	MWF	A	Ar
	3	IV	MWF	A	Ar
	4	V	MWF	A	Ar
	5	VI	MWF	A	Ar
	6	VII	MWF	A	Ar
	7	VIII	MWF	A	Ar
	8	II	TThS	A	Ar
	9	III	TThS	A	Ar
3s*	First Year Basic Course.....				
	(No cred.; fr.; no prereq.)				
	Sec. 1	II	MW & IX T	A	Ar
	2	III	MW & IX T	A	Ar
	3	IV	MW & IX T	A	Ar
	4	V	MW & IX W	A	Ar
	5	VI	MW & IX W	A	Ar
	6	VII	MW & IX W	A	Ar
	7	VIII	MW & IX W	A	Ar
	8	II	TTh & IX W	A	Ar
	9	III	TTh & IX W	A	Ar
4f-5w*	Second Year Basic Course.....				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	II	MWF	A	Ar
	2	III	MWF	A	Ar
	3	IV	MWF	A	Ar
	4	V	MWF	A	Ar
	5	VI	MWF	A	Ar
	6	VII	MWF	A	Ar
	7	VIII	MWF	A	Ar
6s*	Second Year Basic Course.....				
	(No cred.; soph.; prereq., 4-5)				
	Sec. 1	II	MW & IX T	A	Ar
	2	III	MW & IX T	A	Ar
	3	IV	MW & IX T	A	Ar
	4	V	MW & IX W	A	Ar
	5	VI	MW & IX W	A	Ar
	6	VII	MW & IX W	A	Ar
	7	VIII	MW & IX W	A	Ar
	8	II	TTh & IX W	A	Ar
	9	III	TTh & IX W	A	Ar
51f-52w*	First Year Advanced Course.....	Total of five hours to be taken as follows:			
	(6 cred.; prereq., 4-5-6)	One of the two-hour sections:			
	Sec. 1	II	TTh	A	Ar
	2	III	TTh	A	Ar
		One of the three-hour sections:			
	Sec. 1	II	MWF	A	Ar
	2	III	MWF	A	Ar
	3	VI	MWF	A	Ar
	4	VIII	MWF	A	Ar
53s*	First Year Advanced Course.....	Total of five hours to be taken as follows:			
	(3 cred.; prereq., 4-5-6)	One of the four-hour sections:			
	Sec. 1	II	MTWTh	A	Ar
	2	III	MTWTh	A	Ar
		One of the drill sections:			
		IX	T or W	A	Ar

* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
54f-55w*	Second Year Advanced Course.....	Total of five hours to be taken as follows:			
	(6 cred.; prereq., 4-5-6)	One of the two-hour sections:			
	Sec. 1	II	TTh	A	Ar
	2	III	TTh	A	Ar
		One of the three-hour sections:			
	Sec. 1	II	MWF	A	Ar
	2	III	MWF	A	Ar
	3	VI	MWF	A	Ar
	4	VIII	MWF	A	Ar
56s*	Second Year Advanced Course.....	Total of five hours to be taken as follows:			
	(3 cred.; prereq., 4-5-6)	One of the two-hour sections:			
	Sec. 1	II	MW	A	Ar
	2	III	MW	A	Ar
	3	II	TTh	A	Ar
	4	III	TTh	A	Ar
		One of the drill sections:			
	Sec. 1	II	MW & IX T	A	Ar
	2	III	MW & IX T	A	Ar
	3	IV	MW & IX T	A	Ar
	4	V	MW & IX W	A	Ar
	5	VI	MW & IX W	A	Ar
	6	VII	MW & IX W	A	Ar
	7	VIII	MW & IX W	A	Ar
	8	II	TTh & IX W	A	Ar
	9	III	TTh & IX W	A	Ar

PHYSICAL EDUCATION FOR MEN

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s*¶	Freshman Physical Education.....				
	(Cred.;† fr.; no prereq.)				
	(Sections limited to 60 each)				
	Sec. 1	I	MWF	202S	
	2 (w, s only)	I	TThS	202S	
	3	II	MWF	202S	
	4	II	TThS	202S	
	5	III	MWF	202S	
	6	III	TThS	202S	
	7	IV	MWF	202S	
	8	VI	MWF	202S	
	9	VII	MWF	202S	
	10	VIII	MWF	202S	
4w*	Freshman Hygiene	IV	S	202S	
	(Cred.†)				
7f-8w-9s*	Advanced Leaders				
	(3 cred.; soph., jr., sr.; prereq., 1-2-3)				
	Lect.	IV	T	206A	Mr. Keller
	Lab.	Ar	Ar		
10f-11w-12s*¶	Minor Sports				
	(6 cred.; soph., jr., sr.; prereq. 1-2-3)				
	Lect.	IV	S	206A	
	Lab.	IV	MWF		

* Offered on the Minneapolis campus.

† Courses 1-2-3 and 4 carry a total of 3 credits. Both courses must be completed before credit is given.

¶ A maximum of $1.50 is charged all students registered for one or more of these courses.

No.	Title	Hour	Day	Bldg.	Instructor
16f-17w-18s*¶	Drill Substitution ..... (No cred.; by petition only; no prereq.)				
	Sec. 1	II	MWF	S	
	2	III	MWF		
	3	IV	MWF		
30s*¶	Athletic Training and First Aid.....	I	MWF	206A	Dr. Cooke

For additional courses see the bulletin of the College of Education.

PHYSICAL EDUCATION FOR WOMEN

No.	Title	Hour	Day	Bldg.	Instructor
1f*‡‡	Freshman Physical Education..... (1 cred.; required of all students; no prereq.)				
	Sec. 1 Lect.	I	W	201WGm	Ar
	2	II	T	201WGm	Ar
	3	II	Th	201WGm	Ar
	4	III	Th	201WGm	Ar
	5	IV	M	201WGm	Ar
	6	IV	T	201WGm	Ar
	7	VI	W	201WGm	Ar
	8	VI	Th	201WGm	Ar
	Sec. 1 Lab.	II	MWF	3,151,153WGm	Ar
	2	III	MWF	3,151,153WGm	Ar
	3	III	TThS	3,151,153WGm	Ar
	4	IV	MWF	3,151,153WGm	Ar
	5	VI	MWF	3,151,153WGm	Ar
	6	VIII	MWF	3,151,153WGm	Ar
2w†*‡‡	Freshman Physical Education..... (Same as 1f)				
	Sec. 1 Lab.	II	MWF	3,151,153WGm	Ar
	2	III	MWF	3,151,153WGm	Ar
	3	III	TThS	3,151,153WGm	Ar
	4	IV	MWF	3,151,153WGm	Ar
	5	VI	MWF	3,151,153WGm	Ar
	6	VIII	MWF	3,151,153WGm	Ar
3s†*‡‡	Freshman Physical Education..... (Same as 1f)				
	Sec. 1 Lab.	II	MWF	3,151,153WGm	Ar
	2	III	MWF	3,151,153WGm	Ar
	3	III	TThS	3,151,153WGm	Ar
	4	IV	MWF	3,151,153WGm	Ar
	5	VI	MWF	3,151,153WGm	Ar
	6	VIII	MWF	3,151,153WGm	Ar
4s*	Preliminary Hygiene (for nurses and transfer students) ..... (No cred.; no prereq.)	II	T	206Pt	Ar

* Offered on the Minneapolis campus.

† Students may enter any quarter.

¶ A maximum of $1.50 is charged all students registered for one or more of these courses.

‡‡ A fee of $2.50 is charged for this course, provided that no student shall be charged more than $3.50, regardless of the number of physical education courses pursued in any one quarter.

No.	Title	Hour	Day	Bldg.	Instructor
7f,8w†*¶	Sophomore Gymnastics	IV	TS	153WGm	Ar
	(No cred.; soph.; prereq., 1-2-3)				
9s*¶	Sophomore Archery				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	II	MW	151WGm	Ar
	2	IV	TS		Ar
	3	VII	WF		Ar
10f-11w†*¶	Sophomore Orthopedic and Individual Gymnastics				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	I	WF	3WGm	Ar
	2	IV	TS	3WGm	Ar
	3	VI	TTh	3WGm	Ar
12s*¶	Sophomore Orthopedic and Individual Gymnastics	IV	TS	3WGm	Dr. Tolg
	(Same as 10f-11w)				
13f-14w-15s‡*¶	Sophomore Natural Dancing.....	VI	TTh	151WGm	Miss Timberman
	(No cred.; soph.; prereq., 1-2-3)				
13f,s-14w*¶	Sophomore Natural Dancing.....	II	TTh	151WGm	Miss Timberman
	(Same as 13f-14w-15s)				
16f,17w†*¶	Sophomore Games and Folk Dancing	I	WF	151WGm	Miss Dickson
	(No cred.; soph.; prereq., 1-2-3)				
18s*¶	Tennis				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	I	TTh	151WGm	Ar
	2	IV	TS	151WGm	Ar
	3	VI	TTh	151WGm	Ar
	4	VII	WF	151WGm	Ar
	5	VIII	TTh	151WGm	Ar
19f*¶	Sophomore Hockey				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	V	MW	151WGm	Ar
	2	VII	WF	151WGm	Ar
	3	VIII	TTh	151WGm	Ar
20w*¶	Sophomore Basket-Ball				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	V	MW	151WGm	Ar
	2	VII	WF	151WGm	Ar
	3	VIII	TTh	151WGm	Ar
21s*¶	Sophomore Baseball	V	MW	151WGm	Ar
	(No cred.; soph.; prereq., 1-2-3)				
22f,s-23w§*¶	Sophomore Elem. Swimming.....				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	II	TTh	51WGM	Miss Starr
	2	III	MW	51WGm	and others
	3	IV	TS	51WGm	
	4	IV	MW	51WGm	
	5	VII	TTh	51WGm	
	6	VIII(3:30)	TTh	51WGm	
	7	VIII½(4:00)	TTh	51WGm	

* Offered on the Minneapolis campus.

† Students may enter any quarter.

‡ The spring quarter is not open to students who have not had the previous quarter.

¶ A fee of $2 is charged for this course.

No.	Title	Hour	Day	Bldg.	Instructor
22f,w,s*‡‡	Sophomore Elem. Swimming.....	VII	WF	51WGm	
	(Same as 22f,s-23w)				
24f,s‖	Sophomore Horseback Riding.....				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	VIII	TTh	Ar	Miss Starr
	2	IX	TTh	Ar	
25f,s-26w§¶*‡‡	Sophomore Intermed. Swimming.....				
	(No cred.; soph.; prereq., 1-2-3 elementary swimming test)				
	Sec. 1	III	TTh	51WGm	Ar
	2	VIII½ (4:00)	MW	51WGm	Ar
	3	VI	MW	51WGm	Ar
27f**‡‡	Sophomore Golf—Advanced	VI	TTh	Ar	Ar
	(No cred.; soph.; prereq., 1-2-3)				
27s**‡‡	Sophomore Golf—Elementary				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	I	TTh	Ar	
	2	II	TTh	Ar	
	3	II	MW	Ar	
28f,s-29w§¶*‡‡	Sophomore Advanced Swimming.....	VIII	MW	51WGm	Miss Starr
	(No cred.; soph., prereq., 1-2-3, inter. swim. test)				
30s*‡‡	Sophomore Life Saving and Water Sports	IX	MW	51WGm	Miss Starr
	(No cred.; soph., prereq., 1-2-3, adv. swim. test)				
31w††*‡‡	Sophomore Skating				
	(No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	II	TTh	Ar	
	2	VII	WF	Ar	

PHYSIOLOGY

MEDICAL SCHOOL

No.	Title	Hour	Day	Bldg.	Instructor
4f,w,s*	Human Physiology	III, IV	MWF	315MH	Dr. Lyon, Dr. King, and others
	(4 cred.; prereq., 1 qtr. zool., 1 qtr. chem.)				
57f*	Physiologic Chemistry	I	TThS	214MH	Dr. Armstrong and others
	(4 cred.; jr., sr.; prereq., Zool. 5-6-7; Inorg. Chem. 1-2-3 or 9-10)	IV	M		

* Offered on the Minneapolis campus.

‡ The spring quarter is not open to students who have not had the previous quarter.

§ Winter quarter is not open to students who have not had the previous quarter.

¶ No student may register for more than two quarters of swimming without permission. Course 22 is never closed for registration.

‖ Students registering for this course will pay for riding lessons at about $1 per lesson, but not the regular physical education fee. Attendance at class hour is required for credit.

** Students must supply their own golf equipment. Golf course at university recreation field will be used for Course 27f. Student tickets 10 for $4.50.

†† Class meetings will be fifty minutes in length, since weather and ice conditions will cause omissions at times.

‡‡ A fee of $2 is charged for this course, provided that no student shall be charged more than $3.50, regardless of the number of physical education courses pursued in any one quarter.

No.	Title	Hour	Day	Bldg.	Instructor
59s*	Human Physiology ..... (6 cred.; jr., sr.; prereq., same as 57)				
	Lect.	I	TThS	310MH	Dr. Lyon,
		IV	MF		Dr. King,
	Lab.	II, III, IV	T		Dr. Loucks,
	Quiz	II	T		and others
60s	Physiology of Exercise ..... (4 cred.; jr., sr.; prereq., 4)				
	Lect.	I	TThS		
	Lab.	VI, VII, VIII	W		
100w-101s*	Physiologic Chemistry ..... (10 cred.; jr., sr.; prereq., org. chem., phys.) (Div. A and B primarily for medical students)				
	Lect.	IV	MWF		Dr. McClendon,
	Lab. Div. A	I, II, III	TTh	310MH	Dr. Hem-
	Lab. Div. B	I, II, III	FS		ingway,
	Lab. Div. C	VI, VII, VIII	TTh		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.)	VII, VIII, IX	MWF	106,107PP	Mr. Stakman, Mr. Allison, Mr. Eide
7w-8s	Weeds and Grasses ..... (6 cred.; soph., jr., sr.; prereq., Bot. 9 cred.)	III	TThS	100PP	Mr. Larson
		IV	TS	100PP	
9f	Weeds and Seed Testing..... (3 cred.; soph., jr., sr.; prereq., Bot. 9 cred.)	III	TThS	100PP	Mr. Larson
		IV	TS	100PP	
10w	Forest Pathology ..... (5 cred.; soph., jr., sr.; prereq., Bot. 9 cred.)	VII, VIII, IX	MWF	106,107PP	Mr. Stakman, Mr. C. Christensen, Mr. Lorenz
10s	Forest Pathology ..... (Same as 10w)	I	MWF	107PP	Mr. C. Christensen,
		I, II	TThS	106,107PP	Mr. Lorenz
12w	Seed Problems ..... (3 cred.; jr., sr.; prereq., 9)	Ar	Ar	Ar	Mr. Larson
105f-106w-107s	Mycology ..... (6 to 15 cred.; jr., sr.; prereq., 1 or 10)	Ar	Ar	302PP	Mr. Freeman, Miss Dosdall
110w	Principles of Pathology ..... (4 cred.; jr., sr.; prereq., 1 or 10, Bact. 41)	III, IV	MWF	106,107PP	Mr. Stakman, Mr. Allison
111w	Diseases of Cereal Crops..... (3 cred.; jr., sr.; prereq., 1 or 10)	VI, VII	MWF	106,107PP	Mr. J. J. Christensen
112	Disease of Fruit Crops..... (3 cred.; jr., sr.; prereq., 1 or 10)	Not offered in 1931-32			
113s	Diseases of Vegetable Crops..... (3 cred.; jr., sr.; prereq., 1 or 10)	VI, VII	MWF	106,107PP	Mr. Leach

* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
114w	Advanced Forest Pathology..... (3 cred.; jr., sr.; prereq., 1 or 10)	Ar	Ar	Ar	Mr. Stakman, Mr. C. Christensen
116	Pathologic. Histology ..... (3 cred.; jr., sr.; prereq., 1 or 10)	Not offered in 1931-32			
117s	Diseases of Forage and Fiber Crops.. (3 cred.; jr., sr.; prereq., 1 or 10)	Ar	MWF	Ar	Mr. J. J. Christensen
118	Bacterial Diseases of Plants..... (3 cred.; jr., sr.; prereq., 1 or 10)	Not offered in 1931-32			
119s	Principles of Plant Disease Control.. (3 cred.; jr., sr.; prereq., 1 or 10)	Ar	Ar	Ar	Mr. Allison
141f-142w	Insects in Relation to Plant Disease.. (6 cred.; prereq., Ent. 8 cred., Plant Path. 8 cred.)	III, IV	TThS	302Ad	Mr. Granovsky, Mr. Leach
160f or w	Plant Microchemistry ..... (3 or 5 cred.; sr.; prereq., org. chem. or phytochem.)	Ar	Ar	Ar	Mr. Harvey, Mr. Larson
161w	Transport, Storage, and Ripening of Fruits and Vegetables..... (3 cred.; sr.; prereq., Plant Physiol. 5 cred.)	Ar	Ar	Ar	Mr. Harvey
162w	Physiological Relations of Crop Plants to Temperature ..... (3 cred.; sr.; prereq., Phys. 23)	Ar	Ar	206PP	Mr. Harvey

POULTRY HUSBANDRY

No.	Title	Hour	Day	Bldg.	Instructor
1f,w	Poultry ..... (3 cred.; no prereq.)	VI	MWF	102Ve	Mr. Smith
2w	Poultry Judging ..... (3 cred.; prereq., 1)	VI, VII, VIII	TTh	102Ve	Mr. Smith
4s	Incubating and Brooding..... (3 cred.; no prereq.)	VI	MWF	102Ve	Mr. Smith
5s	Advanced Poultry Judging..... (3 cred.; prereq., 2)	VI, VII, VIII	TTh	102Ve	Mr. Smith
6s	Poultry Problems ..... (1 cred.; jr., sr.; prereq., 1)	Ar	Ar	Ar	Mr. Smith, Mr. Hutt
101w	Advanced Poultry Breeding..... (3 cred.; jr., sr.; prereq., Agron. 131)	Ar	Ar	Ar	Mr. Hutt

PREVENTIVE MEDICINE AND PUBLIC HEALTH

MEDICAL SCHOOL

No.	Title	Hour	Day	Bldg.	Instructor
3f,w,s*	Personal Hygiene and Elementary Sanitation ..... (2 cred.; fr.; no prereq.)				
	Sec. 1 (women)	IV	TS	Ar	Dr. Boynton,
	(men)	IX	TTh	Ar	Dr. Lees,
	2 (men)	IV	TS		and others

* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
52f,s	Health Care of the Family.....				
	(3 cred.; prereq., Bact. 41, Physiol. 4)				
	(Laboratory sections limited to 20)				
	Lect.	VIII	Th	313HE	Dr. Boynton
	Sec. 1 Lab.	VI, VII	TTh	WH	Miss Fisher
	2	VI, VII	MF	WH	
	3 (s only)	III, IV	TS	WH	
57s*	Health of Infant and Pre-school Child	III	TTh	Ar	
	(2 cred.; jr., sr.; prereq., Zool. 1-2, Psy. 1-2, or 50, or 53)				
80w*	Health Supervision of the School Child	II	MWF	Ar	Dr. Diehl
	(3 cred.; jr., sr.; prereq., 50, 52 or 53)				

For additional courses see the bulletins of the Medical School and College of Education.

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.)				
	Sec. 1	I	MWF	OLAud	Mr. Elliott
	2	III	MWF	OLAud	
1w-2s*	General Psychology	IX	MWF	Psy115	
	(Same as 1f-2w)				
	(Limited to 40)				

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	301Ad	Mr. Kirkwood
	(9 cred.; jr., sr.; prereq., Journ. 13-14-15, 51-52)				
19w	Publicity	I	TThS	105En	Mr. Kirkwood
	(3 cred.; jr., sr.; prereq., Eng. A-B-C., Comp. 4-5-6, or exemption)				

For additional courses see under the Department of Journalism in the bulletin of the College of Science, Literature, and the Arts.

RHETORIC

No.	Title	Hour	Day	Bldg.	Instructor
1f	Rhetoric I				
	(3 cred.; no prereq.)				
	(Limited to 35 each)				
	Sec. 1	I	MWF	308En	Miss Thurston
	2	II	MWF	310En	Miss Thompson
	3	III	MWF	310En	Miss Thompson
	4	IV	MWF	308En	Miss Thurston
	5	III	TThS	308En	Miss Thurston
	6	I	MWF	310En	Miss Thompson
	7	II	MWF	308En	Miss Thurston
	8	II	TThS	308En	Mr. Lansing

* Offered on the Minneapolis campus.

† The full course must be completed before credit will be given.

No.	Title	Hour	Day	Bldg.	Instructor
1w	Rhetoric I	I	MWF	310En	
	(Same as 1f)				
	(Limited to 35)				
1s	Rhetoric I	VI	MWF	310En	Miss Thompson
	(Same as 1f)				
2w	Rhetoric II				
	(3 cred.; prereq., 1)				
	(Limited to 35 each)				
	Sec. 1	II	MWF	310En	Miss Thompson
	2	III	TThS	308En	Miss Thurston
	3	II	TThS	310En	Miss Thompson
	4	III	MWF	310En	Miss Thompson
	5	I	MWF	308En	Miss Thurston
	6	IV	MWF	308En	Miss Thurston
	7	II	MWF	216En	Mr. Lansing
	8	II	TThS	307En	Mr. Lansing
2s	Rhetoric II	II	MWF	308En	Miss Thurston
	(Same as 2f)				
	(Limited to 35)				
3f	Rhetoric III	IV	MWF	310En	Mr. Lansing
	(3 cred.; prereq., 2)				
	(Limited to 35)				
3s	Rhetoric III				
	(Same as 3f)				
	(Limited to 35 each)				
	Sec. 1	II	MWF	310En	Miss Thompson
	2	IV	MWF	307En	Mr. Lansing
	3	I	MWF	308En	Miss Thurston
	4	III	MWF	308En	Miss Thurston
	5	II	TThS	308En	Miss Thurston
	6	III	TThS	310En	Miss Thompson
11f	Argumentation	I	MWF	307En	Mr. Lansing
	(3 cred.; soph., jr., sr.; prereq., 3, 22 recommended)				
	(Limited to 30)				
11w	Argumentation	III	MWF	307En	Mr. Lansing
	(Same as 11f)				
	(Limited to 30)				
11s	Argumentation	II	MWF	307En	Mr. Lansing
	(Same as 11f)				
	(Limited to 30)				
22f,s	Public Speaking	III	MWF	311En	Mr. Routledge
	(3 cred.; soph., jr., sr.; prereq., 3)				
	(Limited to 20)				
22w	Public Speaking				
	(Same as 22f,s)				
	(Limited to 20)				
	Sec. 1	I	MWF	311En	Mr. Routledge
	2	II	MWF	311En	
23f,w,s	Public Speaking	IV	MTWFS	311En	Mr. Routledge
	(5 cred.; soph., jr., sr.; prereq., 3)				
	(Limited to 30)				
24s	Advanced Public Speaking.....	II	MWF	311En	Mr. Routledge
	(3 cred.; soph., jr., sr.; prereq., 22)				
28f	Play Production	III	TThS	AudAd	Mr. Routledge
	(3 cred.; soph., jr., sr.; prereq., 3)				
29s	Advanced Play Production.....	III	TThS	311En	Mr. Routledge
	(3 cred.; jr., sr.; prereq., 28)				

No.	Title	Hour	Day	Bldg.	Instructor
31f	Survey of English Literature I..... (5 cred.; soph., jr., sr.; prereq., 3) (Limited to 40)	III	MTWThF	307En	Mr. Lansing
31w	Survey of English Literature I..... (Same as 31f) (Limited to 40)	II	MTWThF	308En	
31s	Survey of English Literature I..... (Same as 31f) (Limited to 40)	III	MTWThF	307En	
32f	Survey of English Literature II..... (3 cred.; soph., jr., sr.; prereq., 3) (Limited to 35)	III	TThS	310En	Miss Thompson
33w.s	Modern Literature ..... (3 cred.; soph., jr., sr.; prereq., 3)	IV	MWF	310En	Mr. Lansing
34f	Books and Reading..... (1 cred.; soph., jr., sr.; no prereq.)	IV	T	310En	Miss Thompson

SOCIOLOGY AND SOCIAL WORK

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

T. T. h S.

No.	Title	Hour	Day	Bldg.	Instructor
1f,w,s	Introduction to Sociology..... (3 cred.; 3d qtr. fr., soph., jr., sr.; no prereq.)	IV III T. h. S.	MWF	~~204Da~~ 108 Da 301 Fd	Ar
14f,w	Rural Sociology ..... (3 cred.; soph., jr., sr.; prereq., 1 or sr. class)	I	MWF T.h.S	204Da	Ar
114s	Rural Social Institutions..... (3 cred.; jr., sr.; prereq., 4 courses in soc. or 1 and 15 cred. in soc. sci., educ., philos., or psychol.)	II I	MWF	204Da	Ar

For additional courses and additional sections of the above courses offered on the Minneapolis campus, 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.; no prereq.)				
	Lect.	III	TTh	204So	Mr. Rost
	Sec. 1 Lab.	III, IV	S	201So	
	2	VIII, IX	F	201So	
5s	Soil Fertility ..... (3 cred.; soph., jr., sr.; no prereq.)				
	Lect.	II	TTh	204So	Mr. Alway
	Sec. 1 Lab.	I, II	S	201So	
	2	VIII, IX	T	201So	
8w	Physical Properties of Soils..... (3 cred.; soph., jr., sr.; prereq., 4)	Ar	Ar	201So	Mr. McMiller
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, Mr. Rost

No.	Title	Hour	Day	Bldg.	Instructor
104	Soil Surveying ..... (3 cred.; jr., sr.; prereq., 108)	Ar	Ar	Ar	
107w	Fertilizers and Manures ..... (2 cred.; jr., sr.; prereq., 4, 5)	IV	TS	204So	Mr. Rost
108w	Physical Properties of Soils..... (3 cred.; jr., sr.; prereq., 4)	Ar	Ar	201So	Mr. McMiller

VETERINARY MEDICINE

No.	Title	Hour	Day	Bldg.	Instructor
2f-3w-4s	Comparative Anatomy and Physiology of Domestic Animals	VI (f)	MWF	103Ve	Mr. Nilson
	(9 cred.;† soph., jr., sr.; no prereq.)	I (w and s)	TThS	103Ve	Mr. Kernkamp
6f	Physiology of Reproduction..... (4 cred.; jr., sr.; prereq., 2-3-4)	IV	MTWF	103Ve	Mr. Boyd
9w-10s	Veterinary Studies ..... (6 cred.;‡ jr., sr.; prereq., Bact. 41)	III	TThS	102Ve	Mr. Donham
12w	Infectious Diseases ..... (3 cred.; jr., sr.; prereq., 2-3-4, Bact. 41)	I	MWF	103Ve	Mr. Fitch
101w-102s	Advanced Anatomy of Domestic Animals ..... (6 cred.; jr., sr.; prereq., 2 or equiv.) (Limited to 9)	Ar	Ar	Ar	Mr. Kernkamp
103w-104s	Advanced Comparative Physiology.... (6 cred.;§ jr., sr.; prereq., 3-4 or equiv.)	Ar	Ar	Ar	Mr. Nilson

ZOOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
14f-15w-16s*¶	General Zoology (Agr., For.)..... (9 cred.;§ no prereq.)	VI, VII, VIII	TTh	101,313Z	Mr. Dawson
17f-18w*¶	General Zoology (H.E.)..... (6 cred.;§ no prereq.)	VII, VIII, IX	TTh	101,313Z	Mr. Turner

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. The course may be started at the opening of any quarter.

‡ Full credit will not be allowed for this course when other courses in this division are completed. Students pursuing other courses in Veterinary Medicine should apply to the division for adjustment of credit. The full course must be completed before credit will be given..

§ The full course must be completed before credit will be given.

¶ A special fee of $1 per quarter will be charged for this course.