

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

*The College of Agriculture, Forestry,
and Home Economics*

Part I
Announcement of Courses for the Years
1926 - 1928



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THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

FACULTY

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Edward M. Freeman, Ph.D., Dean of the College of Agriculture, Forestry,
and Home Economics
Edward E. Nicholson, M.A., Dean of Student Affairs
Anne D. Blitz, M.A., Dean of Women
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AGRICULTURAL ECONOMICS

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AGRICULTURAL EDUCATION

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AGRONOMY AND FARM MANAGEMENT

Professors Andrew Boss, Herbert K. Hayes, D.Sc.; Associate Professors Albert C. Army, M.S., Louis B. Bassett, George A. Pond, M.S.; Assistant Professors Lewis F. Garey, M.A., Forrest W. McGinnis, M.S., Frederick J. Stevenson, M.S.; Instructors Olaf S. Aamodt, M.S.,

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Harvey E. Brewbaker, M.S., Andrew T. Hoverstad, B.S., Ferdinand H. Steinmetz, M.S.; Extension Specialists William L. Cavert, M.S., Ralph F. Crim, B.S. in Agr.

ANIMAL HUSBANDRY

Professors Walter H. Peters, M.Agr., Evan F. Ferrin, M.Agr., Henry W. Vaughan, M.S.; Assistant Professors Philip A. Anderson, B.S. in Agr.; Instructors Alfred L. Harvey, M.S., Mark A. McCarty, M.S.; Extension Specialists Austin A. Dowell, M.S., Henry G. Zavoral, B.S.A.

BEE CULTURE

Professor Francis Jager; Instructor James W. Thompson, B.S.

DAIRY HUSBANDRY

Professors Clarence H. Eckles, D.Sc., Willis B. Combs, M.A.; Professor Emeritus Theophilus L. Haecker; Associate Professor Otto G. Schaefer, M.S.; Assistant Professors Thor W. Gullickson, M.S., Harold Macy, B.S., William E. Petersen, M.S.; Instructor Lloyd M. Thurston, B.S.; Assistants Samuel T. Coulter, B.S., Harold B. Richie, B.S.; Extension Specialists Charles C. Geddes, Edwin A. Hanson, B.S. in Agr., Harold R. Searles, B.S. in Agr., Leslie V. Wilson, B.S.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Professors Royal N. Chapman, Ph.D., William A. Riley, Ph.D., Arthur G. Ruggles, M.A.; Assistant Professors Samuel A. Graham, Ph.D., Maynard S. Johnson, Ph.D., Clarence E. Mickel, Ph.D.

FORESTRY

Professors Henry Schmitz, Ph.D., John H. Allison, Ph.B., M.F., Edward G. Cheyney, B.A., Raphael Zon, B.A., B.S., F.E.; Associate Professor John P. Wentling, M.A.; Assistant Professor Thorwald S. Hansen, B.S., M.F.; Instructors Alexander M. Koroleff, M.S., M.F., David A. Kribs, B.S., Edwin E. Probstfield, M.F.

HOME ECONOMICS

Professor Wylle B. McNeal, M.A.; Associate Professors Alice Biester, Ph.D., Harriet I. Goldstein, Marion Weller, B.A.; Assistant Professors Alice M. Child, M.A., Amy P. Morse, B.A., Katharine McFarland, M.A., Ethel L. Phelps, Ph.D., Lucy A. Studley, M.A.; Instructors Carlotta Brown, Kathleen Dietrich, B.S., Adella Eppel, M.S., Vetta Goldstein, Ethel Gorman, M.S., Lucille Horton, B.S., Agnes Kolshorn, M.A., Caroline Little, B.S., Jessie E. McMahon, M.S., Beatrice Olson, M.S., Fern Osbeck, B.S., Irene Sell, Ph.B., Louise Soby, B.S. in H.E., Louise Stoddard.

HOME ECONOMICS EDUCATION

Professor Wylle B. McNeal, M.A.; Associate Professor Harriet Goldstein; Assistant Professors Clara M. Brown, M.A.; Instructors Aura Keever, B.S., Louise Landis, B.S., Muriel G. McFarland, B.S., Verna Payson, Ella J. Rose, B.S., Irene Sell, Ph.B.

HORTICULTURE

Professor William H. Alderman, B.S.A.; Associate Professor Wilfred G. Brierley, M.S. in Hort.; Assistant Professors John H. Beaumont, B.S. in Agr., Clarence E. Cary, B.S. in Agr.; Instructors Basil I. Burrell, B.S., Fred A. Krantz, M.S., Arthur N. Wilcox, M.S.; Extension Specialist Roger S. Mackintosh, M.S. in Agr.

MILITARY SCIENCE AND TACTICS

Professor Bernard Lentz, Major, Infantry; Assistant Professors Kent Nelson, Lieutenant Colonel, Medical Corps, Ray C. Hill, Major, Infantry, Frederick H. Bockoven, Major, Dental Corps, Don F. Pratt, Captain, Infantry, Wilton B. Persons, Captain, Signal Corps, Arthur R. Walk, Captain, Infantry, Nyal L. Adams, Captain, Coast Artillery Corps, William F. Rehm, Captain, Infantry, Julian H. Gist, Captain, Infantry, Myron J. Conway, Lieutenant, Infantry, John F. Cassidy, Lieutenant, Coast Artillery Corps; Instructors, Alfred Brandt, Master Sergeant, Harry E. Strider, Master Sergeant, Aubrey R. Dunkum, Staff Sergeant, John Coop, Sergeant, Ernest R. Mylk, Sergeant.

PHYSICAL EDUCATION FOR MEN

Professor Fred W. Luehring, Ph.M.; Associate Professors Louis J. Cooke, M.D., Louis F. Keller, M.A.; Instructor Harold T. Taylor, M.A.

PHYSICAL EDUCATION FOR WOMEN

Professor J. Anna Norris, M.D.; Assistant Professors Gertrude M. Baker, B.A., May S. Kissock, B.A., Alice J. H. Tolg, M.D.; Instructors Else Bockstruck, B.S., Irene A. Clayton, B.S., Mary S. Conger, Grace E. Denny, B.S., Helen W. Hazelton, B.A., Pauline Lane, B.A.; Assistant Evelyn M. Anderson, B.S.

PLANT PATHOLOGY

Professors Edward M. Freeman, Ph.D., Elvin C. Stakman, Ph.D.; Assistant Professors Jonas J. Christensen, Ph.D., Arthur W. Henry, Ph.D.; Alvin H. Larson, B.S. in Agr., Julian G. Leach, Ph.D.; Instructors Louise Dossdall, Ph.D., Ralph M. Nelson, M.S., Paul D. Peterson, B.S.; Extension Specialist Raymond C. Rose, M.S.

POULTRY HUSBANDRY

Professor Arthur C. Smith, B.S.; Extension Specialists Norton E. Chapman, M.A., Cora E. Cooke, B.S.

PUBLICATIONS AND RURAL JOURNALISM

Professor William P. Kirkwood, M.A.; Extension Specialist Edwin C. Torrey.

RHETORIC

Assistant Professors Robert C. Lansing, M.A., Harry J. Burtis, B.A.; Instructors Paul S. Conklin, M.A., Jessie J. Pinkham, M.A.

SOILS

Professor Frederick J. Alway, Ph.D.; Associate Professor Clayton O. Rost, Ph.D.; Assistant Professor Paul R. McMiller, M.S.

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VETERINARY MEDICINE

Professors Clifford P. Fitch, M.S., D.V.M., Willard L. Boyd, D.V.S., Myron H. Reynolds, B.S.A., D.V.M., Phm.G.; Assistant Professors Earl A. Hewitt, B.A., B.S., D.V.M., Howard C. H. Kernkamp, D.V.M., Raymond E. Lubbehusen, B.S., D.V.M.

MEMBERS OF OTHER FACULTIES GIVING INSTRUCTION IN
THE COLLEGE OF AGRICULTURE, FORESTRY,
AND HOME ECONOMICS

ANIMAL BIOLOGY

Professors Royal N. Chapman, Ph.D., Hal Downey, Ph.D., William A. Riley, Ph.D., Charles P. Sigerfoos, Ph.D.

ARCHITECTURE

Instructor Herbert S. Wilson.

ART EDUCATION

Assistant Professor Ruth Raymond, B.S.; Instructors Hazel S. Martin, Gertrude D. Ross, B.S.

BACTERIOLOGY AND IMMUNOLOGY

Professors Winford P. Larson, M.D., Arthur T. Henrici, M.D.; Associate Professor Robert G. Green, M.A., M.D.; Instructors Beryl S. Green, B.A., Halvor O. Halvorson, M.A., Robert L. Starkey, Ph.D.; Teaching Fellow Irwin A. Montank, M.A.

BOTANY

Professor J. Arthur Harris, Ph.D., C. Otto Rosendahl, Ph.D.; Assistant Professor Ned L. Huff, M.A.

CHEMISTRY

Professors William H. Hunter, Ph.D.; M. Cannon Sneed, Ph.D.

EDUCATIONAL PSYCHOLOGY

Professor Wilford S. Miller, Ph.D.; Assistant Professor Marvin J. Van Wagenen, Ph.D.

GEOLOGY AND MINERALOGY

Professor William H. Emmons, Ph.D.; Assistant Professors John W. Gruner, Ph.D., George A. Thiel, Ph.D.; Instructor Ira S. Allison, Ph.D.

HISTORY AND PHILOSOPHY OF EDUCATION

Assistant Professor Ross L. Finney, Ph.D.; Instructor Jean H. Alexander, M.A.

FACULTY

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PHYSIOLOGY

Professors Elias P. Lyon, Ph.D., M.D., Jesse F. McClendon, Ph.D., Frederick H. Scott, Ph.D., M.B., D.Sc.; Associate Professor Chauncey J. V. Pettibone, Ph.D.; Assistant Professors Esther Greisheimer, Ph.D., M.D., Maurice Visscher, Ph.D.; Instructor Joseph T. King, M.A., M.D.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

Associate Professor Harold S. Diehl, M.A., M.D.; Instructors Hally J. Fisher, R.N., Lillian M. Mayer, B.S., M.D.

PSYCHOLOGY

Professors Richard M. Elliott, Ph.D., Donald G. Paterson, M.A.

SOCIOLOGY AND SOCIAL WORK

Professors F. Stuart Chapin, Ph.D.; Assistant Professors Gustav A. Lundquist, Ph.D., Carle C. Zimmerman.

GENERAL INFORMATION

ADMISSION

New students are admitted at the opening of any quarter provided a suitable program can be arranged. Prospective students, however, are advised to enter at the opening of the fall quarter if possible.

All students entering for the first time must submit their credentials to the Enrolment Committee.

Admission is either by certificate (in the case of graduates of accredited schools) or by examination. Candidates must have completed the equivalent of a four-year high school course and must present:

1. Four units of English; or three units of English and four units of a foreign language; or three units of English and two units in each of two foreign languages.
2. One unit of elementary algebra and one unit of plane geometry.
3. Enough additional work to make in all fifteen units, of which not more than four may be in subjects not listed in the admission groups in the general information bulletin.

Graduates of the School of Agriculture of the University of Minnesota who have completed the two summers of supervised work offered in the school course, one additional school year, and one additional summer's work, or the equivalent thereof, will be admitted to the College of Agriculture, Forestry, and Home Economics.

For details of admission requirements and definition of "unit," see the bulletin of general information.

Applicants for admission are urged to present physics (1 unit) and chemistry (1 unit), for entrance credits. If not completed in the high school, additional work in these subjects will have to be taken in the University, thus postponing some of the vocational courses.

Every prospective student in agriculture is urged to obtain, before entering college, at least six months' practical experience on a farm. Entering students whose farm experience credentials are not satisfactory will be examined as to their familiarity with farm practices, and farm experience will be required during the college course in accordance with the results of these examinations. For students who major in dairy husbandry at least three of the six months of approved farm experience must be on an accredited dairy farm.

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 include as much as possible of the fundamental science work and other

non-technical courses outlined in the courses of study pages 15 to 44. For special announcement giving full information concerning this possibility of transfer of credit address the registrar, University Farm, St. Paul, Minnesota.

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.

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
Incidental fee, per quarter	4.00
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	
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 course of study 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 course 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	189	189	Bachelor of science
Agricultural Engineering (professional course)	210	None	Bachelor of science in agricultural engineering

Degrees with distinction.—The degree of bachelor of science with distinction is granted to graduates of this college who have attained special excellence in scholarship as evidenced by an average grade of "B" for the entire four-year course. 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.

GRADING SYSTEM AND HONOR POINTS

There are four passing grades, A, B, C, and D, of which A is the highest and D the lowest. In addition there are the following non-passing grades: E (condition), F (failure), and I (incomplete). For rules governing the non-passing grades, see the booklet of Faculty Regulations.

Honor points are awarded on the following basis: each credit hour with a grade of A counts three honor points; each credit hour with a grade of B counts two honor points; and each credit hour with a grade of C counts one honor point. A grade of D counts no honor points.

CANDIDATES FOR THE TEACHER'S CERTIFICATE IN AGRICULTURE AND HOME ECONOMICS

The university teacher's certificate will be granted only to graduates of the College of Education. Students expecting to receive this certificate upon graduation shall be registrants in the College of Education from the beginning of the junior year. Students in the College of Agriculture, Forestry, and Home Economics desiring the university teacher's certificate shall in addition to their registration in this college register also in the College of Education. No formal application is necessary for transfer from the college of Agriculture, Forestry, and Home Economics to the

College of Education if such transfer is made at the beginning of the junior year. However, no student may transfer who has not earned 90 credits and 90 honor points.

BOARD AND ROOM

Sanford Hall.—The one dormitory for university women, is located near the Minneapolis campus. It accommodates ninety women, about one half of whom may be freshmen. The charge for room and board is \$330 for the university year. 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 on the first floor of the Administration Building 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.

COURSES OF STUDY

AGRICULTURE

(See pages 15 to 32)

A. Technical Agricultural Course. This course of study provides an opportunity in the junior and senior years to major in one of the following groups:

- | | |
|---|---|
| 1. Agricultural Economics and Farm Management | 3. Agricultural Sciences and Plant Industry |
| 2. Animal Industry | 4. Agricultural Engineering |

Several suggested curricula have been arranged which students are advised to follow. These curricula are:

- | | |
|--|-------------------------|
| 1. General Agriculture | 7. Dairy Husbandry |
| 2. Agricultural Economics | 8. Dairy Products |
| 3. Agricultural Education ¹ | 9. Farm Management |
| 4. Agricultural Engineering | 10. Fur Farming |
| 5. Agricultural Extension | 11. Horticulture |
| 6. Animal Husbandry | 12. Landscape Gardening |

Students desiring to specialize in one of the agricultural sciences with a view to further study in the Graduate School may arrange majors in the following fields:

- | | |
|---------------------------------|------------------------------------|
| 1. Agricultural Biochemistry | 6. Entomology and Economic Zoology |
| 2. Agricultural Economics | 7. Horticulture |
| 3. Agronomy and Farm Management | 8. Plant Pathology and Botany |
| 4. Animal Husbandry | 9. Soils |
| 5. Dairy Husbandry | 10. Veterinary Medicine |

B. Agricultural Science Course. This course provides opportunities for specializing in the following fields of work:

- | | |
|------------------------------------|--------------------|
| 1. Agricultural Biochemistry | 5. Nutrition |
| 2. Agronomy | 6. Plant Breeding |
| 3. Entomology and Economic Zoology | 7. Plant Pathology |
| 4. Horticulture | 8. Soils |

C. Agricultural Engineering Professional Course. The professional course 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 | 3. Reclamation |
| 2. Farm Machinery | |

D. Agriculture-Pre-Business Course. Students desiring to prepare for admission to the School of Business may complete the Agriculture-Pre-Business Course and in their junior and senior years, after entering the School of Business, major in Agricultural Business.

¹ Offered jointly with the College of Education.

FORESTRY

(See pages 33 to 37)

The course of study in forestry provides an opportunity in the junior and senior years to major in one of the following fields:

- | | |
|-------------------------|------------------------|
| 1. General Forestry | 4. Forest Sciences |
| 2. Commercial Lumbering | 5. Landscape Gardening |
| 3. Forest By-Products | |

HOME ECONOMICS

(See pages 38 to 44)

The course of study in home economics provides an opportunity in the junior and senior years to follow one of the following outlined curricula:

- | | |
|--|---------------------------|
| 1. General Home Economics, as a type of general arts education for women | 3. Textiles and Clothing |
| 2. Foods and Nutrition | 4. Dietitians |
| | 5. Institution Management |

The following teachers' courses are also offered jointly with the College of Education:

- | | |
|------------------------------|--------------------------|
| 6. General Home Economics | 9. Textiles and Clothing |
| 7. Home Economics Extension | 10. Related Art |
| 8. Foods and Home Management | |

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 45 to 78. 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 10 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.

COURSES OF STUDY IN AGRICULTURE

- A. Technical Agricultural Course, pages 15 to 28.
- B. Agricultural Science Course, pages 28 to 29.
- C. Agricultural Engineering, Professional Course, pages 29 to 31.
- D. Agricultural-Pre-Business Course, pages 31 to 32.

A. TECHNICAL AGRICULTURAL COURSE

This course of study requires 20.4 credit hours for graduation and is made up of (1) required subject courses which every student must complete and (2) elective subject courses distributed according to several methods described below (pages 17 to 27).

REQUIRED SUBJECT COURSES¹

Required subject courses are required of every student before graduation. These constitute approximately half of the curriculum and are considered fundamental and necessary to any course of study in technical agriculture. Every student must complete these subject courses, if possible, before the end of the sophomore year.

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. Registration for from 15 to 18 credit hours of work each quarter will be allowed without special permission. 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 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 20.4 credit hours, Freshman lectures. A course of lectures intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter.

Mil. Sci. 1f-2w-3s, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.

¹ Modifications in the requirements of the freshman and sophomore year may be permitted upon approval by the Students' Work Committee where students have a very definite objective in their college course in which substitutions for certain of the above 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.

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Phys. Ed. 4f,w,s, 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:

Agr. Eng. 13w,s, Tractor and Auto Work, 3; Agr. Eng. 28w, Land Clearing, 3; Agr. Eng. 31f,w,s, Principles of Drainage, 3; Agr. Eng. 37s, Rural Sanitation, 3. One or more of these courses are required in the junior and senior years of several of the outline 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.

¹Agron. 1f,w,s, Farm Crops, 3

¹An. Husb. 1f,w, Types and Market Classes of Livestock, 5

Bot. 4f-5w-6s, General Botany, 9. Bot. 9, 21, or 22. May be taken in place of the last quarter of 4-5-6.

Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high school chemistry may omit this course and register for Chem. 9-10. Those required to take this course because of inability to carry successfully Chem. 9-10 will be allowed not more than 10 credits.

Chem. 9f-10w, Advanced General Inorganic Chemistry, 10. (1 yr. h. s. chem.) Those required to take Chem. 1-2-3 may omit this course.

¹Dy. Husb. 1f,s, Elements of Dairying, 5

¹Hort. 6f, Fruit Growing, 3; or Hort. 32s, Vegetable Growing, 3

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.

²Rhet. 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.

Agr. Biochem. 7f,w-8w,s, General Agricultural Biochemistry, 10 (Chem. 10 cred.)

Agr. Econ. 1f,w, Principles of Economics, 5

Agr. Econ. 2w,s, Agricultural Economics, 3 (Agr. Econ. 1)

¹Agr. 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 course of study.

An. Biol. 14f-15w-16s, General Zoology, 9

Bact. 51f,w,s, General Bacteriology, 5 (Chem., biol.)

Soils 4f, Soils, 3 (Chem., 10 credits)

Soils 5s, Soil Fertility, 3 (Chem., 10 credits)

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 76.

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)

ELECTIVE SUBJECT COURSES

Elective subject 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 course of study which he plans to pursue during his junior and senior years. Such statements from each student will make it possible to provide a workable program of subject courses. The student may make, and is strongly advised to make, this statement at the end of his freshman year. In this case he would have ample opportunity to change his course at the end of the sophomore year. A change from one method or course of study to another after the close of the sophomore year is permitted only on approval and does not exempt the student from any of the requirements of the course of study which he finally selects. Such changes usually involve inconvenience and sometimes loss of credit to the student. All students are invited to consult with the dean of the college concerning the selection of courses of study.

Method I—*Open Elective Course of Study*

Recommended for those students who are preparing themselves for some special line of work and who have definitely in mind the relations of subjects offered to this work:

Under this method the student, with the approval of his adviser, may select any course of study which complies with the following requirements:

- a. A major of from 24 to 36 credit hours.
- b. A minor of 18 credit hours.
- c. Limited electives 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 3 (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. Animal Industry, including
 - Animal Husbandry
 - Dairy Husbandry
 - Poultry Husbandry
 - Veterinary Medicine

3. Agricultural Sciences and Plant Industry, including
 - Agricultural Biochemistry
 - Agronomy
 - Entomology and Economic Zoology
 - Horticulture
 - Plant Pathology and Botany
 - Soils
4. Agricultural Engineering
 - B. Groups from which electives only may be chosen
 1. Agricultural Education¹
 2. Bee Culture
 3. Forestry
 4. Home Economics
 5. Military Science and Tactics
 6. Physical Education
 7. Rural Publications and Journalism
 8. Courses in departments of other schools and colleges of the University

Method II—*Suggested Elective Courses of Study*

The following courses of study have been arranged and are recommended by the several departments as useful and suggestive. Changes may be made with the approval of the Students' Work Committee. The subject course programs and the offerings of subjects in different quarters are based primarily on these courses of study so that students will have an opportunity of getting the subject courses in their proper sequence and without conflict. These specified courses are offered in the hope that they will also be of value to the student in vocational guidance. Students who desire to select any of these courses with modifications should study the changes involved to see whether or not the desired modifications admit of a possible program.

I. GENERAL AGRICULTURE

Recommended for those students who desire a general course in agriculture. It is designed especially for those who aim to obtain a broad general training and for those who expect to engage in general farming. It 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 course is completely included in the courses in agricultural education and agricultural extension, and in the general courses in farm management and agricultural economics. It is included, with only a few substitutions, in the courses in animal husbandry, dairy husbandry, and in horticulture.

¹ All students intending to teach agriculture are referred to the required curriculum in Agricultural Education, page 19.

JUNIOR YEAR

Fall Quarter

Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
 Agron. 121f, Cereal Crops, 3 (Agron. 1, Bot. 9 cred.)
 Agron. 131f,w, Principles of Genetics, 3 (Bot. or An. Biol. 9 cred.)
 An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 1)
 Hort. 6f, Fruit Growing, 3 (May be omitted if completed as a part of the general requirements)
 Electives, 2 or 5

SENIOR YEAR

Agron. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
 Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 10)
 Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
 Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
 Soc. 14f,w,s, Rural Sociology, 3 (sr. class or Sociol. 1)

Winter Quarter

Agron. 122w, Corn and Potato Crops, 3 (Agron. 1, Bot. 9 cred.)
 An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)
 Ent. 3f,w, Economic Entomology, 3 (An. Biol. 16)
 Electives, 8

Agr. Econ. 141w,¹ Marketing Organization: Semi-Perishables, 3 (Agr. Econ. 140)
 Agr. Eng. 7w, Farm Structures I, 3 (Agr. Eng. 3)
 Agron. 103w,s, Farm Management Operation, 3 (Agron. 102)
 An. Husb. 5w, Livestock Breeding, 3 (Agron. 131)
 Vet. 9w, Veterinary Studies, 3
 Electives, 2

Spring Quarter

Agr. Econ. 140f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
 Agron. 11s, Farm Machinery, 3
 Agron. 123s, Forage and Fiber 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 or 3

Vet. 10s, Veterinary Studies, 3 (Vet 9)
 Electives, 14

2. GENERAL COURSE IN AGRICULTURAL ECONOMICS

Opportunities for majoring in Agricultural Economics are offered in various lines. Those who desire to take a general course with emphasis on agricultural economics are requested to consult with the chief of that division.

3. AGRICULTURAL EDUCATION

(Required for university teacher's certificate)

Students who desire to teach agriculture in the high schools or other secondary schools may, upon graduation, obtain the university teacher's certificate in addition to the regular college degree, by registering in both the College of Education and the College of Agriculture, Forestry, and Home

¹ Agron. Econ. 110f, Economics of Agricultural Production I, 3 (Agr. Econ. 2) may be substituted for this course.

Economics, in the junior and senior years. It is desirable to consult the head of the Department of Agricultural Education earlier to avoid difficulties that may arise in the program of specialization. The university teacher's certificate entitles the holder to teach agriculture in any Minnesota high school for two years. Upon satisfactory completion of the teaching of these two years, the holder may have the certificate renewed as a life certificate by approval of the president of the University and the state commissioner of education.

JUNIOR YEAR

Fall Quarter

Agr. Ed. 11f,w,s, Principles of Vocational Education, 3
 Agr. Ed. 21f, Vocational Education, 3
 Agron. 121f, Cereal Crops, 3 (Agron. 1, Bot. 9 cred.)
 Agron. 131f,w, Principles of Genetics, 3 (Bot. or An. Biol. 9 cred.)
 An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 1)
 Hort. 6f, Fruit Growing, 3 (May be omitted if completed as a part of the general requirements)
 Electives, 0 or 2

SENIOR YEAR

Agr. Ed. 154f,w, Rural Education and Community Life, 3 (Agr. Ed. 11) or Sociol. 14f,w,s, Rural Sociology, 3 (Sociol. 1 or sr. class.)
 Agron. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
 Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)
 Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
 Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)

Winter Quarter

Agr. Ed. 41f,w,s, Apprentice Teaching, 2 (See tabular statement)
 Agron. 122w, Corn and Potato Crops, 3 (Agron. 1, Bot. 9 cred.)
 An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)
 Ent. 3f,w, Economic Entomology, 3 (An. Biol. 16)
 Electives, 6

Agr. Econ. 141w, Marketing Organization: Semi-Perishables, 3 (Agr. Econ. 140)
 Agr. Ed. 42f,w,s, Teaching, 3 (See tabular statement)
 Agr. Ed. 75w,s, Visual Presentation, 3 (Agr. Ed. 11)
 Agron. 103w,s, Farm Management Operation, 3 (Agron. 102)
 Vet. 9w, Veterinary Studies, 3
 Electives, 2

Spring Quarter

Agr. Econ. 140f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
 Agr. Ed. 131w,s, Methods in Teaching High School Agriculture, 5 (See tabular statement)
 Agron. 123s, Forage and Fiber 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)

Agr. Ed. 151w,s, Organization and Management, 5 (Agr. Ed. 11, 21)
 Agr. Eng. 40f,s, Mechanical Training I, 3
 Vet. 10s, Veterinary Studies, 3 (Vet. 9)
 Electives, 6

4. GENERAL COURSE IN AGRICULTURAL ENGINEERING

Suggested for those who intend to prepare for general farming, with emphasis on engineering. Students desiring a professional course in Agricultural Engineering are referred to the curriculum outlined on page 29.

JUNIOR YEAR

SENIOR YEAR

Fall Quarter

Agr. Eng. 5f, Farm Building Construction, 3
 Agr. Eng. 31f,w,s, Principles of Drainage, 3
 Agron. 121f, Cereal Crops, 3 (Agron. 1, Bot. 9 cred.)
 An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 1)
 Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)

Agr. Eng. 19f, Elementary Surveying, 3 (Agr. Eng. 3, 11 or equiv.)
 Agron. 131f,w, Principles of Genetics, 3 (Bot. or An. Biol. 9 cred.)
 Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)
 Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
 Sociol. 14f,w,s, Rural Sociology, 3 (Sociol. 1 or sr. class.)
 Electives, 2

Winter Quarter

Agr. Eng. 7w, Farm Structures I, 3 (Agr. Eng. 3)
 Agr. Eng. 13f,w,s, Tractor and Auto Work I, 3
 Agron. 122w, Corn and Potato Crops, 3 (Agron. 1, Bot. 9 cred.)
 An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)
 Ent. 3f,w, Economic Entomology, 3 (An. Biol. 16)
 Electives, 2

Agr. Eng. 24w, Agricultural Physics I, 4 (Agr. Eng. 11, 23 or equiv.)
 Agron. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
 An. Husb. 5w, Livestock Breeding, 3 (Agron. 131)
 Electives, 7

Spring Quarter

Agr. Econ. 140f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
 Agr. Eng. 14s, Tractor and Auto Work II, 3 (Agr. Eng. 13)
 Agron. 11s, Farm Machinery, 3
 An. Husb. 8s, Fundamentals of Feeding and Management, 5
 Electives, 3

Agr. Econ. 142s, Marketing Organization: Perishables, 3 (Agr. Econ. 140)
 Agr. Eng. 25s, Agricultural Physics II, 4 (Agr. Eng. 24)
 Agr. Eng. 32s, Drainage and Surveying, 3 (Agr. Eng. 3, 11, 31 or equiv.)
 Agr. Eng. 37s, Rural Sanitation, 3
 Agron. 103w,s, Farm Management Operation, 3 (Agron. 102)
 Electives, 1

5. GENERAL COURSE IN AGRICULTURE EXTENSION

Suggested for those preparing for some phase of agricultural extension. For special modifications consult the Division of Agricultural Education.

JUNIOR YEAR

SENIOR YEAR

Fall Quarter

Agr. Ed. 11f,w,s, Principles of Vocational Education, 3
 Agron. 121f, Cereal Crops, 3 (Agron. 1, Bot. 9 cred.)
 Agron. 131f,w, Principles of Genetics, 3 (Bot. or An. Biol. 9 cred.)
 An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 1)
 Hort. 6f, Fruit Growing, 3 (May be omitted if completed as a part of the general requirements)
 Electives, 2 or 5

Agron. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
 Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)
 Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
 Pl. Pathology 1f,w, Plant Pathology, 5 (Bot. 9 cred.)
 Sociol. 14f,w,s, Rural Sociology, 3 (sr. class. or Sociol. 1)

Winter Quarter

- Agron. 122w, Corn and Potato Crops, 3
(Agron. 1, Bot. 9 cred.)
An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)
Ent. 3f.w, Economic Entomology, 3 (An. Biol. 16)
Electives, 8
- Agr. Econ. 141w, Marketing Organization: Semi-Perishables, 3 (Agr. Econ. 140)
Agr. Ed. 75w.s, Visual Presentation, 3 (Agr. Ed. 11)
Agron. 103w.s, Farm Management Operation, 3 (Agron. 102)
Vet. 9w, Veterinary Studies, 3
Electives,¹ 5

Spring Quarter

- Agr. Econ. 140f.s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
Agr. Ed. 131w.s, Method of Teaching High School Agriculture, 5 (See tabular statement)
Agron. 123s, Forage and Fiber 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 or 1
- Agr. Ed. 81s, Extension Work, 3 (6 cred. in farm mgt., 6 cred. in farm crops, 15 cred. in an. ind., 6 cred. in agr. ed.)
Agr. Eng. 40f.s, Mechanical Training, 3
Vet. 10s, Veterinary Studies, 3 (Vet. 9)
Electives,¹ 8

6. GENERAL COURSE IN ANIMAL HUSBANDRY

For those who aim to make a special study of livestock as a preparation for (a) various phases of livestock farming, 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

- Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
Agron. 131f.w, Principles of Genetics, 3 (Bot. or An. Biol. 9 cred.)
An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 1)
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
Vet. 2f, Anatomy of Domestic Animals, 5

SENIOR YEAR

Fall Quarter

- Agr. Econ. 140f.s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
Agron. 102f.w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
An. Husb. 7f, Meats, 3 (An. Husb. 2-3, Agr. Biochem. 15)
An. Husb. 101f, Advanced Stock Judging, 3 (An. Husb. 4)
Vet. 6f, Physiology and Hygiene of Br.ed, 3 (Vet. 3-4)
Electives, 2

¹ Agr. Ed. 82f.w.s, Agricultural Extension Field Course may be taken provided the student has pursued a broad curriculum approved by the Department of Agricultural Education and has obtained a position as assistant county agent approved by the Division of Agricultural Extension. The course carries from 3 to 10 credits based upon studies and reports to be made from time to time and evidences of proficiency obtained from other sources.

Winter Quarter

- Agron. 122w, Corn and Potato Crops, 3
(Agron. 1, Bot. 9 cred.)
An. Husb. 3w, Types and Breeds of
Livestock, 3 (An. Husb. 2)
An. Husb. 5w, Livestock Breeding, 3
(Agron. 131)
Ent. 3f,w, Economic Entomology, 3 (An.
Biol. 16)
Vet. 3w, Comparative Physiology, 3
(Vet. 2)
- Agr. Econ. 141w,¹ Marketing Organiza-
tion: Semi-Perishables, 3 (Agr. Econ.
140)
Agr. Eng. 7w, Farm Structures I, 3 (Agr.
Eng. 3)
Agron. 103w,s, Farm Management Op-
eration, 3 (Agron. 102)
An. Husb. 6w, Livestock Feeding, 5 (Agr.
Biochem. 15)
Vet. 12w, Infectious Diseases, 3 (Vet.
3-4, Bact. 51)

Spring Quarter

- Agron. 11s, Farm Machinery, 3
Agron. 123s, Forage and Fiber Crops, 3
(Agron. 1, Bot. 9 cred.)
An. Husb. 4s, Livestock Judging, 3 (An.
Husb. 2-3)
An. Husb. 9s, Pedigrees and Herd
Books, 3 (An. Husb. 5)
Vet. 4s, Comparative Physiology, 3 (Vet.
3)
Electives, 2
- An. Husb. 102s, Horse Husbandry, 3
(An. Husb. 2-3) 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)
An. Husb. 108s, Seminar, 3 (An. Husb.
5, 6)
Electives, 11

7. GENERAL COURSE IN DAIRY HUSBANDRY

Recommended for those students who plan definitely to engage in dairy farming or in some practical branch of dairy production.

JUNIOR YEAR

- Agr. Biochem. 15f, Principles of Animal
Nutrition, 3 (Agr. Biochem. 7-8)
An. Husb. 2f, Types and Breeds of Live-
stock, 3 (An. Husb. 1)
Dy. Husb. 6f, Judging Dairy Cattle, 1
(An. Husb. 1)
Dy. Husb. 101f, Milk Production, 5 (Dy.
Husb. 1)
Vet. 2f, Anatomy of Domestic Animals,
5

SENIOR YEAR

Fall Quarter

- Agron. 102f,w, Farm Management Or-
ganization, 3 (Agron. 1, Agr. Econ. 2,
Soils 4)
Agron. 121f, Cereal Crops, 3 (Agron. 1,
Bot. 9 cred.)
Agron. 131f,w, Principles of Genetics, 3
(Bot. or An. Biol. 9 cred.)
Dy. Husb. 105f, Seminar I, 1 (3 courses
in dy. husb.)
Pl. Path. 1f, Plant Pathology, 5 (Bot.
9 cred.)
Vet. 6f, Physiology and Hygiene of
Breeding, 3 (Vet. 3-4)

Winter Quarter

- Agron. 122w, Corn and Potato Crops, 3
(Agron. 1, Bot. 9 cred.)
An. Husb. 3w, Types and Breeds of Live-
stock, 3 (An. Husb. 2)
Dy. Husb. 2w,s, Dairy Bacteriology, 5
(Bact. 51)
Vet. 3w, Comparative Physiology, 3
(Vet. 2)
Electives, 3
- Agr. Econ. 131w, Market Prices, 3
(Agr. Econ. 140)
Agron. 103w,s, Farm Management Op-
eration, 3 (Agron. 102)
An. Husb. 5w, Livestock 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.)
Electives, 3

¹Agr. Econ. 110f, Economics of Agricultural Production I, 3 (Agr. Econ. 2) may be substituted for this course.

Spring Quarter

Agr. Econ. 140f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)	Agron. 104s, Advanced Farm Management, 3 (Agron. 103)
Agr. Eng. 40f,s, Mechanical Training, 3	An. Husb. 105s, Swine Husbandry, 3 (An. Husb. 5, 6)
Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1, Bot. 9 cred.)	Dy. Husb. 107s, Seminar III, 1 (3 courses in dy. husb.)
Dy. Husb. 104s, Advanced Study of Dairy Breeds, 3 (Dy. Husb. 6, 101)	Sociol. 14f,w,s, Rural Sociology, 3 (Sociol. 1 or sr. class.)
Vet. 4s, Comparative Physiology, 3 (Vet. 3)	Electives, 7
Electives, 2	

8. GENERAL COURSE IN DAIRY PRODUCTS

Those desiring to specialize in dairy products may enter the Agricultural Science Course beginning with the freshman year or pursue the general requirements for the Technical Agricultural Course. In either case specialization will begin with the junior year. Major groups will be arranged to include suitable courses from the General Course in Dairy Husbandry and in addition the following of special importance to the dairy products field.

- Agr. Biochem. 103s, Dairy Chemistry, 5 (Agr. Biochem. 7-8)
 - Agr. Econ. 25f,w, Principles of Accounting, 4
 - Dy. Husb. 102s, Market Milk, 3 (Dy. Husb. 1, 2)
 - Dy. Husb. 111f, Dairy Products I, 3 (Dy. Husb. 1, 2)
 - Dy. Husb. 112s, Dairy Products II, 3 (Dy. Husb. 1, 2)
 - Dy. Husb. 113s, Technical Control, 3 (Dy. Husb. 111 or 112)
- The minor may be in Agricultural Economics or Agricultural Biochemistry.

9. GENERAL COURSE IN FARM MANAGEMENT

Suggested for those who desire a broad training in agriculture in preparation for general farm management. This includes the subjects of the general course and suggested electives which add an emphasis upon those subjects which bear on technical farm management.

JUNIOR YEAR

SENIOR YEAR

Fall Quarter

Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)	Agr. Econ. 140f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
Agron. 121f, Cereal Crops, 3 (Agron. 1, Bot. 9 cred.)	Agron. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
Agron. 131f,w, Principles of Genetics, 3 (Bot. or An. Biol. 9 cred.)	Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)
An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 1)	Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
Hort. 6f, Fruit Growing, 3 (May be omitted if completed as a part of the general requirements)	Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
Electives, 2 or 5	

Winter Quarter

- | | |
|---|--|
| <p>Agron. 122w, Corn and Potato Crops, 3
(Agron. 1, Bot. 9 cred.)</p> <p>An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)</p> <p>An. Husb. 5w, Livestock Breeding, 3
(Agron. 131)</p> <p>Ent. 3f,w, Economic Entomology, 3 (An. Biol. 16)</p> <p>Electives, 5</p> | <p>Agr. Econ. 141w,¹ Marketing Organization: Semi-Perishables, 3 (Agr. Econ. 140)</p> <p>Agr. Eng. 7w, Farm Structures I, 3
(Agr. Eng. 3)</p> <p>Agron. 103w,s, Farm Management Operation, 3 (Agron. 102)</p> <p>Sociol. 14f,w,s, Rural Sociology, 3 (sr. class. or Sociol. 1)</p> <p>Vet. 9w, Veterinary Studies, 3
Electives, 2</p> |
|---|--|

Spring Quarter

- | | |
|---|---|
| <p>Agron. 11s, Farm Machinery, 3</p> <p>Agron. 101s, Farm Management, 3
(Agron. 1, Agr. Econ. 2)</p> <p>Agron. 123s, Forage and Fiber Crops, 3
(Agron. 1, Bot. 9 cred.)</p> <p>An. Husb. 8s, Fundamentals of Feeding, and Management, 5</p> <p>Hort. 32s, Vegetable Growing, 3 (May be omitted if completed as a part of the general requirements)</p> <p>Electives, 0 or 3</p> | <p>Agron. 104s, Advanced Farm Management, 3 (Agron. 103)</p> <p>Vet. 10s, Veterinary Studies, 3 (Vet. 9)</p> <p>Electives, 11</p> |
|---|---|

10. FUR FARMING

The prices for furs during the past few years have stimulated greatly the interest in fur-bearing animals. Some fox farms and skunk farms have been established and other fur-bearing animals are being raised with a view to supplying furs for the trade. This has aroused frequent inquiry for a course that would fit students for such work either as a business or in connection with other farm enterprises. The college does not offer a special curriculum for students desiring to engage in fur farming but the important studies underlying such a course are already provided by the required work of the curriculum of the College of Agriculture, Forestry, and Home Economics. Certain elective courses are also available which under faculty regulations may be so chosen as to meet the needs of students wishing to specialize in fur farming.

11. GENERAL COURSE IN HORTICULTURE

A foundation course suggested for those who purpose to engage in the production of horticultural crops or to enter into some horticultural business.

¹ Agr. Econ. 110f, Economics of Agricultural Production I, 3 (Agr. Econ. 2) may be substituted for this course.

26 AGRICULTURE, FORESTRY, AND HOME ECONOMICS

JUNIOR YEAR

SENIOR YEAR

Fall Quarter

Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
 An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 1)
 Hort. 6f, Fruit Growing, 3 (May be omitted if completed as a part of the general requirements)
 Hort. 56f, Plant Propagation and Nursery Practice, 2
 Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
 Electives, 1 or 4

Agron. 121f, Cereal Crops, 3 (Agron. 1, Bot. 9 cred.)
 Hort. 93f, Judging Horticultural Crops, 2 (Hort. 6, Bot. 9 cred.)
 Hort. 107f, Orchard Management, 3 (Hort. 6, Bot. 9 cred.) or
 Hort. 131f, Advanced Vegetable Production, 3 (Hort. 32, Bot. 9 cred.)
 Hort. 109f,w, Principles of Genetics, 3 (Bot. or An. Biol. 9 cred.)
 Hort. 193f, Horticultural Seminar, 1 (Hort. 9 cred.)
 Sociol. 14f,w,s, Rural Sociology, 3 (sr. class. or Sociol. 1)
 Electives, 2

Winter Quarter

An. Husb. 3, Types and Breeds of Livestock, 3 (An. Husb. 2)
 Ent. 3f,w, Economic Entomology, 3 (An. Biol. 16)
 Hort. 21w, Small Fruit Culture, 3 (Hort. 6 or 32, Bot. 9 cred.)
 Hort. 135w, Potato Production, 3 (Hort. 6 or 32, Bot. 9 cred.)
 Vet. 9w, Veterinary Studies, 3 (May be omitted if Plant Physiology is elected from the option offered in the spring quarter following)
 Electives, 0 or 2

Agr. Eng. 7w, Farm Structures I, 3 (Agr. Eng. 3)
 Agron. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
 An. Husb. 5w, Livestock Breeding, 3 (Hort. 109) or
 Hort. 110w, Horticultural Crop Breeding 3 (Hort. 109)
 Hort. 194w, Horticultural Seminar, 1 (Hort. 193)
 Electives, 7

Spring Quarter

Agr. Econ. 140f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
 Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1, Bot. 9 cred.)
 An. Husb. 8s, Fundamentals of Feeding and Management, 5
 Bot. 22f,s, Elementary Plant Physiology, 5 (Bot. 2 or 5, org. chem. advised) or
 Vet. 10s, Veterinary Studies, 3 (Vet. 9)
 Hort. 32s, Vegetable Growing, 3 (May be omitted if completed as a part of the general requirements)
 Electives, 0 or 5

Agr. Econ. 142s,¹ Marketing Organization: Perishables, 3 (Agr. Econ. 140)
 Agron. 11s, Farm Machinery, 3
 Agron. 103w,s, Farm Management Operation, 3 (Agron. 102)
 Electives, 8

¹ Agr. Econ. 110f, Economics of Agricultural Production I, 3 (Agr. Econ. 2) may be substituted for this course.

12. LANDSCAPE GARDENING

A suggested course for students majoring in landscape gardening.

JUNIOR YEAR

SENIOR YEAR

Fall Quarter

Arch. 21f,w, Freehand Drawing, 2
 Hort. 71f, Plant Materials I, 2 (Bot. 9 cred.)
 Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.) or Pl. Path. 10f,s, Forest Pathology, 5 (Bot. 9 cred.) Not required of students who have completed Pl. Path. 10 as a part of the general requirements in forestry.
 Soils 4, Soils, 3 (Chem. 10 cred.) Not required of students who have completed this course as a part of the general requirements in agriculture.
 Electives, 8 or 10

Agr. Eng. 19f, Elementary Surveying, 3 (Agr. Eng. 3, 11, or equiv.)
 Hort. 74f, Principles of Landscape Design, 3 (Arch. 23)
 Hort. 190f, Special Problems, 3 (Instructor's permission)
 Pol. Sci. 51f, Business Law, 3
 Electives, 5

Winter Quarter

Arch. 22ws, Freehand Drawing, 2
 For. 27w, Groves and Windbreaks, 3
 For students who have completed the freshman and sophomore years in agriculture.
 Hort. 73w, History of Landscape Gardening, 3
 Electives, 9

Ent. 3f,w, Economic Entomology, 3 (An. Biol. 16)
 Hort. 75w, Landscape Problems, 3 (Hort. 74, Agr. Eng. 3, 19)
 Hort. 191w, Special Problems, 3 (Hort. 190)
 Pol. Sci. 52w, Business Law, 3
 Electives, 5

Spring Quarter

Arch. 23s, Freehand Drawing, 2
 Hort. 50s, Floriculture, 3
 Hort. 56s, Plant Propagation and Nursery Practice, 3 (Bot. 9 cred.)
 Hort. 72s, Plant Materials II, 2 (Bot. 9 cred.)
 Soils 5, Soil Fertility, 3 (Chem. 10 cred.)
 Not required of those who have completed this course as a part of the general requirements in agriculture.
 Electives, 4 or 7

Agr. Engineering 31f,w,s, Principles of Drainage, 3 (Agr. Eng. 3, 11, or equiv.)
 Hort. 76s, Landscape Construction, 3 (Hort. 75)
 Hort. 192s, Special Problems, 3 (Hort. 191)
 Electives, 8

AGRICULTURAL SCIENCES

Opportunity is offered to students who have completed the required subject courses of the Technical Agricultural Course 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 Course 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 course and who have a clear understanding of the study to be pursued and who have a lasting and abiding enthusiasm for the chosen field of specialization should enter upon

these courses. Since a comparatively small number of students will enter these special courses and since the specialization may vary considerably even in one field with the individual student, complete curricula are not suggested in all lines.

Students in these courses may prepare themselves for teaching in colleges and universities, for research and experimental work in experiment stations, for regulatory, experimental, and extension service in the state and federal departments of agriculture, and for various technical and industrial positions in agricultural industries and in the industries related to agriculture. For the opportunities offered, the student is advised to consult with the various divisions and with the dean of the college.

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 Course in Agriculture as are consistent with his special course. The attention of the student is also called to the modern language requirements for graduate students. In many divisions French or German is required for the Master's degree and in all cases both French and German are required for a degree of doctor of philosophy. At least one modern language should be obtained during the undergraduate work.

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 | 6. Entomology and Economic Zoology |
| 2. Agricultural Economics | 7. Horticulture |
| 3. Agronomy and Farm Management | 8. Plant Pathology and Botany |
| 4. Animal Husbandry | 9. Soils |
| 5. Dairy Husbandry | 10. Veterinary Medicine |

B. AGRICULTURAL SCIENCE COURSE

This course of study requires 192 credit hours for graduation and is made up of (1) required subject 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 lectures. A course of lectures intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter. Mil. Sci. 1f-2w-3s, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education. Phys. Ed. 4f,w,s, 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. An. Biol. 14f-15w-16s, General Zoology, 9 or Bot. 4f-5w-6s, General Botany, 9 Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high school chemistry may omit this course and register for Chem. 9-10. Those required to take this course because of inability to carry successfully Chem. 9-10 will be allowed not more than 10 credits.

Chem. 9f-10w, Advanced General Inorganic Chemistry, 10 (1 yr. h. s. chem.). Those required to take Chem. 1-2-3 may omit this course.
 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 (Chem., 10 cred.)
 An. Biol. 14f-15w-16s, General Zoology, 9 or Bot. 4f-5w-6s, General Botany, 9
 Bact. 51f,w,s, General Bacteriology, 5 (Chem., biol.)
 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 (e) Nutrition
 (b) Agronomy (f) Plant Breeding
 (c) Entomology and Economic Zoology (g) Plant Pathology
 (d) Horticulture (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.

C. AGRICULTURAL ENGINEERING (Professional Course)

This course of study leads to the degree of bachelor of science in 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 course 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 course of study 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. 13f, Tractor and Auto Work I, 3
 Agr. Eng. 19f-20s, Surveying, 6 (Draw. 3 or M. & M. 12, or equiv.)
 Agr. Eng. 24w-25s, Agricultural Physics, 8 (M. & M. 13, Agr. Eng. 23 or equiv.)
 Agr. Eng. 31w, Principles of Drainage, 3
 Agr. Eng. 40s, Mechanical Training I, 3
 Agron. 1w, Farm Crops, 3
 Hort. 6f, Fruit Growing, 3. Those entering without high school physics must postpone Hort. 6 until later in their course of study and register for Agr. Eng. 23f, General Physics, 5
 Hort. 32s, Vegetable Growing, 3
 M. & M. 24f, Differential Calculus, 5 (M. & M. 13)
 M. & M. 25w, Integral Calculus, 5 (M. & M. 24)
 M. & M. 84s, Technical Mechanics, 5 (M. & M. 25)
 Soils 4f, Soils, 3 (Chem. 10 cred.)
 Soils 8w, Physical Properties of Soils, 3 (Soils 4)

JUNIOR AND SENIOR YEARS

The following courses are required of all students in the professional course in Agricultural Engineering. Electives should be chosen from the recommended list with view to specialization in one of the three fields of work.

JUNIOR YEAR

Fall Quarter

- Agr. Econ. 1f,w, Principles of Economics, 5
 C. E. 51f, Highways and Pavements, 3 (Agr. Eng. 20)
 Geol. 5f, Engineering Geology, 3
 M. & M. 85f, Strength of Materials, 4 (M. & M. 84)
 M. E. 38f, Machine Design, 3 (M. & M. 84)

Winter Quarter

- Agr. Econ. 2w,s, Principles of Economics II, 3 (Agr. Econ. 1)
 Agr. Eng. 7w, Farm Structures I, 3 (Draw. 3 or equiv.)
 Agr. Eng. 42w, Principles of Irrigation, 3
 Agr. Eng. 133w, Applied Electricity, 5 (Agr. Eng. 25 or equiv.)
 M. & M. 86w, Hydraulics with Laboratory, 3 (M. & M. 84)

Spring Quarter

- Agr. Eng. 134s, Agricultural Hydraulics, 3 (Agr. Eng. 25, M. & M. 25)
 Agron. 11s, Farm Machinery, 3
 An. Husb. 8s, Fundamentals of Feeding and Management, 5
 C. E. 37s, Structural Engineering, 3 (M. & M. 84)
 Dy. Husb. 1, Elements of Dairying, 5

SENIOR YEAR

- Agr. Eng. 37f, Rural Sanitation, 3
 Agr. Eng. 122f, Farm Power Machinery, 4 (Agr. Eng. 14)
 Agron. 102f,w, Farm Management Organization, 3 (Agr. Econ. 2, Soils 4)
 C. E. 144f, Reinforced Concrete, 3 (M. & M. 85)
 Electives, 5

- Agr. Eng. 121 w, Steam Boilers and Engines, 3 (Agr. Eng. 25)
 Agron. 103w,s, Farm Management Operation, 3 (Agron. 102)
 G. E. 101w, Contracts and Specifications, 3 (sr. class.)
 Electives, 9

- Agr. Eng. 126s, Selection of Farm Equipment, 3 (Agr. Eng. 12)
 Agr. Eng. 150s, Seminar, 2 (Agr. Eng. 102, 112, 125 or parallel 136)
 Econ. 85s, Principles of Marketing, 3 (Agr. Econ. 2)
 G. E. 193s, Engineering Practice, 2 (sr. class.)
 Electives, 8

RECOMMENDED ELECTIVES

1. Farm Structures

- Agr. Eng. 5f, Farm: Building Construction, 3
- Agr. Eng. 36w, Rural Heating and Ventilation, 4
- Agr. Eng. 67s, Farm Structures II, 3
- Agr. Eng. 111f, Structural Materials, 3
- Agr. Eng. 112s, Farm Building Problems, 3
- Agr. Eng. 136w, Experimental Physical Analysis, 5
- For. 27w, Farm Wood Lots and Windbreaks, 3
- Hort. 77w, Principles of Landscape Design, 3
- Rhet. 22f,w,s, Public Speaking, 3

2. Farm Mechanics

- Agr. Eng. 14s, Tractor and Auto Work II, 3
- Agr. Eng. 15f, Ignition and Carburetion, 3
- Agr. Eng. 28w, Land Clearing I, 3
- Agr. Eng. 101f, Drainage Engineering and Works, 4
- Agr. Eng. 123s, Farm Power, 4
- Agr. Eng. 125w, Farm Machinery Design, 4
- Agr. Eng. 135f, Ignition Systems, 4
- Agr. Eng. 136w, Experimental Physical Analysis, 5
- Rhet. 22f,w,s, Public Speaking, 3

3. Reclamation

- Agr. Eng. 28w, Land Clearing I, 3
- Agr. Eng. 101f, Drainage Engineering and Works, 4
- Agr. Eng. 102s, Advanced Drainage Problems, 3
- Agr. Eng. 103s, Irrigation Engineering and Works, 4
- Agr. Eng. 104w, Drainage Administration and Law, 3
- Agr. Eng. 136w, Experimental Physical Analysis, 5
- Agr. Eng. 141f,w,s, Land Clearing II, 3
- C. E. 161f, Hydrology, 3
- Hort. 77w, Principles of Landscape Design, 3
- Rhet. 22f,w,s, Public Speaking, 3

D. AGRICULTURE-PRE-BUSINESS COURSE

This course offers an opportunity for those who wish to prepare specifically for some branch of agricultural business, such as the marketing of farm products, farm finance, farm implements, farm real estate, country merchandising, and the like. The first two years are 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. The junior and senior years are offered in the School of Business. The transfer to the School of Business may be made without petition when the required work of the freshman and sophomore years outlined below has been completed with a minimum of 101 credits and 101 honor points. For definition of "honor point" see page 10. Approximately half of the last two years is elective and may include advanced courses in agriculture and economics.

FRESHMAN YEAR

The freshman year consists of the regular freshman courses outlined on pages 15 to 17, 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. 1, to the winter quarter of 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, 5

Agr. Econ. 2w, Agricultural Economics, 3 (Agr. Econ. 1)

Agr. Econ. 6s, Economic History of Agriculture, 5 (Agr. Econ. 1 or parallel)

Agr. Econ. 8s, Rural Economics, 3 (Agr. Econ. 1)

Agr. Econ. 25w, Principles of Accounting, 4

Agr. Econ. 6os, Farm Finance, 5 (Agr. Econ. 2)

An. Biol. 14f-15w-16s, General Zoology, 9

Econ. 26s, Principles of Accounting, 4 (Agr. Econ. 25) or Agr. Econ. 47s. Marketing Accounting, 4 (Agr. Econ. 25)

Psychology 1f-6w, General Psychology for Business Students, 6

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 AND SENIOR YEARS

See bulletin of the School of Business.

COURSES OF STUDY IN FORESTRY

The course of study is made up of 204 credit hours of work including:

1. Required subject courses, 140 to 157 credit hours, which every student must complete. These are considered as fundamental to any course in forestry.

2. Elective subject courses, 47 to 64 credit hours, distributed according to several methods described below (pages 35 to 37).

(For explanation of terms and course numbers, see page 13.)

REQUIRED SUBJECT COURSES

Required subject courses, 140 to 157 credit hours, are required of every student before graduation. These are considered fundamental and necessary to any course of study in forestry. For some students the outline for the first two years, given below, represents more than the regular amount of work of 17 credit hours per quarter. In such cases those subjects which cannot be taken in the freshman and sophomore years must take precedence the following year. Registration for from 15 to 18 credit hours of work each quarter (summer quarter at Itasca Park, 6 credit hours), will be allowed without special permission. 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 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 lectures. A course of lectures intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter

Mil. Sci. 1f-2w-3s, Basic Course. Students found to be physically unfit may be required to substitute corrective exercises in Physical Education.

Phys. Ed. 4f,w,s, 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.

¹Agr. Eng. 3f,s, Mechanical Drawing, 2

Bot. 4f-5w-6s, General Botany, 9

Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high school chemistry may omit this course and register for Chem. 9-10. Those required to take this course because of inability to carry successfully Chem. 9-10 will be allowed not more than 10 credits.

¹ Students presenting acceptable high school work in this course may substitute an elective.

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Chem. 9f-10w, Advanced General Inorganic Chemistry, 10 (1 yr. h. s. chem.) Those required to take Chem. 1-2-3 are exempt.

For. 1f, General Forestry, 3

For. 3w, Dendrology, 3

For. 4s, Dendrology, 4

¹Math. 5f,w,s, Higher Algebra, 5

Math. 6f,w,s, Trigonometry, 5 (Math. 5 or equiv.)

²Rhet. 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)

Bot. 3su, Forest Botany, 1½

For. 2su, Field Dendrology, 1½

For. 5su, Field Silviculture, 1½

For. 9su, Field Mensuration, 1½

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, 5

Agr. Econ. 2w,s, Principles of Economics II, 3

Agr. Eng. 19f-20s, Surveying, 5 (Agr. Eng. 3, 11 or equiv.)

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 course of study.

An. Biol. 14f-15w-16s, General Zoology, 9

For. 7f-8w, Forest Mensuration, 8 (Math. 6 or equiv., For. 4)

Geol. 1f,w,s, General Geology, 5 or Geol. 29f, General Physiography, 5

Pl. Path. 10f,s, Forest Pathology, 5 (Bot. 4-5-6)

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)

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. 8, Agr. Eng. 11, 23 or equiv.)

Ent. 6w, Forest Protection against Insects, 3 (An. Biol. 16)

For. 28w, Logging, 3 (For. 7-8)

For. 33f-34w, Wood Structure and Identification, 6 (For. 3-4)

For. 126f, Silvics, 3 (For. 7-8)

For. 127w, Silviculture, 3 (For. 126)

For. 130f, Forest Valuation, 5 (For. 7-8)

For. 131w, Forest Policy and Administration, 5 (For. 130)

¹ Students presenting higher algebra for entrance may omit this course and substitute 5 credits elective.

² Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 76.

3. *Special courses* selected from one of the major groups (pages 35 to 37 and electives to make from 15 to 18 credit hours per quarter. Full work for the year consists of 51 credit hours.

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. 37w, Forest Protection, 3
For. 134f-135w, Forest Problems, 6 (sr. class.)

ELECTIVE SUBJECT COURSES

Elective subject courses, 47 to 64 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 course of study which he plans to pursue during his junior and senior years. Such statements from each student will make it possible to provide a workable program of subject courses. The student may make, and is strongly advised to make, this statement at the end of his freshman year. In this case he would have ample opportunity to change his course at the end of the sophomore year. A change from one course of study to another after the close of the sophomore year is permitted only on approval and does not exempt the student from any of the requirements of the course which he finally selects. Such changes usually involve inconvenience and sometimes loss of credit to the student. All students are invited to consult with the dean of the college concerning the selection of courses of study.

The student, with the approval of his adviser, may select any course of study which complies with the following requirements:

- a. A major of from 24 to 36 credit hours 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.

I. 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. 13s, Forest Mensuration Laboratory, 2 (For. 7-8)
For. 31s, Logging Laboratory, 1 (For. 28)
For. 128s, Silviculture Laboratory, 7 (For. 127)
For. 132s, Forest Regulation Laboratory, 7 (For. 131)

The major will be selected from the following:

- Agr. Biochem. 7f-8w, General Agricultural Biochemistry, 10
- Agron. 131f,w, Principles of Genetics, 3
- Bot. 7s, Taxonomy of Flowering Plants, 5
- Bot. 20f, Forest Ecology, 3
- Bot. 22f,s, Elementary Plant Physiology, 5
- Bot. 101f,s, Elementary Biometry, 3
- Bot. 131f, Field Ecology, 5
- Bot. 132w, Ecological Anatomy, 5
- Bot. 133s, Forest Geography of North America, 5
- Bot. 141f-142w-143s, Advanced Plant Physiology, 15
- Chem. 31w-32s, Elementary Organic Chemistry, 10
- For. 20w, Grazing, 3
- For. 101w, Advanced Dendrology, 3
- For. 112w, Advanced Forest Mensuration, 3
- For. 122f-123w, Forestry Seminar, 2
- For. 125s, Wood Preservation, 3
- For. 136f, Forest Economics, 3
- Geol. 2w-3s, General Geology, 10
- Pl. Path. 108f, Methods, 3
- 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. 60s, Farm Finance, 5
- Agr. Econ. 90f, Agricultural Statistics, 5
- Agr. Econ. 140f,s, Principles of Marketing Organization, 3
- Econ. 26f,w,s, Principles of Accounting, 4
- Econ. 72w, Economics of Transportation, 3
- Econ. 73s, Railway Traffic and Rates, 3
- Econ. 89f,s, Industrial Organization, 3
- Econ. 112f, Business Statistics, 3
- Econ. 141, Monetary and Banking Policy, 3
- Econ. 143f-144w, The Financial System, 8
- Econ. 155s, Corporation Finance, 3
- Econ. 161w, Labor Problems and Trade Unionism, 3
- For. 13s, Forest Mensuration Laboratory, 2 (Cloquet)
- For. 23s, Factory Experience, 2-5
- For. 30s, Wood Seasoning, 3
- For. 31s, Logging Laboratory, 1 (Cloquet)
- For. 46s, Forest Regulation Laboratory, 7 (Cloquet)
- For. 107f-108w-109s, Uses of Wood, 9
- For. 112w, Advanced Forest Mensuration, 3
- For. 114f-115w-116s, Mechanical and Physical Properties of Wood, 9
- For. 133w, Lumber Distribution, 5
- For. 136f, Forest Economics, 3

3. FOREST BY-PRODUCTS

Suggested for those who wish to enter the field of pulp and paper manufacture, wood distillation, wood preservation, etc. Includes a series of courses in Chemistry and a thoro training in the structure, handling, and uses of wood. The major will be chosen from the following courses:

- Agr. Biochem. 2f, Quantitative Methods, 5
- Agr. Biochem. 3f-4w, Types of Carbon Compounds, 6
- Agr. Biochem. 101f-102w, Agricultural Quantitative Analysis, 6
- Agr. Biochem. 111f-112w, Phytochemistry, 6
- Agr. Biochem. 113f-114w-115s, Biochemistry Laboratory, 6
- Chem. 11f,s, Qualitative Chemical Analysis, 4
- Chem. 27f, Quantitative Chemistry, 4
- Chem. 35f-36w-37s, Organic Chemistry, 15
- For. 23s Factory Experience, 3 to 5
- For. 29f, Sawmill and Wood-Working Machinery, 3
- For. 30s, Wood Seasoning, 3
- For. 107f-108w-109s, Uses of Wood, 9
- For. 113w, Wood Pulp and Paper, 3
- For. 114f-115w-116s, Mechanical and Physical Properties of Wood, 9
- For. 119f-120w, Advanced Wood Structure, 6
- For. 125s, Wood Preservation, 3
- 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
- Phys. 21w, Heat, 1
- Phys. 122s, Pyrometry and Heat, 3

4. FOREST SCIENCES

Suggested for those who wish to specialize in the fundamental sciences. This course is also recommended to those students who wish to prepare themselves for work in grazing. Attention is called to the language requirement for the Master's degree. The major should be selected from any courses offered in the following fields:

Chemistry	Soils
Botany	Genetics
Entomology and Zoology	Geography
Plant Pathology	Economics

5. LANDSCAPE GARDENING

The major should be selected from the following courses:

- Agr. Eng. 31s, Principles of Drainage, 3
- Arch. 21f,w, Freehand Drawing, 2
- Arch. 22w,s, Freehand Drawing, 2
- Arch. 23s, Freehand Drawing, 2
- Hort. 50s, Floriculture, 3
- Hort. 56f, Plant Propagation and Nursery Practice, 3
- Hort. 71f, Plant Materials I, 2
- Hort. 72s, Plant Materials II, 2
- Hort. 73w, History of Landscape Gardening, 3
- Hort. 74f, Principles of Landscape Design, 3
- Hort. 75w, Landscape Problems, 3
- Hort. 76s, Landscape Construction, 3
- Hort. 190f, 191w, 192s, Special Problems, 9

COURSES OF STUDY IN HOME ECONOMICS

The courses of study are designed (a) to prepare women for the responsibilities of citizenship and of home making; (b) to prepare teachers for the extension of home economics education; (c) to prepare women for vocations which have as their foundation, work of the home economics group.

A number of courses of study are outlined on the following pages. In addition, opportunity is offered through substitutions and selections of electives to prepare for other special fields of work.

The College of Agriculture, Forestry, and Home Economics, and the College of Education co-operate in the preparation of teachers of home economics as outlined in the Course in Home Economics Extension, the Teachers' Courses in General Home Economics, in Foods and Home Management, in Textiles and Clothing, and in Related Art.

The teachers' courses, designed to prepare for the teaching of vocational courses in home economics, are arranged in accordance with the provisions of the Smith-Hughes Act.

The required work of the freshman and the sophomore years is the same in each course of study. Specialization is provided for in the junior and senior years.

(For explanation of terms and course numbers, see page 13.)

HOME PRACTICE

Garment making.—Home practice in garment making is required of students who have completed H.E. 11, as a prerequisite to H.E. 13. The character and amount of the home practice work will be arranged with a member of the faculty of the textile and clothing section.

Foods and cookery.—Home practice in foods and cookery following Course 22, Food Economics, is a prerequisite for H.E. 35, H.E. Ed. 47 and 49. A conference with a home economics instructor should precede this work and an examination must be passed.

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. Registration for from 14 to 16 credit hours of work each quarter will be allowed without special permission. Care should be taken in registration to give precedence to courses offered only one quarter.

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.

1. *Non-credit courses* required for graduation in addition to the 189 credit hours.
Freshman lectures. A course of lectures intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter
Phys. Ed. 1f-2w-3s, Elementary Physical Training.
Phys. Ed. 4f, Preliminary Hygiene.
2. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequences of continuation courses and the prerequisites must be observed.
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 course of study.
An. Biol. 14f-15w-16s, General Zoology, 9. Bot. 8s, General Botany, 5, may be substituted for An. Biol. 16s.
Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high school chemistry may omit this course and register for Chem. 9-10. Those required to take this course because of inability to carry Chem. 9-10 successfully will be allowed not more than 10 credits.
Chem. 9f-10w, Advanced General Inorganic Chemistry, 10 (1 yr. h. s. chem.). Those required to take Chem. 1-2-3 are exempt from this course.
H. E. 3f,w,s, Textiles, 5
H. E. 11f,w,s, Garment Making, 3
H. E. 50f,w,s-51w,s,f, Color and Design, 6
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)

SOPHOMORE YEAR

1. *Non-credit courses* required for graduation in addition to the 189 credit hours.
Phys. Ed. 22f, Sophomore Elementary Swimming. Not required of those who can pass the swimming test in their freshman year.
2. *Freshman courses* which were not completed during the freshman year.
3. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence for continuation courses and prerequisites must be observed. From 15 to 17 credit hours should be selected each quarter.
Agr. Biochem. 3f,w-4w,s, Types of Carbon Compounds, 6 (Chem. 10 cred.)
Bact. 51f,w,s, Elementary Bacteriology, 5 (Chem., biol.)
H. E. 13f,w,s, Dressmaking, 5 (H. E. 3, 11, 51, home practice in garment making)
H. E. 21f,w,s, Foods and Cookery, 5 (Agr. Biochem. 3, 4 parallel). Not required of those who qualify for H. E. 26
H. E. 22f,w,s, Food Economics I, 5 (H. E. 21 or 26)
H. E. 26f, 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. 26 for H. E. 21.
Physiol. 4w,s, Human Physiology, 5 (Chem. 4 cred., An. Biol. 3 cred.)
Psy. 1f,w-2w,s, General Psychology, 6
Rhet. 22f,w,s, Public Speaking. 3 (Rhet. 3)
Sociol. 1f,w,s, Introduction to Sociology, 3

¹ Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 76.

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4. *Electives*.—Enough elective credits should be selected to make, with the required work of the freshman and sophomore years, a total of 93 credit hours. The number selected will vary from 1 to 11 credit hours depending upon the specific high school preparation of each student. Those whose programs permit are advised to register for Rhet. 11, Argumentation, 3, otherwise required in the junior year.

JUNIOR YEAR

1. *General courses*.—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and prerequisites must be observed.
- Agr. Econ. 1f,w,s, Principles of Economics, 5
H. E. 52f,w,s, Art History and Appreciation, 3 (H. E. 51)
H. E. 53f,w,s, Advanced Design, 3 (H. E. 51)
H. E. Ed. 40f,w,s, Child Training, 3 (Psy. 1-2)
Prev. Med. 52f,w,s, Health Care of the Family, 3 (Bact. 51, 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) or Pub. and Rur. Jour. 20f, Writing for the Press, 3 (Rhet. 9 cred.)
2. *Special courses* as prescribed by the curriculum of the line of specialization selected. See special requirements on pages 40 to 44.
3. *Electives*.—Enough electives should be selected to make, with those listed in 1 and 2 above, from 15 to 17 credit hours each quarter. Full work for the year consists of 48 credit hours.

SENIOR YEAR

1. *General courses*.—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and prerequisites must be observed.
- H.E. 34f,w,s, Home Management: Operation and Maintenance, Lectures, 3 (H. E. 22, 35 parallel, Agr. Econ. 1 or parallel, Prev. Med. 52)
H. E. 35f,w,s, Home Management: Operation and Maintenance, Laboratory, 6 (H. E. 22, H. E. Ed. 40, or parallel, Prev. Med. 52, home practice in foods and cookery; must parallel H. E. 34)
H. E. 131f,w,s, Home Management: House Planning and Equipment, 5 (H. E. 52, 53)
2. *Special courses* are prescribed by the curriculum of the line of specialization selected. See special requirements on pages 40 to 44.
3. *Electives*.—Enough electives should be selected to make, with those listed above, from 15 to 17 credit hours each quarter. Full work for the year consists of 48 credit hours.

GROUP II. SPECIAL REQUIREMENTS IN THE DIFFERENT LINES OF SPECIALIZATION (SUPPLEMENTARY TO GROUP I)

Students should consult with the faculty of the section in which they have chosen to major with reference to the elective courses which must be chosen to make up the 189 credit hours required for graduation.

In selecting electives, note particularly (a) prerequisites, (b) classes of students (fr., soph., jr., or sr.) to which courses are offered, (c) number of credits, (d) quarter or quarters offered, and be sure that provision is made in registration for the proper sequence of continuation courses.

Registration for courses as electives in other colleges of the University must be in conformity with the regulations of the college offering the course.

Elective courses in the College of Science, Literature, and the Arts, are separated into junior college courses (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.

I. GENERAL COURSE IN HOME ECONOMICS

JUNIOR YEAR

General requirements listed on page 40
 H. E. 23f,w, Nutrition I, 5 (H. E. 21
 or 26, Physiol., 4)
 H. E. 108f,w,s, Nutrition II, 5 (H. E. 23)

SENIOR YEAR

General requirements listed on page 40
 Agr. Econ. 126s, Economics of Consumption, 3 (Agr. Econ. 1)
 H. E. 17f,w,s, Advanced Clothing Construction, 3 (H. E. 13, 53)
 H. E. 103f,w,s, Nutrition of the Family, 3 (H. E. 23, 108 or parallel)
 H. E. 104f,w,s, Field Work in Nutrition, 3 (H. E. 40, 103 or parallel or 156)

2. COURSE IN FOODS AND NUTRITION

Those students planning to specialize in foods and nutrition may omit Advanced Clothing Construction and should add the following courses to those listed in the General Course:

JUNIOR YEAR

Agr. Biochem. 2f, Quantitative Methods, 5 (Chem. 10 cred.)
 H. E. 105f,w,s, Experimental Cookery, 3 (H. E. 22)
 H. E. 109w, Advanced Nutrition, 5 (H. E. 108, Agr. Biochem. 2)

SENIOR YEAR

H. E. 105f,w,s, Experimental Cookery, 3 (H. E. 22)
 H. E. 110s, Special Problems in Dietetics, 3 (H. E. 103)
 Agr. Biochem. 108s, Chemistry of Wheat and Wheat Products, 3 (Agr. Biochem. 3) or H. E. 111f,s, Special Food Problems, 3 (H. E. 105)

3. COURSE IN TEXTILES AND CLOTHING

Those students planning to specialize in textiles and clothing should register for Advanced Clothing Construction in the junior year and add the following courses to those listed in the General Course, omitting Nutrition I, Nutrition II, Nutrition of the Family, and Field Work in Nutrition.

JUNIOR YEAR

Agr. Biochem. 2w, Quantitative Methods, 5 (Chem. 10 cred.)
 H. E. 55f, Decorative Needlework and Other Crafts, 3 (H. E. 51, 53, or parallel)
 H. E. 123w,s, Clothing Economics, 2 (H. E. 13, Agr. Econ. 1)

SENIOR YEAR

H. E. 18s, Commercial Clothing Manufacture, 4 (H. E. 17, or parallel)
 H. E. 58s, Costume Design, 3 (H. E. 13, 53, 55 recommended)
 H. E. 122w,s, Advanced Textiles, 3 (H. E. 3, Agr. Econ. 5 or parallel)
 H. E. 126s, Textile Analysis and Related Problems, 3 (H. E. 122, Agr. Biochem. 2)

4. COURSE FOR DIETITIANS

Those students planning to become dietitians may omit the following courses from the General Course: Advanced Clothing Construction, Economics of Consumption.

They should add the following courses to those listed in the General Course:

JUNIOR YEAR

Agr. Biochem. 2f, Quantitative Methods, 5 (Chem. 10 cred.)
 Ed. Psy. 55f,w,s, Educational Psychology, 3 (Psy. 1-2) or Agr. Ed. 11f,w,s Principles of Vocational Education, 3
 H. E. 109w, Advanced Nutrition, 5 (H. E. 108, Agr. Biochem. 2)
 H. E. Ed. 42f,w,s, Special Methods of Teaching Home Economics, 5 (H. E. 13, 22, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)

SENIOR YEAR

H. E. 61f,w, Large Quantity Cookery and Marketing, 4 (H. E. 22)
 H. E. 63f,w,s, Institution Experience, 3 (H. E. 22)
 H. E. 105f,w,s, Experimental Cookery, 3 (H. E. 22)
 H. E. 151s, Institution Management Problems, 4 (H. E. 61, 63)

5. COURSE IN INSTITUTION MANAGEMENT

Those students specializing in institution management may omit the following courses from the General Course in Home Economics: Advanced Clothing Construction, Economics of Consumption.

They should add the following courses to those listed in the General Course:

JUNIOR YEAR

Agr. Eng. 34w, Household Mechanics, 4 (Agr. Eng. 23 or equiv.)
 H. E. 61f,w, Large Quantity Cookery and Marketing, 4 (H. E. 22)
 H. E. 63f,w,s Institution Experience, 3 (H. E. 22)

SENIOR YEAR

Agr. Econ. 25f,w, Principles of Accounting, 4
 Agr. Econ. 40s, Principles of Marketing, 3 (Agr. Econ. 1)
 H. E. 105f,w,s, Experimental Cookery, 3 (H. E. 22)
 H. E. 151s, Institution Management Problems, 4 (H. E. 61, 63)

COURSES FOR TEACHERS

(College of Education)¹

For the junior and senior years the following courses 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 the university teacher's certificate are required to pursue one of the following courses.

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 who expects to teach home economics and who expects to obtain the university endorsement for a certificate must sign specialization card at the beginning of the junior year and meet the following requirements:

¹ See scholarship requirements for admission to the College of Education, page 10.

(A) Completion of not less than 22 credits of *professional work*, including:

JUNIOR YEAR

Ed. Psy. 55f,w,s, Ed. Psy., 3 (Psy. 1-2)
or Agr. Ed. 11f,w,s, Principles of Vocational Education, 3
Hist. and Philos. of Ed. 5s, Public Ed. in U. S. 3 (Psy. 1-2) or Hist. and Philos. of Ed. 1f,w,s, Brief Course in History of Education, 5 (6 cred. in psy.)
H. E. Ed. 40f,w,s, Child Training, 3 (Psy. 1-2)
H. E. Ed. 42f,w,s, Special Methods of Teaching Home Economics, 5 (H. E. 13, 22, Psy. 1-2, Ed. Psy. 55 or Agr. Ed. 11)

SENIOR YEAR

H. E. Ed. 46, 47, 48, or 49f,w,s, Observation and Teaching, 8 (H. E. Ed. 12)

(B) Satisfaction of special *scholarship requirement*

Prior to registration for Observation and Teaching, the student must have a grade of C in each of the following home economics courses: Garment Making, Dressmaking, Textiles, Foods and Cookery, Food Economics, Drawing and Design, and Advanced Design.

(C) Completion of one of the following courses:

6. TEACHERS' COURSE IN GENERAL HOME ECONOMICS

Students specializing in this course must complete the required work of the General Course in Home Economics (page 41) and in addition the professional subjects listed above.

7. TEACHERS' COURSE IN FOODS AND HOME MANAGEMENT

Students specializing in this course must complete the requirements of the General Course in Home Economics, page 41 (with the exception of Advanced Clothing Construction) and in addition the professional courses listed above. The following courses must be added in the senior year: H.E. 105f,w,s, Experimental Cookery, 3 (H.E. 22, 23) H.E. 111s, Special Food Problems, 3 (H.E. 105).

8. TEACHERS' COURSE IN TEXTILES AND CLOTHING

Students specializing in this course must complete the required work in the General Course in Home Economics (with the exception of Nutrition I, Nutrition II, Nutrition of the Family, and Field Work in Nutrition) and in addition the professional courses listed above. The following courses must be added:

JUNIOR YEAR

H. E. 55f, Decorative Needlework and Other Crafts, 3 (H. E. 51, 53 or parallel)
H. E. 123w,s, Clothing Economics, 2 (H. E. 13, Agr. Econ. 1)

SENIOR YEAR

H. E. 18s, Commercial Clothing Manufacture, 4 (H. E. 17, or parallel)
H. E. 58s, Costume Design, 3 (H. E. 55)
H. E. 122w,s, Advanced Textiles, 3 (H. E. 3, Agr. Econ. 1 or parallel)

9. **TEACHERS' COURSE IN RELATED ART**

Students specializing in this course must complete the required work in the General Course in Home Economics (with the exception of Economics of Consumption, Nutrition I, Nutrition II, Nutrition of the Family, and Field Work in Nutrition) and in addition the professional subjects listed on page 43. The following courses must be added:

JUNIOR YEAR

Art Ed. 32A,f-33A,w-34A,s, Still Life, 3
 Art Ed. 32C,f-33C,w-34C,s, Sketch, 3
 H. E. 58w, Costume Design, 3 (H. E. 55)
 H. E. 123w,s, Clothing Economics, 2
 (H. E. 13, Agr. Econ. 1)

SENIOR YEAR

Art. Ed. 43C,f-44C,w-45C,s, Sketch 3
 (Art Ed. 32C, 33C, 34C)
 H. E. 54w, Interior Design, 3 (H. E.
 52, 53, 131)
 H. E. 57s, Batik and Other Crafts, 3
 (H. E. 3, 53 or parallel)
 H. E. Ed. 43w, Organization and Meth-
 ods for Related Art Teaching, 3 (H.
 E. 53, 52, H. E. Ed. 42)

10. **COURSE IN HOME ECONOMICS EXTENSION**

Students having had two or more years of experience in teaching and who wish to go into General Home Economics Extension work, should take the Teacher's Course in Home Economics and add the following courses as electives:

JUNIOR YEAR

Agr. Ed. 75f,s, Visual Presentation, 3
 (Agr. Ed. 11)
 Sociol. 14f,w,s, Rural Sociology (3 cred.;
 soph., jr., sr.; prereq., 1 or sr. class.)

SENIOR YEAR

H. E. 44w, Home Economics Extension
 Work, 3 (H. E. Ed. 42, 49 or
 parallel)

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. Types of Carbon Compounds. The groups of carbon compounds, with special reference to their relationships and their occurrence in plant and animal materials used as food.
- 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. Chemical Technology of Agricultural Products. The composition of the principle products and by-products of agriculture and their utilization as raw material in various industries, and the methods of chemical control work in these industries.
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.
109. Selected Flour Laboratory Methods. A laboratory course in which particular attention is given to recently developed methods for testing wheat products. Less extensive than 110. Designed for men with commercial laboratory experience. (Not open to students who have credit in Course 110.)

110. Flour Laboratory Methods. A laboratory course in methods of analysis of wheat and its products; milling tests of wheat, baking, and special tests of flour. Designed to train students for research and control work in the cereal industry. (Not open to students who have credit in Course 109.)
- 111-112. Phytochemistry. Advanced course dealing with the colloidal state, and the chemistry of proteins, carbohydrates, glucosides, tannins, fats, plant acids, enzymes, and pigments and their 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, with especial reference to the detection and estimation of such compounds in cells or tissues.
116. Advanced Animal Nutrition. Lectures and assigned readings on recent developments in animal nutrition, covering the field of proteins, mineral metabolism, vitamins, and the relation of nutrition to disease.
117. Laboratory Problems in Animal Nutrition. A laboratory course on methods used in nutrition studies through assisting in investigations under way or carrying out independent studies under the direction of the instructors.
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

1. Principles of Economics I.
2. Principles of Economics II.
6. Economic History of Agriculture. The evolution of the economic organization with special reference to agriculture. The development of methods of agricultural production and marketing, types of farming, and tenure systems.
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.
60. 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 agricultural data.
110. Economics of Agricultural Production I. The principles of production economics applied to agriculture, especial emphasis being placed upon comparative advantage and localization of production. (Includes old Course 7, Economic Geography of Agriculture.)

111. Economics of Agricultural Production II. Continuation of Economics 110.
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.
130. 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.
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 Forecasting Prices. 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. Principles of Marketing Organization. The principles of organization of the market and of marketing enterprises, both proprietary and co-operative, applied especially to non-perishables.
141. Marketing Organization: Semi-Perishables.
142. Marketing Organization: Perishables.
- 145-146. Marketing Management. Principles of organization, management, and accounting applied to the details of managing the important types of proprietary and co-operative business units.
161. Advanced Farm Finance.
170. Land Economics. Land as a factor of production; rural and urban utilization; rents and land values; land classification; land exchange.
171. Land Tenure. Property in land; tenancy; farm labor; evolution of the tenure classes.

See also courses in Economics.

AGRICULTURAL EDUCATION

COLLEGE OF EDUCATION

11. Principles of Vocational Education. The fundamental principles upon which education is based. Emphasis is placed on those phases which are most closely related to vocational education.
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.
42. Teaching. Preparation of lesson plans and actual teaching of classes under careful supervision in recitation and laboratory; criticism and

- discussion of plans, methods, and results of student teaching. Review and discussion of assigned professional readings.
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 Work. Actual field practice in extension work on part salary in addition to credits. Number admitted to course limited by positions available. Usually will cover summer quarter, may extend into fall quarter.
 121. Teachers' Course, Home and School Gardening. A lecture and laboratory course designed to give teachers the preparation necessary for the proper planning, management, and supervision of home and school gardens. (Not offered in 1926-27.)
 131. Methods in Teaching High School Agriculture. Fundamentals of method in teaching as related to teaching agriculture in high school. Organizing subject-matter of daily work; selection and manipulation of devices. Classroom and laboratory method. Specific plans for teaching secondary agriculture.
 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.
 151. Organization and Management. Organization and management of work in secondary schools, particularly in Minnesota, with special reference to agricultural work, courses of study, programs, equipment, laboratory and class management, extension work, plots, and co-ordination of work.
 153. Consolidated Rural Schools. To prepare principals to meet the problems of organization and management peculiar to consolidated rural schools, such as building arrangements, curriculum adjustments, transportation of pupils, and home project work.
 154. Rural Education and Community Life. The rural school as a community center, and ways and means of organizing educational and recreational activities, such as clubs, festivals, fairs, and other desirable features of rural community life.
 155. Consolidated Rural School Problems. Opportunity for intensive study and research in special problems of administration and supervision of village and consolidated rural schools.

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. Basic principles of agricultural science and elements of practical agriculture. Emphasis on concrete problems in soils, crops, and animal husbandry, as related to classroom instruction and to school and home projects. (Not offered in 1926-27.)
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.
- 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. The conventions, lettering, scale reading, kinds of drawings, practice in pictorial drawing and drawing building plans.
4. Blacksmithing. The management of forge and fire in bending, shaping, and welding iron.
5. Farm Building Construction. Instruction and practice in 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, proportions, variations, investments, cost problems, etc.
13. Tractor and Auto Work I. Theory, operation, care, and repair of gasoline engines.
14. Tractor and Auto Work II. Instruction and practice in the care, adjustment, and operation of the farm tractor.

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.
17. Advanced Blacksmithing. Bending, shaping, welding, and tempering of steel.
19. Elementary Surveying. Use of tape, transit, level, and traverse board in agricultural field problems, e.g., mensuration surveys, laying out plots in series, 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, mapping 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. Special emphasis given to farm power, hydraulics, heating, ventilation, and meteorology.
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 drainage in relation to plant growth, crop and land values, and farm development.
32. Drainage and Surveying. Simple surveying problems with special attention to leveling; grade determination and field technique of the drainage survey; measurement of water-flow in tile and open ditches.
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.
36. Rural Heating and Ventilation. Fundamental principles of combustion, heat transmission, heating and ventilation. Application of heating and ventilating systems to homes, rural schools, churches, warehouses, and farm structures.
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; sharpening tools; pipe fitting; cold metal work; electric wiring; babbiting; glazing; painting; wood finishing; harness repair; etc.
41. Mechanical Training II. Instruction and laboratory practice in mechanical trades embracing metal work, tool sharpening, painting, wood finishing, cement construction, 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.
111. Structural Materials. Use, strength, practicability, and durability of materials used in farm building construction and equipment.
112. Farm Building Problems. Investigations in the utility and durability of building materials such as concrete, hollow building tile, lumber, prepared roofing, etc., as well as methods of construction of farm buildings.
121. Steam Boilers and Engines. Lecture and laboratory study of the construction, operation, and care of simple steam engines and boilers.
122. Farm Power Machinery. Lecture and laboratory course dealing with the construction, operation, care, adjustment, and testing of the farm tractor and of farm machinery driven by tractor or other power.
123. Farm Power. Comparative study of the application and cost of the different sources of motive 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. Field laboratory study of types and construction of machinery and equipment suited to the various farm and farm home operations.

133. Applied Electricity. Course, largely of laboratory work in direct and alternating current machines as used on farms, including generators, motors, storage batteries, transformers, and complete isolated electric and hydro-electric plants.
134. Agricultural Hydraulics. A laboratory and lecture course on hydraulics as applied to water movements in pipes, tile and open ditches in farm water systems, drainage, and irrigation.
135. Ignition Systems. Lecture and laboratory course in the study of ignition and generating systems used on gas engines and tractors.
136. Experimental Physical Analysis. A laboratory course in physical measurements for specialists in the agricultural sciences. The work includes the use of bridges, potentiometers, galvanometers, refractometers, spectrometers, polarimeters, thermocouples, etc.
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 AND FARM MANAGEMENT

- I. Farm Crops. The important field crops of the United States with emphasis upon those of local importance; distribution, economic importance, agricultural classification, cultural methods, and principles of improvement and seed selection.
- II. Farm Machinery. Lectures and laboratory work covering classification, mechanical construction, adjustment, and operation of the different kinds of farm machinery.
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. Advanced Farm Management. An advanced seminar course, including cost of production studies, farm business analyses, and farm practices.
121. Cereal Crops. An advanced study of the cereal crops. Structure, group classifications, improvement, growing, and utilization. Brief score card practice and a limited amount of placing on intrinsic value included.
122. Corn and Potato Crops. Corn and potato crops similar to that outlined in Course 121.
123. Forage and Fiber Crops. A study of the production, curing, and storing of forage and fiber crops through assigned reading, laboratory,

and field work. Following the study of each crop some attention is given to score card practice and comparative placing of representative samples.

124. Advanced Farm Crops. This course includes a survey of modern farm practices and emphasizes the application of recent discoveries in agricultural science to crop production problems. It is especially designed to meet the needs of high school instructors in agriculture.
131. Principles of Genetics. Fundamental principles of breeding, heredity, variation, biometry, and evolution. Same as Hort. 109.
132. Farm Crops Plant Breeding. Applied genetics. Methods of breeding each of the important agricultural crops.
133. Judging and Grading Farm Crops. Experimental evidence regarding the factors which determine the market value of the crops as a basis for judging and grading work.
134. Laboratory Problems in Genetics. Methods of taking and arranging genetics data. Special inheritance problems with *Drosophila*. Construction of chromosome map.

ANIMAL BIOLOGY

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 60.

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

- 14-15-16. General Zoology. Structure, physiology, embryology, classification, and evolution of animals. Third quarter is devoted to the Arthropoda, principally the Insecta.
21. Introduction to General Physiology.
23. Introductory Entomology.
24. Introductory Animal Parasitology.
25. Introductory Histology.
26. Comparative Anatomy.
- 29-30. Histology and Organology.
- 31-32-33. General Physiology.
44. Animal Parasites.
45. Insects and Disease.
- 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.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

ANIMAL HUSBANDRY

1. 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.
- 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.
5. Livestock Breeding. The application of the principles of genetics to the breeding of livestock; a review of the master-breeders' methods and consideration of the practical breeders' problems.
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.
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. Seminar. Special problems and research assignments on investigations pertaining to the livestock industry.
- 109. 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.)

ANTHROPOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

- 51. Introduction to Anthropology.
- 53. Cultural Anthropology.
- 54. Cultural Anthropology.
- 55. Human Migrations.
- 80. The American Indian.
- 110. Physical Anthropology.
- 112. The American Negro.

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

- 51. General Bacteriology.
- 103. Soil Microbiology. Studies of the microscopic inhabitants of the soil, their inter-relationships 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.

BEE CULTURE

Students registering for beekeeping should have a working knowledge of botany, zoology, and entomology.

1. Elementary Bee Science. Classification, structure of *Apis Melifica*. Development and life history of the queen, worker, and drone. Organization of the colony. Colony instincts and activities. Breeding, swarming; hibernation.
2. 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.
3. Advanced Beekeeping. Outfit of a commercial apiary. Location and management of out-apiaries. Migratory beekeeping. Package bees, nuclei, queen raising, judging. Bee products.
5. Bee Diseases. Fungi and parasites. Brood and mature bee diseases. The diagnosis, causes, and practical treatment of American and European foul brood diseases. Bee inspection.
6. Bee Products. Analysis, purity of honey, specific gravity, granulation. Color grading of honey. Influence of weather, soil, etc., on quality and color of honey. Honey judging, by taste and color. Wax, foundation, vinegar, and by-products.
7. Beekeeping Problems. (For beginners and amateurs.) Study of chief bee instincts and functions leading to management of bees for production of comb and extracted honey.

BOTANY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

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.
- 4-5-6. General Botany. Same as Course 1-2, extended throughout three quarters. For students in agriculture and forestry only.
7. Taxonomy of Flowering Plants.
8. General Botany. A course adapted to the needs of students in home economics.
12. General Morphology of Algae.
13. General Morphology of Fungi.
20. Forest Ecology. Relation between forest trees and their environment; soil and atmospheric factors, their influence upon function, structure, and distribution; forest communities and successions.

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. Forest Geography of North America.
141. Physical Phases of Plant Physiology.
142. Plant Metabolism.
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.

CHEMISTRY

SCHOOL OF CHEMISTRY

- 1-2-3. General Inorganic Chemistry.
- 9-10. General Inorganic Chemistry.
11. Qualitative Chemical Analysis.
- 12-13. Qualitative Chemical Analysis.
- 20-21. Quantitative Analysis.
- 35-36-37. Organic Chemistry.
- 140-141-142. Physical Chemistry.
143. Physical Chemistry.

For additional courses and course descriptions see the bulletin of the School of Chemistry.

CHILD WELFARE INSTITUTE

- 50-51. Nursery School Methods. A consideration of the materials and methods utilized in the training of small children as individuals and in groups. Special attention will be paid to the home. The Nursery School will be used for illustration and observation. Lectures, discussions, and reports.
- 52-53-54. Nursery School Technique. The technique and practice of Nursery School instruction and management. The student will be expected to spend considerable time in the Nursery School.
60. The Nursery School and Parental Education Movement. The purpose of this course is to orient the student with reference to the development of the Nursery School and the movement for parental education. Consideration will be given to other movements such as the kindergarten and the Montessori School and to the physical and mental hygiene movement in relation to the pre-school period.

130. The Development of the Small Child. An advanced course dealing with the development of the pre-school child from the anatomical, physiological, psychological, educational, and social angles. Lectures, readings in the experimental literature, and reports.
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 small 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 small child.
- 190-191. Mental Examination of Pre-School Children. A study of the methods used in testing small 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.
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.
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; formation of rations.
104. Advanced Study of Dairy Breeds. Practice in comparative judging of dairy cattle representing different breeds and ages; selection and valuation of cattle according to type and pedigree; a study of important strains and families; visits to purebred herds.
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.

- 111. Dairy Products I. The manufacture of butter, condensed milk, and powdered milk, with special reference to the chemical and bacteriological processes involved. Organization, construction, equipment, operation, and accounting in such factories. Laboratory exercises to illustrate these processes.
- 112. Dairy Products II. The manufacture of cheese and ice cream 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. Problems in Dairy Bacteriology. Investigations of specific problems on the bacteriology of milk and dairy products.

ECONOMICS

SCHOOL OF BUSINESS

- 3. Mechanism of Exchange.
- 73. Railway Traffic and Rates.
- 89. Industrial Organization.
- 103-104. Value and Distribution.
- 112. Business Statistics.
- 113-114. Theory of Statistics.
- 131-132-133. Cost Accounting.
- 141. Monetary and Banking Policy.
- 149. Business Cycles.
- 155. Corporation Finance.
- 172. Economics of Transportation.
- 176. Commercial Policies.
- 177. Foreign Trade.

For additional courses and course descriptions see the bulletin of the School of Business.

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.
- 106-107-108. Advanced Educational Psychology.
- 111. Educational Diagnosis.

For additional courses and course descriptions see the bulletin of the College of Education.

ENGLISH

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

- 1-2-3. General Survey of English Literature.
- 6. Chaucer.
- 8. Shakespeare.
- 40. The Bible As Literature.
- 41. Browning.
- 44-45. American Literature.

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 Animal Biology of the College of Science, Literature, and the Arts. Courses 37-38-39, 44, 117-118-119, 125-126-127, 130, 139-140, 144-145-146, and 197 of this division are also offered under these numbers by the Department of Animal Biology.

For introductory courses in general entomology see 37-38-39 and An. Biol. 16.

- 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.
- 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 the case of certain species.
- 20. Home Economic Entomology. Designed for home economic students. Insects as related to public health problems, insects of the household and those attacking foods will be discussed. The principles of control of insect pests of plants will be considered.

- 37-38-39. General Entomology. Leads up to discussion of the principles of taxonomy and their application to the classification of insects. Text-book, lectures, quizzes, and laboratory.
44. Introductory Course in Animal Parasites and Parasitism. Lectures and laboratory work. A consideration of the origin and biological significance of parasitism, and of the structure, life history, and economic relations of representative animal parasites. Methods of control and prevention will be emphasized.
- 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.
130. Biology and Taxonomy of the Aphididae. Intensive study of the natural history, bibliography, and classification of the Aphididae. Additional work is offered in Course 197.
- 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 animal.
150. Insecticides and Their Action. A study of the chemical composition, the physical properties, and the physiological action of standard, of little-known, and of new insecticides.
160. General Forest Entomology. Lectures, laboratory and library work treating of the life history, habits, and ecological relationships of insects that affect trees and forest products.
197. Introduction to Research. Preparation for investigational work in lines of entomology, parasitology, or economic zoology. Advanced laboratory, field, and library work; training in preparation of bibliographies and manuscripts; special problems. Summer work should be planned when possible.

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.
- 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 tables, growth of trees, and yield tables.
9. 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.
13. Forest Mensuration Laboratory. Field work at the Cloquet Forest Experiment Station; advanced work in log scaling; timber cruising; valuation surveys; stem analysis, and the study of measurements of the stand valuation and yield.
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. Two or more months in a factory utilizing wood by-products such as pulp or paper mill, wood distillation or wood preservation plant.
27. Groves and Windbreaks. Trees and their relation to the farm. Planning and planting farm windbreaks and shelterbelts. Utilization and marketing of farm, grove, or woodlot products.
28. Logging. The practice, cost, and development of the different logging methods in use in the different forest regions of the United States, and the modifications required by forest management. Report based on personal investigations required.
29. Sawmill, and Wood-Working Machinery. Sawmills, wood-working machinery, and other processes in the primary manufacture of lumber products.
30. Seasoning of Wood. The theory and practice of air seasoning and kiln drying the different species of wood and the different forms of wood products; the results obtained and the defects to be avoided.
31. Logging Laboratory. The student will be required to spend at least one week in an approved logging camp and make a complete report according to an outline which will be furnished him.
- 33-34. Wood Structure and Identification. Structure, classification, and identification of the most important commercial, domestic, and foreign woods. Lectures, papers, laboratory. Record's *Economic Woods* used as a text.
37. Forest Protection. The protection of forests from fire, fire prevention, and fire suppression. The causes of forest fires and their elimination, climate and fires, fire fighting and fire legislation.

47. Forest Products I. An introductory survey of all the wood products of forests including regions of production, amounts, value, etc. Lectures, reading, reports.
48. Forest Products II. An introductory survey of the products of forests other than wood as naval stores, tannins, wood pulp, paper, etc. Lectures, reading, reports.
101. Advanced Dendrology. A continuation of Course 3-4 with special studies in classification and distribution of the 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 centers, 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.
- 110-111. Mechanical and Physical Properties of Wood. Study of strength as related to density, quality, and structure. Wood stresses and methods of timber testing. Water absorption, shrinkage, seasoning, specific gravity. Lectures, reading, reports, and laboratory.
112. Advanced Forest Mensuration. Continuation of Course 10 with special emphasis on tree forms. The development of the formula used in study of volume and growth of trees.
113. Wood Pulps and Papers. Cellulose and its properties. Methods of production of wood pulp and paper products, naval stores, tannins, oils, wood distillation products, etc. Lectures, reading, reports.
119. Advanced Wood Structure I. A detailed study of the elements and structure of native and foreign economic woods. Preparation, sectioning, and mounting of typical sections. Reference reading and reports.
120. Advanced Wood Structure II. Classification of woods based on structure. Relation of structure to mechanical failures, variation in density, strength, etc. Fiber studies and measurements.
- 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. Silvicultural Laboratory. Nursery practice and field planting. Field investigations and planting plans. Seed collecting, extracting, and storing. Daily nursery and field work.
130. Forest Valuation. The business of forest management. A study of the different factors entering into the valuation of forest property.
131. 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.
133. Lumber Distribution. The standing timber of the United States in its relation to the lumber market. The organization of the industry and the distributing agencies.
- 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.

GEOLOGY AND MINERALOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

1. General Geology.
2. Historical Geology.
3. Economic 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. Rapid Reading.
7. Prose and Poetry.
8. Advanced Prose and Poetry.

28-29. Chemical German.

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

The following courses are planned primarily for students majoring in home economics, and are required in the courses of study in home economics. They are open for election to students in other courses who offer the stated prerequisites.

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. Garment Making. Instruction and laboratory practice in hand sewing, reading and adaptation of commercial patterns, use of the sewing machine, designing, cutting, and making simple garments from washable materials.
13. Dressmaking. Laboratory practice in costume modeling; preparation of the dress form; adaptation of textile and art principles in selection of materials and designs; instruction and practice in construction of one wool and one silk problem.
17. Advanced Clothing Construction. Laboratory course involving application of principles of costume modeling in the construction of one high-grade garment, suit, coat, or dress. One day a week devoted to a millinery problem.
18. Commercial Clothing Manufacture. Laboratory practice upon commercial basis. Shop organization, with problems involving clothing design and construction.
20. Economic Aspects of the Food Supply. A study of the quality and cost of foods on the market. Laboratory and field work.
21. Foods and Cookery. (a) Production, manufacture, chemical composition of typical foods; their classification into food principles; changes

- in digestion; function in nutrition. (b) Fundamental science principles from chemistry, physics, biology, bacteriology, and their application in typical cookery processes.
22. Food Economics I. Cost and nutritive value of typical foods; the study of dietaries; preparation and serving of meals, the cost bearing a definite relation to the family budget.
 23. Nutrition I. (1) The groups of compounds occurring in the cell and in food, (2) digestion, and (3) absorption.
 24. Camp Cookery. The simpler cookery processes; and such adaptations as are practicable in the several types of out-of-door camps. Not open to home economics students. For prospective foresters, engineers, and others. (Given in alternate years. Not offered in 1926-27.)
 26. Foods and Cookery. (For students who have had foods training in high school.)
 34. Home Management: Operation and Maintenance, Lectures. Discussion of management responsibilities of homemaker with special emphasis on budgets and household accounts.
 35. Home Management: Operation and Maintenance, Laboratory Experience. Twelve weeks actual experience in a home management house with various household management problems including the care and behavior of a child of pre-school 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.
 45. Home Economics Survey. A discussion of the historical development of home economics with special emphasis upon current problems.
 - 50-51. Color and Design. Composition, perspective, color theory, and color harmonies applied to costume design and interiors; harmony, proportion, emphasis, balance, and rhythm, in design.
 52. Art History and Appreciation. The historical development of art, architecture, decoration, furniture, and costumes, studied with special emphasis on design and influence upon modern styles.
 53. Advanced Design. Principles discussed and problems worked out relating to costume and house furnishing design.
 54. Interior Design. Special problems of small house decoration will be studied. Elevation drawings made. Actual materials will be used as far as possible.
 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. Application 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.

58. *Costume Design.* A study of figure construction; line, color, and textures for beautiful arrangements and with reference to individual types. Laboratory work with fabrics and designs carried out in pencil and water colors.
61. *Large Quantity Cookery and Marketing.* Application of principles of cookery to large quantity preparation; planning of meals for dining hall and cafeteria; calculation of cost and calories in standard servings; study of problems involved in purchase of institution supplies.
63. *Institution Experience.* Experience in the minor problems of administration.
70. *Food Preparation.* (For social workers, dental and public health nurses.)
71. *Elementary Dietetics.* (For social workers, dental and public health nurses.)
72. *Special Problems in Home Management.* (For social workers, dental and public health nurses.)
103. *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.
104. *Field Work in Nutrition.* Laboratory, case, and group work on problems of feeding.
105. *Experimental Cookery.* An intensive study of problems in foods and food preparation with individual laboratory problems.
108. *Nutrition II. Metabolism* including work on tissues, blood, milk, and urine.
109. *Advanced Nutrition.* Selected quantitative methods applicable to investigations relating to digestion and metabolism.
110. *Special Problems in Dietetics.* An intensive study of problems relating to diet involving assigned readings, discussions, and field work.
111. *Special Food Problems.* A continuation of experimental cookery involving more advanced problems.
112. *Special Food Problems.* Same as Course 111 but a more extended course.
122. *Advanced Textiles.* An intensive study of general textile applications and experimental study of some special textile problems.
123. *Clothing Economics.* General consideration of the economic problems in clothing production; health aspects; conservative styles; the clothing budget.
126. *Textile Analysis and Related Problems.* Problems and application of quantitative methods in textile analysis with special reference to establishing standards for fabrics.
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. Budget Problems. An intensive study of problems relating to individual and family budgets. Readings, discussions, and field work.
- 151. Institution Management Problems. Lectures and discussions of the problems involved in institution management; organization; service; institution planning, decoration, and equipment; budgets; and the study of different types of institutions.
- 180. Nutrition in Disease. A study of the fundamental principles involved in using diet in the treatment of certain diseases.
- 181. Digestion and Metabolism. An intensive study of problems relating to digestion and metabolism involving lectures, readings, demonstrations, and laboratory work.

HOME ECONOMICS EDUCATION

COLLEGE OF EDUCATION

The university teacher's certificate will be granted only to graduates of the College of Education. Students expecting to receive this certificate upon graduation shall be registrants in the College of Education from the beginning of the junior year. No formal application is necessary 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. Curricula, equipment, methods of teaching for home economics. Required of all students preparing to teach.
- 43. Organization and Methods for Related Art Teaching. Organization of a related art course and methods of teaching art principles as applied to familiar objects and processes.
- 46. Observation and Teaching: Related Art. A course similar to 47, but dealing with the teaching of related art.
- 47. Observation and Teaching: Foods and Home Management. Observation of teaching in regular classes; criticism and discussion of class practice, lesson plans, methods, result, and examinations; preparation of lesson plans, and directed teaching of foods and cookery, and home management.
- 48. Observation and Teaching: Textiles and Clothing. A course similar to 47, but dealing with the teaching of textiles and clothing.
- 49. Observation and Teaching: General Home Economics. A combination of 47 and 48 giving the student experience in teaching both fields of work. Required of students in the general teaching course. Those who have completed 46, 47, or 48 may register and receive 2 credits.
- 141. Problems in Vocational Education in Home Economics. The place and development of home economics in the vocational education pro-

gram. Study of the problems of the all day, evening, and part time schools.

142. Educational Measurement in Home Economics. Survey of accomplishment in this field; evaluation and construction of objective tests.

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.
21. Small Fruit Culture. Cultural practices for each of the small fruits. Brief consideration is given to their botanical relationships and the history of their commercial development. Lectures, problems, and survey of literature.
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. Plant Materials I. Deciduous and evergreen trees, shrubs and vines, identification; fall and winter characters and use in landscape gardening. Lectures, field trips, and problems.
72. Plant Materials II. Deciduous and evergreen trees, shrubs and vines, herbaceous perennials, biennials, annuals, and bulbs, identification; spring and summer characteristics; use in landscape gardening. Lectures, field trips, and problems.
73. History of Landscape Gardening. Literature and development of landscape gardening from ancient to modern times and influences that have affected the different periods. Lectures, assigned readings, field trips, and reports.
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 in 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.

77. Principles of Landscape Design (for senior professional agriculture engineers only). A study of the principles underlying the arranging of land and landscape for human use and enjoyment.
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.
109. Principles of Genetics. Same as Agronomy 131.
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.
- 131-132. Advanced Vegetable Production. Methods of crop production in the various specified branches of the vegetable industry.
135. Potato Production. A study of the growth, climatic requirements, regional distribution, standardization of varieties according to soil, climate, and markets. Seed plots and seed certification, cultural methods, storage, and marketing.
- 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.

MATHEMATICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

5. Higher Algebra.
8. Commerce Algebra.

For additional courses and course descriptions see 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.

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 For special fees for these courses and practice fees see General Information Bulletin.

- 1-2-3. Freshman Physical Education.
- 4. Freshman Hygiene. Required of all freshmen. Fall quarter A-H; winter quarter I-R; spring quarter S-Z.
- 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 primarily 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 year 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 bodily 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 4), 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 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.

- 1-2-3. Elementary Physical Training. Lighter forms of 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.
- 7-8-9. Sophomore Physical Training.
- 10-11-12. Sophomore Orthopedic Gymnastics.
- 13-14-15. Sophomore Interpretive Dancing.
- 16-17-18. Sophomore Games and Folk Dances.
- 19-20-21. Sophomore Major Sports.
- 22-23. Sophomore Elementary Swimming.
- 28-29 Sophomore Advanced Swimming
- 30. Sophomore Figure Skating.

- 31. General Swimming.
- 32-33-34. Hockey, Basket-Ball, and Baseball.
- 36. Winter Sports.
- 43-44-45. Play and the Playground.
- 66-67-68. Interpretive Dancing.
- 69-70-71. Advanced Interpretive Dancing.

For additional courses and course descriptions see the bulletin of the College of Education.

PHYSICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

- 1. Elements of Mechanics and Sound.
- 2. Elements of Mechanics Laboratory.
- 9. Acoustics.
- 21. Heat.
- 22. Heat Laboratory.
- 31. Optics.
- 32. Optics Laboratory.
- 41. Magnetism and Electricity.
- 42. 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.
- 57.² Physiologic Chemistry.
- 58-59.¹ Human Physiology.
- 100-101.² Physiologic Chemistry.
- 103.² Physiology of Muscle, Nerve, Blood, Circulation, and Digestion.
- 104.² Physiology of the Nervous System and Special Senses.

For additional courses and course descriptions see the bulletin of the Medical School.

PLANT PATHOLOGY AND BOTANY

- 1. Plant Pathology. Plant diseases due to fungi, bacteria, and slime molds; life histories and preventive methods. Lectures, laboratory, and reference. Not open to those who have completed 10.
- 7-8. Weeds and Grasses. Agricultural and applied botanical study of weeds and grasses with special reference to agricultural importance.

¹ Courses 57 and 58-59 constitute a sequence recommended for students who wish a fair 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.

² The lectures only of these courses may be registered for as 100x, etc.

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.
14. Plant Disease Control. A detailed study of methods of controlling diseases of plants. Practical applications.
- 105-106-107. Mycology. Morphology and taxonomy of fungi. Lectures, laboratory, greenhouse, and field work.
108. Methods. Plant pathological methods including mycological and bacteriological technique. Laboratory, lecture, and greenhouse work. Special problems.
110. Principles of Pathology. Physiology of plant pathogens; parasitism, physiological specialization, host reactions, predisposition, resistance, and immunity.
111. Diseases of Field Crops. Detailed study of diseases of cereal and forage crops, including symptomatology, etiology, and practical methods of control. Laboratory, lecture, and field work.
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 1926-27.)
113. Diseases of Vegetable Crops. A detailed study of diseases of potatoes and other vegetable crops. Lecture, reference, laboratory, and greenhouse work. (Given in alternate years. Offered in 1925-26.)
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. Offered in 1926-27.)
116. Pathological Histology. A study of the histological changes in diseased plants. Lectures, laboratory, and reference work.

POLITICAL SCIENCE

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

1. American Government.
7. State Government.
- 51-52-53. Business Law.

For additional courses and course descriptions see the bulletin of the College of Science, Literature, and the Arts.

POULTRY HUSBANDRY

1. Poultry. The magnitude of the poultry industry, 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.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

MEDICAL SCHOOL

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.
58. Maternal and Child Hygiene.
59. Social Hygiene.
60. The Tuberculosis Problem.
61. Mental Hygiene.
73. Occupational Hygiene and Disease.
80. Educational Hygiene.
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.
- 1-6. General Psychology for Business Students.
3. Psychology Applied to Daily Life.
- 4-5. Introductory Laboratory Psychology.
7. Introductory Laboratory 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.

20. Writing for the Press. For students who may wish to acquire some knowledge of the rules governing writing for newspapers and other periodicals.

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, supplementary reading.
3. Rhetoric III. Description, narration, supplementary reading.
11. Argumentation. Gathering evidence, reasoning, briefing, formal and informal argument, persuasion, debating.
22. Public Speaking. A practical course in fundamentals of speech making. Rules of order and practice in conducting assemblies included.
24. Advanced Public Speaking. Problems of speech and leadership of county agents, teachers, and college graduates in general.
26. Parliamentary Law. Theoretical study and practical usage in conduct of occasional and regular meetings of organizations. One hour lecture, one hour practice.
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.

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.
- 50-51-52. Elementary French Conversation.
- 53-54-55. Elementary French Composition.

Spanish

- 1-2. Beginning Spanish.
- 3-4. Intermediate Spanish.
- 20. Oral and Written Spanish.
- 50-51-52. Spanish Conversation.
- 53-54-55. Spanish Composition.
- 65-66-67. 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. Modern Social Reform Movements.
- 14. Rural Sociology.
- 45. Social Statistics.
- 55. Housing Problems.
- 60. Child Welfare.
- 100. Social Psychology.
- 110. Methods of Community Organization and Social Work in Small Towns and Country.
- 112. The Rural Social Survey.
- 114. Rural Social Institutions.
- 115. The Rural Church As a Social Institution.
- 119. The Family.
- 120. Social Progress.
- 134. Legal Protection of the Child.

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 soil problems 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.
105. Minnesota Soils. Detailed study of the soils of Minnesota. Origin, formation, and classification; physical and chemical characteristics; moisture relations; response to manures, fertilizers, and soil amendments; naturally unproductive types and their reclamation. Lectures and laboratory.
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, moisture equivalent, and hygroscopic coefficient.

VETERINARY MEDICINE

2. Anatomy of Domestic Animals. Anatomy of the common farm animals with special reference to bones, muscles, and viscera. Lectures and demonstrations.
- 3-4. Comparative Physiology. A recitation and lecture course in physiology with special reference to the physiology of domesticated animals. Special emphasis is given to digestion and metabolism.
6. Physiology and Hygiene of Breeding. Anatomy and physiology of reproduction. Embryology, obstetrics, sterility, hygiene, and common diseases of breeding animals.
8. Veterinary Studies.¹ Study of causes, prevention, treatment of common diseases; simple surgical operations; lameness and unsoundness; common medicines. Planned especially for students taking only one quarter veterinary work.
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.
13. Non-Infectious Diseases. General principles of diagnosis, causes, morbid anatomy, symptomatology, prevention, and the basis of treatment of the non-infectious diseases of animals. Those who have completed Course 8 can obtain only half credit for this course.
- 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.

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.

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

*The College of Agriculture, Forestry,
and Home Economics*

Part II

Announcement of Program for the Year
1927 - 1928



Vol. XXX No. 37 April 25 1927

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FRESHMAN WEEK

Every student entering any department of the University for the first time as a freshman in the fall of 1927 is required to be here throughout the week before the opening of classes. Every new freshman must present himself at the registrar's office either Friday, September 16, Saturday, September 17, or Monday, September 19, to begin the process of registration. Those coming later than 5:00 p.m. Monday, September 19, will be subject to the usual penalty for late registration. See Penalty Fees, page 47 of the bulletin of general information.

During the week September 20 to 24, in addition to carrying out their registration, freshmen will meet for lectures on such subjects as how to study, the use of the library, important university and college regulations, and will visit the library, the scientific laboratories, and other points of interest to them in connection with their choice of studies and of their future occupations.

During this week there will be the usual physical examinations and psychological tests and such other examinations as will enable the faculty to place the students in classes for which they are best fitted.

The general purpose of the Freshman Week is to help the student to make a good start on his work and to adjust himself to the new and perplexing conditions of university life.

NOTICE THAT ATTENDANCE THROUGHOUT FRESHMAN WEEK IS A REQUIREMENT

It is recommended that as many as possible present themselves for registration on Friday, September 16, in order to avoid the inconvenience and delay incident to the congestion on the last day.

1927							1928													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2	1	2	3	4	5	6	7	1	2	3	4	5	6	7
3	4	5	6	7	8	9	8	9	10	11	12	13	14	8	9	10	11	12	13	14
10	11	12	13	14	15	16	15	16	17	18	19	20	21	15	16	17	18	19	20	21
17	18	19	20	21	22	23	22	23	24	25	26	27	28	22	23	24	25	26	27	28
24	25	26	27	28	29	30	29	30	31	..	..	..	..	29	30	31	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
AUGUST							FEBRUARY							AUGUST						
..	1	2	3	4	5	6	..	..	..	1	2	3	4	..	..	..	1	2	3	4
7	8	9	10	11	12	13	5	6	7	8	9	10	11	5	6	7	8	9	10	11
14	15	16	17	18	19	20	12	13	14	15	16	17	18	12	13	14	15	16	17	18
21	22	23	24	25	26	27	19	20	21	22	23	24	25	19	20	21	22	23	24	25
28	29	30	31	..	..	..	26	27	28	29	..	..	..	26	27	28	29	30	31	..
..
SEPTEMBER							MARCH							SEPTEMBER						
..	..	..	..	1	2	3	..	..	..	..	1	2	3	..	..	..	..	..	..	1
4	5	6	7	8	9	10	4	5	6	7	8	9	10	2	3	4	5	6	7	8
11	12	13	14	15	16	17	11	12	13	14	15	16	17	9	10	11	12	13	14	15
18	19	20	21	22	23	24	18	19	20	21	22	23	24	16	17	18	19	20	21	22
25	26	27	28	29	30	..	25	26	27	28	29	30	31	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	..	..	..	..	..	..
OCTOBER							APRIL							OCTOBER						
..	..	..	..	..	..	1	1	2	3	4	5	6	7	..	1	2	3	4	5	6
2	3	4	5	6	7	8	8	9	10	11	12	13	14	7	8	9	10	11	12	13
9	10	11	12	13	14	15	15	16	17	18	19	20	21	14	15	16	17	18	19	20
16	17	18	19	20	21	22	22	23	24	25	26	27	28	21	22	23	24	25	26	27
23	24	25	26	27	28	29	29	30	..	..	..	..	..	28	29	30	31	..	..	..
30	31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER						
..	..	1	2	3	4	5	..	..	1	2	3	4	5	..	..	..	..	1	2	3
6	7	8	9	10	11	12	6	7	8	9	10	11	12	4	5	6	7	8	9	10
13	14	15	16	17	18	19	13	14	15	16	17	18	19	11	12	13	14	15	16	17
20	21	22	23	24	25	26	20	21	22	23	24	25	26	18	19	20	21	22	23	24
27	28	29	30	..	..	..	27	28	29	30	31	..	..	25	26	27	28	29	30	..
..
DECEMBER							JUNE							DECEMBER						
..	..	..	..	1	2	3	..	..	..	..	..	1	2	..	..	..	..	..	..	1
4	5	6	7	8	9	10	3	4	5	6	7	8	9	2	3	4	5	6	7	8
11	12	13	14	15	16	17	10	11	12	13	14	15	16	9	10	11	12	13	14	15
18	19	20	21	22	23	24	17	18	19	20	21	22	23	16	17	18	19	20	21	22
25	26	27	28	29	30	31	24	25	26	27	28	29	30	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	31	..	..	..	..	..

CALENDAR

DEPARTMENT OF AGRICULTURE

1927-28

1927

Fall Quarter

September	15	Thursday	Payment of fees closes, except for new students
September	15-17		Entrance examinations (for removal of entrance deficiencies)
September	16-19		Registration of all new students entering the freshman class
September	19-23		Examinations for removal of conditions Physical examinations
September	20-24		Freshman week
September	22-23		Registration days ¹ for students with advanced standing and old students not previously registered.
September	23	Friday	Payment of fees for new students closes
September	26	Monday	Fall quarter classes begin, 8:15 ² a.m.
October	3	Monday	First term School of Agriculture begins
October	20	Thursday	Senate meeting, 4:30 p.m.
October	22	Saturday	Homecoming Day
November	11	Friday	Armistice Day; a holiday
November	24	Thursday	Thanksgiving Day; a holiday
December	1	Thursday	State Day Convocation
December	1-10		Ice Cream Operators' Short Course
December	14-17		Final examination period
December	15	Thursday	Commencement Convocation Senate meeting, 4:30 p.m.
December	17	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	21	Wednesday	Payment of fees closes for all students in residence fall quarter ³
December	23	Friday	First term School of Agriculture closes

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration in Part I.

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 on the Minneapolis campus.

³ New students must pay fees on dates announced for registration.

Winter Quarter

December	27-29		Entrance examinations
1928			
January	3	Tuesday	Registration day ¹ for new students Second term School of Agriculture begins
January	4	Wednesday	Christmas vacation ends, winter quarter classes begin, 8:15 ² a.m.
Jan. 4-Feb.	5		Creamery Operators' Short Course
January	16-21		Farmers' and Home-Makers' Week Short Course
Jan. 30-Feb.	4		Nurserymen's Short Course
February	13	Monday	A holiday (February 12, Sunday, Lin- coln's Birthday)
February	16	Thursday	Charter Day Convocation Senate meeting, 4:30 p.m.
February	22	Wednesday	Washington's Birthday; a holiday
Feb. 23-March	3		Advanced Creamery Operators' Short Course
March	13-14		Banker-Farmer Short Course
March	14-17		Final examination period
March	15	Thursday	Commencement Convocation Payment of fees closes for all students in residence winter quarter ³
March	17	Saturday	Winter quarter ends, spring vacation be- gins, 5:30 p.m.

Spring Quarter

March	19-21		Entrance examinations
March	21	Wednesday	Second term School of Agriculture closes
March	22-24		Horticulture Short Course
March	23-24		Registration days ¹ for new students
March	26	Monday	Spring vacation ends, spring quarter classes begin, 8:15 ² a.m.
April	4-9		Home Nursing Short Course
April	6	Friday	Good Friday; a holiday
May	10	Thursday	Cap and Gown Day Convocation
May	10-12		Editors' Short Course
May	15-18		Beekeepers' Short Course

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration in Part I.

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 on the Minneapolis campus.

³ New students must pay fees on dates announced for registration.

May	17	Thursday	Senate meeting, 4:30 p.m.
May	30	Wednesday	Memorial Day; a holiday
June	4-9		Boys' and Girls' Short Course
June	6-9		Final examination period
June	9	Saturday	Spring quarter closes, 5:20 p.m.
June	10	Sunday	Baccalaureate service
June	11	Monday	Fifty-sixth annual commencement

Summer Quarter

June	15-16		Summer Session first term begins, registration and payment of fees
June	18	Monday	Classes begin, 8:00 a.m.
July	4	Wednesday	Independence Day; a holiday
July	21-22		Veterinary Short Course
July	28	Saturday	Registration and payment of fees for second term closes
July	30	Monday	Second term classes begin
August	1-12		Forestry, Woodcraft, and Scouting Short Course
September	1	Saturday	Second term Summer Session closes

COURSES OF STUDY

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.

TECHNICAL AGRICULTURAL COURSES

REQUIRED SUBJECT COURSES

Freshman year.—Freshman lectures; Mil. Sci. 1-2-3; Phys. Ed. 4 or Prev. Med. 3; Agr. Eng. 13, 28, 31, or 37; Agr. Eng. 9-10 or 11 or Math. 5 or 8; Agron. 1; An. Husb. 1; Bot. 4-5, 6, 9, 21, or 22; Chem. 1-2-3 or 9-10; Dy. Husb. 1; Hort. 6 or 32; Rhet. 1, 2, 3.
Sophomore year.—Mil. Sci. 4-5-6; Agr. Biochem. 7-8; Agr. Econ. 1, 2; Agr. Eng. 3, 23; An. Biol. 14-15-16; Bact. 51; Soils 4, 5.
Junior year.—Rhetoric 11 or 31, 22.

ELECTIVE SUBJECT COURSES

General Courses in Agriculture

Junior year.—Agr. Biochem. 15; Agr. Econ. 140; Agron. 11, 121, 122, 123, 131; An. Husb. 2-3, 8; Ent. 3; Hort. 6 or 32.
Senior year.—Agr. Econ. 141; Agr. Eng. 7; Agron. 102, 103; An. Husb. 5; Dy. Husb. 6, 101; Pl. Path. 1; Sociol. 14; Vet. 9-10.

General Course in Agricultural Economics

Consult division for outline of course of study.

Agricultural Education

Same as general course in Agriculture omitting Agr. Biochem. 15, Agr. Eng. 7, Agron. 11, An. Husb. 5, and adding the following:
Junior year.—Agr. Ed. 11, 21, 41, 131.
Senior year.—Agr. Ed. 42, 75, 151; Agr. Eng. 40. Agr. Ed. 154 may be substituted for Sociol. 14.

Agricultural Engineering

Same as general course in Agriculture omitting Agr. Biochem. 15, Agr. Econ. 141, Agron. 123, Hort. 6 or 32, Vet. 9-10 and adding the following:
Junior year.—Agr. Eng. 5, 13, 14, 31.
Senior year.—Agr. Econ. 142, Agr. Eng. 19, 24, 25, 32, 37.

General Course in Agricultural Extension

Same as course in Agricultural Education omitting Agr. Ed. 21, 41, 42, 151, 154, and adding Agr. Ed. 81.

General Course in Animal Husbandry

Same as general course in Agriculture omitting Agron. 121, An. Husb. 8, Dy. Husb. 6, 101, Hort. 6 or 32, Sociol. 14, Vet. 9-10 and adding the following:
Junior year.—An. Husb. 4, 9; Vet. 2, 3-4.
Senior year.—An. Husb. 6, 7, 101, and one of the following: 102, 103, 104, or 105; Vet. 6.

General Course in Dairy Husbandry

Same as general course in Agriculture omitting Agr. Econ. 141, Agr. Eng. 7, Agron. 11, An. Husb. 8, Ent. 3, Hort. 6 or 32, Vet. 9-10 and adding the following:
Junior year.—Agr. Eng. 40; Dy. Husb. 2, 104; Vet. 2, 3-4.

8 AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Senior year.—Agr. Econ. 110, 131; Agron. 104; An. Husb. 105; Dy. Husb. 103, 105, 106, 107; Vet. 6.

General Course in Dairy Products

Arrange course with adviser on major-minor plan.

General Course in Farm Management

Same as general course in Agriculture adding the following:

Junior year.—Agron. 101.

Senior year.—Agron. 104.

General Course in Horticulture

Same as general course in Agriculture omitting Agr. Econ. 141, Agron. 122, Dy. Husb. 6, 101, and adding the following:

Junior year.—Bot. 22; Hort. 21, 56, 135.

Senior year.—Agr. Econ. 142; Hort. 93, 107 or 131, 193-194. Hort. 110 may be substituted for An. Husb. 5.

Landscape Gardening

Junior year.—Arch. 21-22-23; For. 27; Hort. 50, 56, 71, 72, 73; Pl. Path. 1 or 10; Soils 4, 5.

Senior year.—Agr. Eng. 19, 31; Ent. 3; Hort. 74, 75, 76, 190-191-192; Pol. Sci. 51-52.

OPEN ELECTIVE COURSE OF STUDY

In addition to the required subject courses a major of 24 to 36 credits may be chosen from one of the following groups: (a) Agricultural Economics and Farm Management, (b) Animal Industry, (c) Agricultural Sciences, and Plant Industry, (d) Agricultural Engineering; together with a minor of 18 credits from any group except that chosen for the major. Not more than half of the remaining electives can be chosen from the same groups as the major and minor.

AGRICULTURAL SCIENCE

Freshman year.—Freshman lectures; Mil. Sci. 1-2-3; Phys. Ed. 4 or Prev. Med. 3; An. Biol. 14-15-16 or Bot. 4-5-6; 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; An. Biol. 14-15-16 or Bot. 4-5-6; Bact. 51; 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 electives in applied or technical agriculture.

AGRICULTURAL ENGINEERING

(Professional Course)

Freshman year.—See bulletin of the College of Engineering and Architecture.

Sophomore year.—Mil. Sci. 4-5-6; Agr. Eng. 13, 19-20, 24-25, 31, 40; Agron. 1; Hort. 6, 32; M.&M. 24, 25, 84; Soils 4, 8.

Junior year.—Agr. Econ. 1, 2; Agr. Eng. 7, 12, 42, 54, 133; An. Husb. 15; C.E. 37, 51; Dy. Husb. 1; Geol. 5; M.&M. 85, 86; M.E. 38.

Senior year.—Agr. Eng. 37, 121, 122, 126, 150; Agron. 102, 103; C.E. 144; Econ. 85; G.E. 101, 193.

AGRICULTURE—PRE-BUSINESS

Freshman year.—Same as for Agriculture.

Sophomore year.—Mil. Sci. 4-5-6; Agr. Econ. 1, 2, 6, 8, 25, 60; An. Biol. 14-15-16; Econ. 26 or Agr. Econ. 47; Psy. 1-6.

Junior and senior years.—See bulletin of the School of Business Administration.

FORESTRY

REQUIRED SUBJECT COURSES

Freshman year.—Freshman lectures; Mil. Sci. 1-2-3; Phys. Ed. 4 or Prev. Med. 3; Agr. Eng. 3; Bot. 4-5-6; Chem. 1-2-3 or 9-10; For. 1, 3-4; Rhet. 1-2-3; Math. 5-6; (summer at Itasca Park).

Sophomore year.—Mil. Sci. 4-5-6; Agr. Econ. 1, 2; Agr. Eng. 19-20, 23; An. Biol. 14-15-16; For. 7-8; Geol. 1 or 29; Pl. Path. 10; Rhet. 11 or 22 or 31.

Junior year.—Agr. Eng. 24-25; Ent. 6; For. 28, 33-34, 126, 127, 130, 131.

Senior year.—For. 37, 134-135.

ELECTIVE COURSES

See elective groups in Part I of the bulletin.

HOME ECONOMICS

REQUIRED SUBJECT COURSES

Freshman year.—Freshman lectures; Phys. Ed. 1-2-3, 4; Agr. Eng. 23; An. Biol.¹ 14-15, 16 or Bot. 8; Chem. 1-2-3 or 9-10; H.E. 3, 11, 50, 51; Rhet. 1-2-3.

Sophomore year.—Phys. Ed. 22; Agr. Biochem. 3-4; Bact. 51; H.E. 13, 15, 21 or 26, 22; Physiol. 4; Psy. 1-2; Rhet. 22; Sociol. 1.

Junior year.—Agr. Econ. 1; H.E. 52, 53; H.E. Ed. 40; Prev. Med. 52; Rhet. 11 or 31, or Pub. 20.

Senior year.—H.E. 34, 35,² 131.

ELECTIVE SUBJECT COURSES

General Course in Home Economics

Junior year.—H.E. 23, 108.

Senior year.—Agr. Econ. 126; H.E. 17, 103, 104

Course in Foods and Nutrition

Same as the general course omitting H.E. 13 and 17 with the addition of the following:

Junior year.—Agr. Biochem. 2, H.E. 105, 109.

Senior year.—H.E. 110, 111.

Course in Textiles and Clothing

Same as the general course omitting H.E. 23, 103, 104, 108 and adding the following:

Junior year.—Agr. Biochem. 2; H.E. 55, 123.

Senior year.—H.E. 18, 122, 126, 163.

Course for Dietitians

Same as the general course omitting Agr. Econ. 126, H.E. 13, 17, 104 and adding the following:

Junior year.—Agr. Biochem. 2; Ed. Psy. 55 or Agr. Ed. 11; H.E. 109; H.E. Ed. 42.

Senior year.—H.E. 61, 63, 105, 151, 156.

¹ May be postponed to the sophomore year with the approval of the adviser.

² A special project in the field of home management may be substituted or required at the discretion of the Home Economics Division.

Course in Institution Management

Same as the general course omitting Agr. Econ. 126, H.E. 13, 17, and adding the following:

Junior year.—H.E. 61, 63.

Senior year.—Agr. Econ. 25, 140, 142; H.E. 105, 151.

Teachers' Course in General Home Economics¹

Same as the general course with the addition of the following:

Junior year.—Ed. Psy. 55 or Agr. Ed. 11; Hist. and Phil. of Ed. 5; H.E. Ed. 42.

Senior year.—H.E. Ed. 49.

Course in Home Economics Extension¹

Same as the Teachers' Course in General Home Economics with the addition of the following:

Junior year.—Agr. Ed. 75; Sociol. 14.

Senior year.—H.E. 44.

Teachers' Course in Foods and Home Management¹

Same as the general course omitting H.E. 17 and adding the following:

Junior year.—Ed. Psy. 55 or Agr. Ed. 11; Hist. and Phil. of Ed. 5; H.E. Ed. 42.

Senior year.—H.E. 105, 111; H.E. Ed. 47.

Teachers' Course in Textiles and Clothing¹

Same as the course in Textiles and Clothing omitting Agr. Biochem. 2, H.E. 126 and adding the following:

Junior year.—Ed. Psy. 55 or Agr. Ed. 11; Hist. and Phil. of Ed. 5; H.E. Ed. 42.

Senior year.—H.E. Ed. 48.

Teachers' Course in Related Art¹

Same as the Teachers' Course in Textiles and Clothing omitting Agr. Econ. 126, H.E. 18, 122, H.E. Ed. 48 and adding the following:

Junior year.—Art Ed. 4-5-6, 7-8-9; H.E. 163.

Senior year.—Art Ed. 29-30-31; H.E. 57, 162; H.E. Ed. 46, 160.

¹ Offered jointly with the College of Education and leads to the university 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—Thursdays, IV hour, University Armory.

CLASS SCHEDULE

Other schools and colleges.—For programs of classes given in other schools and colleges of the University, not listed below, send to the registrar, University of Minnesota, Minneapolis.

Abbreviations.—The following abbreviations are used to indicate names of buildings, those marked with an asterisk (*) are located on the Minneapolis campus; all others are at University Farm:

A, *Armory	Gy, Gymnasium
AB, *Animal Biology	HE, Home Economics
Ad, Administration	HH, Haecker Hall
B, *School of Business Administration	Hr, Horticulture
BB, Beef Barn	IA, *Institute of Anatomy
BCh, Biochemistry	Lib, *Library
Bot, *Botany	MH, *Millard Hall
C, *Chemistry	MS, Meat Shop
Ch, Agricultural Chemistry	Mu, *Music
CWI, *Child Welfare Institute	OL, *Old Library
Da, Old Dairy Hall	P, *Pillsbury Hall
DB, Dairy Barn	Ph, *Physics
DiH, Dining Hall	PP, Plant Pathology
E, *Main Engineering	Psy, *Psychology
Ed, *Education	S, *Stadium
En, Agricultural Engineering	St, Stock Pavilion
F, *Folwell Hall	Ve, Veterinary
FH, Farm House	WGm, *Women's Gymnasium
G, *Greenhouse	WH, Women's Hall

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.

PROGRAM

1927-28

AGRICULTURAL BIOCHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
2f	Quantitative Methods (5 cred.; jr., sr.; prereq., Chem. 10 cred.)	VI, VII, VIII, IX	MWF	108BCh	Mr. Franke
3f-4w	Types of Carbon Compounds (6 cred.; soph., jr., sr.; prereq., Chem. 10 cred.) (Limited to 40 each)				
	Sec. 1	I	MWF	116BCh	Mr. Bailey
	2	I	TThS	116BCh	Mr. Sandstrom
3w-4s	Types of Carbon Compounds (Same as 3f-4w) (Limited to 40)	I	MWF	113BCh	Mr. Sandstrom
7f-8w	General Agricultural Biochemistry .. (10 cred.; soph., jr., sr.; prereq., Chem. 10 cred.)				
	Lect.	II	TThS	113BCh	Mr. Willaman
	Lab.	VII, VIII, IX	MW	102BCh	
7w-8s	General Agricultural Biochemistry .. (Same as 7f-8w)				
	Lect.	III	TThS	113BCh	Mr. Willaman
	Lab.	VII, VIII, IX	MF	108BCh	
9w-10s	General Biochemistry for Students in Forestry (10 cred.; soph., jr., sr.; prereq., Chem. 10 cred.)				
	Lect.	VI	MWF	116BCh	Mr. Franke
	Lab.	VII-IX	WF	102BCh	
15f	Principles of Animal Nutrition (3 cred.; jr., sr.; prereq., 7-8)	III	MWF	116BCh	Mr. Palmer
101f-102w	Agricultural Quantitative Analysis .. (6 cred.; jr., sr.; prereq., 7-8)	VI, VII, VIII	MWF	208BCh	Mr. Bailey
103s	Dairy Chemistry (5 cred.; jr., sr.; prereq., 7-8)				
	Lect.	VI	MWF	116BCh	Mr. Palmer
	Lab.	VII, VIII, IX	MWF	208BCh	Mr. Palmer
106f, w, s	Biochemistry in Industry (1 cred.; jr., sr.; prereq., org. chem.)	At	At	At	Mr. Willaman
108s	Chemistry of Wheat and Wheat Products (3 cred.; jr., sr.; prereq., 3-4 or 7-8)	I	MWF	116BCh	Mr. Bailey
110s	Flour Laboratory Methods (3-5 cred.; jr., sr.; prereq., 101-102 or Technol. Chem. 100-101-102)	VI, VII, VIII, IX	MWF	202BCh	Mr. Bailey
111f-112w	Phytochemistry (6 cred.; sr.; prereq., Biol., 9 cred., org. chem.)	III VI	MWF Th	113BCh 113BCh	Mr. Gortner

† The full course must be completed before credit will be given.
‡ A total of not more than 6 credits may be earned in this course.

Same as with 84.

Same

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
113f-114w-115s	Biochemical Laboratory Methods ... (6 cred.; sr.; prereq., quant. anal., parallel 111-112)	VI, VII, VIII VII, VIII, IX	T Th	202, 208BCh	Mr. Sandstrom
116w	Advanced Animal Nutrition ... (3 cred.; jr., sr.; prereq., 15 and 111 or physiologic chem.)	III II	TTh Th	116BCh	Mr. Palmer, Miss Kennedy
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) ... (5 cred.; soph., jr., sr.; no prereq.)	I	MTWThF	204Da	Ar
1w	Principles of Economics I (Same as 1f)				
	Sec. 1 (Agriculture)	I	MTWThF	204Da	<i>Working</i>
	2 (Forestry)	III	MTWThF	204Da	
1f,w,s	Principles of Economics I (Home Economics) ... (Same as 1f)	II(f,w) III(s)	MTWThF	203HE 206Da	
2w	Principles of Economics II (Agriculture) ... (3 cred.; soph., jr., sr.; prereq., 1)	I	TThS	206Da	Ar
2s	Principles of Economics II (Same as 2w)				
	Sec. 1 (Agriculture)	I	TThS	204Da	
	2 (Forestry)	II	MWF	204Da	
6s	Economic History of Agriculture ... (5 cred.; prereq., 1 or parallel)	IV	MTWFS	204Da	Mr. Working
8c	Rural Economics ... (3 cred.; soph., jr., sr.; prereq., 1)	III	TThS	204Da	Mr. Black
25f,w	Principles of Accounting ... (4 cred.; soph., jr., sr.)				
	Lect.	II	MWF	204Da	Mr. Holt
	Sec. 1 Lab.	VIII, IX III, IV	W S	204Da Ar	
40s	Principles of Marketing (Forestry and Home Economics) ... (3 cred.; soph., jr., sr.; prereq., 1)	VI	MWF	204Da	Mr. Price
47s	Marketing Accounting ... (4 cred.; soph., jr., sr.; prereq., 25)	II	TThS	204Da	Mr. Holt
	 Lect.	Ar	Ar	Ar	
60s	Farm Finance ... (5 cred.; soph., jr., sr.; prereq., 2)	I	MTWThF	108Da	Mr. Gile
90f	Agricultural Statistics ... (5 cred.; soph., jr., sr.; prereq., 2)				
	Lect.	III	TThS	204Da	
	Lab.	VI, VII	TTh	204Da	

AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
110f	Economics of Agricultural Production I (3 cred.; jr., sr.; prereq., 2)	I	TThS	206Da	Mr. Black
111w	Economics of Agricultural Production II (3 cred.; jr., sr.; prereq., 110)	I	TThS	108Da	Mr. Black
126s	Economics of Consumption (3 cred.; jr., sr.; prereq., 1)	I	MWF	204Da	Mr. Waite
	Sec. 1	IV	MWF	108Da	
	2	II	TThS	204Da	
130f	Prices of Farm Products (3 cred.; jr., sr.; prereq., 2)	II	TThS	206Da	Mr. Waite
131w	Market Prices (3 cred.; jr., sr.; prereq., 140)	III	TThS	108Da	Mr. Waite
135s	Methods of Forecasting Prices (3 cred.; sr.; prereq., 90, 130)	III	TThS	108Da	Mr. Waite
140f	Principles of Marketing Organization (Agriculture) (3 cred.; soph., jr., sr.; prereq., 2)	I	MWF	108Da	Mr. Price
140s	Principles of Marketing Organization (Agriculture) (Same as 140f)	II	TThS	108Da	Mr. Price
141w	Marketing Organization: Semi-Perishables (3 cred.; jr., sr.; prereq., 140)	II	TThS	204Da	Mr. Price
142s	Marketing Organization: Perishables (3 cred.; jr., sr.; prereq., 140)	III	MWF	108Da	Mr. Price, Mr. Holt
145w-146s	Marketing Management (6 cred.; sr.; prereq., 141)	IV	MWF	206Da	Mr. Holt
161s*	Advanced Farm Finance (3 cred.; sr.; prereq., 60 or Econ. 5)	VI, VII	F	104B	
170s*	Land Economics (3 cred.; jr., sr.; prereq., 110)	VII, VIII	TTh	209B	Mr. Black
171	Land Tenure	Not offered in 1927-28			

For additional courses see Economics and the bulletin of the School of Business Administration.

181. *General Session on 1929 and 1930. Mr. Little*
Field Survey of Occupational Opportunities in Ag. Econ.
AGRICULTURAL EDUCATION
COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
11f	Principles of Vocational Education (3 cred.; jr., sr.; § no prereq.)	III	MWF	202Ad	
11w,s	Principles of Vocational Education (Same as 11f)	II	TThS	202Ad	
21f	Vocational Education (3 cred.; jr., sr.; no prereq.)	III	TThS	202Ad	Mr. Mayne
41f,w,s,‡	Apprentice Teaching (2 cred.; jr., sr.; ¶ prereq., 11)	Ar	At	Ar	Mr. Field, Mr. Lathrop, Mr. Nylin

* Offered on the Minneapolis campus.

‡ A special fee of \$1 per credit hour is charged for this course.

¶ Only students pursuing the Agricultural Education curriculum are eligible to register for this course. Registration limited. Written approval of head of Department of Agricultural Education must be obtained before registration. Students entering this course will be expected to have completed the Agricultural Education curriculum of the preceding quarters.

§ Offered only to those preparing to teach.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
42f,w,s†	Teaching (3 cred.; jr., sr.;¶ prereq., 131 and 2 hon. pts. in 41)	Ar	Ar	Ar	Mr. Field, Mr. Lathrop, Mr. Nylin
53w,s	Visual Presentation (3 cred.; jr., sr.; prereq., 11)				
	Lect.	VI	M	202Ad	Mr. Field
	Lab.	VI, VII	WF	202Ad	
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	118Ad	Mr. Storm, Mr. Peck
82f,w,s	Agricultural Extension Field Course (3 to 10 cred.; jr., sr.; prereq., †† 81)	Ar	Ar	Ar	Mr. Storm, Mr. Peck
121	Teachers' Course, Home and School Gardening (2 cred.; prereq., division approval)	Not offered in 1927-28			
131w,s†	Methods in Teaching High School Agriculture (5 cred.; jr.,** sr.;¶ prereq., 2 hon. pts. in 41)	III	MTWThF	202Ad	Mr. Field
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., 131)	Ar	Ar	Ar	Mr. Lathrop
151w,s†	Organization and Management (5 cred.; sr.;§ prereq., 11, 21)	IV	MTWFS	202Ad	Mr. Storm, Mr. Lathrop
153w,s	Consolidated Rural Schools (3 cred.; jr., sr.;§ prereq., 11)	Ar	Ar	Ar	
154	Rural Education and Community Life (3 cred.; sr.; prereq., 11)	Ar	Ar	Ar	
155	Consolidated Rural School Problems (3 cred.; jr., sr.;§ prereq., 11, 153, or equiv.)	Ar	Ar	Ar	
171w,s	Problems in Procedure (3 cred.; sr.;§ prereq., 42, 131, or equiv.)	Ar	Ar	Ar	Mr. Lathrop
176s	Problems in Visual Presentation (3 cred.; jr., sr.; prereq., 75)	Ar	Ar	Ar	Mr. Field
191f-192w-					
193s	Seminar in Agricultural Education .. (6 cred.; sr.; prereq., 11 cred.)	Ar	Ar	Ar	Mr. Storm, Mr. Lathrop, Mr. Field

† A special fee of \$1 per credit hour is charged for this course.

** Open to juniors on the approval of the chief of the division.

†† Broad curriculum approved by the Agricultural Education Division and a position approved by the Agricultural Extension Division are also prerequisites in this course.

‡ Only students pursuing the Agricultural Education curriculum are eligible to register for this course. Registration limited. Written approval of head of Department of Agricultural Education must be obtained before registration. Students entering this course will be expected to have completed the Agricultural Education curriculum of the preceding quarters.

§ Offered only to those preparing to teach.

AGRICULTURAL ENGINEERING

No.	Title	Hour	Day	Bldg.	Instructor
3f,s	Mechanical Drawing	III, IV	MWF	303En	Mr. Jacobson
	(2 cred.; no prereq.)				
5f	Farm Building Construction	I, II	TThS	48En	Mr. White
	(3 cred.; no prereq.)				
7w	Farm Structures I				
	(3 cred.; jr., sr.; prereq., 3)				
	Lect.	IV	TS	305En	Mr. White
	Lab.	VII, VIII, IX	M	305En	Mr. White
9f,w	Applied Mathematics	III	MTWFS	103En	Mrs. Page
	(3 cred.; no prereq.)				
10w,s	Applied Mathematics	II	TThS	215En	Mrs. Page
	(2 cred.; prereq., 9)				
11f,w	Applied Mathematics	III	MWF	215En	Mr. Neal
	(5 cred.; no prereq.)		TS	105En	Mr. Neal
12s	Farm Machinery	VI, VII, VIII	WF	52En	Mr. Torrance
	(3 cred.; jr., sr.; no prereq.)				
13f	Tractor and Auto Work	VI, VII, VIII	TTh	216,37En	Mr. Torrance
	(3 cred.; no prereq.)				
13w	Tractor and Auto Work	III, IV	MWF	216,37En	Mr. Torrance
	(Same as 13f)				
13s	Tractor and Auto Work	VI, VII, VIII	MF	216,37En	Mr. Torrance
	(Same as 13f)				
14s	Elementary Power Machinery	VI, VII, VIII	TTh	216,37En	Mr. Torrance
	(3 cred.; prereq., 13)				
15	Ignition and Carburetion	Not offered in 1927-28			
19f	Elementary Surveying				
	(3 cred.; prereq., 3, 11, or equiv., or Draw. 3 and M. & M. 12)				
	Lect.	VI	M	215En	Mr. Roe
	Lab.	VI, VII, VIII	WF	215,305En	Mr. Neal
20s	Advanced Surveying				
	(3 cred.; prereq., 19)				
	Lect.	VI	M	215En	Mr. Roe,
	Lab.	VII, VIII, IX	MF	305En	Mr. Neal
23f	General Physics				
	(5 cred.; no prereq.)				
	Lect.	III	TThS	101En	Mr. Romness
	Sec. 1 Lab.	I, II	TS	102En	Mr. Romness
	2	VI, VII	TTh	102En	Mr. Tyler
	3	VI, VII	MW	102En	Mr. Romness
23s	General Physics				
	(Same as 23f)				
	Sec. 1 Lect.	III	TThS	101En	Mr. Stewart
	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
24w	Agricultural Physics I				
	(4 cred.; prereq., 11, 23, or equiv.)				
	Lect.	II	TThS	101En	Mr. Romness
	Lab.	VI, VIII, IX			
			T, W, or F	103En	

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
25s	Agricultural Physics II (4 cred.; prereq., 24)				
	Lect.	II	TThS	101En	Mr. Romness
	Lab.	VII, VIII, IX	W or F	103En	
28w	Land Clearing (3 cred.; jr., sr.; no prereq.)	I	TThS	103En	Mr. Thompson, Mr. Schwantes
31f,w,s	Principles of Drainage (3 cred.; no prereq.)	III	TThS	215En	Mr. Roe
32s	Drainage and Surveying (3 cred.; jr., sr.; prereq., 3, 11, 31 or equiv.)				
	Lect.	VI	T	215En	Mr. Roe
	Lab.	VII, VII, IX	TW	215En	
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. Stewart
37s	Rural Sanitation (3 cred.; no prereq.)	I	TThS	101En	Mr. Stewart
40f	Mechanical Training I (3 cred.; no prereq.)	I, II	MWF	20,106En	Mr. Dent
40s	Mechanical Training I (Same as 40f)				
	Sec. 1	I, II	MWF	20,106En	Mr. Dent
	2	V, VI	TWF	20,106En	Mr. Dent
41w	Mechanical Training II (3 cred.; no prereq.)	I, II	MWF	20,106En	Mr. Dent
67s	Farm Structures II (3 cred.; jr., sr.; prereq., 7)	I, II	TThS	305En	Mr. White
102s	Advanced Drainage Problems (3 cred.; sr.; prereq., 32)	Ar	Ar	Ar	Mr. Roe
112s	Farm Building Problems (3 cred.; sr.; prereq., 67)	VI, VII, VIII	TTh	305En	Mr. White
136s	Experimental Physical Analyses (5 cred.; jr., sr.; prereq., 25)				
	Lect.	IV	TS	101En	Mr. Stewart
	Lab.	VI, VII, VIII	MW or TTh§	103En	

Courses 36, 101, 103, 104, 111, 121, 122, 123, 125, 126, 133, 134, 135, 136, and 150 not offered in 1927-28.

ANIMAL BIOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
14f-15w-16s*	General Zoology (Agr., For., and H.E.)	VI, VII, VIII	TTh	101,313AB	Ar
	(9 cred.; ¶ no prereq.)				

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

* Offered on the Minneapolis campus.

¶ The full course must be completed before credit will be allowed except that students in Home Economics may receive credit for the first two quarters' work when Botany 8 has been satisfactorily completed.

§ May be taken any two of the afternoons listed.

ANIMAL HUSBANDRY

No.	Title	Hour	Day	Bldg.	Instructor
1f,w	Types and Market Classes of Livestock (5 cred.; no prereq.)	I, II	MTWFS	CSt	Mr. Vaughan
2f-3w	Types and Breeds of Livestock (6 cred.; soph., jr., sr.; prereq., 1)	I, II	MWF	WSt	Mr. McCarty
4s	Livestock Judging (3 cred.; jr., sr.; prereq., 2-3)	III, IV	MWF	CSt	Mr. Ferrin
5w	Livestock Breeding (3 cred.; jr., sr.; prereq., Agron. 131)	IV	MWF	3St	Mr. Peters
6w	Livestock Feeding (5 cred.; jr., sr.; prereq., Agr. Biochem. 15)	III	MTWFS	3St	Mr. Ferrin
7f	Meats (3 cred.; 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. Harvey
9s	Pedigrees and Herd Books (3 cred.; jr., sr.; prereq., 5)	II	TThS	3St	Mr. Anderson
15s	Fundamentals of Livestock Production (3 cred.; jr., sr. in prof. Agr. Eng.; no prereq.)	I	TThS	WSt	Mr. Peters
101f	Advanced Stock Judging (3 cred.; sr.; prereq., 4)	VII, VIII	MWF	CSt	Mr. Ferrin
102s	Horse Husbandry (3 cred.; jr., sr.; prereq., 5, 6)				
	Lect.	II	TTh	WSt	Mr. Peters
	Lab.	VI, VII, VIII	F	CSt	
103s	Beef Cattle Husbandry (3 cred.; jr., sr.; prereq., 5, 6)				
	Lect.	III	MW	WSt	Mr. Vaughan
	Lab.	VI, VII, VIII	T	BB	Mr. Harvey
104s	Sheep Husbandry (3 cred.; jr., sr.; prereq., 5,6)				
	Lect.	IV	WF	3St	Mr. Anderson
	Lab.	VI, VII, VIII	M	CSt	
105s	Swine Husbandry (3 cred.; jr., sr.; prereq., 5,6)				
	Lect.	III	TS	3St	Mr. Ferrin
	Lab.	VI, VII, VIII	Th	CSt	Mr. McCarty
106w	Advanced Meats (3 cred.; jr., sr.; prereq., 7)	VI, VII, VIII	WF	MS	Mr. Anderson
107s	Meat Problems (3 cred.; sr.; prereq., 106)				
	Lect.	IV	TS	MS	Mr. Anderson
	Lab.	VI, VII, VIII	W	MS	
108f-109w-110s	Seminar (3 cred.; jr., sr.; prereq., 2-3)	II		F 3St	Mr. Peters
111w	Utilization of Meats (3 cred.; Home Econ. students; no prereq.)	III, IV	MW	MS	Mr. Anderson
			F	MS	

PROGRAM

ARCHITECTURE

COLLEGE OF ENGINEERING AND ARCHITECTURE

No.	Title	Hour	Day	Bldg.	Instructor
21f-22w-23s*	Freehand Drawing				
	(6 cred.; jr., sr.; no prereq.)				
	Sec. 1	II, III	MWF	417ME	Mr. Young
	2	VI, VII	MWF	417ME	Mr. Young

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.	I, II	TThS	404F	Miss Raymond
	2	II, III	TThS	404F	Miss Raymond
	Sec. 1 Lab.	III	TThS	404F	Mrs. Hanley
	2	IV	TThS	404F	Miss Clousing
4f-5w-6s*	Still Life				
	(3 cred.; no prereq.)				
	Sec. 1	III, IV	M	404F	Mrs. Hanley
	2	III, IV	W	404F	Miss Clousing
7f-8w-9s*	Sketch				
	(3 cred.; no prereq.)				
	Sec. 1	I, IV	F	401F	Mr. Hilpert
	2	II, III	F	401F	
	3	III, IV	W	401,402F	Mrs. Hanley
10f-11w-12s*	Composition				
	(3 cred.; no prereq.)				
	Sec. 1	I, II	M	406F	Miss Raymond
	2	III, IV	M	406F	Miss Raymond
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	TThS	401F	Mr. Hilpert
	Lab.	I	TThS	401F	
29f-30w-31s*	Sketch, Course II				
	(3 cred.; soph., jr., sr.; prereq., 7, 8, 9)				
	Sec. 1	I, II	TTh	401F	Miss Raymond
	2	II, III	F	402F	Miss Raymond, Miss Clousing
	3	III, IV	F	401F	Miss Raymond

For additional courses see the bulletin of the College of Education.

BACTERIOLOGY AND IMMUNOLOGY

MEDICAL SCHOOL

No.	Title	Hour	Day	Bldg.	Instructor
51f,w,s*	General Bacteriology	VII, VIII, IX	MWF	Ar	
	(5 cred.; soph., jr., sr.; prereq., chem. and biol.)				

* 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
103w*	Soil Microbiology	I, II, III	TS	MH	Dr. Skinner
	(5 cred.; jr., sr.; prereq., 51)	I, II	Th	MH	
121w	Industrial Bacteriology	I, II	TTh	Ar	Ar
	(3 cred.; jr., sr.; prereq., 51)				
122s*	Industrial Bacteriology (con't)	I, II	TTh	MH	Ar
	(Same as 121)				

For additional courses see the bulletin of the Medical School.

BEE CULTURE

No.	Title	Hour	Day	Bldg.	Instructor
1f,w,s	Elementary Bee Science				
	(3 cred.; no prereq.)				
	Sec. 1	IV	MWF	2FH	Mr. Jager
	2	V	MWF	2FH	Mr. Jager
2f,w	Industrial Beekeeping	V	TTh	2FH	Mr. Thompson
	(3 cred.; no prereq.)	2 hours to be arranged			
2s	Industrial Beekeeping				
	(Same as 2f,w)				
	Sec. 1	IV	TS	2FH	Mr. Thompson
	2	2 hours to be arranged			
		V	TS	2FH	Mr. Thompson
		2 hours to be arranged			
3w,s	Advanced Beekeeping II	Ar	Ar	2FH	Mr. Jager
	(3 cred.; prereq., 1, 2)				

BOTANY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
3su	Forest Botany	Given at Itasca Park			Mr. Rosendahl
	(1½ cred.; no prereq.)				
4f-5w-6s*	General Botany				
	(9 cred.; students in Agr. and For.)				
	Lect.	VIII	TTh	212,214,220P	Mr. Harris,
	Lab.	VI, VII	TTh	212,214,220P	Mr. Huff
8s*	General Botany				
	(5 cred.; students in H.E.; no prereq.)				
	Lect.	II	TThS	210P	Mr. Harris,
	Lab.	I, II	MWF	212,214,220P	Mr. Huff
9s*	Taxonomy of Flowering Plants				
	(3 cred.; prereq., 5 or 8)				
	Lect.	VIII	TTh	212,214,220P	Mr. Rosendahl
	Lab.	VI, VII	TTh	210P	

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

CHEMISTRY

SCHOOL OF CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	General Inorganic Chemistry				
	(8 cred.; no prereq.)				
	Lect.	VII	MWF	100C	Mr. Pervier
	Lab.	VIII, IX	MW	110C	

* Offered on the Minneapolis campus.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
3s*	General Inorganic Chemistry (4 cred.; prereq., 1-2)				
	Lect.	VII	MF	325C	Mr. Pervier
		IV	S	325C	
	Lab.	VIII, IX	MF	110C	
9f-10w*	General Inorganic Chemistry (10 cred.; prereq., 1 yr. h. s. chem.)				
	Lect.	VII	MWF	225C	Mr. Reyerson
	Lab.	VIII, IX	MWF	210C	

For additional courses see the bulletin of the School of Chemistry.

CHILD WELFARE INSTITUTE

No.	Title	Hour	Day	Bldg.	Instructor
50w-51s*	Nursery School Methods (6 cred.; jr., sr.; prereq., 20, 6 cred. in Psy. or Ed.)	VI	MWF	Ar	Mrs. Foster
52f-53w-54s*	Nursery School Technique (6 cred.; jr., sr.; prereq., 50-51 and permission of instructor)	Ar	Ar	105CWI	Mrs. Foster
60f*	The Nursery School and Parental Education Movement (2 cred.; jr., sr.; prereq., 6 cred. in Psy. or Ed.)	VI	TTh	Ar	Miss Dixon
120s*	Health Care of Young Child (2 cred.; sr.; prereq., 50-51 and permission of instructor)	Ar	Ar	4CWI	Dr. Boyd
130s*	The Development of the Small Child (3 cred.; sr., grad.; prereq., 15 cred. in Psy. or equiv. and permission of instructor)	I	TThS	Ar	Mr. Anderson
133f-134w-135s*	Observation and Experimental Methods in Study of Young Child (4 or 6 cred.; sr.; prereq., 10 cred. in Psy. or Ed. Psy., incl. 1 lab. course, or equiv., permission of instructor)	Ar	Ar	201CWI	Miss Good-enough
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.)	VI	MWF	Ar	Miss Dixon
173w-174s*	Technique and Practice of Parental Education (6 cred.; sr., grad.; prereq., 170 and permission of instructor)	Ar	Ar	100CWI	Miss Dixon
190f-191w*	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)	Ar	Ar	201CWI	Miss Good-enough

* Offered on the Minneapolis campus.

DAIRY HUSBANDRY

No.	Title	Hour	Day	Bldg.	Instructor
1f,s	Elements of Dairying (5 cred.; no prereq.) (Limited to 35)				
	Lect.	III	TWS	100HH	Mr. Combs,
	Lab.	III, IV	MF		Mr. Thurston
2w	Dairy Bacteriology (5 cred.; soph., jr., sr.; prereq., Bact. 51) (Limited to 12)	VI, VII, VIII	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. 1)	VI, VII, VIII	Th	DB	Mr. Schaefer
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	MW	210HH	Mr. Macy
103w	Dairy Stock Feeding (3½ cred.; sr.; prereq., 101 Agr. Bio- chem. 15)	VI, VII, VIII	Th		
		III	MWF	210HH	Mr. Eckles
104s	Advanced Study of Dairy Breeds .. (3 cred.; jr., sr.; prereq., 6, 101)	VI, VII, VIII	MW	210HH	Mr. Schaefer
		VI	F	210HH	Mr. Schaefer
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
111f	Dairy Products I (3 cred.; jr., sr.; prereq., 1, 2)	VI	MW	210HH	Mr. Combs,
		VI, VII, VIII	F		Mr. Thur- ston
112s	Dairy Products II (3 cred.; jr., sr.; prereq., 1, 2)	IV	TS	210HH	Mr. Combs,
		VI, VII, VIII	T	210HH	Mr. Coulter
					Mr. Richie
113s	Technical Control (3 cred.; sr.; prereq., 111 or 112)	I, II, III	TTh	210HH	Mr. Combs,
					Mr. Macy
114su	Problems in Dairy Husbandry	Ar	Ar	Ar	Mr. Schaefer
115f,w,s	Problems in Dairy Bacteriology (3 cred.; sr.; prereq., 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., Hist. and Philos. of Ed. 1 or 101-102-103, Ed. Sociol. 3)	I	MWF	Ar	Mr. Peik
119Tf- 120Tw*	The Elementary School Curriculum .. (Same as 119f)	I, II	S	Ar	Mr. Peik

For additional courses see the bulletin of the College of Education.

* Offered on the Minneapolis campus.

† Only two credits allowed those who have completed An. Husb. 8.

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	Psy	Mr. Miller
106f-107w-108s*	Advanced Educational Psychology .. (9 cred.; jr., sr.; prereq., 55 or equiv.)	III	MWF	Psy	Mr. Miller
111s*	Educational Diagnosis (3 cred.; jr., sr.; prereq., 55 or equiv.)	II	MWF	Psy	Mr. Miller

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., An. Biol. 16)	VI, VII, VIII	WF	301Ad	Mr. Ruggles
4w	Economic Vertebrate Zoology (3 cred.; jr., sr.; prereq., An. Biol. 16)	Ar	Ar	Ar	Mr. Johnson
6w	Forest Protection Against Insects .. (3 cred.; soph., jr., sr.; prereq., An. Biol. 16)	VI, VII, VIII	MTh	301Ad	Mr. Graham
8f	Varieties and Habits of Fur Bearing Animals (3 cred.; soph., jr., sr.; prereq., An. Biol. 9 cred.)	Ar	Ar	Ar	Mr. Johnson
37f-38w-39s*	General Entomology (9 cred.; soph., jr., sr.; prereq., An. Biol. 9 cred.)	I, II	MWF	212AB	
44s*	Introductory Course in Animal Parasites and Parasitism (3 cred.; soph., jr., sr.; prereq., An. Biol. 9 cred.)	VI, VII, VIII	WF	212AB	Mr. Riley
117f-118w-119s*	General Ecology of Insects (9 cred.; jr., sr.; prereq., 37-38-39 or equiv.)	VI, VII, VIII	TTh	401AB	Mr. Chapman
125f-126w-127s*	Advanced General Entomology (9 cred.; jr., sr.; prereq., 37-38-39 or equiv.)	III, IV	TThS	212AB	
139f-140w	Histology and Development of Insects (6 cred.; jr., sr.; prereq., 37-38-39 or equiv.)	III, IV II, III	T Th	302Ad 302Ad	Mr. Riley
144f-145w-146s*	Animal Parasites and Parasitism ... (3 to 9 cred.; jr., sr.; prereq., An. Biol. 9 cred.)	VI, VII, VIII	WF	212AB	Mr. Riley
160w	Advanced Forest Entomology (3 cred.; jr., sr.; prereq., An. Biol. 15 or equiv.)	VI, VII, VIII	WF	302Ad	Mr. Graham

* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
175f-176w-177s	Advanced Economic Entomology (9 cred.; sr.; prereq., 3 or 6, An. Biol. 117-118-119)	I	MWF	302Ad	Mr. Strand, Mr. Ruggles
197f,w,s	Introduction to Research (5 or more cred.; sr.; prereq., 37-38-39 or 44 and other work as prescribed by the division)	Ar	Ar	Ar	Mr. Chapman, Mr. Riley, Mr. Ruggles, Mr. Graham, Mr. Mickel

FARM MANAGEMENT, AGRONOMY, AND PLANT GENETICS

No.	Title	Hour	Day	Bldg.	Instructor
1f,w	Farm Crops (3 cred.; no prereq.)	III, IV	MWF	100Ad	Mr. Sprague
101s	Farm Management (3 cred.; jr., sr.; prereq., 1, Agr. Econ. 2)	II	TThS	118Ad	Mr. Bond, Mr. Haverstad
102f	Farm Management: Organization ... (3 cred.; sr.; prereq., 1, Agr. Econ. 2, Soils 4) Sec. 1 Lab. 2	II VI, VII II, III	MW T F	118Ad 118Ad Ar	Mr. Garey
102w	Farm Management: Organization ... (Same as 102f)	I VII, VIII	MW Th	118Ad 118Ad	Mr. Garey
103w	Farm Management: Operation (3 cred.; sr.; prereq., 102)	II VI, VII	MW T	118Ad 118Ad	Mr. Garey
103s	Farm Management: Operation (Same as 103w)	I VII, VIII	MW Th	118Ad 118Ad	Mr. Garey Mr. Garey
104s	Advanced Farm Management (3 cred.; sr.; prereq., 101, 102)	II	MWF	118Ad	Mr. Boss
121f	Grain Crops (3 cred.; jr., sr.; prereq., 1, Bot. 9 cred.)	VI, VII, VIII	TTh	100Ad	
<i>Cancel</i> 122w 1-11-28	Special Crops (3 cred.; jr., sr.; prereq., 1, Bot. 9 cred.)	VI, VII, VIII	TTh	100Ad	Mr. McGinnis
123s	Forage Crops (3 cred.; jr., sr.; prereq., 1, Bot. 9 cred.)	VI, VII, VIII	TTh	100Ad	Mr. Arny, Mr. Sprague
124f,w,s	Advanced Farm Crops (3 cred. per qtr.; sr.; prereq., 127, and 142 or 143, or parallel)	Ar	Ar	Ar	
131f,w	Principles of Genetics (3 cred.; soph., jr., sr.; prereq., Bot. or An. Biol. 9 cred.) Lect. Lab.	I I, II	ThS T	102Ad 102Ad	Mr. Stevenson Mr. Stevenson
132s	Farm Crops Plant Breeding (3 cred.; jr., sr.; prereq., 131)	I I, II	ThS T	102Ad 102Ad	Mr. Stevenson
133w	Judging and Grading Farm Crops .. (3 cred.; jr., sr.; prereq., 121, 122)	I, II	MWF	100Ad	Mr. Arny
134f,w	Laboratory Problems in Genetics ... (2 cred.; jr., sr.; prereq., 131 or parallel)	Ar	Ar	Ar	Mr. Brewbaker

PROGRAM

FORESTRY

No.	Title	Hour	Day	Bldg.	Instructor
1f	General Forestry	I	TThS	102Hr	Mr. Cheyney
	(3 cred.; no prereq.)				
4su	Field Dendrology	Given at Itasca Park			Mr. Wentling
	(1½ cred.; no prereq.)				
3w	Dendrology	III	MWF	102Hr ^{108 Hr.}	Mr. Schmitz
	(3 cred.; no prereq.)				
4s	Dendrology				
	(4 cred.; no prereq.)				
	Lect.	III	MWF	301Hr	Mr. Schmitz
	Lab.	II, III	S	301Hr	Mr. Kribs
5su	Field Silviculture	Given at Itasca Park			Mr. Cheyney
	(1½ cred.; no prereq.)				
7f-8w	Forest Mensuration				
	(10 cred.; all; prereq., 3-4)				
	Lect.	II	MWThF	302Hr	Mr. Brown
	Lab.	VII, VIII, IX (f)	M	302Hr	
		I, II, III(w)	S	302Hr	
9su	Field Mensuration	Given at Itasca Park			Mr. Allison, Mr. Brown
	(1½ cred.; no prereq.)				
13s	Forest Mensuration Laboratory	Given at Cloquet			Mr. Hansen
	(2 cred.; jr., sr.; prereq., 7-8)				
20w	Grazing	II	TThS	301Hr	Mr. Allison
	(3 cred.; soph., jr., sr.; no prereq.)				
23*	Factory Experience	Ar	Ar	Ar	
	(3 to 5 cred.; jr., sr.; prereq., 33-34)				
27w	Farm Wood Lots and Windbreaks ..	IV	MWF	301Hr	Mr. Cheyney
	(3 cred.; no prereq.‡)				
28w	Logging	III	MWF	302Hr	Mr. Brown
	(3 cred.; jr., sr.; prereq., 7-8)				
29f	Sawmill and Woodworking Machin- ery	IV	MWF	302Hr	Mr. Cheyney
	(3 cred.; soph., jr., sr.; prereq., 3-4)				
30s	Wood Seasoning	I	TThS	302Hr	Mr. Wentling
	(3 cred.; jr., sr.; prereq., 33-34)				
31s	Logging Laboratory	Given at Cloquet			Mr. Brown
	(1 cred.; jr., sr.; prereq., 28)				
33f-34w	Wood Structure and Identification ..	VI, VII, VIII	WF	303Hr	Mr. Wentling
	(6 cred.; jr., sr.; prereq., 3-4)				
37w	Forest Protection	III	MWF	^{301 Hr.} 302Hr	Mr. Hansen
	(3 cred.; jr., sr.; prereq., 127)				
47f	Forest Products I	II	TThS	301Hr	Mr. Kribs
	(3 cred.; no prereq.)				
48w	Forest Products II	I	TThS	102Hr	Mr. Allison
	(3 cred.; no prereq.)				
50s	House and Furniture Woods	III, IV	TS	303Hr	Mr. Wentling
	(2 cred.; ‡ soph., jr., sr.; no prereq.)				
101w	Advanced Dendrology	I	TThS	301Hr	Mr. Schmitz
	(3 cred.; jr., sr.; prereq., 3-4)				
107f	Uses of Wood I	IV	MWF	301Hr	Mr. Wentling
	(3 cred.; sr.; prereq., 33-34)				

* Arrangements for this course must be made in advance.

‡ Not open to students majoring in Forestry.

¶ Credit in this course will be allowed only when Course 31 is also completed.

AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
108W	Uses of Wood II (3 cred.; sr.; prereq., 33-34)	IV	MWF	303Hr	Mr. Wentling
109S	Uses of Wood III (3 cred.; sr.; § prereq., 107, 108)	VI, VII, VIII	TTh	303Hr	Mr. Wentling
112W	Advanced Forest Mensuration (3 cred.; sr.; prereq., 10)	Ar	Ar	Ar	Mr. Brown
113f	Wood Pulp and Paper (3 cred.; jr., sr.; prereq., 33-34, Chem. 3 or 10)	IV	MWF T. F. S.	301Hr	Mr. Allison
114f-115W	Mechanical and Physical Properties of Wood (6 cred.; sr.; prereq., 33-34)	I, II	TThS	303Hr	Mr. Wentling
116S	Mechanical and Physical Properties of Wood (3 cred.; sr.; prereq., 33-34)	I, II	MWF	303Hr	Mr. Kribs
119W	Advanced Wood Structure I (3 cred.; sr.; prereq., 33-34)	VI, VII, VIII	TTh	303Hr	Mr. Kribs
120S	Advanced Wood Structure II (3 cred.; sr.; prereq., 33-34)	VI, VII, VIII	WF	303Hr	Mr. Kribs
122f-123W	Forestry Seminar (2 cred.; sr.; prereq., 10, 35, 41, Bot. 10)	IX	W	302Hr	Mr. Schmitz, Mr. Allison Mr. Cheyney, Mr. Wentling
125S	Wood Preservation (3 cred.; jr., sr.; prereq., 33-34)	II	MWF	301Hr	Mr. Schmitz
126f	Silvics (3 cred.; jr., sr.; prereq., 7-8)	IX	MWF	4PP	Mr. Cheyney
127W	Silviculture (3 cred.; jr., sr.; prereq., 126)	III	TThS	301Hr	Mr. Cheyney
128S	Silviculture Laboratory (7 cred.; jr., sr.; prereq., 127)	Given at Cloquet			Mr. Cheyney
130f	Forest Valuation (5 cred.; jr., sr.; prereq., 7-8)	I	MTWThF	301Hr	Mr. Allison
131W	Forest Policy and Administration ... (5 cred.; jr., sr.; prereq., 130)	IV	MTWFS	204Da	Mr. Allison
132S	Forest Regulation Laboratory (7 cred.; jr., sr.; prereq., 131)	Given at Cloquet			Mr. Allison
134f-135W	Forest Problems (4 cred.; sr. class)	Ar	Ar	Ar	Mr. Schmitz
136f	Forest Economics (3 cred.; jr., sr.; prereq., 131, Econ. 2)	II	MWF	204Da 001 Hn	Mr. Allison

FRESHMAN LECTURES

No.	Title	Hour	Day	Bldg.	Instructor
1f	Agriculture and Forestry (No cred.; required of all freshmen in Agr. and For.)	III	Th	Aud† or 107En	Mr. Freeman
2f	Home Economics (No cred.; required of all freshmen in H.E.)	III	Th	Aud† or 213HE	Mr. Freeman

† See Official Daily Bulletin for room assignment.
 § Open only to those majoring in Forest Products.

* Indiv. work. Stud may reg. in this
 course during any quarter. For dia
 6-4-27

PROGRAM

GEOLOGY AND MINERALOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*†§	General Geology				
	(10 cred.; all; prereq., course in chem.)				
	Sec. 1 Lect.	I	TWThF	210P	Mr. Thiel
	Lab.	I-II	M or S	112P	
	2 Lect.	VII	MTWTh	110P	Mr. Allison
	Lab.	VI-VII or VI-VII	F	112P	
			Th		
1f-3w*†§	General Geology				
	(Same as 1f-2w)				
	Lect.	III	MTFS	110P	Mr. Emmons
	Lab.	III-IV	W	112P	
	or	VI-VII	Th		
1w-2s*†§	General Geology				
	(Same as 1f-2w)				
	Lect.	IV	TWFS	110P	Mr. Brownell
	Lab.	III-IV	M	112P	
	or	VI-VII	T		
1w-3s*†§	General Geology				
	(Same as 1f-2w)				
	Lect.	II	WThFS	200aP	Mr. Allison
	Lab.	I-II	T	112P	
1s-2f*†§	General Geology				
	(Same as 1f-2w)				
	Lect.	III (s)	MTThFS	110P	Mr. Emmons
	Lab.	III-IV (w, s)	W	112P	
	Lect.	III (f)	MTWTh	110P	Mr. Davidson
	Lab.	II-III (f)	F	112P	
8f*	Introductory Geology	II	MWThFS	110P	Mr. Thiel
	(5 cred.; all; no prereq.)				
8w*	Introductory Geology	IV	MTWFS	110P	Mr. Thiel
	(Same as 8f)				
8s*	Introductory Geology	II	MWThFS	110P	Mr. Thiel
	(Same as 8f)				
23w*	Elements of Mineralogy				
	(Chem.; ‡ jr., sr.; prereq., chem.)				
	Lect.	II	WF	110P	Mr. Gruner
	Lab.	III	WF	100P	
(See program of School of Mines and Metallurgy for additional sections.)					
24s*	Elements of Mineralogy				
	(Same as 23w)				
	Lect.	II	MWF	110P	Mr. Gruner
	Rec.	III	T		
	Sec. 1 Lab.	VII-VIII	M	100P	
		VI-VII	T		
	2	III-IV	M		
		VII-VIII	F		

* 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.

AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
25f*	Elements of Mineralogy				
	(Same as 23w)				
	Lect.	III	MWF	Ar	Mr. Gruner
	Rec.	VIII	F		
	Sec. 1 Lab.	VI-VII	MW		
	2	VII-VIII	T		
		VI-VII	F		
29f*	General Physiography	III	MTThFS	210P	Mr. Allison
	(5 cred.; soph., jr., sr.; no prereq.)				

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

HISTORY AND PHILOSOPHY OF EDUCATION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
1f*	Brief Course in the History of Education				
	(5 cred.; jr., sr.; prereq., 6 cred. in psy.)				
	Sec. 1	II	MTWThF	210OL	Miss Alexander
	2	IV	MTWFS	204Ed	Miss Alexander
1w,s*	Brief Course in the History of Education	II	MTWThF	210OL	Miss Alexander
	(Same as 1f)				
3f*	Educational Sociology				
	(3 cred.; jr., sr.; prereq., 6 cred. in psy.)				
	Sec. 1	I	MWF	210OL	Mr. Finney
	2	III	MWF	210OL	Mr. Finney
3w,s*	Educational Sociology	III	MWF	210OL	Mr. Finney
	(Same as 3f)				
5s	Public Education in the United States	VIII	MWF	106HE	Miss Alexander
	(3 cred.; jr., sr.; prereq., 6 cred. in psy.)				

For additional courses see the bulletin of the College of Education.

HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
3f,w	Textiles				
	(5 cred.; no prereq.)				
	Sec. 1	I, II	MTWThF	311,307HE	Miss Weller
	2	III, IV	MTWFS	311,307HE	Miss Eppel
3s	Textiles	I, II	MTWThF	311,307HE	Miss Weller
	(Same as 3f,w)				
	(Limited to 24)				
4f,s	Textiles (S. L. and A.)	VI, VII	MWF	311, 307HE	Miss Weller, Miss Eppel
	(3 cred.; no prereq.; not open to students in H.E.)				
	(Limited to 24 each)				

* Offered on the Minneapolis campus.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor	
11f,s	Clothing Planning and Construction, A (3 cred.; no prereq.)					
	Sec. 1	I, II	MWF	304HE	Miss Eppel, Miss Gorham	
	(Limited to 24 each)	2	I, II	TThS	304HE	Miss Eppel, Miss Gorham
		3	VI, VII, VIII	TTh	304HE	Miss Eppel, Miss Gorham
11w	Clothing Planning and Construction, A (Same as 11f,s)	Sec. 1	I, II	TThS	304HE	Miss Gorham
	(Limited to 24 each)	2	VI, VII, VIII	TTh	304HE	Miss Gorham
13f,6	Clothing Planning and Construction, B (3 cred.; prereq., 3, 11, 51, home pract. in garment making)					
	Sec. 1	III, IV	MWF	304HE	Miss Little	
	(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 Little
	(Limited to 24 each)	2	VI, VII, VIII	TTh	305HE	Miss Gorham
15f,w,s	Clothing Problems					
	(3 cred.; 3rd qtr. fr., soph., jr., sr.; prereq., 3, 51, 13 or parallel)	Lect.	II	S		
		Lab.	VI, VII, VIII	Th T	313HE	Miss Weller, Miss Gorham
17f,w	Advanced Clothing					
	(3 cred.; jr., sr.; prereq., 13, 53)		III, IV	MWF	305HE	Miss Gorham, Miss Carlotta Brown
	(Limited to 24)					
17s	Advanced Clothing					
	(Same as 17f,w)	Sec. 1	III, IV	MWF	305HE	Miss Gorham, Miss Carlotta Brown
	(Limited to 24 each)	2	I, II	TThS	305HE	
18s	Commercial Clothing Manufacture ..		VI, VII, VIII,			
	(4 cred.; sr.; prereq., 17 or parallel)		IX	MWF	305HE	Miss Gorham
	(Limited to 15)					
20s	Economic Aspects of the Food Supply (2 cred.; no prereq.)		VI, VII	TTh	106,103HE	Miss Kolshorn
21f	Foods and Cookery					
	(5 cred.; prereq., Agr. Biochem. 3, parallel 4)		I, II	MTWThF	209HE	Miss Olson
	(Limited to 20)					
21w,s	Foods and Cookery					
	(Same as 21f)	Sec. 1	VI, VII	MTWThF	209HE	Miss Olson, Miss Kolshorn
	(Limited to 20 each)	2	III, IV	MTWFS	209HE	Miss Kolshorn
22f,w	Food Economics I		III, IV	MTWFS	203,207HE	Miss Kolshorn
	(5 cred.; soph., jr., sr.; prereq., 21 or 26)					
	(Limited to 20)					
22s	Food Economics I					
	(Same as 22f)	Sec. 1	III, IV	MTWFS	203,207HE	Miss Kolshorn
	(Limited to 20 each)	2	VI, VII	MTWThF	203,207HE	Miss Kolshorn

* Offered on the Minneapolis campus.

AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor	
23f	Nutrition I (5 cred.; soph., † jr., sr.; prereq., 21 or 26, Physiol. 4)	Sec. 1 2	III, IV VI, VII, VIII, IX	MTWFS MWF	211, 213 211, 213	HE Miss Counts HE Miss Dietrich
23s	Nutrition I (Same as 23f)	Sec. 1 2	I, II III, IV	MTWThF MTWFS	211, 213 211, 213	HE Miss Counts HE Miss Dietrich
24s	Camp Cookery (2 cred.; no prereq.; not open to students in H.D.)	II	VII, VIII, IX	T W	105, 106	HE Miss Child
26w	Foods and Cookery (3 cred.; soph., jr., sr.; by examination; prereq., same as 21) (Limited to 20)		VI, VII, VIII	TTh	207	HE Miss Kolshorn
34f,w	Home Management: Operation and Maintenance, Lectures (3 cred.; jr., † sr.; prereq., 22, 35 parallel, Agr. Econ. 1 or parallel, Prev. Med. 52)		VIII	MWF	203	HE Miss Studley
35f,w,s	Home Management: Operation and Maintenance, Laboratory (6 cred.; jr., † sr.; prereq., 22, home practice in foods and cookery, Prev. Med. 52, and H.E. Ed. 40 or parallel, 34 parallel)		Ar	Ar	Ar	Miss Studley, Miss Whiteside
44w	Home Economics Extension Work .. (3 cred.; sr.; prereq., H.E. Ed. 42, 49 or parallel)		V 4 consecutive hours to be arranged	MW	309	HE Miss Newton
50f,w	Color and Design I (3 cred.; no prereq.) (Limited to 20)	Sec. 1 2 3	I, II I, II I, II (f)	MWF TThS TThS	401 401 112	HE Miss V. Goldstein HE Miss Bacon HE
50s	Color and Design I (Same as 50f)	Sec. 1 2	I, II I, II	TThS MWF	112 112	HE Miss H. Goldstein HE Miss Bacon
51f	Color and Design II (3 cred.; all; prereq., 50)	Sec. 1	I, II	MWF	402	HE Miss V. Goldstein
	(Limited to 20 each)	2	I, II	TThS	402	HE Miss V. Goldstein
51w	Color and Design II (Same as 51f)	Sec. 1 2	III, IV I, II	MWF TThS	402 402	HE Miss V. Goldstein

† Open to sophomores only in their third quarter.

‡ Open to juniors only in their third quarter.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
51s	Color and Design II (Same as 51f)				
	Sec. 1	VI, VII, VIII	TTh	402HE	Miss V. Goldstein
	(Limited to 20 each) 2	I, II	MWF	402HE	Miss Stoddard
53f,s	Advanced Design (3 cred.; soph., jr., sr.; prereq., 51, or 56)				
	Sec. 1	VI, VII	MWF	402HE	Miss H. Goldstein
	(Limited to 20 each) 2	III, IV	MWF	402HE	Miss H. Goldstein
53w	Advanced Design (Same as 53f,s) (Limited to 20)	VI, VII	MWF	402HE	Miss H. Goldstein
55f	Decorative Needlework and Other Crafts (3 cred.; jr., sr.; prereq., 51, 53 or parallel) (Limited to 20)	VI, VII, VIII	TTh	401HE	Miss Morse
56f	Applications of Color and Design ... (3 cred.; ‡ no prereq.)	VI, VII, VIII	TTh	402HE	Miss V. Goldstein
57s	Batik and Other Crafts (3 cred.; jr., sr.; prereq., 3, 53 or parallel) (Limited to 20)	VI, VII, VIII	TTh	112HE	Miss Bacon
61f,s	Large Quantity Cookery and Marketing (4 cred.; jr., sr.; prereq., 22)				
	Lect. I		S	309HE	Miss Dunning
	Lab. I, II, III		TTh	DiH	
61w	Large Quantity Cookery and Marketing (Same as 61f) (Limited to 15)				
	Lect. I		S	309HE	Miss Dunning
	Sec. 1 Lab. I, II, III		TTh	DiH	
63f,w,s	Institution Experience (3 cred.; jr., sr.; prereq., 22, 61 or parallel)	VI, VII, VIII	MW	DiH	
	Lect. IV		T	Ar	Miss Dunning, Miss McFarland
	Lab. 4 hrs. to be arranged on MWF during IV & V hrs.				
70f	Food Preparation† (3 cred.; soph., jr., sr.; prereq., 10 cred. in a lab. science)	VI, VII	MWF	209HE	Miss Whiteside
71w	Elementary Dietetics† (3 cred.; soph., jr., sr.; prereq., 70)	VI, VII	MWF	207,313HE	Miss Whiteside
72s	Special Problems in Home Management† (3 cred.; soph., jr., sr.; prereq., 71, Econ. 6-7 or parallel)	VI	MWF	103HE	Miss Whiteside

‡ Intended for students in Science, Literature, and the Arts. Open to students in Home Economics only by permission of chief of division.

† For social workers, dental and public health nurses.

AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
103f,w,s	Nutrition of the Family (3 cred.; jr., sr.; prereq., 23, 108 or parallel)	Lect. III Lab. III	F MW	203HE 107HE	Miss Biester
104f,w,s	Field Work in Nutrition (3 cred.; jr., sr.; prereq., 103 or parallel H.E. Ed. 40) (Limited to 16)	Lect. III Lab. IV	T MTWThF	213HE	Miss Biester Miss Leichsenring, Miss Counts, Miss Hunt
105f,w,s	Experimental Cookery (3 cred.; jr., sr.; prereq., 22) (Limited to 12)	I, II	MWF	107HE	Miss Child
106f,w,s	Experimental Cookery (5 cred.; jr., sr.; prereq., 22)	I, II	MWF	107HE	Miss Child
108f	Nutrition II (5 cred.; jr., sr.; prereq., 23) (Limited to 24)	I, II	4 hours to be arranged MTWThF	211,213HE	Miss Hunt, Miss Dietrich
108w	Nutrition II (Same as 108f)	Sec. 1 III, IV 2 I, II	MTWFS MTWThF	211,213HE	Miss Counts Miss Dietrich
109w	Advanced Nutrition (5 cred.; jr., sr.; prereq., 23, Agr. Biochem. 2)	Lect. I Lab. VI-IX	TTh	313HE 311HE 313HE	Miss Biester Miss Dietrich Miss Biester
110s	Special Problems in Dietetics (3 cred.; jr., sr.; prereq., 103 or parallel)	VI	MWF	313HE	Miss Biester
111f,s	Special Food Problems (3 cred.; sr.; prereq., 105)	VI, VII, VIII	TTh	107HE	Miss Child
112f,s	Special Food Problems (5 cred.; sr.; prereq., 105, Agr. Biochem. 2)	VI, VII, VIII	4 hours to be arranged TTh	107HE	Miss Child
122f	Advanced Textiles (3 cred.; jr., sr.; prereq., 3, Agr. Biochem. 3-4, Agr. Econ. 1 or parallel) (Limited to 16)	VI, VII, VIII	TTh	307,311HE	Miss Phelps
122s	Advanced Textiles (Same as 122f)* (Limited to 16)*	VI, VII	MWF	307,311HE	Miss Weller, Miss Phelps
123f,w	Clothing Economics (2 cred.; jr., sr.; prereq., 13, Agr. Econ. 1)	III	TTh	203HE	Miss Weller
126w	Textile Analysis and Related Problems (3 cred.; jr., sr.; prereq., 122, Agr. Biochem. 2)	VI, VII, VIII	MWF	311HE	Miss Phelps
131f,w	Home Management: House Planning and Equipment (5 cred.; sr.; prereq., 53, 161) (Limited to 20)	III, IV	MTWFS	401HE	Miss Morse

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
131s	Home Management: House Planning and Equipment (Same as 131f) Sec. 1 (Limited to 20) 2	I, II VI, VII	MTWThF MTWThF	401HE 401HE	Miss Morse Miss Morse
136	Budget Problems (3 cred.; sr.; prereq., 34, 35, 103, Agr. Econ. 126 parallel)	Not offered in 1927-28			
145s	Home Economics Survey (2 cred.; sr.; no prereq.)	IV	TS	203HE	Miss McNeal
151s	Institution Management Problems .. (4 cred.; sr.; prereq., 61, 63)	III III, IV	ThS T	106HE 106HE	Miss K. McFarland
156f,w,s	Hospital Social Service (3 cred.; jr., sr.; prereq., 108, 103 parallel) (Limited to 8)	VI, VII, VIII	TTh Ar		Miss Tebbets, Miss Hunt
161f,w,s	Art History and Appreciation (3 cred.; jr., sr.; prereq., 51)	VIII	MWF	313HE	Miss V. Goldstein
162w	Advanced Interior Design (3 cred.; sr.; prereq., 53, 131, 161)	VI, VII, VIII	TTh	402HE	Miss Morse
163s	Advanced Costume Design (3 cred.; jr., sr.; prereq., 43, 50, 55 recommended)	I, II	TThS	402HE	Miss H. Goldstein
180s	Nutrition in Disease (3 cred.; sr.; prereq., 103, 108) Lect.	VII	MWF	213HE	Miss Biester
181f	Digestion and Metabolism (3 cred.; sr.; prereq., 108)	VI, VII, VIII	TTh	213HE	Miss Leichsenring

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	Mr. Anderson
40w*	Child Training (Same as 40f,s)	<i>IX</i>	<i>MW</i> <i>Ar</i>	Ar	Mr. Anderson
42f,s †	Special Methods of Teaching Home Economics (6 cred.; jr., sr.; prereq., H.E. 13, 22, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)	VIII	MTWThF	309HE	Miss Clara Brown, Miss Rose
46f,w †	Observation and Teaching: Related Art (8 cred.; sr.; prereq., † 42, 160 or parallel, H.E. 13, 53) Lect.	IX Ar	TTh Ar	213HE Ar	Miss Kcever
47f,w,s †	Observation and Teaching: Foods and Home Management (8 cred.; sr.; prereq., † 42, H.E. 34, 35) Lect.	IX Ar	TTh Ar	213HE	Miss M. McFarland, Miss Rose

* Offered on the Minneapolis campus.

† 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, 21 or 26, 22, 50, 51, and 53.

‡ A special fee of \$1 per credit hour is charged for this course.

No.	Title	Hour	Day	Bldg.	Instructor
48f,w,s†	Observation and Teaching: Textiles and Clothing				
	(8 cred.; sr.; prereq., † 42, 53)				
	Lect.	IX	TTh	213HE	Miss Keever
	Teaching	Ar	Ar	Ar	Miss Sell, Miss Landis
49f,w,s†	Observation and Teaching: General Home Economics				
	(8 cred.; sr.; prereq., † 42)				
	Lect.	IX	TTh	213HE	Miss Keever
	Teaching	Ar	Ar	Ar	Miss M. McFarland
141f	Problems in Vocational Education in Home Economics	Ar	Ar	Ar	Miss McNeal, Miss Clara Brown
	(2 cred.; sr.; prereq., 42)				
142s	Educational Measurement in Home Economics	Ar	Ar	Ar	Miss Clara Brown
	(2 cred.; sr.; prereq., 42, Ed. Psy. 55)				
160w	Organization and Methods for Related Art Teaching	III	TThS	402HE	Miss H. Goldstein
	(3 cred.; jr., sr.; prereq., 42 or parallel; H.E. 53, 131 or parallel)				

143. Home Economics Curriculum 2 cr. III
 HORTICULTURE

No.	Title	Hour	Day	Bldg.	Instructor
6f	Fruit Growing				
	(3 cred.; no prereq.)				
	Sec. 1 Lect.	II	MW	102Hr	Mr. Alderman
	(Laboratory sections limited to 20 each) Sec. 1 Lab.	2 IV	WF	8aHr	Mr. Alderman
		I, II	T or F	8Hr	Mr. Alderman
		2 VII, VIII	M	8Hr	Mr. Alderman
21w	Small Fruit Culture	I	MWF	102Hr	Mr. Brierley
	(3 cred.; soph., jr., sr.; prereq., 6 or 32, Bot. 9 cred.)				
32s	Vegetable Growing				
	(3 cred.; no prereq.)				
	Sec. 1 Lect.	II	MW	102Hr	Mr. Krantz
	(Laboratory sections limited to 30 each) Sec. 1 Lab.	2 IV	TS	102Hr	Mr. Traub
		I, II	T or F	8Hr	Mr. Traub
		2 VII, VIII	M	8Hr	Mr. Traub
50s	Floriculture	III	MWF	102Hr	Mr. Cary, Mr. Sando
	(3 cred.; no prereq.)				
56s	Plant Propagation and Nursery Practice	I	ThS	8aHr	Mr. Cary
	(3 cred.; jr., sr.; prereq., Bot. 9 cred.)	VI, VII	T	8Hr	Mr. Sando
71f	Plant Materials I	II	Th	8aHr	Mr. Cary
	(2 cred.; prereq., Bot. 9 cred.)	I, II	T	Ar	Mr. Cary
72s	Plant Materials II	IV	T	8aHr	Mr. Cary
	(2 cred.; prereq., Bot. 9 cred.)	III, IV	S	Ar	Mr. Cary
73w	History of Landscape Gardening	II	TThS	102Hr	Mr. Cary
	(3 cred.; all; no prereq.)				
74f	Principles of Landscape Design	VIII	T	8aHr	Mr. Cary
	(3 cred.; sr.; prereq., Arch. 23)	VI, VII	TTh	8aHr	Mr. Cary
75w	Landscape Problems	VI, VII, VIII,			
	(3 cred.; sr.; prereq., 74f; Agr. Eng. 3, 19)	IX	T	305En	Mr. Cary
		VI, VII, VIII	Th	305En	Mr. Cary

† 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, 21 or 26, 22, 50, 51, and 53.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
76s	Landscape Construction (5 cred.; sr.; prereq., 75w)	III VI, VII, VIII	TTh TTh	8aHr 8aHr	Mr. Cary
77w	Principles of Landscape Design (3 cred.; profess. Agr. Eng.; no prereq.)	III	TThS	102Hr	Mr. Cary
93f	Judging Horticultural Crops (2 cred.; soph., jr., sr.; prereq., 6 or 32)	VI, VII, VIII	M	8aHr	Mr. Alderman, Mr. Brierley, Mr. Krantz, Mr. Cary
107f	Orchard Management (3 cred.; jr., sr.; prereq., 6, Bot. 9 cred.)	IV VI, VII	TS W	103Hr 8Hr	Mr. Brierley Mr. Brierley
109f,w	Principles of Genetics Horticultural Crop Breeding (3 cred.; jr., sr.; prereq., 109)	See Agronomy III	131 TThS	106Hr	Mr. Wilcox
111f	Systematic Pomology (3 cred.; jr., sr.; prereq., 6, Bot. 9 cred.)	II VI, VII	TTh Th	102Hr 8Hr	Mr. Alderman Mr. Brierley
131f-132w	Vegetable Production (6 cred.; jr., sr.; prereq., 32, Bot. 9 cred.)	Ar	Ar	Ar	Mr. Krantz
135w	Potato Production (3 cred.; jr., sr.; prereq., 6 or 32, Bot. 9 cred.)	Ar	Ar	Ar	Mr. Krantz

MATHEMATICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
3f†*	Higher Algebra, Short Course (4 cred.; all; prereq., 1 yr. elem. alg.)	VII	MTThF	105F	Ar
3w†*	Higher Algebra, Short Course (See 3f)	VIII	MTThF	105F	Ar
4f†*	Algebra and Trigonometry (4 cred.; all; prereq., 3 or 5, or prep. higher alg.)	VIII	MTThF	105F	Ar
4w†*	Algebra and Trigonometry (See 4f)	VII	MTThF	105F	Ar
4s†*	Algebra and Trigonometry (See 4f)	VIII	MTThF	105F	Ar
5f*	Higher Algebra (5 cred.; all; prereq., 1 yr. elem. alg.)				
	Sec. 1	II	MWThFS	105F	Ar
	2	VI	MTWThF	104F	Ar
5w*	Higher Algebra (Same as 5f)	VI	MTWThF	105F	Ar
5s*	Higher Algebra (Same as 5f)	I	TWThFS	102F	Ar
6f*	Trigonometry (5 cred.; all; prereq., 5 or prep. higher algebra)	IV	MTWFS	104F	Ar
6w*	Trigonometry (See 6f)	IV	MTWFS	105F	Ar
6s*	Trigonometry (See 6f)	IV	MTWFS	105F	Ar

* Offered on the Minneapolis campus.

† For pre-medical and pre-dental students, and others who desire only that mathematics which is needed in the first course in physics or in surveying.

No.	Title	Hour	Day	Bldg.	Instructor
8f*	Commerce Algebra (5 cred.; pre-bus. stud.; prereq., 5 or prep. high. alg.)	I	TWThFS	104F	Ar
8w*	Commerce Algebra (Same as 8f)	II	MWThFS	105F	Ar
8s*	Commerce Algebra (Same as 8f)	VI	MTWThF	105F	Ar
190f-191w- 192s	Special Problems (6 to 12 cred.; jr., sr.; prereq., in- structor's permission)	Ar	Ar	Ar	Mr. Alderman and staff
193f-194w- 195s	Horticultural Seminar (3 cred.; jr., sr.; prereq., 9 cred.)	Ar	Ar	Ar	Horticultural staff

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

MILITARY SCIENCE AND TACTICS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	First Year Basic Course (No cred.; must be legally eligible for enrolment in R.O.T.C.)	V, VI	MWF	A	Ar
3s*	First Year Basic Course (No cred.; fr.; prereq., 1-2)	VII, VIII, IX	T or W	A	Ar
4f-5w*	Second Year Basic Course (No cred.; soph.; prereq., 1-2-3)	V, VI	MWF	A	Ar
6s*	Second Year Basic Course (No cred.; soph.; prereq., 4-5)	VII, VIII, IX	T or W	A	Ar
51f-52w*	First Year Advanced Course (6 cred.; jr.; prereq., Second Year Basic Course)	II III VI	MWF MWF MWF	A A A	Ar Ar Ar
	(Additional 2-hour period to be ar- ranged for each section)	VIII	MWF	A	Ar
53s*	First Year Advanced Course (3 cred.; jr.; prereq., 51-52)	VII, VIII, IX	T or W	A	Ar
	(Additional 2-hour period to be ar- ranged for each section)				
54f-55w*	Second Year Advanced Course (6 cred.; sr.; prereq., 51-52-53)	II III VI	MWF MWF MWF	A A A	Ar Ar Ar
	(Additional 2-hour period to be ar- ranged for each section)	VIII	MWF	A	Ar
56s*	Second Year Advanced Course (3 cred.; sr.; prereq., 54-55)	VII, VIII, IX	T or W	A	Ar
	(Additional 2-hour period to be ar- ranged)				

PHYSICAL EDUCATION FOR MEN

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	Freshman Physical Education				
	(Cred.; † no prereq.)				
	Sec. 1	II	TTh	A	Mr. Taylor,
	2	III	TTh	A	Mr. Keller
	3	VI	TTh	A	
	4	VII	TTh	A	
	5	VIII	TTh	A	

* 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.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
3s*	Freshman Physical Education				
	Sec. 1	II	TTh	A	Mr. Taylor, Mr. Keller
	2	III	TTh	A	
	3	VI	MTh	A	
	4	VII	MTh	A	
5	VIII	MTh	A		
4f*	Freshman Hygiene				
	(Cred.; † A-H inclusive; no prereq.)				
	Sec. 1	II	T	301F	Dr. Cooke
2	III	W	301F		
3	IV	T	301F		
4w*	Freshman Hygiene				
	(Same as 4f; I-R inclusive)				
	Sec. 1	II	T	301F	Dr. Cooke
	2	III	W	301F	
3	IV	S	301F		
4	IV	T	301F		
4s*	Freshman Hygiene				
	(Same as 4f; S-Z inclusive)				
	Sec. 1	II	T	301F	
2	IV	T	301F		
3	III	W	301F		
7f-8w-9s*	Advanced Leaders				
	(3 cred.; soph., jr., sr.; prereq., 1-2-3)				
	Sec. 1	IV	T	A	
		II	TTh	A	
	2	IV	T	A	
		III	TTh	A	
	3	IV	T	A	
		VI	TTh	A	
4	IV	T	A		
	VII	TTh	A		
5	IV	T	A		
	VIII	TTh	A		
6	II	MWF	S		
7	III	MWF	S		
8	IV	MWF	S		
10f-11w-12s*	Minor Sports				
	(6 cred.; soph., jr., sr.; prereq., 1-2-3)				
	Lect.	IV		S A	
Lab.	IV		MWF		
16f-17w-18s*	Drill Substitution				
	(No cred.; by petition only; no prereq.)				
	Sec. 1	II	MWF	S	
	2	III	MWF		
3	IV	MWF			
4	IV	MWF			
30s*	Athletic Training and First Aid	I	MWF	A	Dr. Cooke
	(2 cred.; jr., sr.; no prereq.)				

For additional courses see the bulletin of the College of Education.

* 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.

PHYSICAL EDUCATION FOR WOMEN

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s*†	Elementary Physical Training (No cred.; required of all new students)				
	Sec. 1	III	MWF	3,151,153WGm	Ar
	2	IV	MWF	3,151,153WGm	Ar
	3	VI	MWF	3,151,153WGm	Ar
	4	VIII	MWF	3,151,153WGm	Ar
	5	III	TThS	3,151,153WGm	Ar
4f*	Preliminary Hygiene (No cred.; required of all new students)				
	Sec. 1	I	M	201WGm	Dr. Norris
	2	II	T	201WGm	
	3	III	W	201WGm	
	4	IV	M	201WGm	
	5	VI	T	201WGm	
4w*	Preliminary Hygiene (Same as 4f)	III	W	201WGm	Miss Anderson
4s*	Preliminary Hygiene (Same as 4f)	II	T	201WGm	Miss Anderson
7f-8w*	Sophomore Physical Gymnastics (No cred.; soph.; prereq., 1-2-3)	IV	TS	153WGm	Miss Conger
9s*	Sophomore Archery (No cred.; soph.; prereq., 1-2-3)	II	MW	Ar	Ar
10f-11w*	Sophomore Orthopedic and Individual Gymnastics (No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	IV	TS	3WGm	Dr. Tolg
	2	VI	TTh	3WGm	Miss Denny
	3	II	MW	3WGm	Miss Denny
12s*	Sophomore Orthopedic and Individual Gymnastics (Same as 10-11)	IV	TS	3WGm	Dr. Tolg
13f-14w-15s*	Sophomore Interpretive Dancing (No cred.; soph.; prereq., 1-2-3)	VI	TTh	151WGm	Miss Baker
13f,s*	Sophomore Interpretive Dancing (Same as 13f-14w-15s)	II	MW	151WGm	Miss Bock- struck
14w	Sophomore Interpretive Dancing (Same as 13f-14w-15s)	II	MW	151WGm	Miss Bock- struck
22f-23w*†	Sophomore Elementary Swimming (No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	III	MW	51WGm	Miss Clayton
	2	IV (11:30)	MW	51WGm	Miss Conger
	3	VII	MW	51WGm	Miss Clayton
	4	II	TTh	51WGm	Miss Clayton
	5	IV	TS	51WGm	Miss Clayton
	6	VII	TTh	51WGm	Miss Clayton
	7	VIII (3:30)	TTh	51WGm	Miss Clayton
	8	VIII (4:00)	TTh	51WGm	Miss Conger

For additional courses see the bulletin of the College of Education.

* Offered on the Minneapolis campus.

† The third quarter is open to students who have not taken the preceding quarters, but the winter quarter is open only to those who have completed the work of the fall quarter.

‡ No student may register for more than two quarters of swimming without permission.

50
270. Golf. For. Beginn
1. I T H.
2. II T H. See 2.00

PROGRAM

PHYSIOLOGY
MEDICAL SCHOOL

No.	Title	Hour	Day	Bldg.	Instructor
4w,s*	Human Physiology (5 cred.; prereq., 1 qtr. an. biol., 1 qtr. chem.)	Lect., Dem. and Rec. IV Lab. I, II, III	MTWFS Th III TTh	315MH	Dr. Greisheimer, Dr. King, and others
57f*	Physiologic Chemistry (4 cred.; jr., sr.; prereq., An Biol. 5-6-7; Chem. 1-2-3 or 9-10)	Lab. Div. A I Lab. Div. B II, III, IV	TThS T VI, VII, VIII W	310MH	Dr. Pettibone and others
58w-59s*	Human Physiology (8 cred.; jr., sr.; prereq., same as 57)	Lab. Div. A I Lab. Div. B II, III, IV	TThS T VI, VII, VIII W	301MH	Dr. Lyon, Dr. King, and others
100w-101s*	Physiologic Chemistry (12 cred.; jr., sr.; prereq., an. biol., org. chem., phys.)	Lab. Div. A I Lab. Div. B II, III, IV	TThS T VI, VII, VIII W	310MH	Dr. McClendon, Dr. Pettibone, and others
103f*	Physiology of Muscles, etc. (10 cred.; jr., sr.; prereq., same as 100-101)	Lect. and Rec. IV Lab. I, II, III	MTWFS MWF	301MH	Dr. Scott, Dr. King, Dr. Greisheimer, and others
104w*	Physiology of Nervous System, etc. .. (6 cred.; jr., sr.; prereq., same as 100-101)	Lect. and Rec. IV Lab. VI, VII, VIII	MTWFS M	301MH	Dr. Scott, Dr. Lyon, 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	1,2PP	Mr. Stakman, Mr. Christensen, Mr. Peterson
7w-8s	Weeds and Grasses (6 cred.; soph., jr., sr.; prereq., Bot. 9 cred.)	III IV	TThS TS	3PP 3PP	Mr. Larson
9f	Weeds and Seed Testing (3 cred.; soph., jr., sr.; prereq., Bot. 9 cred.)	III IV	TThS TS	3,4PP 3,4PP	Mr. Larson

* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
10f	Forest Pathology (5 cred.; soph., jr., sr.; prereq., Bot. 9 cred.)	VII, VIII, IX	MWF	1,2PP	Mr. Stakman, Mr. Lindgren
10s	Forest Pathology (Same as 10f)	I	MWF	1PP	Mr. Stakman, Mr. Lindgren
12w	Seed Problems (3 cred.; jr., sr.; prereq., 9)	I, II	TThS	1,2PP	Mr. Larson
14s	Plant Disease Control (3 cred.; jr., sr.; prereq., 1, Ent. 3)	Ar	Ar	Ar	Mr. Christensen
105f-106w- 107s	Mycology (9 cred.; jr., sr.; prereq., 1, 10, or equiv.)	VI, VII, VIII	TTh	42PP	Mr. Freeman, Miss Dossdall
108f	Methods (3 cred.; jr., sr., prereq., 1 or 10, Bact. 51)	Ar	Ar	Ar	Mr. Leach
110w	Principles of Pathology (4 cred.; jr., sr.; prereq., 1 or 10, Bact. 51)	III, IV	MWF	1,2PP	Mr. Stakman, Mr. Henry
111w	Diseases of Field Crops (3 cred.; jr., sr.; prereq., 1 or 10)	VI, VII	MWF	1,2PP	Mr. Stakman, Mr. Christensen
112	Diseases of Fruit Crops (3 cred.; jr., sr.; prereq., 1 or 10)	Not offered in 1927-28			
113s	Diseases of Vegetable Crops (3 cred.; jr., sr.; prereq., 1 or 10)	VI, VII	MWF	Ar	Mr. Leach
114w	Advanced Forest Pathology (3 cred.; jr., sr.; prereq., 1 or 10)	Ar	Ar	Ar	Mr. Stakman, Mr. Lindgren
116f	Pathological Histology (3 cred.; jr., sr.; prereq., 1 or 10)	III, IV	MWF	1,2PP	Mr. Leach
117s	<i>Diseases of Forage & Fibre Crops. Symp. Tomology</i>				
POULTRY HUSBANDRY					
1f,w	Poultry (3 cred.; no prereq.)	VI	MWF	201Ve	Mr. Smith
2w	Poultry Judging (3 cred.; prereq., 1)	VI, VII, VIII	TTh	201Ve	Mr. Smith
4s	Incubating and Brooding (3 cred.; no prereq.)	VI	MWF	201Ve	Mr. Smith
5s	Advanced Poultry Judging (3 cred.; prereq., 2)	VI, VII, VIII	TTh	201Ve	Mr. Smith
6s	Poultry Problems (1 cred.; jr., sr.; prereq., 2)	Ar	Ar	Ar	Mr. Smith

PREVENTIVE MEDICINE AND PUBLIC HEALTH

MEDICAL SCHOOL

No.	Title	Hour	Day	Bldg.	Instructor
3f,w,s*	Personal Hygiene and Elementary Sanitation	IV	TS	101bMH	Dr. Lees and others
	(2 cred.; fr.; no prereq.) (Limited to 40)				

* Offered on the Minneapolis campus.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
52f,w,s	Health Care of the Family (3 cred.; prereq., Bact. 51, Physiol. 4) (Laboratory sections limited to 20)				
	Lect.	I	S	213HE	Dr. Duryea
	Sec. 1 Lab.	VI, VII	TTh	WH	Miss Fisher
	2 (f,s only)	VI, VII	MF	WH	Miss Fisher
55s*	Increasing the Span of Human Life (3 cred.; jr., sr.; prereq., 10 cred. in science or social science)	III	TThS	101bMH	Dr. Myer
57f*	Health of Infant and Pre-school Child (2 cred.; jr., sr.; prereq., An. Biol. 1-2, Psy. 1-2; or 50, 52 or 53)	IV	TS	101bMH	Dr. Boynton
80w*	Child Health and Educational Hygiene (3 cred.; jr., sr.; prereq., 50, 52 or 53)	II	MWF	101bMH	Dr. Diehl

For additional courses see the bulletin of the Medical School.

PSYCHOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	General Psychology (6 cred.; † soph., jr., sr.; no prereq.)				
	Lect.	I or III	MW	OLAud	Mr. Elliott
	Rec.	(one hour)			
		I	Th or F or S	Psy	
		II	Th or F or S	Psy	
		VII	Th or F	Psy	
		VIII	Th or F	Psy	
1w-2s*	General Psychology (Same as 1f-2w) (Sections limited to 30)				
	Sec. 1	VIII	MWF	Psy	
	2	IX	MWF	Psy	

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

Psych. 10-22. I M-S. (6 cr)

PUBLICATIONS AND RURAL JOURNALISM

No.	Title	Hour	Day	Bldg.	Instructor
10f-11w-12s	Agricultural Journalism (9 cred.; jr., sr.; prereq., Journ. 13-14-15, 51-52)	VI	MWF	105Ad	Mr. Kirkwood
19w	Publicity (3 cred.; soph., jr., sr.; prereq., 20)	I	TThS	202Ad	Mr. Kirkwood
20f	Writing for the Press (3 cred.; soph., jr., sr.; prereq., Rhet. 9 cred.)	I	TThS	202Ad	Mr. Kirkwood

For additional courses see under the Department of Journalism in 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.

Journalism 13f. covers same material as Pub. 20.

RHETORIC

No.	Title	Hour	Day	Bldg.	Instructor
1f	Rhetoric I				
	(3 cred.; no prereq.)				
	Sec. 1	I	MWF	308En	Mr. Conklin
	2	II	MWF	308En	Mr. Conklin
	3	III	MWF	310En	Mrs. Pinkham
	4	IV	MWF	308En	Mr. Conklin
	5	II	TThS	310En	Mrs. Pinkham
	6	III	MWF	308En	Mr. Lansing
1w,s	Rhetoric I	VII	MWF	310En	Ar
	(Same as 1f)	<i>w</i>	<i>TThS</i>	<i>310En</i>	<i>Ar</i>
	(Limited to 35)	<i>s</i>	<i>TThS</i>	<i>310En</i>	<i>Ar</i>
2f	Rhetoric II	II	MWF	310En	Mrs. Pinkham
	(3 cred.; prereq., 1)				
	(Limited to 35)				
2w	Rhetoric II				
	(Same as 2f)				
	(Limited to 35 each)				
	Sec. 1	II	MWF	310En	Mrs. Pinkham
	2	IV	MWF	308En	Mr. Conklin
	3	III	TThS	310En	Mrs. Pinkham
	4	II	TThS	308En	Mr. Conklin
	5	III	MWF	308En	Mr. Lansing
	6	I	MWF	308En	Mr. Lansing
	7	III	TThS	308En	Mr. Conklin
2s	Rhetoric II	II	TThS	308En	Mr. Conklin
	(Same as 2f)				
	(Limited to 35)				
3f	Rhetoric III	III	TThS	310En	Mrs. Pinkham
	(3 cred.; prereq., 2)				
	(Limited to 35)				
3w	Rhetoric III	II	TThS	310En	Mrs. Pinkham
	(Same as 3f)				
	(Limited to 35)				
3s	Rhetoric III				
	(Same as 3f)				
	(Limited to 35 each)				
	Sec. 1	II	MWF	308En	Mr. Conklin
	2	IV	MWF	307En	
	3	I	TThS	310En	Mrs. Pinkham
	4	I	TThS	308En	Mr. Conklin
	5	II	MWF	310En	Mrs. Pinkham
	6	III	MWF	310En	Mrs. Pinkham
11f	Argumentation	I	MWF	307En	Mr. Lansing
	(3 cred.; soph., jr., sr.; prereq., 3, 22 recommended)				
	(Limited to 30)				
11w	Argumentation	III	MWF	311En	Mr. Miller
	(Same as 11f)				
	(Limited to 30)				
11s	Argumentation	II	MWF	307En	Mr. Lansing
	(Same as 11f)				
	(Limited to 30)				
10f	Writing for the Press	(See Pub. and Rur. Journ. 20)			

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
22f	Public Speaking (3 cred.; soph., jr., sr.; prereq., 3) (Limited to 30 each)				
	Sec. 1	III	MTWFS	311En	Mr. Miller
	2	IV	MTWFS	311En	Mr. Miller
22w	Public Speaking (Same as 22f) (Limited to 30 each)				
	Sec. 1	I	MTWFS	311En	Mr. Miller
	2	IV	MTWFS	311En	Mr. Miller
22s	Public Speaking (Same as 22f) (Limited to 30)				
	Sec. 1	III	MTWFS	311En	Mr. Miller
	2	IV	MTWFS	311En	Mr. Miller
24w	Advanced Public Speaking I (3 cred.; soph., jr., sr.; prereq., 22)	II	MWF	311En	Mr. Miller
25s	Advanced Public Speaking II (3 cred.; soph., jr., sr.; prereq., 24)	II	TThS	311En	Mr. Miller
26f	Parliamentary Law (1 cred.; all; no prereq.)	II	TTh	311En	Mr. Miller
28f	Play Production (3 cred.; soph., jr., sr.; prereq., 3)	II	MWF	311En	Mr. Miller
31f,w	Survey of English Literature I (5 cred.; soph., jr., sr.; prereq., 3) (Limited to 35)	II	MTWFS	307En	Mr. Lansing
31s	Survey of English Literature I (Same as 31f,w) (Limited to 35 each)	III	MTWFS	307En	Mr. Lansing
32f	Survey of English Literature II ... (3 cred.; soph., jr., sr.; prereq., 3) (Limited to 35)	IV	MWF	310En	Mrs. Pinkham
33w,s	Modern Literature (3 cred.; soph., jr., sr.; prereq., 3)	IV	MWF	310En	Mr. Conklin

SOCIOLOGY AND SOCIAL WORK

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f,w,s	Introduction to Sociology (3 cred.; 3rd qtr. fr., soph., jr., sr.; no prereq.)	IV	MWF	105En	Mr. Lundquist

Additional sections of this course carrying 5 credits will be found in the program for the College of Science, Literature, and the Arts.

6f,w,s*	Modern Social Reform Movements .. (3 cred.; soph., jr., sr.; prereq., 1)				
	Sec. 1	II	TThS	9F	Mr. Clarke
	2	IV	MWF	5F	
	3	VI	MWF	6F	
14f,w	Rural Sociology (3 cred.; soph., jr., sr.; prereq., 1 or sr. class.)				
	Sec. 1*	III	TThS	9F	Mr. Zimmerman
	2*	V	MWF	9F	
	3*	VI	MWF	25F	
	4	I	MWF	105En	Mr. Lundquist

* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
145*	Rural Sociology				
	(Same as 14f,w)				
	Sec. 1	III	TThS	25F	Mr. Zimmerman
	2	V	MWF	25F	
	3	VI	MWF	15F	

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

SOILS

No.	Title	Hour	Day	Bldg.	Instructor
4f	Soils				
	(3 cred.; soph., jr., sr.; prereq., Chem. 10 cred.)				
	Lect.	III	TTh	251Ch	Mr. Rost
	Lab.	III, IV	S	253Ch	
5s	Soil Fertility				
	(3 cred.; soph., jr., sr.; prereq., Chem. 10 cred.)				
	Lect.	II	TTh	251Ch	Mr. Alway,
	Lab.	I, II	S	253Ch	Mr. Rost
8w	Physical Properties of Soils	Ar	Ar	Ar	Mr. McMiller
	(3 cred.; soph., jr., sr.; prereq., 4)				
101f	Chemical Analysis of Soils	Ar	Ar	Ar	Mr. Rost
	(3 to 5 cred.; jr., sr.; prereq., 5. Quant. Anal.)				
102w,s	Special Problems in Soils	Ar	Ar	Ar	Mr. Alway,
	(Cred. assigned according to amount of work; jr., sr.; prereq., 101 or 108)				Mr. Rost
104s	Soil Surveying	Ar	Ar	Ar	Mr. McMiller
	(3 cred.; jr., sr.; prereq., 108)				
105w	Minnesota Soils	Ar	Ar	Ar	Mr. Alway
	(3 cred.; jr., sr.; prereq., 5)				
107w	Fertilizers and Manures	IV	TS	Ar	Mr. Rost
	(2 cred.; jr., sr.; prereq., 5)				
108w	Physical Properties of Soils	Ar	Ar	Ar	Mr. McMiller
	(3 cred.; jr., sr.; prereq., 5)				

VETERINARY MEDICINE

No.	Title	Hour	Day	Bldg.	Instructor
2f-3w-4s	Comparative Anatomy and Physiology of Domestic Animals	VI(f)	MWF	103Ve	Mr. Hewitt,
	(9 cred.; † soph., jr., sr.; no prereq.)	I(w and s)	TThS	103Ve	Mr. Kernkamp
6f	Physiology of Reproduction	IV	MTWTF	102Ve	Mr. Boyd
	(4 cred.; jr., sr.; prereq., 2-3-4)				
9w-10s	Veterinary Studies	III	TThS	102Ve	Mr. Reynolds
	(6 cred.; † soph., jr., sr.; no prereq.)				
12w	Infectious Diseases	I	MWF	103Ve	Mr. Fitch, Mr. Lubbehusen
	(3 cred.; jr., sr.; prereq., 3-4, Bact. 51)				

* Offered on the Minneapolis campus.

† 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.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
101w-102s	Advanced Anatomy of Domestic Animals (6 cred.; jr., sr.; prereq., 2 or equiv.) (Limited to 9)	Ar	Ar	Ar	Mr. Kernkamp
103f-104w	Advanced Comparative Physiology .. (8 cred.; ‡ jr., sr.; prereq., 3-4 or equiv.)	Lect. II Lab. VI, VII	MWF Th	102Ve 209Ve	Mr. Hewitt Mr. Hewitt

‡ The full course must be completed before credit will be given.

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

The School of Agriculture
Courses in Agriculture and Home
Economics

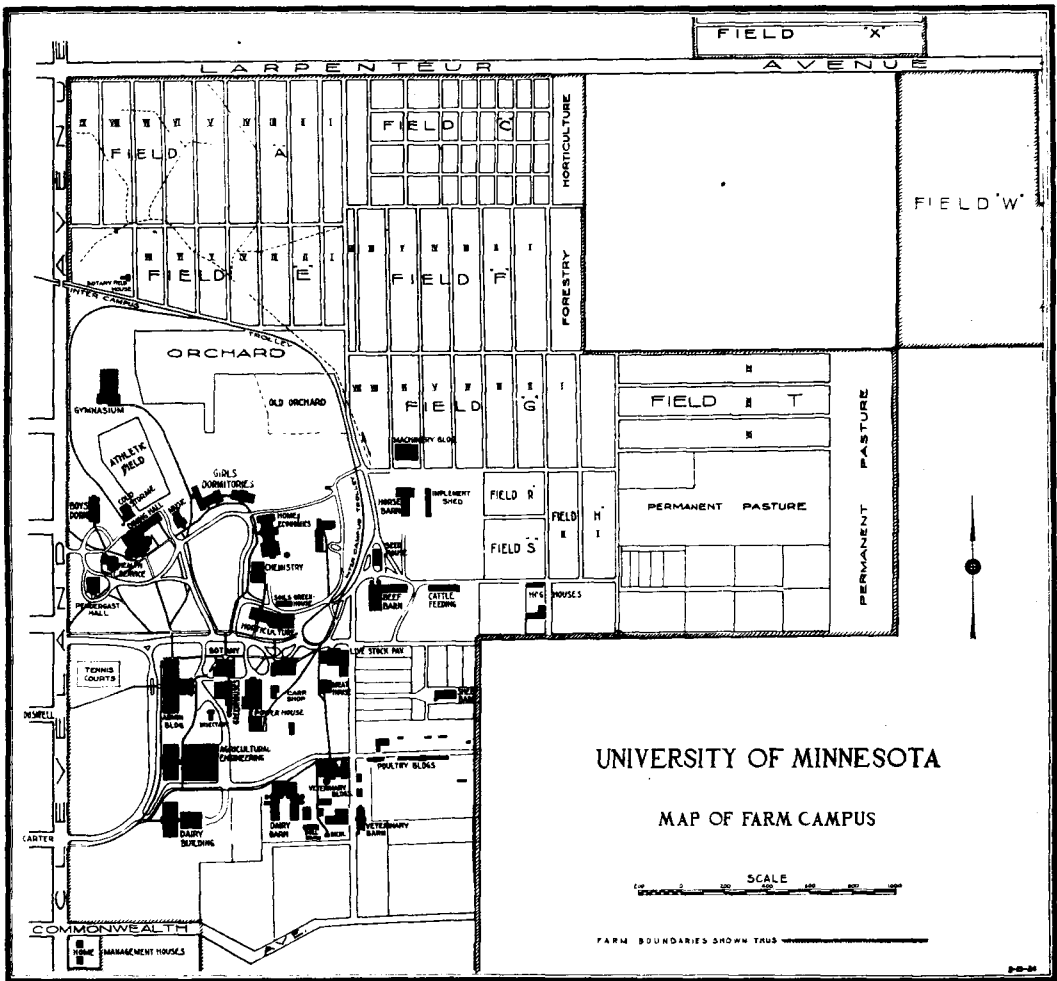
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THE SCHOOL OF AGRICULTURE

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FORESTRY

Henry Schmitz, Ph.D., Chief; Thorwald S. Hansen, B.S., M.F.

THE SCHOOL OF AGRICULTURE

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Johanna Hognason, B.A., Hazelle E. Johnson, Peder L. Johnsrud,
B.S. in Agr., Christine Larson, Gustav A. Lundquist, Ph.D., Marjorie
Martyn, B.A., Laura A. Mattson, M.A., Rose Schaeftgen, Mabel
Willson, Alice Wollin.

SOILS

Frederick J. Alway, Ph.D., Chief; George H. Nesom, B.A., B.S.

VETERINARY MEDICINE

Clifford P. Fitch, M.S., D.V.M., Chief; Willard L. Boyd, D.V.S., Ray-
mond E. Lubbehusen, B.S., D.V.M., Myron H. Reynolds, B.S.A.,
D.V.M., Phm.G.

GENERAL INFORMATION

LOCATION

The School of Agriculture is located at University Farm, St. Paul, Minnesota, about midway between the business portions of the cities of St. Paul and Minneapolis. The school is a part of the Department of Agriculture of the University of Minnesota, and is governed by the Board of Regents.

HOW TO GET TO THE SCHOOL

Check all baggage to Minneapolis or St. Paul and bring checks to the school.

A charge of fifty cents is made by the school for transporting trunks at the opening of the school year. A charge of not more than fifty cents is made for the return of baggage at the close of school, provided it is ready to go on the days assigned.

Take the Como-Harriet or Como-Hopkins car from either St. Paul or Minneapolis, and get off at Doswell Avenue. University Farm is about a ten-minute walk from the car line. The dormitories are on the campus.

TIME OF OPENING AND CLOSING

The School of Agriculture opens late in September and closes late in March. For exact dates of opening and closing of each term see the calendar in Part II of the bulletin.

Instruction begins promptly at the opening of each term. Students should be present the first day and remain until the close of the term. No student will be allowed to register after the second week of the term except by permission of the Students' Work Committee.

PURPOSE

The School of Agriculture was organized in 1888. Its object is to give a practical education to young men and women. It offers a course of study designed to fit young men and young women for successful farm life, and aims to give its students the necessary preparation for useful citizenship. The school course does not aim to prepare students for college.

ADMISSION

Students should correspond with the registrar, University Farm, St. Paul, Minnesota, prior to coming to the institution, to make the necessary preliminary arrangements for registration.

Farm experience.—All male students are required to have had six months' farm practice before entrance.

Minimum age.—No student under seventeen years of age will be admitted. Exceptions to this rule may be made in the case of applicants who have completed one full year of high school work. Similar exception may be made when no high school is immediately available to the applicant.

Scholastic preparation.—Students who have completed eighth grade work, or its equivalent, in the common schools, are admitted without exam-

ination. Each applicant for admission should send to the registrar for a certificate of admission which, when properly filled out by former teacher or superintendent and returned to the registrar, will be accepted in place of entrance examinations. Diplomas should not be sent.

Students from city or grade schools must present a dismissal card from the last school attended; they will not be admitted before finishing eighth grade work, or until their former school records have been passed upon. These records must be presented at least three weeks prior to the opening of the school.

Unclassed students.—Applicants of mature years who cannot meet the above entrance requirements will be admitted for special programs. Such students can graduate when the entrance requirements as well as the requirements of the prescribed course are fully met.

Credit for high school work.—Students will be accepted from approved high schools and be given credit toward graduation from the School of Agriculture as follows:

Minimum number of credit hours	
High school graduate	36
Non-graduate—per unit	2½
Agriculture—per unit (boys)	12½
Maximum number of credit hours	72

High school courses equivalent to courses offered in the School of Agriculture will receive the same credit as those offered in the school. The first year's work in sewing, cooking, and freehand drawing will be allowed the same credit as that offered in the school. Additional credit in these subjects will be allowed only on the approval of the Home Economics Division.

COURSES OF STUDY

Courses in both agriculture and home economics are offered. These cover a wide range of subjects and are largely vocational in character. Provision is also made for instruction in English, mathematics, and other academic subjects. The courses require three winters of six months each for completion. The character of instruction and environment tend to educate students toward the farm, and to develop in them a love for farm life by showing them its possibilities. In this respect the school has been very successful, as over eighty per cent of its graduates continue agricultural pursuits.

HOME PROJECTS

Science with practice is the aim of the School of Agriculture. The school is organized on a plan which provides for teaching agriculture through six months of study at the school and six months of supervised home project work on the farm. Home project work is advised for every pupil in the school. The purpose of the home project work is to give the pupils an opportunity to apply some phase of their classroom instruction to the operation of a farm or a farm home.

The students may have a free choice as to the nature of their projects but are advised to choose those connected with the class work being taken.

Freshmen should select projects connected with freshman subjects; juniors, those connected with junior subjects.

Registration blanks are provided instructors in classes for which summer projects will be accepted, and the registration should be completed before the student leaves the school in the spring. At the time of registration a project book with forms suitable for recording the necessary data will be provided.

Registration for home project work after the close of the spring term must be approved by the chairman of the Home Project Committee.

During the summer season the work of the students will be inspected by instructors from the school so far as possible. The project book must be submitted to the classroom instructors and be graded by them but must have final approval of the Home Project Committee.

Home project work cannot be accepted for credit from students who are not properly registered before starting upon the project.

Three credits of home project work is all that any student should attempt to earn in one season. These may be counted toward graduation from the school or, in the event that a student expects to enter the College of Agriculture, Forestry, and Home Economics, they may be used as one unit toward entrance to the college.

RULES AND REGULATIONS

A pamphlet containing the rules and regulations of the school will be furnished each student at the time of registration or upon application to the registrar's office.

HOME LIFE ON THE CAMPUS

The life of the student while attending the School of Agriculture is subject to supervision. The home life of each student is carefully guarded, and everything is done to promote a healthful and moral atmosphere. The use of tobacco is strictly forbidden. Anyone not in accord with these restrictions and not willing to lend a hand toward promoting a strong moral growth should not come to the School of Agriculture.

STUDENTS IN DORMITORIES

The students' social and dormitory life is supervised and directed by two women instructors of the school faculty, one in charge of the girls' dormitories, the other in charge of the boys' dormitories. All regulations governing the campus life of the student are subject to the approval of the dean of the Department of Agriculture and the principal of the school. A feature in the social life of the boys in the dormitories has been contributed in the form of clubrooms in Pendergast Hall and the Boys' New Dormitory.

From 8:15 a.m. to 4:30 p.m. and also after 7:30 p.m. students not at recitation or assembly are expected to be in their rooms or in the library studying or reading. The rooms shall at all times be quiet, especially in the evening, so that no student will be disturbed.

ASSEMBLY

On each school day, at 12:30 p.m., except Monday and Thursday, the students meet in the assembly hall. After the opening exercises, brief talks are given by the principal, members of the faculty, or invited guests. During the year the list of speakers will include prominent state and national officials, business men, particularly those connected with the agricultural industries, professional men and women, prominent clergymen of all denominations, educators from other institutions, and successful farmers and homemakers. It has been found that this plan gives to the students an opportunity to hear men and women of prominence discuss a wide range of topics, many of which relate to rural and agricultural problems.

HOLIDAYS

On Thanksgiving Day no classes will be held, but school will continue as usual on the Friday and Saturday following.

Armistice Day, November 11; Lincoln's birthday, February 12; and Washington's birthday, February 22, will be observed as holidays.

REQUIREMENTS FOR GRADUATION

The diploma of the School of Agriculture is granted on the completion of

1. The prescribed course of study, including all of the required work and enough elective work to make 108 credit hours, at least 36 of which must be earned by class attendance in the school.
2. Gymnasium for the boys, or physical training for girls, 2 credit hours for each term of residence.
3. Social problems for boys, 1 credit hour, or social training, for girls, 2 credit hours.
4. An honorary standing in deportment.
5. An essay of not less than one thousand words upon a topic connected with agriculture or home economics, typewritten on paper of approved size for binding and filing in the library.
6. For men, at least six months of practical farm experience in addition to the six months required for entrance. This experience may be gained either on the home farm or in the employment of a good farmer. Regularly approved and recorded home project work may be counted toward this requirement. The satisfaction of this requirement shall be certified by the Home Project Committee.

EXPENSES

Each student is required to pay for breakage of apparatus used in practical work.

The cost to the student for board is the actual cost of maintaining the table (including management). Each term board is paid in advance. No deduction in charge is made for any absence of less than five days. If students are compelled to be absent for that length of time, they are allowed half rates, if they make arrangements before leaving.

The buildings are all lighted by electric lights and warmed by steam. The sleeping rooms are each furnished with a bedstead, mattress, dressing bureau, chairs, and table.

Each student provides four sheets, two blankets, or one blanket and one quilt, one bedspread, one pillow, three pillowcases, towels, comb and brushes, one glass tumbler, and one teaspoon.

For the boys' gymnasium work a track suit and gymnasium shoes are required.

Each girl is required to provide two large aprons suitable for the protection of her clothing while working in the foods and cooking laboratory.

For the girls' gymnasium work a uniform suit is required. This should be obtained at the school. All freshman and junior girls will be required to buy the regulation gymnasium shoes sold at the bookstore.

Each girl should be provided with a kimono or bathrobe, a pair of bedroom slippers, at least four changes of undergarments, nightgowns, and hosiery. It is suggested that each girl be provided with two simple school dresses and a dress suitable for social occasions. Rubbers and umbrellas are necessities.

TABLE OF CHARGES

Tuition fee, per term. Residents of the state.....	\$ 3.00
Non-residents	6.00
Deposit as guarantee for the return of books and other material	5.00
Gymnasium fee. Required of every student. Per term.....	1.00
Post-office box fee. Per term.....	.20
Textbook rental fee. For those not desiring to purchase their books. Per term	1.75
Health fee. Per term	2.00
Music fee. Per course.....	10.00
Room in dormitory. (Price subject to change) Per term.....	16.00
Board. Per term. (Price subject to change).....	48.00
Laundry. Per term. (Price subject to change) Required of all in dormitories	4.00
Gymnasium suits—boys. (Price subject to change).....	\$4.00- 5.00
Girls. (Price subject to change)	8.30
Average cost drawing instruments, notebooks, stationery, and supplies. Per year	\$10.00-12.00

The payments to be made to the school at time of registration are as follows:

	Fall Term	Winter Term
Student in dormitory (resident).....	\$80.75	\$71.75
Non-resident	83.75	74.75
Day student (resident)	12.95	7.95
Non-resident	15.95	10.95

Not in attendance first term add \$5 to the winter term charges above.

DORMITORIES

Each student in attendance at the school who expects to return the following year and who desires to room in the dormitory will, before going home, make a deposit of \$2 with the cashier as evidence of good faith that he expects to return on the opening day of the following school year. Dormitory rooms will be assigned to new students in the order in

which their applications are received. Each prospective student who desires to room in the dormitory will be required to send a deposit of \$2, which will be returned in case the application is received after all dormitory rooms are spoken for.

In case of either a former student or a prospective student, this two-dollar deposit will be forfeited if the student does not appear for registration on the opening day of the school term, unless he has signified in writing to the registrar at least ten days before the opening that he does not intend to return. All money orders or checks should be made payable to University of Minnesota, Department of Agriculture.

STUDENTS' HEALTH SERVICE

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

For services which are specialized and individual in character, such as operations, board and laundry when in the hospital, drugs, X-rays, out-patient calls, dentistry, etc., special fees, calculated on a cost basis, are charged. No student, however, will be denied service because of inability to pay these fees.

The offices of the Health Service and the Students' Hospital and Dispensary on the University Farm campus are located in the Health Service Building. The services of the hospital and dispensary are available at all hours of the day and night. The telephone call is Nestor 2881. Physicians of the Health Service will be in attendance daily. Their office hours will be announced.

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

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

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

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

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

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

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

2. *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. Rooming and boarding houses are both inspected and regulated.

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.

CLASS TRUST FUNDS

The classes of 1902, 1916, 1924, and 1925 each left with the school funds "to assist by temporary loans, at a reasonable rate of interest, deserving students needing such help." Applications for loans should be made to the principal.

THE LUDDEN TRUST

The late Honorable John D. Ludden, of St. Paul, gave the University of Minnesota \$10,000, to be held, invested, and reinvested by the University through its Board of Regents, and the income thereof to be collected, received, and applied by said Board of Regents to the financial assistance of students of either sex in the School of Agriculture.

Mr. Ludden imposed the following conditions: "The beneficiaries must be youths who are residents of the State of Minnesota; they must be and continue of unblemished moral character, and of temperate and industrious habits; and they must be such as by examination and trial shall evince and maintain a taste, habit, and aptitude for study and improvement; and any student who shall fail to come, or shall cease to be, within the above conditions shall forfeit all claims to the benefits of such fund. Subject to these conditions the administration of such income is entrusted to the said

Board of Regents, which may make such rules therefor as they may deem judicious."

This fund produces \$400 a year. Those wishing to avail themselves of its benefits should apply to the Executive Committee of the Board of Regents of the University of Minnesota. Application blanks may be obtained from the office of the dean of the Department of Agriculture.

THE DORR FUND

This fund consists of \$50,000 willed by the late Caleb Dorr, of Minneapolis, for the benefit of the Department of Agriculture of the University.

The income from \$20,000 of the fund is to be devoted to establishing and maintaining research fellowships in agriculture; the income from the remainder to be invested in scholarships, donations, and loans to worthy and needy students.

CALEB DORR CASH SCHOLARSHIP PRIZES

Cash prizes amounting to \$180 each year are offered to the students securing the highest standings in general scholarship. Of this amount \$65 will be offered each term in five prizes of \$20, \$18, \$14, \$9, \$4 each. All students carrying the full work of 18 credit hours per term are eligible for these prizes. One prize of \$50 will be awarded at the close of the second term for the senior student graduating from the School of Agriculture with the highest scholarship and student activity record for the first five terms.

The awards will be made on (1) class standings as recorded by instructors for the term's work, and (2) on student activities and department. The class standings will count for 90 per cent and the student activities for 10 per cent. In determining the grades of scholarship the merit point system adopted by the registrar's office will be used. The rating for student activities will be based on the quality of leadership as indicated by a review of the activities participated in and the general deportment of the student during attendance at school. This rating will be determined by the scholarship committee in consultation with the preceptresses and the principal of the School of Agriculture.

Records made in military drill and gymnasium will not be counted in making the scholarship awards.

Besides the above, annual scholarship prizes of \$180 each, divided into smaller awards, are given for excellence in extemporaneous speaking, community betterment, essay writing, and declamation. The rules governing these scholarships may be found in the booklet of information supplied to each student at the time of his registration.

GIDEON MEMORIAL PRIZE IN HORTICULTURE

A fund of \$500 was established in memory of the late Peter Gideon, the originator of the wealthy apple. The annual income is to be divided in three prizes for the best papers on some horticultural subject.

CADY MEMORIAL FUND

The Minnesota Garden Flower Society raised by popular subscription the LeRoy Cady scholarship fund of \$1,500, the interest from which is to be used to aid deserving students who are pursuing courses in horticulture.

ORGANIZATIONS

Students' debating societies.—Students are urged to unite with one of the eight literary societies of the school for both pleasure and profit. The work is under the supervision of one of the instructors in the rhetoric section. It affords training in parliamentary practice, public speaking, debating, and dramatic work.

Students' Christian associations.—The Young Men's and Young Women's Christian associations are voluntary organizations which have for their objects the maintenance of a positive moral and religious atmosphere and the development of a complete Christian manhood and womanhood, physical, intellectual, social, and spiritual. These associations carry on various lines of activity. Employment and housing bureaus are maintained for the use of students. A general reception is given at the beginning of each term. Each Sunday morning at 8:30 a song service is held, followed directly by meetings of Bible, mission, and rural study groups, while in the afternoon at 5:30 a vesper service is conducted. Each Thursday evening at 6:30 o'clock the men gather for a fellowship meeting, and the women for a meeting of the Student Girl Reserves Club. The work is under the direction of general secretaries and the supervision of a board of directors made up of professors, business men, and students. The associations are non-sectarian that all students may find in them an opportunity for Christian activity and mutual helpfulness.

PUBLICATIONS

Agrarian.—The *Agrarian* is an annual published by the senior class of the school. The book gives an outline of all school and class activities; is fully illustrated, and contains, in addition to brief articles and items of purely local interest, a number of contributions from students and faculty members, dealing with the various phases of agricultural education and with agricultural problems.

News of the School of Agriculture.—The *News of the School of Agriculture* is published monthly during the school year. It is managed by a student board elected by the various classes. It aims to give publicity of interest to students and alumni and to serve as a tie between the school and the alumni.

LIBRARY

The agricultural library is well equipped for supplying the needs of both undergraduate and graduate students. It contains over 20,000 volumes of general and technical literature, government reports, and 50,000 unbound pamphlets, bulletins, and reports. The general subject and author card index and the index of publications of the state experiment stations are always at the disposal of students, to aid them in locating the various

sources of information which the library affords. There are complete sets of all the standard encyclopedias and dictionaries, and files of over 225 popular and technical magazines and periodicals.

The librarian and her assistants are always ready and glad to give whatever assistance they can, both to those interested in special research work and to those doing regular reference work in connection with their classes. All those wishing to read or study are made welcome and are given whatever privileges the library can provide.

ZOOLOGICAL MUSEUM

The zoological museum is on the third floor of the Administration Building, connecting with the entomology lecture room. It contains a collection of birds, a large series of mammals, shells, anatomical models, etc., all used in class instruction. One case is given up to models of injurious insects. Another case is devoted to a beautiful series of Minnesota fishes, reptiles, and amphibians, and on two sides of the large room devoted to museum purposes are cases containing thousands of pinned insects. Carefully arranged collections of typical insect groups, with explanatory text, are to be found in the demonstration cases in the hallway. Friends of the institution who are inclined to donate zoological specimens may rest assured that they will be promptly installed and given the best of care.

COURSES OF STUDY

For courses of study in agriculture, see pages 15 to 21.

For courses of study in home economics, see pages 21 to 23.

Figures following the names of courses indicate the number of credit hours. One credit hour is equivalent to one class period devoted to recitation or lecture or to two such periods devoted to laboratory work.

For description of the courses listed in the following outline see pages 24 to 35, and for schedule of classes, Part II.

See page 6 for statement with reference to home project work.

Courses which may be taken either term are indicated by (f,w), those which are offered in the fall term only are indicated by (f), and those offered only in the winter term by (w).

Every student in agriculture who plans to graduate is expected to select one of the following courses of study: (a) general farming, (b) livestock production, (c) farm mechanics, or (d) horticultural and nursery training.

Adults desiring a special course should consult the Enrolment Committee.

Special students of mature years, who do not desire a diploma but who wish to take special work, may, by action of the Enrolment Committee, be allowed to arrange a curriculum under the supervision of a faculty adviser. This adviser will be appointed by the Enrolment Committee after the student has consulted with the committee, and will be ordinarily a member of the division in which the student intends to take the larger part of his or her work. No special student will be eligible for a diploma until both the entrance requirements and the requirements of a prescribed course have been satisfied.

GENERAL FARMING

FRESHMAN YEAR

REQUIRED—FIRST TERM

English I, 3(f,w)
Hygiene, 1(f,w)
Farm Arithmetic, 3(f,w)
Judging Types and Market Classes of Livestock, 2(f,w)
Drawing and Farm Buildings, 3(f,w)
Agricultural Botany, 3(f,w)
Gymnasium, 2(f,w)
Social Problems for Boys, 1(f,w)
Electives, 3

REQUIRED—SECOND TERM

English II, 3(f,w)
Corn and Potatoes, 2(f,w)
Soils, 3(f,w)
Judging Breed Types of Livestock, 3(f,w)
Animal Biology, 3(f,w)
Gymnasium, 2(f,w)
Electives, 4

ELECTIVES

Advanced Farm Arithmetic, 3(f,w)	Landscape Gardening, 3(f)
Physiology, 3(f,w)	Elementary Beekeeping II, 3(f,w)
Blacksmithing I, 3(f,w)	Elements of Music I, 2(f,w)
Farm Buildings I, 3(f,w)	Elements of Music II, 2(f,w)
Tractor and Auto Work I, 3(f,w)	Violin, $\frac{1}{2}$ (f,w) ¹
Farm Mechanical Training, 3(f,w)	Piano, $\frac{1}{2}$ (f,w) ¹
Elementary Beekeeping I, 3(f,w)	Instrumental Music, $\frac{1}{2}$ (f,w) ¹
Spelling, 1(f,w)	Voice, $\frac{1}{2}$ (f,w) ¹
Penmanship, 1(f,w)	Orchestra, $\frac{1}{2}$ (f,w)
Plant Propagation, 3(f)	Chorus, $\frac{1}{2}$ (f,w)
Floriculture, 3(w)	Band, $\frac{1}{2}$ (f,w)
Dramatics, $\frac{1}{2}$ (f,w) ²	Harmony I, 2(f,w)
Debating, 1(w) ²	Harmony II, 2(f,w)
Typewriting I, 3(f,w)	Appreciation of Music, 3(f,w)
Bookkeeping, 3(f,w)	Instrumentation and Conducting, (3f,w)
General Office Practice, 3(f,w)	Home Project, 1 to 3

JUNIOR YEAR

REQUIRED—FIRST TERM

English Classics, 3(f,w)
 Forage Crops, 3(f,w)
 Advanced Livestock Judging, 3(f,w) or
 Dairy Stock Judging, 2(f,w)
 Farm Horticulture, 3(f,w)
 Feeds and Feeding, 3(f,w)
 Gymnasium, 2(f,w)
 Electives, 3 or 4

REQUIRED—SECOND TERM

Business English, 3(f,w)
 Cereal Crops, 3(f,w)
 Farm Dairying 3(f,w)
 Poultry, 3(f,w)
 Gymnasium, 2(f,w)
 Electives, 6

ELECTIVES

Algebra I, 7(f,w)	Greenhouse Construction and Management, 3(f)
Geometry I, 7(f,w)	Special Problems in Horticulture (w)
Industrial History, 3(f,w)	Algebra II, 7(f,w)
Insect Pests of Plants, 3(f)	Geometry II, 7(f,w)
Chemistry of Plant and Animal Life, I 3(f,w)	Meats, 3(f,w)
Mechanics and Water Supply, 3(f,w)	Blacksmithing II, 3(w)
Parliamentary Law, 1(f,w)	Chemistry of Plant and Animal Life II, 3(f,w)
Management of Laying Flock, 1(f,w)	Heat and Electricity, 3(w)
Physiology and Hygiene of Breeding, 2(f)	Incubating and Brooding, 3(w)
Orchard Fruit Growing, 3(f)	Seed Testing, 2(w)
Small Fruit Growing, 3(w)	Tractor and Auto Work II, 3(f,w)
Elements of Bacteriology, 3(w)	Commercial Vegetable Gardening, 3(w)
Co-operative Accounting, 3(w)	Veterinary Studies, 5(w)
Potato Production, 3(w)	Weeds, 2(f)
Advanced Beekeeping, 3(f,w)	American History, 3(f,w)
Dairy Stock Judging, 2(f,w)	Forest Nursery Methods and Tree Planting, 3(w)
Stock Judging Practice, 3(f,w)	
Land Clearing, 3(w)	

SENIOR YEAR

REQUIRED—FIRST TERM

Public Speaking, 3(f,w)
 American Government, 3(f,w)
 Livestock Breeding, 3(f,w)
 Farm Management I, 3(f,w)
 Gymnasium, 2(f,w)
 Electives, 6

REQUIRED—SECOND TERM

English VI, 3(f,w)
 Rural Sociology, 3(f,w)
 Farm Management II, 3(f,w)
 Crop Breeding, 3(w)
 Gymnasium, 2(f,w)
 Electives, 6

¹ A special fee of \$10 is charged for this course. •

² Credit for this course is allowed only under the conditions specified in the booklet of Faculty Regulations.

COURSES OF STUDY

17

ELECTIVES

Livestock Feeding and Management, 3(f) Dairy Stock Feeding, 3(f) Drainage and Roads, 3(f) Farm Implements, 3(f) Elementary Economics, 3(f,w) English Literature I, 5(f)	Advanced Public Speaking, 3(f,w) Plant Diseases, 3(f) Farm Buildings, 3(f) Rural Economics, 3(f,w) Milk Production, 3(w) English Literature II, 5(w) Dairy Stock Selection, 3(w) Judging and Grading Farm Crops, 3(w)
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FARM MECHANICS

FRESHMAN YEAR

REQUIRED—FIRST TERM	REQUIRED—SECOND TERM
English I, 3(f,w)	English II, 3(f,w)
Hygiene, 1(f,w)	Corn and Potatoes, 2(f,w)
Farm Arithmetic, 3(f,w)	Soils, 3(f,w)
Judging Types and Market Classes of Livestock, 2(f,w)	Farm Mechanical Training, 3(f,w)
Drawing and Farm Buildings, 3(f,w)	Farm Buildings I, 3(f,w) or Blacksmithing I, 3(f,w)
Agricultural Botany, 3(f,w) or Animal Biology, 3(f,w)	Gymnasium, 2(f,w)
Gymnasium, 2(f,w)	Electives, 4
Social Problems for Boys, 1(f,w)	
Electives, 3	

ELECTIVES

Advanced Farm Arithmetic, 3(f,w) Agricultural Botany, 3(f,w) Animal Biology, 3(f,w) Poultry, 3(f,w) Elements of Music I, 2(f,w) Elements of Music II, 2(f,w) Penmanship, 1(f,w) Spelling, 1(f,w) Elementary Beekeeping I, 3(f,w) Physiology, 3(f,w) Judging Breed Types of Livestock, 3(f,w) Farm Buildings I, 3(f,w) Dramatics, ½(f,w) ² Debating, 1(w) ² Typewriting I, 3(f,w) Bookkeeping, 3(f,w) General Office Practice, 3(f,w)	Elementary Beekeeping II, 3(f,w) Violin, ½(f,w) ¹ Piano, ½(f,w) ¹ Instrumental Music, ½(f,w) ¹ Voice, ½(f,w) ¹ Orchestra, ½(f,w) Chorus, ½(f,w) Band, ½(f,w) Harmony I, 2(f,w) Harmony II, 2(f,w) Appreciation of Music, 3(f,w) Instrumentation and Conducting, 3(f,w) Blacksmithing I, 3(f,w) Plant Propagation, 3(f) Floriculture, 3(w) Landscape Gardening, 3(f) Home Projects, 1 to 3
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JUNIOR YEAR

REQUIRED—FIRST TERM	REQUIRED—SECOND TERM
English Classics, 3(f,w)	Business English, 3(f,w)
Forage Crops, 3(f,w)	Cereal Crops, 3(f,w) or Farm Horticulture, 3(f,w)
Farm Horticulture, 3(f,w) or Advanced Livestock Judging, 3(f,w)	Farm Dairying, 3(f,w)
Tractor and Auto Work I, 3(f,w)	Heat and Electricity, 3(w)
Mechanics and Water Supply, 3(f,w)	Gymnasium, 2(f,w)
Gymnasium, 2(f,w)	Electives, 6
Electives, 3	

¹ A special fee of \$10 is charged for this course.

² Credit for this course is allowed only under the conditions specified in the booklet of Faculty Regulations.

ELECTIVES

Feeds and Feeding, 3(f,w)	Special Problems in Horticulture (w)
Algebra I, 7(f,w)	Greenhouse Construction and Management, 3(f)
Insect Pests of Plants, 3(f)	Veterinary Studies, 5(w)
Parliamentary Law, 1(f,w)	Algebra II, 7(f,w)
Chemistry of Plant and Animal Life I, 3(f,w)	Meats, 3(f,w)
Geometry I, 7(f,w)	Geometry II, 7 (f,w)
Farm Horticulture, 3(f,w)	Blacksmithing II, 3(w)
Stock Judging Practice, 3(f,w)	Elements of Bacteriology, 3(w)
Dairy Stock Judging, 2(f,w)	Chemistry of Plant and Animal Life II, 3(f,w)
Industrial History, 3(f,w)	Cereal Crops, 3(f,w)
Physiology and Hygiene of Breeding, 2(f)	Seed Testing, 2(w)
Management of Laying Flocks, 1(f,w)	Incubating and Brooding, 3(w)
Orchard Fruit Growing, 3(f)	Forest Nursery Methods and Tree Planting, 3(w)
Small Fruit Growing, 3(w)	American History, 3(f,w)
Commercial Vegetable Gardening, 3(w)	Advanced Beekeeping, 3(f,w)
Co-operative Accounting, 3(w)	
Weeds, 2(f)	
Potato Production, 3(w)	
Land Clearing, 3(w)	

SENIOR YEAR

REQUIRED—FIRST TERM	REQUIRED—SECOND TERM
Public Speaking, 3(f,w)	English VI, 3(f,w)
Farm Buildings, 3(f) or Drainage and Roads, 3(f)	American Government, 3(f,w)
Rural Sociology, 3(f,w)	Farm Management II, 3(f,w)
Farm Implements, 3(f)	Tractor and Auto Work II, 3(f,w)
Farm Management I, 3(f,w)	Gymnasium, 2(f,w)
Gymnasium, 2(f,w)	Electives, 6
Electives, 3	

ELECTIVES

Drainage and Roads, 3(f)	Dairy Stock Selection, 3(w)
Farm Building, 3(f)	Advanced Public Speaking, 3(f,w)
Livestock Feeding and Management, 3(f)	Milk Production, 3(w)
Elementary Economics, 3(f,w)	Rural Economics, 3(f,w)
Dairy Stock Feeding, 3(f)	Crop Breeding, 3(w)
Plant Diseases, 3(f)	English Literature II, 5(w)
Livestock Breeding, 3(f,w)	Judging and Grading Farm Crops, 3(w)
English Literature I, 5(f)	

HORTICULTURAL AND NURSERY TRAINING

FRESHMAN YEAR

REQUIRED—FIRST TERM	REQUIRED—SECOND TERM
English I, 3(f,w)	English II, 3(f,w)
Hygiene, 1(f,w)	Soils, 3(f,w)
Farm Arithmetic, 3(f,w)	Drawing and Farm Buildings, 3(f,w)
Agricultural Botany, 3(f,w)	Floriculture, 3(w)
Farm Horticulture, 3(f,w)	Commercial Vegetable Gardening, 3(w)
Plant Propagation, 3(f)	Gymnasium, 2(f,w)
Judging Types and Market Classes of Livestock, 2(f,w)	Electives, 3
Social Problems for Boys, 1(f,w)	
Gymnasium, 2(f,w)	

COURSES OF STUDY

19

ELECTIVES

<p>Corn and Potatoes, 2(f,w) Judging Breed Types of Livestock, 3(f,w) Elementary Beekeeping I, 3(f,w) Blacksmithing I, 3(f,w) Advanced Farm Arithmetic, 3(f,w) Elements of Music I, 2(f,w) Elements of Music II, 2(f,w) Spelling, 1(f,w) Penmanship, 1(f,w) Physiology, 3(f,w) Dramatics, $\frac{1}{2}$(f,w)² Debating, 1(w)² Typewriting I, 3(f,w) Bookkeeping, 3(f,w)</p>	<p>Elementary Beekeeping II, 3(f,w) Tractor and Auto Work I, 3(f,w) Farm Buildings I, 3(f,w) Poultry, 3(f,w) Chorus, $\frac{1}{2}$(f,w) Violin, $\frac{1}{2}$(f,w)¹ Piano, $\frac{1}{2}$(f,w)¹ Instrumental Music, $\frac{1}{2}$(f,w)¹ Orchestra, $\frac{1}{2}$(f,w) Voice, $\frac{1}{2}$(f,w)¹ Band, $\frac{1}{2}$(f,w) Harmony I, 2(f,w) Harmony II, 2(f,w) Appreciation of Music, 3(f,w) Instrumentation and Conducting, 3(f,w)</p>
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JUNIOR YEAR

REQUIRED—FIRST TERM	REQUIRED—SECOND TERM
<p>English Classics, 3(f,w) Chemistry of Plant and Animal Life I, 3(f,w) Animal Biology, 3(f,w) Greenhouse Construction and Management, 3(f) Landscape Gardening, 3(f) Gymnasium, $\frac{1}{2}$(f,w) Electives, 3</p>	<p>Business English, 3(f,w) Seed Testing, 2(w) Tractor and Auto Work I, 3(f,w) or Farm Mechanical Training, 3(f,w) Forest Nursery Methods and Tree Planting, 3(w) Gymnasium, 2(f,w) Electives, 7</p>

ELECTIVES

<p>Cereal Crops, 3(f,w) Forage Crops, 3(f,w) Feeds and Feeding, 3(f,w) Tractor and Auto Work II, 3(f,w) Orchard Fruit Growing, 3(f) Special Problems in Horticulture (w) Management of Laying Flock, 1(f,w) Algebra I, 7(f,w) Geometry I, 7(f,w) Industrial History, 3(f,w) Elements of Bacteriology, 3(w) Chemistry of Plant and Animal Life, II, 3(f,w) Advanced Beekeeping, 3(f,w) Parliamentary Law, 1(f,w) Land Clearing, 3(w)</p>	<p>Dairy Stock Judging, 2(f,w) Advanced Livestock Judging, 3(f,w) Meats, 3(f,w) Blacksmithing II, 3(w) Mechanics and Water Supply, 3(f,w) Heat and Electricity, 3(w) Potato Production, 3(w) Weeds, 2(f) Incubating and Brooding, 3(w) Algebra II, 7(f,w) Geometry II, 7(f,w) American History, 3(f,w) Physiology and Hygiene of Breeding, 2(f) Veterinary Studies, 5(w) Farm Dairying, 3(f,w) Co-operative Accounting, 3(w)</p>
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SENIOR YEAR

REQUIRED—FIRST TERM	REQUIRED—SECOND TERM
<p>Public Speaking, 3(f,w) American Government, 3(f,w) Plant Diseases, 3(f,w) Insect Pests of Plants, 3(f) Gymnasium, 2(f,w) Electives, 6</p>	<p>English VI, 3(f,w) Rural Sociology, 3(f,w) Crop Breeding, 3(w) General Office Practice, 3(f,w) Small Fruit Growing, 3(w) Gymnasium, 2 (f,w) Electives, 3</p>

¹ A special fee of \$10 is charged for this course.

² Credit for this course is allowed only under the conditions specified in the booklet of Faculty Regulations.

ELECTIVES

Judging and Grading Farm Crops, 3(w)	Farm Management II, 3(f,w)
Farm Implements, 3(f)	Livestock Breeding, 3(f,w)
Farm Management I, 3(f,w)	Milk Production, 3(w)
Livestock Feeding and Management, 3(f)	Dairy Stock Selection, 3(w)
Dairy Stock Feeding, 3(f)	Farm Building, 3(f)
Drainage and Roads, 3(f)	English Literature II, 5(w)
English Literature I, 5(f)	Advanced Public Speaking, 3 (f,w)
Elementary Economics, 3(f,w)	Rural Economics, 3(f,w)

LIVESTOCK PRODUCTION

FRESHMAN YEAR

REQUIRED—FIRST TERM

English I, 3(f,w)
 Hygiene, 1(f,w)
 Farm Arithmetic, 3(f,w)
 Judging Types and Market Classes of Livestock, 2(f,w)
 Drawing and Farm Buildings, 3(f,w)
 Agricultural Botany, 3(f,w)
 Gymnasium, 2(f,w)
 Social Problems for Boys, 1(f,w)
 Electives, 3

REQUIRED—SECOND TERM

English II, 3(f,w)
 Corn and Potatoes, 2(f,w)
 Soils, 3(f,w)
 Judging Breed Types of Livestock, 3(f,w)
 Animal Biology, 3(f,w)
 Gymnasium, 2(f,w)
 Electives, 4

ELECTIVES

Advanced Farm Arithmetic, 3(f,w)
 Physiology, 3(f,w)
 Blacksmithing I, 3(f,w)
 Farm Buildings I, 3(f,w)
 Tractor and Auto Work I, 3(f,w)
 Elementary Beekeeping I, 3(f,w)
 Farm Mechanical Training, 3(f,w)
 Spelling, 1(f,w)
 Penmanship, 1(f,w)
 Poultry, 3(f,w)
 Farm Horticulture, 3(f,w)
 Elementary Beekeeping II, 3(f,w)
 Dramatics, 1(f,w)²
 Debating, 1(w)²
 Typewriting I, 3(f,w)
 Bookkeeping, 3(f,w)
 General Office Practice, 3(f,w)
 Elements of Music I, 2(f,w)

Elements of Music II, 2(f,w)²
 Violin, 1(f,w)¹
 Piano, 1(f,w)¹
 Instrumental Music, 1(f,w)¹
 Voice, 1(f,w)¹
 Orchestra, 1(f,w)
 Chorus, 1(f,w)
 Band, 1(f,w)
 Harmony I, 2(f,w)
 Harmony II, 2(f,w)
 Appreciation of Music, 3(f,w)
 Instrumentation and Conducting, 3(f,w)
 Plant Propagation, 3(f)
 Floriculture, 3(w)
 Landscape Gardening, 3(f)
 Home Project, 1 to 3

JUNIOR YEAR

REQUIRED—FIRST TERM

English Classics, 3(f,w)
 Forage Crops, 3(f,w)
 Advanced Livestock Judging, 3(f,w) or Dairy Stock Judging, 2(f,w)
 Physiology and Hygiene of Breeding, 2(f)
 Feeds and Feeding, 3(f,w)
 Gymnasium, 2(f,w)
 Electives, 4 or 5

REQUIRED—SECOND TERM

Business English, 3(f,w)
 Meats, 3(f,w)
 Farm Dairying, 3(f,w)
 Veterinary Studies, 5(w)
 Gymnasium, 2(f,w)
 Electives, 4

¹ A special fee of \$10 is charged for this course.

² Credit for this course is allowed only under the conditions specified in the booklet of Faculty Regulations.

ELECTIVES

Insect Pests of Plants, 3(f)	Greenhouse Construction and Management, 3(f)
Chemistry of Plant and Animal Life I, 3(f,w)	Heat and Electricity, 3(w)
Mechanics and Water Supply, 3(f,w)	Cereal Crops, 3(f,w)
Algebra I, 7(f,w)	Blacksmithing II, 3(w)
Industrial History, 3(f,w)	Incubating and Brooding, 3(w)
Parliamentary Law, 1(f,w)	Tractor and Auto Work II, 3(f,w)
Geometry I, 7(f,w)	Commercial Vegetable Gardening, 3(w)
Management of Laying Flock, 1(f,w)	Elements of Bacteriology, 3(w)
Orchard Fruit Growing, 3(f)	Seed Testing, 2(w)
Small Fruit Growing, 3(w)	Chemistry of Plant and Animal Life II, 3(f,w)
Algebra II, 7(f,w)	Weeds, 2(f)
Geometry II, 7(f,w)	American History, 3(f,w)
Co-operative Accounting, 3(w)	Advanced Beekeeping, 3(f,w)
Potato Production, 3(w)	Dairy Stock Judging, 2(f,w)
Special Problems in Horticulture (w)	Forest Nursery Methods and Tree Planting, 3(w)
Advanced Livestock Judging, 3(f,w)	
Land Clearing, 3(w)	

SENIOR YEAR

REQUIRED—FIRST TERM	REQUIRED—SECOND TERM
Public Speaking, 3(f,w)	English VI, 3(f,w)
American Government, 3(f,w)	Rural Sociology, 3(f,w)
Livestock Feeding and Management, 3(f) or Milk Production, 3(w)	Farm Management II, 3(f,w)
Livestock Breeding, 3(f,w) for men or 3(w) for women	Gymnasium, 2(f,w)
Problems in Livestock Improvement, 3(w) for women	Electives, 9
Farm Management I, 3(f,w)	
Gymnasium, 2(f,w)	
Electives, 3	

ELECTIVES

Plant Diseases, 3(f)	Milk Production, 3(w)
Crop Breeding, 3(w)	Dairy Stock Feeding, 3(f)
Farm Buildings, 3(f)	Rural Economics, 3(f,w)
Drainage and Roads, 3(f)	Dairy Stock Selection, 3(w)
Farm Implements, 3(f)	English Literature II, 5(w)
Elementary Economics, 3(f,w)	Advanced Public Speaking, 3(f,w)
English Literature I, 5(f)	Judging and Grading Farm Crops, 3(w)
Livestock Feeding and Management, 3(f)	

HOME ECONOMICS

The Home Economics course is planned primarily to train girls for home making, but in addition it is possible for them to elect work along several different lines preparing for wage earning. The elective work in millinery and in dressmaking would be sufficiently comprehensive to enable them to utilize their training for wage earning in these occupations. Certain hospitals will accept graduates of the School of Agriculture as probationers for the nurses' training. Courses in music give, to those who have special ability along that line, an opportunity to learn to conduct community singing, orchestras, and to give elementary instruction in music. Each girl makes her program under the direction of one of the members of the Home Economics faculty.

THE SCHOOL OF AGRICULTURE

FRESHMAN YEAR

REQUIRED—FIRST TERM	REQUIRED—SECOND TERM
Related Science I, 3(f,w)	Related Science II, 3(f,w)
English I, 3(f,w)	English II, 3(f,w)
Selection and Preparation of Food, 3(f,w)	Meal Preparation, 3(f,w)
Garment Making I, 2(f,w)	Garment Making II, 2(f,w)
Drawing and Design I, 1(f,w)	Drawing and Design II, 1(f,w)
Physical Training, 2(f,w)	Electives, 6
Electives, 6	Physical Training, 2(f,w)
Social Training, 2(f)	

ELECTIVES

Elements of Music I, 2(f,w)	Typewriting I, 3(f,w)
Elements of Music II, 2(f,w)	Stenography I, 3(f,w)
Chorus, ½(f,w)	Bookkeeping, 3(f,w)
Violin, ¼(f,w) ¹	General Office Practice, 3(f,w)
Piano, ¼(f,w) ¹	Spelling, 1(f,w)
Voice, ½(f,w) ¹	Penmanship, 1(f,w)
Instrumental Music, ½(f,w) ¹	Poultry, 3(f,w)
Orchestra, ½(f,w)	Elementary Beekeeping I, 3(f,w)
Dramatics, ½(f,w) ²	Elementary Beekeeping II, 3(f,w)
Debating, 1(w) ²	Farm Horticulture, 3(f,w)
Harmony I, 2(f,w)	Landscape Gardening, 3(f)
Harmony II, 2(f,w)	Plant Propagation, 3(f)
Appreciation of Music, 3(f,w)	Floriculture, 3(w)
Instrumental and Conducting, 3(f,w)	Farm Arithmetic, 3(f,w)
	Advanced Farm Arithmetic, 3(f,w)
	Agricultural Botany, 3(w)
	Physiology, 3(f,w)

JUNIOR YEAR

REQUIRED—FIRST TERM	REQUIRED—SECOND TERM
English Classics, 3(f,w)	Business English, 3(f,w)
Food and Nutrition, 2(f,w)	Biology, 3(w)
Textiles and Care of Fabrics, 3(f,w)	House Planning and Furnishing, 3(f,w)
Home Nursing and Hygiene I, 2(f,w)	American History, 3(f,w)
Electives, 8	Electives, 6
Physical Training, 2(f,w)	Physical Training, 2(f,w)

ELECTIVES

Millinery I, 3(f)	Algebra I, 7(f,w)
Advanced Millinery, 3(w)	Algebra II, 7(f,w)
Dressmaking I, 3(f,w)	Geometry I, 7(f,w)
Decorative Needlework, 3(w)	Geometry II, 7(f,w)
Dressmaking II, 3(f,w)	Industrial History, 3(f,w)
Chemistry of Plant and Animal Life I, 3(f,w) ¹	Parliamentary Law, 1(f,w)
Elements of Bacteriology, 3(w) ²	Chemistry of Plant and Animal Life II, 3(f,w) ¹
Household Physics, 5 (f)	Typewriting II, 3(f,w)
Utilization of Meats, 3(w)	Stenography II, 3(f,w) ³
Advanced Beekeeping, 3(f,w)	Stenography III, 3(f,w)
Farm Dairying, 3(f,w)	Typewriting III, 3(f,w)
	Insect Pests of Plants, 3(f)
	Orchard Fruit Growing, 3(f)
	Small Fruit Growing, 3(w)
	Incubation and Brooding, 3(w)
	Management of Laying Flock, 1(f,w)

¹ A special fee of \$10 is charged for this course.

² Credit for this course is allowed only under the conditions specified in the booklet of Faculty Regulations.

³ Courses should be elected by those who contemplate taking the nurses' training upon graduation.

SENIOR YEAR

REQUIRED—FIRST TERM

Public Speaking, 3(f,w)
 American Government, 3(f,w)
 Home Management, 3(f,w)
 Electives, 9
 Physical Training, 2(f,w)

REQUIRED—SECOND TERM

English VI, 3(f,w)
 Rural Sociology, 3(f,w)
 Home Nursing and Hygiene II, 2(w)
 Economics of Buying I, 3(f,w)
 Child Care and Training, 2(w)
 Electives, 5
 Physical Training, 2(f,w)

ELECTIVES

Economics of Buying II, 2(f,w)
 Trade Dressmaking, 5(w)¹
 Trade Millinery, 5(w)¹

Elementary Economics, 3(f,w)
 Rural Economics, 3(f,w)
 Advanced Public Speaking, 3(f,w)
 English Literature I, 5(f)
 English Literature II, 5(w)
 Plant Diseases, 3(f)
 Commercial Law, 3(f)

ADMISSION TO THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Graduates of the School of Agriculture of the University of Minnesota who have completed the two summers of supervised farm work offered in the school course, one additional school year, and one additional summer's work, or the equivalent thereof, will be admitted to the College of Agriculture, Forestry, and Home Economics.

¹ Not offered in 1926-27.

DESCRIPTION OF COURSES

AGRICULTURAL BIOCHEMISTRY

- A1-2. Chemistry of Plant and Animal Life. The fundamental principles of chemistry necessary for an understanding of common daily phenomena. The scope of agricultural chemistry and the help which the farmer may expect from the chemical laboratories of the state are outlined.

AGRICULTURAL ECONOMICS

- A1. Co-operative Accounting. Nature and kind of accounts for co-operative business. Practice in properly recording business transactions, preparation and interpretation of balance sheets and income statements for various types of co-operative organizations.

AGRICULTURAL ENGINEERING

- A1. Blacksmithing I. The management of the forge, bending, shaping, and welding iron, to familiarize the student with the operations for blacksmith repair work on the farm.
- A2. Blacksmithing II. Bending, shaping, and welding steel, and tempering steel tools, to familiarize the student with the operations necessary for blacksmith steel work on the farm.
- A11. Tractor and Auto Work I. Theory and practice work in gasoline and kerosene engines.
- A12. Tractor and Auto Work II. An advanced course in gasoline and kerosene engines and tractors, giving attention to adjustments, care, and operation.
- A16. Farm Mechanical Training. Instruction and laboratory practice in rope splicing, knots, belt lacing, pulleys and shafting, soldering, pipe fitting, electric wiring, babbitting, cement work, and work with cold metals.
- A18. Mechanics and Water Supply. The mechanics of solids, liquids, and gases. Special emphasis is given to water supplies, water systems, sewage disposals, weather conditions, and forecasts. Laboratory work will be a part of the course.
- A19. Heat and Electricity. Heat and electricity as applied to home heating and lighting with a study of electric batteries, motors, and other appliances. Laboratory work will be given.
- A21. Farm Buildings I. The care and use of tools is taught by means of shop exercises. Each student is required to sharpen his own tools and is given instruction in painting, estimating building materials, and farm building construction.
- A31. Drawing and Farm Buildings. Sketching, practice in pictorial drawing, and drawing farm building plans. Set of instruments not required.

- A32. Farm Buildings II. Location, planning, construction, and maintenance of farm buildings.
- A41. Household Physics. Household mechanics, air, and water pressure, heat, and electricity. The economics of power, heat, light, and electricity in the home are considered.
- A51. Drainage and Roads. Conditions requiring, purposes of, benefits from drainage. Legal organization for extensive drainage. Kinds of drainage; essential features of drainage system; practice ditching and tile laying to grade. Country road administration; earth road construction and maintenance.
- A52. Land Clearing. Systematized development of timber land farms; brushing; burning; timber salvage for fences, buildings and fuel; stump and stone removal; blasting temporary ditches; breaking and management of virgin timber soils.

AGRONOMY AND FARM MANAGEMENT

- A1. Cereal Crops. Including the history, culture, judging, and uses of the important cereal crops.
- A2. Corn and Potatoes. The history and classification with a careful study of the culture, judging, and uses of the corn and potato crops.
- A3. Forage Crops. Grasses and legumes and other forage crops, and methods in growing them for forage.
- A5. Crop Breeding. Modern methods of propagating and breeding the various agricultural crops with plans for growing and certifying pedigreed seed.
- A6. Judging and Grading Farm Crops. Factors which influence the value of crops for seed, feed, and market, with practice in the application of federal grades.
- A11. Farm Implements. Studies and discussions of the selection, operation, and care of farm machinery; also the cost, depreciation, efficiency, and adaptability of the various machines to the work to be accomplished.
- A21. Farm Management I (Records). Practice in taking farm inventories and in keeping labor, crop, field, and feed records. Studies of cost of production. The use of farm capital; mortgages; farm loans; contracts; deeds; taxes; insurance; general farm business methods.
- A22. Farm Management II (Organization). Farm organization as related to types of farming, combinations of enterprises, crop rotation, soil management, field and farmstead arrangement, and the efficient use of labor and equipment.

ANIMAL HUSBANDRY

- A1. Judging Types and Market Classes of Livestock. The livestock industry; demonstration of types and market classes of cattle, horses, sheep, and swine and their relation to production; score card practice and the fundamentals of livestock judging.

- A2. Judging Breed Types of Livestock. The origin, present day characteristics and adaptability of the breeds of cattle, horses, sheep, and swine. Practice in judging purebred animals.
- A3. Advanced Livestock Judging. Practice in judging livestock from both the market type and breed standpoint.
- A4. Meats. Lectures, demonstrations, and practice work in dressing animals, cutting and curing meats.
- A5. Livestock Breeding. Livestock improvement and variation, heredity, environment and selection as factors therein; line breeding, inbreeding, crossbreeding and grading up; the purebred sire; pedigree registration; practical breeders problems.
- A6. Livestock Feeding and Management. The business side of stock farming, buying and selling, record keeping, economic principles involved in efficient feeding of beef cattle, horses, sheep, and swine. Study of the several forms of specialization in livestock production.
- A7. Utilization of Meats. Lectures on methods of utilizing cuts from the beef, pork, and mutton carcass; curing and storing of meats for summer use; laboratory practice in preparing cuts of meat for cooking; sausage making and lard rendering. (This course is intended primarily for women students.)
- A8. Problems in Livestock Improvement. Methods used in improving the various types of livestock. The problems of heredity, variation, environment, and selection as affecting livestock improvement. Herd record keeping and the registration of purebred livestock.

BEE CULTURE

- A1. Elementary Beekeeping I. Fundamentals of bee behavior and of beekeeping practice during spring and early summer; spring management. Swarming, swarm control, and increase.
- A2. Elementary Beekeeping II. Fundamentals of bee behavior and of beekeeping practice during late summer, fall, and winter. Production of extracted honey, comb honey, and wax. Feeding, requeening. Wintering of bees. Bee diseases.
- A3. Advanced Beekeeping. Commercial and out apiaries. Migratory beekeeping. Package bees and nuclei. Home queen rearing. Marketing of honey.

DAIRY HUSBANDRY

- A1. Feeds and Feeding. The principles of feeding including the composition of feeds and of the animal body, digestion; a study of the various feedstuffs, and of feeding standards.
- A2. Farm Dairying. Milk, its composition, properties, cleanly production, and care. Principles of, and practice in, separating, testing, and farm butter making. Forms and methods of marketing.
- A3. Dairy Stock Judging. Practice in judging dairy cattle both from the standpoint of the farmer who is interested in the production of dairy products for market and the breeder of purebred cattle.

- A5. Milk Production. Characteristics of the dairy breeds, selection, care and management of the dairy herd, selection of the sire, calf raising; dairy barns.
- A6. Dairy Stock Feeding. Feeding the cow for milk production and the growing animals. Formulation of rations with special attention to economy and efficiency, a study of roughages and concentrates. Rations for cows on official tests.
- A7. Dairy Stock Selection. A study of type, comparative judging, a study of pedigrees in relation to values. Visits to noted herds near the Twin Cities.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

- A1. Animal Biology. Fundamental principles of animal life such as metabolism, respiration, digestion, growth, and reproduction. The more important groups of the animal kingdom and their relation to man.
- A3. Biology. Such topics as inheritance, reproduction, natural selection, nervous activity, and metamorphosis are dealt with.
- A16. Insect Pests of Plants. Life cycles of insect pests injurious to cultivated plants and methods of combating them.

FORESTRY

- A1w. Forest Nursery Methods and Tree Planting. Seed collecting, storing, sowing, raising seedlings, transplanting, packing for shipment; woodlot and windbreak plans, kinds of trees used, planting and care.

GYMNASIUM AND PHYSICAL TRAINING

MEN

The gymnasium with its facilities is kept open every afternoon and evening for the use of students.

The primary aim of the gymnasium work is to provide exercise and recreation for all the students of the school. Interclass basket-ball, volley ball, indoor baseball, track meets, and handball tournaments are organized, and interscholastic competition in track and basket-ball is provided for.

Special attention is given to teaching such games as tennis, handball, volley ball, baseball, boxing and wrestling, with the thought that such games can be continued at home, thereby helping in making the home and community life more interesting.

- A1. Gymnasium. Proper use of gymnasium facilities, swimming, various athletic games and how to play them. Emphasis placed on athletic games as a means of recreation as well as physical development.

WOMEN

The aim of this department is to maintain the health of the student; to give gymnastic exercises and deep breathing; to stimulate functional activity, and to give co-ordination and poise. The department offers opportunities for swimming in the gymnasium swimming pool, organized games,

cross-country tramps, and skating. A girl scout leadership course is offered which will enable the girls to become scout leaders in their communities. Every girl is required to pass a swimming test before graduating, proving that she can save her life in case of an accident on the water.

All girls entering the school for the first time are required to take a physical examination. This examination is conducted by the director of health and physical education for women, and a corps of doctors and nurses. It consists of an examination of the heart and lungs, nose and throat, spine and feet. Height and weight are measured, eyes and ears tested. Medical advice is given and recommendations for special exercises are made for students who would be benefited by them.

- A1-2. Freshman Physical Training. Formal gymnastics, games, beginning apparatus work, folk dancing, remedial gymnastics, and swimming.
- A3-4. Junior Physical Training. Formal gymnastics, games, apparatus work, folk dancing, remedial gymnastics, and swimming.
- A5-6. Senior Physical Training. Formal gymnastics, games, advanced apparatus work, diving, and swimming.

HOME ECONOMICS

- A1. Garment Making I. Qualities, prices, and uses of standard muslins; use and care of the sewing machine; reading and alteration of commercial patterns; making of an apron and undergarments.
- A2. Garment Making II. Suitable design and materials for children's garments; construction of children's clothing; repair of clothing.
- A3. Dressmaking I. Selection of suitable fabrics, and design for, and construction of, simple wash dress and blouse or similar garment.
- A4. Textiles and Care of Fabrics. Textile fibers and standard fabrics; methods of determining fastness of color and durability of fabrics; storage, methods of home laundering, cleaning, and dyeing of clothing and household fabrics.
- A5. Dressmaking II. Fabrics and designs suitable for, and construction of, a wool dress of tailored design, using commercial patterns and simple modeling; additional problems such as lingerie or simple silk dress.
- A6. Decorative Needlework. Applied design in needlework, adapted to decoration of clothing, hats, and household furnishings; emphasis on attaining sufficient skill and speed to have work of commercial value.
- A7. Millinery I. Design and construction of different types of hats. Care and renovation of hat materials and trimmings.
- A8. Advanced Millinery. Continuation of Millinery I with more advanced work in designing and construction of all types of hats. Emphasis on commercial problems. Work planned on a shop basis.
- A9. Economics of Buying I. The budget and its use; information regarding hosiery, shoes, underwear, outer garments, household furnishings, and home marketing which is necessary for intelligent shopping. Standards of dress.

- A10. Economics of Buying II. Supplementary course to be carried parallel with Economics of Buying I in which opportunity will be given to do a certain amount of shopping and to get acquainted with the various wholesale houses.
- A12. Trade Dressmaking. To be offered in co-operation with city dress-making shops, giving students actual trade experience. (Not offered in 1926-27.)
- A13. Trade Millinery. To be offered in co-operation with city millinery shops, giving students actual trade experience. (Not offered in 1926-27.)
- A21. Drawing and Design I. Principles of design and color harmony with special reference to furnishing and arrangement of rooms; one craft problem.
- A22. Drawing and Design II. Continuation of Course A21 with special emphasis on color harmonizing.
- A26. House Planning and Furnishing. A consideration of the house in regard to location, convenient arrangement of floor space, and heating and plumbing equipment; selection and cost of interior finish, wall and floor coverings, furniture, curtains, and pictures.
- A31. Selection and Preparation of Food. Food combinations, planning of menus and serving simple breakfasts and luncheons.
- A32. Meal Preparation. Continuation of A31 with emphasis on dinner menus.
- A33. Foods and Nutrition. Adequate diet for members of class, based on height-weight record and food requirements. Planning and preparing meals for all members of the family considering health and economy.
- A34. Home Management. The homemaker's responsibilities; distribution of the family income, household accounts, scheduling and dispatching of work in connection with meal preparation; care of the house and its equipment. Especial attention to labor saving devices.
- A35. Child Care and Training. Physical care of infants and small children. Habit formation and methods of control; games and reading suitable for the pre-school child.
- A50. Related Science I. Interesting phenomena of every day life, especially those relating to the home and scientific principles which explain them.
- A51. Related Science II. A continuation of Course A50.

HORTICULTURE

- A1. Farm Horticulture. Growing fruits, vegetables, and ornamentals for use on the farm. Location and planning of the orchard and garden and the culture of the important crops. Propagation of common plants. Culture and use of ornamentals.
- A2. Orchard Fruit Growing. Commercial orcharding with a special consideration of the profitable management of an orchard on the Minnesota farm. Location; planting; selection of varieties; cultural systems; pruning; pest control; harvesting and marketing of fruit.

- A3. Commercial Vegetable Gardening. Growing of vegetable crops for market. Locating, planting, and care of the commercial garden; consideration of the important crops; marketing methods; types of glass structures, their uses, and the production of vegetables under glass.
- A4. Small Fruit Growing. A practical study of berry growing as a commercial enterprise in Minnesota and the Northwest, covering the establishing and management of plantations of strawberries, raspberries, blackberries, gooseberries, currants, and grapes.
- A5. Plant Propagation. Methods of propagation of plants by seeds, cuttings, layers, grafting, and budding are studied. The principles of greenhouse management, transplanting, watering, and ventilation are studied.
- A7. Floriculture. A working knowledge of the culture and use of house plants, annuals, and perennials.
- A8. Landscape Gardening. Practice and principles of ornamental plantings as applied to the home and community. Common trees, shrubs, and herbaceous perennials.
- A10. Greenhouse Construction, Management, and Practice. Construction and management of the greenhouse from the standpoint of the fruit, vegetable, or flower grower. Various crops in relation to types of glass construction. Practice work in crops in the greenhouse.
- A14. Potato Production. Growth, climatic requirements, regional distribution, standardization of varieties according to soil, climate, and markets. Identification, exhibiting, judging, handling of seed plots, certification, cultural methods, storage, and marketing.
- A15. Special Problems. Individual instruction in the various phases of horticulture adjusted to meet the needs of the student. Credit may be earned in one or more quarters.

PLANT PATHOLOGY AND BOTANY

- A1. Agricultural Botany. The parts of economic flowering plants, emphasizing their significance in relation to agricultural practice. Seeds, fungi causing diseases of plants, and decay organisms.
- A2. Seed Testing. The seeds of the common farm weeds, with special attention to those of noxious weeds. A set of seed cases is made and practice is given in testing seeds for purity and germination.
- A4. Agricultural Botany. Economic flowering plants. The course also contains a brief study of molds, mushrooms, rots or decays, and yeast.
- A11. Plant Diseases. Important diseases of Minnesota crop plants, with special emphasis on methods of control.
- A12. Weeds. Farm weeds with special emphasis on their identification, control, and eradication.

POULTRY HUSBANDRY

- A1. Poultry. Importance of the industry, market products, best methods of house construction, feeding for egg production; common ailments and simple treatments.

- A2. Management of Laying Flock. Practice in feeding and management, feeds, a study of laying rations, selection for laying qualities, selection for breeding qualities, keeping accounts.
- A3. Incubation and Brooding. The best methods of incubation and brooding, natural and artificial, includes selection of breeders, eggs for incubation, feeding and care of chicks, how to avoid losses.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

- A1. Home Nursing and Hygiene I. Home nursing equipment and methods practicable in the household. Communicable diseases, methods of prevention, control, and disinfection.
- A2. Home Nursing and Hygiene II. Hygiene requirements during infancy, childhood, womanhood, maturity. Household emergencies, preparation for maternity, care of infant.
- A8. Hygiene. Methods for promotion of health and prevention of disease will be considered with a view to acquainting the student with the fundamentals of right living and the individual and community activities against the spread of disease.

RHETORIC

- A1. English I. The sentence, parts of speech, punctuation, spelling, supplementary reading.
- A2. English II. Paragraphs and themes in narration, description, and exposition. Supplementary reading.
- A3. English Classics. American and English authors.
- A4. Business English. Practice in various forms of correspondence and business forms.
- A5. Public Speaking. Voice exercise, platform deportment. Practice in delivery of memorized and extemporaneous speeches.
- A6.* English VI. Exposition and argument. Gathering and outlining material. Instruction in the writing of senior thesis. Debating.
- A14. Advanced Public Speaking. A continuation of Course A5. Selecting and organizing material for speeches and the presentation of speeches effectively before a given audience.
- A21-22. English Literature I, II. The history of English literature, with a study of selections. For students planning to enter the College of Agriculture, Forestry, and Home Economics.
- A31. Dramatics. Students who are selected by the coach of dramatics to take major parts in a play will receive one-half point credit upon the recommendation of the coach.
- A32. Debating. Students participating in intersociety debates under the supervision of a teacher of debating will receive a one point credit upon completing a required amount of work. Debaters should report to the coach as soon as they are chosen.

* Students who substitute credits in English gained in other schools for the credits in this course must register for the course to receive instructions in writing the senior thesis.

SCHOOL (GENERAL)

- A1. Farm Arithmetic. Training in simple mathematical processes, applications of principles to problems requiring measurements of material, extension, capacity. Practical applications to farm and home life. Assists in the mathematics of the technical school courses.
- A2. Advanced Farm Arithmetic. Similar in outline to Course A1. Special emphasis on farming as a business.
- A4. Algebra I. Fundamental operations: properties of algebraic numbers, addition, subtraction, multiplication, division, factoring simple equations, fractions.
- A5. Algebra II. Fractional equations, literal numbers, proportions, simultaneous equations, radicals, quadratics. Emphasis upon the development and use of formulae. Problems taken from fields allied to agriculture.
- A6. Geometry I. Parallel and perpendicular lines, triangles, loci, polygons, proportion, similar polygons. Theorems developed both inductively and deductively. In this term's work emphasis is placed upon geometry as a reasoning process.
- A7. Geometry II. Inequalities, circles, numerical relations, areas, regular polygons. Special emphasis on those problems relating to farm life such as the calculation of areas, surveying, and problems taken from mechanics.
- A21. Elements of Music I. Fundamental principles of musical notation, pitch, rhythm, musical terms, formation of major scales, sight reading, singing, and ear training.
- A22. Elements of Music II. Formation of minor scales, intervals, chord construction, ear training in rhythm and intervals. Musical terms. Chords applied to piano.
- A23. Chorus. Sight reading and ear training. From this chorus, students with unusual ability and experience will be chosen for the school chorus, which is divided into men's glee club, girls chorus, mixed chorus and quartet.
- A24. Violin. Elementary: Rosenkranz, *Kayser Etudes*, *Schradieck Scales*, *Solos in Comparison*. Intermediate: scales in all positions, Seveik, Mazas, Dont, compositions of medium difficulty. Advanced: Kreutzer, Fiorillo, Rode, Gavinie, sonatas of Handel, Gade, David, concertos of Viotti, DeBeriot, Mendelssohn. Ten thirty-minute lessons, \$10 per term.
- A25.* Piano. Elementary and advanced technical training, scales, arpeggios, octaves, chords, selected technical studies. Bach: Inventions, Well-Tempered Clavichord. Sonatinas: Clementi, Kuhlman. Sonatas: Haydn, Mozart, Beethoven. Solos for all grades; classics and best modern material. Ten thirty-minute lessons, \$10 per term.

* Piano students may register for orchestra and receive training through piano quartet (two pianos), subject to the approval of the instructor.

- A26. Instrumental. Band and orchestral instruments, such as cornet, clarinet, saxophone, trombone, baritone, alto, horn, tuba, etc., using standard textbook containing latest methods. Ten thirty-minute lessons, \$10 per term.
- A27.* Orchestra. Standard works in orchestral music. Special attention is given to interpretation, rhythm, phrasing, intonation, and sight reading.
- A28. Voice. Voice placing, breath development, enunciation, diction, illustrated by elementary studies and exercises by Sieber, Clippinger, Con Cone; songs of medium difficulty. Ten thirty-minute lessons, \$10 per term.
- A29. Harmony I. Formation and progression of triads, seventh and ninth chords, harmonizing a given bass.
- A30. Harmony II. Harmonizing simple melodies, cadences, modulations, transposition, accompaniment writing, and melody building.
- A32. Appreciation of Music. Appreciation of music; brief history; biographies of well-known composers; and a knowledge of standard musical literature for the orchestra, band, chorus, solo work, and any combination or group of instruments or voices.
- A33. Instrumentation and Conducting. A knowledge of instruments of the band and orchestra, their origin and development, construction, part they play, and how played. Combinations of instruments. Essentials of conducting and actual practice in directing band and orchestra.
- A34. Band. Ensemble playing, sight reading, breathing, scales, intonation, phrasing, rhythm, and a practical band experience is given. Best standard musical literature. Advanced methods in non-pressure tone production and attack, etc.
- A41. Parliamentary Law. Principles of parliamentary law, how to organize a society, duties of officers, how to record proceedings, and how to conduct meetings. Students will be given practice under the direction of the instructor.
- A42. American Government. Origin, necessity, nature, and various forms of government. Functions of the legislative, executive, and judicial departments in each division of government. Local, state, national, and international government as it operates today. Current problems.
- A43. Elementary Economics. Fundamental laws governing production, consumption, distribution, and exchange. Special attention devoted to such topics as taxation, co-operation, industry of today, rural credit, and international trade. Current economic problems are discussed.
- A44. Rural Economics. The general principles of economics as applied to the farmer's relationships, as a producer and as a consumer. Special topics considered. Marketing of farm products, co-operative societies, rural credits, taxation, farm labor, and tenancy.

* Piano students may register for orchestra and receive training through piano quartet (two pianos), subject to the approval of the instructor.

- A45. Industrial History. The general industrial development in the United States with special emphasis upon the development of agriculture. The yearbooks of the Department of Agriculture are used in connection with assigned readings.
- A46. Rural Sociology. A practical course including a study of rural conditions, how to make a survey, the cause of present conditions and how they may be improved. Study of rural organizations, religions, and educational institutions.
- A47. American History. Causes and effects of great movements are emphasized. History of the westward migration, immigration, foreign relations, and special emphasis on our history since 1900.
- A55. Social Training. Fundamental principles governing the individual in social contacts; attention to the rights and the responsibilities of the individual in institutional life; the home as the social center; discussion of problems arising in current social activities.
- A56. Social Problems for Boys. An open forum for the discussion of social conventions of home, school, and public life.
- A61. Spelling. Students poor in spelling should elect this course and continue until able to spell words in ordinary conversation and correspondence. A spelling text is used and drills on lists of commonly misspelled words are given.
- A62. Penmanship. A standard muscular movement system is taught. Students who are poor in penmanship should elect this course.

BUSINESS COURSES

The object of these courses is to prepare students whose services are not immediately required for home work, for office work on the farm, in the village, or to take subordinate positions in regular offices.

The subject-matter of the course in home making and agriculture fits students, with the training in business subjects, to take positions as office assistants in farm bureaus, co-operative creameries, and local elevator.

- A63. Typewriting I. The touch method of typewriting is taught. Following the acquirement of the command of the keyboard, repetition drills to assist in memorizing the keyboard, concentration drills, and acceleration drills are given.
- A64. Typewriting II. The continuous development of speed and accuracy through carefully planned speed drills. Tabulating, letter writing and lessons on different machines and their care.
- A65. Stenography I. Principles of phonography are taught by the Gregg system. Thoro drill is given in word forms and in combining them into phrases and sentences.
- A66. Dictation. Students review carefully the principles of stenography, and take short letters by dictation, which are transcribed on the typewriter. Accuracy of transcription is the aim, rather than speed.
- A67. Stenography II. Continuation of Stenography I. Drills on words, forms, and phrases. Copying exercises for speed and taking short paragraphs by dictation.

- A68. Bookkeeping. Principles of double entry illustrated by keeping a set of books for a firm, making out the forms necessary for the various transactions, and closing the books.
- A69. Typewriting III. Business correspondence from typist's viewpoint. Business letters and documents which help in gaining correct first impressions are studied and copied. Construction work requiring judgment in arrangement, and developing initiative and power to solve original problems.
- A70. General Office Practice. This is a business practice course giving the elements of accounting, business law, the filing of papers, the use of office appliances. Insurance policies, wills, deeds, abstracts, and mortgages are explained in a practical way.
- A72. Commercial Law. Elementary principles governing contracts, business papers, partnerships and corporations, insurance, wills, deeds, mortgages, stocks and bonds. Safe investments and the proper use of credit and special laws governing co-operative association.

SOILS

- A1. Soils. Minnesota soils, their formation, properties, and characteristics. Treatment of lime-deficient, alkali, and peat soils. Farm manures, green manures, and commercial fertilizers. Laboratory demonstrations, examination of soils, and discussion of soil problems.

VETERINARY MEDICINE

- A1. Physiology. The purpose of the course is to give an intelligent conception of the various organs and systems of the body; how they function and how managed for continued health and efficiency.
- A4. Elements of Bacteriology. Lectures and demonstrations of the fundamental principles underlying the science of bacteriology, with special reference to organisms which cause disease. The preparation and use of vaccines, bacterines, antitoxins, immune sera.
- A5. Physiology and Hygiene of Breeding. Gross anatomy of the reproductive organs; physiology of reproduction; the breeding season; gestation and care of the female during parturition and lactation.
- A7. Veterinary Studies. The animal body in health and disease; causes and prevention of animal diseases in general; specially important diseases in detail; simple surgical operations, e.g., castration, dehorning, tapping for bloat, abscess drainage, etc.

NOTICE TO PROSPECTIVE STUDENTS

Please read the bulletin carefully, noting the paragraphs headed How to Get to the School, Admission, Home Life on the Campus, and Expenses. If you plan to enter the school, send to the registrar, University Farm, St. Paul, for an admission blank. Please do NOT send DIPLOMAS. In case you have had any work in HIGH SCHOOL grade, be sure to have it recorded on the blank or send certificates covering the work done.

If you desire a room in the dormitory, send with your admission blank to the registrar a money order or draft for \$2 made payable to University of Minnesota, Department of Agriculture. In case your application is received after all space in the dormitories is spoken for, your money will be returned to you. In case you decide after making application that you cannot enter the school, you should notify the registrar as soon as possible. If this is done prior to ten days before the opening of school, the money which you sent to reserve a room will be returned to you, otherwise it will not. ROOMS WILL NOT BE HELD AFTER THE OPENING DAY OF THE TERM FOR THOSE WHO ARE NOT PRESENT TO CLAIM THEM.

New students should not depend upon obtaining work at the institution to pay expenses. The regular work of the course takes so much time that a student should not do any outside work unless compelled to by necessity. Practically all the work at the institution for which pay is given is spoken for a year ahead, so none is left for new students. Any able-bodied student ought to be able to earn enough during the six months of vacation to pay his way through the school year.

Students who for any reason cannot enter the school on the opening day or very soon thereafter should wait until the opening of the next term before coming.

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

The School of Agriculture
Courses in Agriculture and Home
Economics
Part II

Announcement of Program for the Year
1927-1928



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1927							1928													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	..	..	1	2	3	4	5	6	7	1	2	3	4	5	6	7
3	4	5	6	7	8	9	8	9	10	11	12	13	14	8	9	10	11	12	13	14
10	11	12	13	14	15	16	15	16	17	18	19	20	21	15	16	17	18	19	20	21
17	18	19	20	21	22	23	22	23	24	25	26	27	28	22	23	24	25	26	27	28
24	25	26	27	28	29	30	29	30	31	..	..	..	..	29	30	31	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
AUGUST							FEBRUARY							AUGUST						
..	1	2	3	4	5	6	..	..	..	1	2	3	4	..	..	..	1	2	3	4
7	8	9	10	11	12	13	5	6	7	8	9	10	11	5	6	7	8	9	10	11
14	15	16	17	18	19	20	12	13	14	15	16	17	18	12	13	14	15	16	17	18
21	22	23	24	25	26	27	19	20	21	22	23	24	25	19	20	21	22	23	24	25
28	29	30	31	..	..	..	26	27	28	29	..	..	..	26	27	28	29	30	31	..
..
SEPTEMBER							MARCH							SEPTEMBER						
..	..	..	..	1	2	3	..	..	..	..	1	2	3	..	..	..	..	..	..	1
4	5	6	7	8	9	10	4	5	6	7	8	9	10	2	3	4	5	6	7	8
11	12	13	14	15	16	17	11	12	13	14	15	16	17	9	10	11	12	13	14	15
18	19	20	21	22	23	24	18	19	20	21	22	23	24	16	17	18	19	20	21	22
25	26	27	28	29	30	..	25	26	27	28	29	30	31	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	..	..	..	..	..	..
OCTOBER							APRIL							OCTOBER						
..	..	..	..	..	..	1	1	2	3	4	5	6	7	..	1	2	3	4	5	6
2	3	4	5	6	7	8	8	9	10	11	12	13	14	7	8	9	10	11	12	13
9	10	11	12	13	14	15	15	16	17	18	19	20	21	14	15	16	17	18	19	20
16	17	18	19	20	21	22	22	23	24	25	26	27	28	21	22	23	24	25	26	27
23	24	25	26	27	28	29	29	30	..	..	..	..	..	28	29	30	31	..	..	..
30	31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER						
..	..	1	2	3	4	5	..	..	1	2	3	4	5	..	..	..	..	1	2	3
6	7	8	9	10	11	12	6	7	8	9	10	11	12	4	5	6	7	8	9	10
13	14	15	16	17	18	19	13	14	15	16	17	18	19	11	12	13	14	15	16	17
20	21	22	23	24	25	26	20	21	22	23	24	25	26	18	19	20	21	22	23	24
27	28	29	30	..	..	..	27	28	29	30	31	..	..	25	26	27	28	29	30	..
..
DECEMBER							JUNE							DECEMBER						
..	..	..	..	1	2	3	..	..	..	..	..	1	2	..	..	..	..	..	..	1
4	5	6	7	8	9	10	3	4	5	6	7	8	9	2	3	4	5	6	7	8
11	12	13	14	15	16	17	10	11	12	13	14	15	16	9	10	11	12	13	14	15
18	19	20	21	22	23	24	17	18	19	20	21	22	23	16	17	18	19	20	21	22
25	26	27	28	29	30	31	24	25	26	27	28	29	30	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	31	..	..	..	..	..

CALENDAR
SCHOOL OF AGRICULTURE

1927-28

1927			
October	3	Monday	First term begins; entrance examinations, registration, payment of fees
October	4	Tuesday	Regular class work begins
November	11	Friday	Armistice Day; a holiday
November	24	Thursday	Thanksgiving Day; a holiday
December	23	Friday	First term closes; Christmas vacation begins, 12:00 m.
1928			
January	3	Tuesday	Second term begins; entrance examinations, registration, payment of fees
January	4	Wednesday	Regular class work begins
February	22	Wednesday	Washington's Birthday; a holiday
March	17	Saturday	Second term closes
March	20	Tuesday	Alumni Day
March	21	Wednesday	Thirty-ninth annual commencement

COURSES OF STUDY

The following summary of required work in the various courses of study is for convenience in registration. For a full outline see Part I of the bulletin.

In addition to the courses listed, Gymnasium is required each term for all boys and Physical Training for all girls.

GENERAL FARMING

Freshman year.—English I and II, Hygiene, Farm Arithmetic, Judging Types and Market Classes of Livestock, Drawing and Farm Buildings, Agricultural Botany, Social Problems for Boys, Corn and Potatoes, Soils, Judging Breed Types of Livestock, Animal Biology.

Junior year.—English Classics, Forage Crops, Advanced Livestock Judging or Dairy Stock Judging, Farm Horticulture, Feeds and Feeding, Business English, Cereal Crops, Farm Dairying, Poultry.

Senior year.—Public Speaking, American Government, Livestock Breeding, Farm Management I and II, English VI, Rural Sociology, Crop Breeding.

FARM MECHANICS

Freshman year.—English I and II, Hygiene, Farm Arithmetic, Judging Types and Market Classes of Livestock, Drawing and Farm Buildings, Agricultural Botany or Animal Biology, Social Problems for Boys, Corn and Potatoes, Soils, Farm Mechanical Training I, Farm Buildings I.

Junior year.—English Classics, Forage Crops, Farm Horticulture or Advanced Livestock Judging, Tractor and Auto Work I, Mechanics and Water Supply, Business English, Cereal Crops or Farm Horticulture, Farm Dairying, Heat and Electricity.

Senior year.—Public Speaking, Farm Buildings or Drainage and Roads, Rural Sociology, Farm Implements, Farm Management I and II, English VI, American Government, Tractor and Auto Work II.

GRAIN ELEVATOR MANAGEMENT

Freshman year.—English I and II, Hygiene, Farm Arithmetic I and II, Farm Crops I and II, Tractor and Auto Work, Soils, Farm Mechanical Training, and optional courses.

Junior year.—English Classics, Business English, Feeds and Feeding, Book-keeping, Co-operative Accounting, Commercial Law, Elementary Economics, Parliamentary Law, Plant Pests, Seed Testing, and optional courses.

Senior year.—Public Speaking, English VI, American Government, Farm Management I, Crop Breeding, Cereal Technology, Grain Marketing I and II, Grain Inspection.

HORTICULTURAL AND NURSERY TRAINING

Freshman year.—English I and II, Hygiene, Farm Arithmetic, Agricultural Botany, Farm Horticulture, Plant Propagation and Nursery Practice, Judging Types and Market Classes of Livestock, Social Problems for Boys, Soils, Drawing and Farm Buildings, Floriculture, Commercial Vegetable Gardening.

Junior year.—English Classics, Chemistry of Plant and Animal Life I, Animal Biology, Greenhouse Construction and Management, Landscape Gardening, Business English, Seed Testing, Tractor and Auto Work I or Farm Mechanical Training, Forest Nursery Methods and Tree Planting.

Senior year.—Public Speaking, American Government, Plant Diseases, Insect Pests and Plants, English VI, Rural Sociology, Crop Breeding, General Office Practice, Small Fruit Growing.

LIVESTOCK PRODUCTION

Freshman year.—Same as for General Farming, see above.

Junior year.—English Classics, Forage Crops, Advanced Livestock Judging or Dairy Stock Judging, Physiology and Hygiene of Breeding, Feeds and Feeding, Business English, Meats, Farm Dairying, Veterinary Studies.

Senior year.—Public Speaking, American Government, Livestock Feeding and Management or Milk Production, Breeding (men) or Problems in Livestock Improvement (women), Farm Management I and II, English VI, Rural Sociology.

HOME ECONOMICS

Freshman year.—Related Science I and II, English I and II, Selection and Preparation of Food, Clothing I and II, Design, Social Training, Meal Preparation.

Junior year.—English Classics, Foods and Nutrition, Textiles and Dressmaking I, Home Nursing and Hygiene I, Business English, Biology, House Planning and Furnishing, American History.

Senior year.—Public Speaking, American Government, Home Management, English VI, Rural Sociology, Home Nursing and Hygiene II, Textiles and Dressmaking II, Child Care and Training.

TABULAR STATEMENT AND PROGRAM OF COURSES

EXPLANATION OF TABULAR STATEMENT

Course numbers.—All courses in the School of Agriculture are designated by the capital letter A preceding the course number to distinguish them from collegiate courses of the same number. The letter f indicates a fall term course, and the letter w, a winter term course. For example: A5f,w indicates that Course A5 is offered both fall and winter terms. A5f-6w would indicate a year course continuing through two terms.

Credits and prerequisites.—The number of credits which each course counts toward graduation, the classes of students to which the course is offered, and the prerequisite courses are indicated in parentheses, immediately below the descriptive name of the course. For example: (2 cred.; sr. agr.; prereq., A1, A2) means that the course counts two credits; that it is offered to senior students in agriculture (not home economics); and that before registering for the course, Courses A1 and A2, offered by the same division, must have been satisfactorily completed. If neither agriculture nor home economics students are designated the course may be taken by both.

ABBREVIATION OF BUILDINGS

Ad	Administration	HH	Haecker Hall
BB	Beef Barn	Hr	Horticulture
BCh	Biochemistry	MS	Meat Shop
Da	Old Dairy Hall	MuH	Music Hall
DB	Dairy Barn	PP	Plant Pathology
En	Agricultural Engineering	St	Stock Pavilion
FH	Farm House	Ve	Veterinary
Gy	Gymnasium	WH	Women's Hall
HE	Home Economics		

CLASS HOURS

I	8:15- 9:05	VI	1:30-2:20
II	9:15-10:05	VII	2:30-3:20
III	10:15-11:05	VIII	3:30-4:20
IV	11:15-12:05	IX	4:30-5:20

No classes are scheduled for the V hour, which is reserved for assembly (12:10-12:45) and dinner hour.

PROGRAM

AGRICULTURAL BIOCHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
A1f-2w	Chemistry of Plant and Animal Life	II	MWF	116BCh	Mr. Taylor
	(6 cred.*; jr., sr.; no prereq.)				
A1w	Chemistry of Plant and Animal Life	IV	TThS	116BCh	Mr. Taylor
	(3 cred.*; jr., sr.; no prereq.)				
A2f	Chemistry of Plant and Animal Life	III	TThS	116BCh	Mr. Taylor
	(3 cred.*; jr., sr.; prereq., A1)				

AGRICULTURAL ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
A1w	Co-operative Accounting	VI	TTh	204Da	Mr. Holt
	(3 cred.; jr., sr. agr.; prereq., Sch. A68 or A70)	VII, VIII	T	204Da	Mr. Holt

AGRICULTURAL ENGINEERING

No.	Title	Hour	Day	Bldg.	Instructor
A10f	Farm Implements	VI, VII, VIII	TTh	49,52En	Mr. Torrance
	(3 cred.; sr. agr.; no prereq.)				
A11f	Tractor and Auto Work I ..	VI, VII, VIII	WF	216,37En	Mr. Torrance
	(3 cred.; all agr.; no prereq.)				
A11w	Tractor and Auto Work I ..				
	(Same as A11f)				
	Sec. 1	VI, VII, VIII	TTh	216,37En	Mr. Torrance
	2	VI, VII, VIII	WF	216,37En	Mr. Torrance
A12f,w	Tractor and Auto Work II ..	III, IV	TThS	216,37En	Mr. Torrance
	(3 cred.; jr., sr. agr.; prereq., C grade in A11)				
A16f,w	Farm Mechanical Training I	VI, VII, VIII	TTh	20,106En	Mr. Dent
	(3 cred.; all agr.; no prereq.)				
A17f,w	Farm Mechanical Training II	VI, VII, VIII	WF	20,106En	Mr. Dent
	(3 cred.; all agr.; no prereq.)				
A18f	Mechanics and Water Supply				
	(3 cred.; jr., sr. agr.; no prereq.)				
	Lect.	I	MW	101En	Mr. Tyler
	Lab. Sec. 1	I, II	F	102En	Mr. Tyler
	2	VI, VII	M	103En	Mr. Tyler
A18w	Mechanics and Water Supply	II	ThS	103En	Mr. Tyler
	(3 cred.; jr., sr. agr.; no prereq.)	I, II	T	102En	Mr. Tyler

* Both Course A1 and A2 must be completed in order to receive credit.

THE SCHOOL OF AGRICULTURE

No.	Title	Hour	Day	Bldg.	Instructor
A19w	Heat and Electricity (3 cred.; jr., sr. agr.; no prereq.)	Sec. 1	I	MW 101En	Mr. Tyler
			I, II	F 102En	Mr. Tyler
		2	III	TTh 101En	Mr. Tyler
			III, IV	S 102En	Mr. Tyler
A21f,w	Farm Buildings I (3 cred.; all agr.; no prereq.)	Sec. 1	VI, VII, VIII	TTh 41En	Mr. White
		2	VI, VII, VIII	WF 41En	Mr. White
A31f,w	Drawing and Farm Buildings; (3 cred.; all agr.; no prereq.)	Sec. 1	VI, VII, VIII	TTh 303En	Mr. Jacobson
		2	VI, VII, VIII	WF 303En	Mr. Jacobson
A32f	Farm Buildings II (3 cred.; sr. agr.; prereq., A21, A31)	I	M	305En	Mr. White
		I, II	WF	305En	Mr. White
A41f	Household Physics (5 cred.; jr., sr. H.E.; no prereq.)	VIII	MTThF	101En	Mr. Tyler
		VIII, IX	W	102En	Mr. Tyler
A51f	Drainage and Roads (3 cred.; sr. agr.; no prereq.)	I, II	MWF	215En	Mr. Roe, Mr. Neal
A52w	Land Clearing (3 cred.; jr., sr. agr.; no prereq.)	III	TThS	217En	Mr. Schwantes

ANIMAL HUSBANDRY

No.	Title	Hour	Day	Bldg.	Instructor
A1f,w	Judging Types and Market Classes of Livestock (2 cred.; all agr.; no prereq.)	Sec. 1	I, II	MW ESt	Mr. Harvey, Mr. McCarty
		2	III, IV	TTh ESt	
		3	III, IV	MW WSt	
A2f,w	Judging Breed Types of Live- stock (3 cred.; all agr.; prereq., A1)	Sec. 1	I, II	TThS WSt	Mr. Harvey
		2	III, IV	TThS WSt	Mr. Harvey, Mr. McCarty
A3f,w	Advanced Livestock Judging (3 cred.; jr., sr. agr.; prereq., A1, A2)	VI, VII	MWF	ESt	Mr. Harvey
A4f	Meats (3 cred.; jr., sr.; prereq., A1, A2)	VI, VII, VIII	WF	MS	Mr. Anderson
A4w	Meats (Same as A4f)	VI, VII, VIII	TTh	MS	Mr. Anderson
A5f,w	Livestock Breeding (3 cred.; sr. agr.; prereq., A1, A2)	III	MWF(f)	3St	Mr. Vaughan
			(w)	206Da	

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
A6f	Livestock Feeding and Management (2 cred.; sr. agr.; prereq., A1, A2, Dy. Husb. A1)	IV	MWF	3St	Mr. Harvey
A7w	Utilization of Meats (3 cred.; jr., sr. H.E.; no prereq.)	VI, VII, VIII	M	MS	Mr. Anderson
A8w	Problems in Livestock Improvement (3 cred.; sr. women spec. in livestock production; prereq., A1, A2)	I	TThS	3St	Mr. Peters

BEE CULTURE

No.	Title	Hour	Day	Bldg.	Instructor
A1f	Elementary Beekeeping I (3 cred.; all; no prereq.)				
	Sec. 1	I	MWF	1FH	Mr. Thompson
	2	II	MWF	1FH	Mr. Jager
	3	I	TThS	1FH	Mr. Thompson
A1w	Elementary Beekeeping I (Same as A1f)				
	Sec. 1	II	TThS	1FH	Mr. Jager
	2	III	TThS	1FH	Mr. Thompson
A2f	Elementary Beekeeping II (3 cred.; all; prereq., A1)	II	TThS	1FH	Mr. Jager
A2w	Elementary Beekeeping II (Same as A2f)				
	Sec. 1	I	MWF	1FH	Mr. Thompson
	2	II	MWF	1FH	Mr. Jager
	3	I	TThS	1FH	Mr. Thompson
A3f,w	Advanced Beekeeping (3 cred.; jr., sr.; prereq., A1, A2, and one summer experience)	Ar	Ar	1FH	

DAIRY HUSBANDRY

No.	Title	Hour	Day	Bldg.	Instructor
A1f,w	Feeds and Feeding (3 cred.; jr., sr. agr.; no prereq.)				
	(Sections limited to 35 students each)				
	Sec. 1	IV	TThS	100HH	Mr. Gullickson
	2	IV	TThS	109HH	Mr. Petersen
A21,w	Farm Dairying (3 cred.; jr., sr.; no prereq.)				
	(Limited to 30 students each)				
	Sec. 1	I, II	TThS	109HH	Mr. Thurston
	2	VI, VII	MWF	109HH	Mr. Gullickson
A3f	Dairy Stock Judging (2 cred.; jr., sr. agr.; no prereq.)				
	(Limited to 30 students each)				
	Sec. 1	III, IV	MW	DB	Mr. Petersen
	2	VI, VII	MW	DB	Mr. Schaefer
A3w	Dairy Stock Judging (Same as A3f)				
	(Limited to 30 students each)				
	Sec. 1	III, IV	MW	DB	Mr. Petersen
	2	VI, VII	TTh	DB	Mr. Schaefer

THE SCHOOL OF AGRICULTURE

No.	Title	Hour	Day	Bldg.	Instructor
A5w	Milk Production (5 cred.; sr. agr.; no prereq.)	I	MTWThF	100HH	Mr. Petersen
A6w	Dairy Stock Feeding (3 cred.; sr. agr.; prereq., A1)	II	MWF	109HH	Mr. Schaefer
A7w	Dairy Stock Selection (3 cred.; sr. agr.; prereq., A3, A5)	VI, VII	MWF	100HH	Mr. Schaefer
A8w	Test Association Methods ... (3 cred.; jr., sr. agr.; prereq. A1, A2, and approval of instructor)	VIII	MWF	210HH	Mr. Hanson, Mr. Geddes

ENTOMOLOGY AND ECONOMIC ZOOLOGY

No.	Title	Hour	Day	Bldg.	Instructor
A1f,w	Animal Biology (3 cred.; all agr.; no prereq.)				
	Sec. 1	I	TThS	301Ad	Mr. Olson
	2	II	MWF	301Ad	
	3	III	MWF	301Ad	
A3w	Biology (3 cred.; jr., sr. H.E.; no prereq.)	II	TThS	307Ad	Mr. Olson
A16f	Insect Pests of Plants (3 cred.; jr., sr.; no prereq.)	VI, VII, VIII	TTh	301Ad	Mr. Ruggles

FARM MANAGEMENT, AGRONOMY, AND PLANT GENETICS

No.	Title	Hour	Day	Bldg.	Instructor
A1f,w	Cereal Crops (3 cred.; jr., sr. agr.; no prereq.)				
	Lect. Sec. 1	I	TS	105Ad	Mr. Tysdal
	Lab. I, II		Th	105Ad	
	Lect. 2	IV	ThS	105Ad	
	Lab. III, IV		T	105Ad	
A2f,w	Corn and Potatoes (2 cred.; all agr.; no prereq.)				
	Sec. 1	II	MWF	105Ad	
	2	III	MWF	105Ad	
	3	IV	MWF	105Ad	
A3f,w	Forage Crops (3 cred.; jr., sr. agr.; no prereq.)				
	Sec. 1	I, II	T	100Ad	Mr. Higgins
		II	ThS	100Ad	Mr. Higgins
	2	III, IV	Th	100Ad	Mr. Higgins
		III	TS	100Ad	Mr. Higgins
A5w	Crop Breeding (3 cred.; sr. agr.; no prereq.)				
	Sec. 1	I	MWF	102Ad	Mr. Brew-
	2	II	MWF	102Ad	baker
A6w	Judging and Grading Farm Crops (3 cred.; sr. agr.; prereq., A1, A2)	VI, VII	MWF	100Ad	

PROGRAM

II

No.	Title	Hour	Day	Bldg.	Instructor
A21f,w	Farm Management I (3 cred.; sr. agr.; no prereq.)				
	Sec. 1	III, IV	MWF	118Ad	Mr. Bassett
	2	III, IV	TThS	118Ad	Mr. Hoverstad
A22f,w	Farm Management II (3 cred.; sr. agr.; no prereq.)				
	Sec. 1	VI, VII	MWF	118Ad	Mr. Bassett
	2	VI, VII	MWF	108Da	

FORESTRY

No.	Title	Hour	Day	Bldg.	Instructor
A1w	Forest Nursery Methods and Tree Planting (3 cred.; jr., sr. agr.; no prereq.)	III	TThS	8Hr	Mr. Hansen

GYMNASIUM AND PHYSICAL TRAINING

No.	Title	Hour	Day	Bldg.	Instructor
<i>Men</i>					
A1f,w	Gymnasium (2 cred.; all agr.; no prereq.)				
	Sec. 1	IX	TTh	Gy	Mr. Thompson
		1 additional hour		to be arranged	
	2	VII	TTh	Gy	Mr. Thompson
		1 additional hour		to be arranged	
<i>Women</i>					
A1f,w-2w,f	Freshman Physical Training (2 cred.; all H.E.; no prereq.)				
	Sec. 1	IX	MWF	Gy	Mrs. Cram
	2	VIII	MWF	Gy	Miss Kaercher
A3f,w-4w,f	Junior Physical Training ... (2 cred.; jr., sr. H.E.; prereq., A1-2)	III	TTh	Gy	Mrs. Cram
		VIII	Th	Gy	Miss Kaercher
A5f,w-6w,f	Senior Physical Training .. (2 cred.; sr. H.E.; prereq., A3-4)	IV	TTh	Gy	Mrs. Cram,
		IX	Th	Gy	Miss Kaercher

HOME ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
A1f	Clothing I (3 cred.; all H.E.; no prereq.)				
	Sec. 1	II	MTWThF	114HE	Miss Sell
	2	VI, VII	MWF	114HE	Miss Sell
A1w	Clothing I (Same as A1f)	II	MTWThF	114HE	Miss Sell
A2f	Clothing II (3 cred.; all H.E.; prereq., A1)	I	MTWThS	114HE	Miss Sell
A4f	Textiles and Dressmaking I .. (3 cred.; jr., sr. H.E.; prereq., A2)	III, IV	MWF	112HE	Miss Landis
A5w	Textiles and Dressmaking II (3 cred.; jr., sr. H.E.; prereq., A4)	VI, VII	MWF	112HE	Miss Landis

THE SCHOOL OF AGRICULTURE

No.	Title	Hour	Day	Bldg.	Instructor
A6w	Decorative Needlework (3 cred.; jr., sr. H.E.; prereq., A2, A21)	VI, VII, VIII	TTh	114HE	Miss Stod- dard
A7f	Millinery I (3 cred.; jr., sr. H.E.; prereq., A2, A21)	VI, VII, VIII	TTh	112HE	Miss Brown
A8w	Advanced Millinery (3 cred.; jr., sr. H.E.; prereq., A7)	VI, VII, VIII	TTh	112HE	Miss Brown
A12	Trade Dressmaking (5 cred.; sr. H.E.; prereq., A5, A6, A11)	Not offered in 1927-28			
A13	Trade Millinery (5 cred.; sr. H.E.; prereq., A8)	Not offered in 1927-28			
A21f	Design (2 cred.; all H.E.; no prereq.)	III, IV	TTh	112HE	Miss Stod- dard
A21w	Design (Same as A21f)	I, II	TTh	112HE	Miss Stod- dard
A26f	House Planning and Furnish- ing (3 cred.; all H.E.; prereq., A21)	VI, VII, VIII	TTh	106HE	Miss Stod- dard
A26w	House Planning and Furnish- ing (Same as 26f)	VI, VII	MWF	106HE	Miss Stod- dard
A31f	Selection and Preparation of Food (3 cred.; all H.E.; no prereq.)				
	Sec. 1	I	MTWThF	105HE	
	2	VI	MTWThF	105HE	
A31w	Selection and Preparation of Food (Same as A31f)	VI	MTWThF	105HE	
A32f,w	Meal Preparation (3 cred.; all H.E.; prereq., A31)	III, IV	TThS	105HE	
A33f,w	Foods and Nutrition (2 cred.; jr., sr. H.E.; prereq., A32)	VII	MTWTh	105HE	Miss Rose
A34f,w	Home Management (3 cred.; sr. H.E.; prereq., A33)	III, IV	MWF	105HE	
A35w	Child Care and Training (2 cred.; sr. H.E.; prereq., Prev. Med. A1)	II	MW	106HE	
A50f,w	Related Science I (3 cred.; all H.E.; no prereq.)	IV	MW	WH	Miss Rose
		III, IV	F	WH	
A51f,w	Related Science II (3 cred.; all H.E.; no prereq.)	II	MW	WH	Miss Rose
		I, II	F	WH	

HORTICULTURE

No.	Title	Hour	Day	Bldg.	Instructor
A1f,w	Farm Horticulture				
	(3 cred.; all; no prereq.)				
	Sec. 1	III	MWF	102Hr	Mr. Daniels
	2	IV	MWF	102Hr	Mr. Daniels
A2f	Orchard Fruit Growing	II	MWF	8aHr	Mr. Daniels
	(3 cred.; jr., sr.; no prereq.)				
A3w	Commercial Vegetable Gardening	II	TThS	8aHr	Mr. Daniels
	(3 cred.; jr., sr. agr.; no prereq.)				
A4w	Small Fruit Growing	II	MWF	102Hr	Mr. Daniels
	(3 cred.; jr., sr.; no prereq.)				
A5f	Plant Propagation and Nursery Practice	I	MW	8aHr	Mr. Cary
	(3 cred.; all; prereq. Pl. Path. 1 or 4)	VIII, IX	T	8Hr	Mr. Sando
A7w	Floriculture	IV	MWF	8aHr	Mr. Sando
	(3 cred.; all; no prereq.)				
A8f	Landscape Gardening	III	MW	8aHr	Mr. Cary
	(2 cred.; all; no prereq.)				
A10w	Greenhouse Construction, Management, and Practice	VI, VII	MW	102Hr	Mr. Sando
	(3 cred.; jr., sr. agr.; prereq. A5)				
A14w	Potato Production	II	MWF	8aHr	Mr. Krantz
	(3 cred.; jr., sr. agr.; prereq. Agron. A3)				
A15w	Special Problems	Ar	Ar	Ar	Mr. Alderman and staff
	(Variable credit; prereq., instructor's permission)				

PLANT PATHOLOGY AND BOTANY

No.	Title	Hour	Day	Bldg.	Instructor
A1f,w	Agricultural Botany				
	(3 cred.; all agr.; no prereq.)				
	Lect. Sec. 1	VI	M	4PP	Mr. Roden-
	Rec.	VI	F	4PP	hiser
	Lab.	VI, VII	W	3PP	
	Lect. 2	VII	W	4PP	Mr. Parson
	Rec.	VII	F	4PP	
	Lab.	VI, VII	M	3PP	
A2w	Seed Testing	VI, VII	TTh	3-4PP	Mr. Larson
	(2 cred.; jr., sr. agr.; prereq., A1)				
A4w	Agricultural Botany				
	(3 cred.; all H.E.; no prereq.)				
	Lect.	I	T	4PP	Mr. Roden-
	Rec.	I	S	4PP	hiser
	Lab.	I, II	Th	3PP	
A11f	Plant Diseases	IV	MWF	1PP	Mr. Roden-
	(3 cred.; sr.; prereq., A1 or A4)				hiser
A12f	Weeds	VI, VII	TTh	3PP	Mr. Larson
	(2 cred.; jr., sr. agr.; prereq., A1)				

THE SCHOOL OF AGRICULTURE

POULTRY HUSBANDRY

No.	Title	Hour	Day	Bldg.	Instructor
A1f,w	Poultry (3 cred.; all; no prereq.)				
	Sec. 1	II	TThS	201Ve	Mr. Smith
	2	IV	TThS	201Ve	Mr. Smith
	3	VII	MWF	201Ve	Mr. Smith
A2f,w	Management of Laying Flock (1 cred.; jr., sr.; prereq., A1 or parallel)	Ar	Ar	Ar	Mr. Hoberg
A3w	Incubating and Brooding (3 cred.; jr., sr.; prereq., A1)				
	Lect.	III	MF	201Ve	Mr. Smith
	Lab.	Ar	Ar	Ar	Mr. Hoberg
A7f	Poultry Judging (2 cred.; all; no prereq.)	VI, VII	TTh	201Ve	Mr. Hoberg
A10f	Dressed Poultry (1 cred.; all, no prereq.)	Ar	Ar	Ar	Mr. Hoberg

PREVENTIVE MEDICINE AND PUBLIC HEALTH

No.	Title	Hour	Day	Bldg.	Instructor
A1f	Home Nursing and Hygiene I (2 cred.; jr., sr. H.E.; no prereq.) (Limited to 20)				
	Lect.	I	W	106HE	Dr. Duryea
	Lab.	I, II	F	WH	Miss Fisher
A1w	Home Nursing and Hygiene I (Same as A1f) (Limited to 20)				
	Lect.	I	M	106HE	Dr. Duryea
	Lab.	I, II	W	WH	Miss Fisher
A2w	Home Nursing and Hygiene II (2 cred.; sr. H.E.; prereq., A1)				
	Lect.	I	W	106HE	Dr. Duryea
	Lab.	I, II	F	WH	Miss Fisher
A8f,w	Hygiene (1 cred.; all agr.; no prereq.)				
	Sec. 1	II	S	102Ve	Dr. Cady
	2	III	S(f) (w)	102Ve 103Ve	Dr. Cady

RHETORIC

No.	Title	Hour	Day	Bldg.	Instructor
A1f	English I (3 cred.; all; no prereq.)				
	Sec. 1	I	MWF	306En	Mrs. Hause
	2	I	TThS	312En	Miss Andrist
	3	III	MWF	307En	Miss Langtry
A1w	English I (Same as A1f)				
	Sec. 1	II	MWF	306En	Mrs. Hause
	2	IV	TThS	312En	Miss Andrist
	3	I	MWF	306En	Ar

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No.	Title	Hour	Day	Bldg.	Instructor
A2f	English II (3 cred.; all; prereq., A1)				
	Sec. 1	II	MWF	312En	Miss Andrist
	2	III	TThS	312En	Miss Andrist
A2w	English II (Same as A2f)				
	Sec. 1	I	MWF	312En	Miss Andrist
	2	III	MWF	312En	Miss Andrist
	3	III	TThS	306En	Mrs. Hause
	4	IV	MWF	312En	Miss Andrist
A3f	English Classics (3 cred.; jr., sr.; prereq., A2)				
	Sec. 1	I	TThS	306En	Mrs. Hause
	2	III	MWF	312En	Miss Andrist
	3	IV	MWF	307En	Miss Langtry
A3w	English Classics (Same as A3f)				
	Sec. 1	II	MWF	312En	Miss Andrist
	2	II	TThS	312En	Miss Langtry
A4f	Business English (3 cred.; jr., sr.; prereq., A3)				
	Sec. 1	III	MWF	306En	Mrs. Hause
	2	III	TThS	306En	Mrs. Hause
A4w	Business English (Same as A4f)				
	Sec. 1	I	TThS	306En	Mrs. Hause
	2	III	MWF	306En	Mrs. Hause
	3	IV	MWF	306En	Mrs. Hause
A5f	Public Speaking (3 cred.; sr.; prereq., A4)				
	Sec. 1	I	TThS	307En	Miss Langtry
	2	II	MWF	306En	Miss Langtry
	3	IV	TThS	307En	MissMcNabb
A5w	Public Speaking (Same as A5f)				
	Sec. 1	I	MWF	307En	Miss Langtry
	2	III	TThS	307En	MissMcNabb
A6f	English VI (3 cred.; sr.; prereq., A4)	II	TThS	308En	Miss Langtry
A6w	English VI (Same as A6f)				
	Sec. 1	II	MWF	308En	Miss Langtry
	2	III	TThS	312En	Miss Langtry
	3	IV	MWF	307En	Miss Langtry
A14f	Advanced Public Speaking .. (3 cred.; sr.; prereq., A5)	III	TThS	307En	MissMcNabb
A14w	Advanced Public Speaking .. (Same as A14f)	IV	TThS	307En	MissMcNabb
A21f-22w	English Literature I, II (10 cred.; sr.; prereq., A4)	VII	MTWThF	307En	MissMcNabb
A31f,w	Dramatics (1 cred. under special conditions. See Faculty Regulations)	Ar	Ar	Ar	MissMcNabb
A32w	Debating (1 cred.* under special conditions. See Faculty Regulations)	Ar	Ar	Ar	Miss Langtry

* No credit allowed until course is completed.

SCHOOL (GENERAL)

No.	Title	Hour	Day	Bldg.	Instructor	
A1f,w	Farm Arithmetic					
	(3 cred.; all agr.; no prereq.)					
	Sec. 1	I	TThS	106En	Mr. Johnsrud	
		2	I	MWF	107En	Mr. Johnsrud
		3	III	MWF	106En	Mr. Johnsrud
		4	III	TThS(w)	106En	Mr. Johnsrud
A1f,w	Farm Arithmetic					
	(3 cred.; all H.E.; no prereq.)					
	Sec. 5	II	TThS	106En		
A2f,w	Advanced Farm Arithmetic ..	IV	MWF	106En	Mr. Johnsrud	
	(3 cred.; all; prereq., I or high school cred. in arith.)					
A4f,w	Algebra I	III	MTWThFS(f)	217En	Miss Martyn	
	(7 cred.; all; no prereq.)		(w)	107En	Miss Martyn	
A5f,w	Algebra II	IV	MTWThFS	217En	Miss Martyn	
	(7 cred.; all; no prereq.)					
A6f,w	Geometry I	I	MTWThFS	217En	Miss Martyn	
	(7 cred.; all; no prereq.)					
A7f,w	Geometry II	II	MTWThFS	217En	Miss Martyn	
	(7 cred.; all; prereq., algebra or parallel advised)					
A21f,w	Elements of Music I					
	(2 cred.; all; no prereq.)					
	Sec. 1	III	TTh	202MuH	Miss Dickerman	
		2	VII	TTh	202MuH	Miss Larson
A22f,w	Elements of Music II	I	TTh	202MuH	Miss Willson	
	(2 cred.; all; prereq., A21)					
A23f,w	Chorus					
	($\frac{1}{2}$ -3* cred.; all; no prereq.)					
	Mixed Chorus	6:15	W	201MuH	Mrs. Larson	
	Girls' Chorus	4:30	Th	201MuH	Mrs. Larson	
	Men's Chorus	6:15	F	201MuH	Miss Dickerman	
A24f,w	Violin	Ar	Ar	203MuH	Miss Schaeffgen	
	($\frac{1}{2}$ -3* cred.; all; no prereq.)					
A25f,w	Piano	Ar	Ar	203MuH	Miss Willson	
	($\frac{1}{2}$ -3* cred.; all; no prereq.)					
A26f,w	Instrumental Music	Ar	Ar	205MuH	Mr. Boland	
	($\frac{1}{2}$ -3* cred.; all; no prereq.)					
A27f,w	Orchestra	6:30	TTh	201MuH	Mr. Boland	
	($\frac{1}{2}$ -3* cred.; all; no prereq.)					
A28f,w	Voice	Ar	Ar	204MuH	Mrs. Larson	
	($\frac{1}{2}$ -3* cred.; all; no prereq.)					
A29f,w	Harmony I	II	TTh	200MuH	Miss Willson	
	(2 cred.; all; prereq., A22)					
A30f,w	Harmony II	VII	TTh	202MuH	Miss Willson	
	(2 cred.; all; prereq., A29)					
A32f,w	Appreciation of Music	VI	MWF	202MuH	Mr. Boland	
	(3 cred.; all; no prereq.)					
A33f,w	Instrumentation and Conducting	Ar	Ar	202MuH	Mr. Boland	
	(3 cred.; all; prereq., A21)					

* This course may be continued for six quarters giving a maximum of 3 credits.

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No.	Title	Hour	Day	Bldg.	Instructor
A34f,w	Band ($\frac{1}{2}$ -3* cred.; all agr.; no prereq.)	IX	MWF	MuH	Mr. Boland
A41f,w	Parliamentary Law (1 cred.; jr., sr.; no prereq.)	I		S 107En	Mr. Mayne
A42f,w	American Government (3 cred.; sr.; no prereq.)	II	TThS	108Da	Mr. Christianson
A43f,w	Elementary Economics (3 cred.; sr.; no prereq.)	II	MWF	108Da	Mr. Christianson
A44f,w	Rural Economics (3 cred.; sr.; no prereq.)	II	TThS	105En	Mr. Lundquist
A45f,w	Industrial History (3 cred.; jr., sr.; no prereq.)	VI	MWF	204Da	Mr. Christianson
A46f,w	Rural Sociology (3 cred.; sr.; no prereq.)	III	TThS	108Da	Mr. Lundquist
A47f,w	American History (3 cred.; jr., sr.; no prereq.)	IV	TThS	108Da	Mr. Christianson
A55f,w	Social Training (2 cred.; all H.E.; no prereq.)	III	MW	106HE	Miss Mattson
A56f,w	Social Problems for Boys ... (1 cred.; all agr.; no prereq.)				
	Sec. 1	I		Th 4PP	Miss Hoganson
	2	II		T 4PP	Miss Hoganson
	3	III		S 4PP	Miss Hoganson
A61f,w	Spelling (1 cred.; all; no prereq.)				
	Sec. 1	II		S 107Da	Miss Johnson
	2	IV		S 107Da	Miss Wollin
	3	VI		F 107Da	Miss Johnson
A62f,w	Penmanship (1 cred.; all; no prereq.)				
	Sec. 1	II		TTh 107Da	Miss Johnson
	2	IV		TTh 107Da	Miss Wollin
	3	VI		MW 107Da	Miss Johnson
A63f,w	Typewriting I (3 cred.; all; no prereq.)				
	Sec. 1	III, IV		MWF 106Da	Miss Wollin
	2	III, IV		TThS 106Da	
	3	VI, VII		MWF 106Da	
	4	I, II		MWF 106Da	
	5	I, II		TThS 106Da	
A64f,w	Typewriting II (3 cred.; jr., sr. H.E.; prereq., A63)				
	Sec. 1	I, II		MWF 106Da	Miss Wollin
	2	VI, VII, VIII		TTh 106Da	
A65f,w	Stenography I (3 cred.; all H.E.; no prereq.)	IV	MWF	106Da	Miss Johnson
A66f,w	Stenography III (3 cred.; jr., sr. H.E.; prereq., A67)	II	MWF	106Da	Miss Johnson

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No.	Title	Hour	Day	Bldg.	Instructor
A67f,w	Stenography II (3 cred.; jr., sr. H.E.; prereq., A65)	III	MWF	106Da	Miss Johnson
A68f,w	Bookkeeping I (3 cred.; all; no prereq.)	VI, VII, VIII	TTh	105Da	Miss Johnson
A69f,w	Bookkeeping II (3 cred.; all; prereq. A68)	III, IV	TThS	105Da	Miss Johnson
A70f,w	Typewriting III (3 cred.; jr., sr. H.E.; prereq., A64)	VI	MWF	106Da	Miss Johnson
A72f	Commercial Law (3 cred.; sr. H.E.; no prereq.)	I IV	TTh M	118Ad 301Ad	Mr. Mayne

SOILS

No.	Title	Hour	Day	Bldg.	Instructor
A1f,w	Soils (3 cred.; all agr.; no prereq.)				
	Sec. 1	I	TTh	251Ch	Mr. Nesom
		I, II	S	251Ch	Mr. Nesom
	2	IV	TTh	251Ch	Mr. Nesom
		III, IV	S	251Ch	Mr. Nesom

VETERINARY MEDICINE

No.	Title	Hour	Day	Bldg.	Instructor
A1f	Physiology (3 cred.; all; no prereq.)	IV	MWF	103Ve	Mr. Reynolds
A1w	Physiology (Same as A1f)	II	TThS	103Ve	Mr. Reynolds
A4w	Elements of Bacteriology ... (3 cred.; jr., sr.; no prereq.)	II	MWF	103Ve	Mr. Lubbe- husen
A5f	Physiology and Hygiene of Breeding (2 cred.; jr., sr. agr.; no pre- req.)	II	WF	103Ve	Mr. Boyd
A7w	Veterinary Studies (5 cred.; jr., sr. agr.; no pre- req.)	I	MTWThF	102Ve	Mr. Reynolds

*The Bulletin
of the University of
Minnesota*

*North Central School and Station
Grand Rapids, Minnesota
Announcement for the Year
1927-1928*



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SCHOOL CALENDAR, 1927-1928

1927			
October	3	Monday	Registration
October	4	Tuesday	Organization of classes
October	29	Saturday	Mothers' and Fathers' Day
November	11	Friday	Armistice Day exercises
November	24	Thursday	Thanksgiving Day; a holiday
December	23	Friday	First term closes; Christmas recess be- gins
1928			
January	2	Monday	Registration of new students
January	3	Tuesday	Second term begins; organization of classes
March	23	Friday	School term closes
April	9th-13th	Week	Junior Short Course

FACULTY

Lotus D. Coffman, Ph.D., LL.D., President of the University
 Walter C. Coffey, M.S., Dean of the Department of Agriculture

AT GRAND RAPIDS ADMINISTRATION

Otto I. Bergh, B.S.Agr., Superintendent
 Mary Kulstad, Registrar
 Don S. Anderson, B.Agr., Director of Home Projects
 Otto W. Swenson, Preceptor
 Marie Opgrande Mollins, Director of Dining Hall
 Harold Stunneck, Accountant
 Lillian Shumaker, Secretary

AGRICULTURAL ENGINEERING

Don S. Anderson, B.Agr.

AGRONOMY

Otto I. Bergh, B.S.Agr., Soils and Farm Management
 Don S. Anderson, B.Agr., Farm Crops
 Otto W. Swenson, Assistant in Agronomy

HORTICULTURE

....., Botany, Vegetable Gardening, Orchards, and Forestry

ANIMAL HUSBANDRY

Carroll L. Blakeslee, B.S., Animal and Dairy Husbandry
 Don S. Anderson, B.Agr., Poultry

ASSOCIATED SUBJECTS

....., Advanced Subjects, Chemistry and Physics
 Marie Opgrande Mollins, English and Music
 Mary Kulstad, Mathematics and History
 , Business Training, Debate and Public Speaking
 Otto W. Swenson, Athletics

GENERAL INFORMATION

Location.—The North Central School of Agriculture is located at the Experiment Station, one mile east of Grand Rapids, Minnesota, on the paved State Highway, No. 35. Busses from the Twin Cities and from the Mesabi Range stop at the station when requested.

Purpose.—The school offers a practical course of study designed to fit young men for useful citizenship and successful farm life.

Time of opening.—The fall term opens for registration October 3, 1927. Classes will begin at 8:00 o'clock, Tuesday October 4. The fall term closes on December 23, 1927.

The winter term will open for registration January 3, and classes will begin at 8:00 o'clock, January 3, 1928. This term closes March 23, 1928.

Three years' course.—The course of study offered covers a wide range of subjects and requires three winters of six months each for completion. The methods of instruction tend to educate the student toward the farm instead of away from it; to develop in them a love of farm life by showing its possibilities.

Admission.—Applicants who have completed eighth grade work in the common schools and who have had six months' farm experience, or equivalent, will be admitted without examination. Applicants who have not completed eighth grade work or who cannot offer a record of satisfactory farm experience should write to the superintendent for further information.

Rooms in dormitory.—Students planning to attend the School of Agriculture should reserve rooms in advance. Write early asking the registrar to reserve a room in the dormitory.

When to come.—Students should not come before Monday, October 3, or Monday, January 2. The first meal served in the Dining Hall will be at noon on those days.

What to bring.—Each student should come provided with two night-gowns, blankets, quilts, towels, and personal toilet articles, such as combs, brushes, one glass tumbler, and a teaspoon.

Expenses.—The necessary expenses for a term of three months do not exceed \$75. This amount does not include traveling and personal expenses.

Each student is required to pay for breakage of apparatus used in practical work, and for all damage done to school property.

Textbooks are furnished at a rental of \$1 to students who do not desire to purchase. A fee of \$2.50 each term will entitle all students to attend all school functions, athletic contests, games, and entertainments.

It should be remembered that expenses for fees are for the entire term; after the first month, the only expenses are for board and room.

Board is payable the first of each month in advance. A surtax of 10 per cent is added to all bills delinquent more than ten days. No deduction is made for board for any absences of less than five days. No room refunds will be made for any period less than one month. If students are

compelled to be absent for that length of time, they are allowed half rates, provided they make arrangements with the accountant before leaving. On entering the school, each student should bring sufficient money to pay for one month's board and room, and for books and fees. This amounts to about \$35.

The following expenses are charged to all students. Fees are payable at the time of registration, and board and room at the first of each month.

Registration fee for any part of school year.....	\$5.00
Registration for non-residents of Minnesota.....	10.00
Deposit as guarantee of proper treatment of school property.....	5.00
Board per week	4.25
Room per week, including flat laundry.....	1.25
Book rent, per term.....	1.00
Student privilege ticket for all school functions, athletic contests, games, and entertainments	2.50

In addition there are laboratory fees of \$.50 per term for carpentry, engineering, farm mechanics, sewing, cooking, chemistry, and dairying; \$3 per term for typewriting; \$2 for blacksmithing; \$7 per term for private music lessons, with \$2.50 per term piano rental. *If any of these subjects are taken, this cost must be added to the total for each term.* These subjects are all elective. Therefore, the total expense indicated above is a fair estimate of the student's necessary expense while attending school.

Requirements for graduation.—Completion of the prescribed course of study, including all required work and enough electives to make a total of 150 credit hours.

One summer of supervised home project work. Of the 150 credits necessary for graduation 5 must be home project work, and 10 will be allowed.

An honorable standing in department.

Payment of all school accounts.

College preparatory.—Graduates from the regular courses who have completed two summers of supervised work on their home farms, one additional school year of six months, and one additional summer's work or the equivalent thereof, will be admitted to the College of Agriculture, Forestry, and Home Economics of the University of Minnesota.

Home life in the dormitory.—The dormitory life of the student while attending the School of Agriculture is subject to supervision. Everything possible is done to promote moral atmosphere.

The preceptor and preceptress have charge of students in the dormitory and regulations enforced are for the good of all.

From 8:15 a.m. to 4:30 p.m. students are busy with their school work. From 4:30 p.m. to 6:00 p.m., there is a recreation period in which the students' time is at their own disposal. After 7:30 p.m., students are expected to be in their rooms and to be quiet so that all may study undisturbed. Students are permitted to leave the campus in the evening only upon the permission of the preceptor.

The use of profanity and tobacco is strictly forbidden. Anyone not in accordance with the restrictions and not willing to lend a hand toward strong moral growth should not come to the school.

Infraction of dormitory rules may be sufficient cause for dismissal from school. Complete dormitory rules and regulations are posted in each dormitory room.

Assembly period.—An assembly period is held each morning throughout the school year. Students are required to attend these assembly exercises. It is the purpose of the school to secure prominent speakers to address the student body at these morning exercises. The assembly period is also used as a forum for public discussion of the many questions and announcements of importance to the student body. The various societies and organizations also use this period for the promotion of their work.

Holidays.—Lincoln's and Washington's birthdays will be appropriately observed, but classes will be held as usual. On Thanksgiving Day, no classes will be held, but school will continue as usual on the Friday and Saturday following.

Junior Short Course.—The second annual Junior Short Course, from April 9 to April 13, 1928, is open to boys and girls from 12 to 20 years of age. With the exception of \$3 for board, there is no expense connected with the course. The course aims to deepen the interest of boys and girls in life on the farm. Special emphasis is placed on boys' and girls' club work. Instruction is given for the planning and carrying out of work in such projects and contests as gardening, corn and potato growing, pig, calf, and chicken raising, cooking, sewing, and canning. Illustrated lectures, moving pictures of educational value, games, singing, and excursions add interest and pleasure to the course.

Experiment Station.—The North Central Station connected with the school is conducting extensive experiments in agronomy, soils, horticulture, forestry, animal husbandry, and agricultural engineering.

These together with the splendid dairy herd, sheep, swine, poultry, and station forest afford added facilities for practical instruction and training for successful farm life.

COURSES OF STUDY

THREE-YEAR COURSE

FIRST YEAR

Figures preceding the names of courses indicate the number of credit hours.

One credit hour is equivalent to one class period per week devoted to recitation or two such periods devoted to laboratory work.

A class period is forty-five minutes and a laboratory period is ninety minutes.

<i>Fall Term</i>	<i>Spring Term</i>
Credit Hours	Credit Hours
5 English	5 English
5 Livestock	5 Livestock
Farm Dairying	Study of Breeds
Dairy Breeds	Stock Judging
5 Farm Crops	Poultry Production
Potato Growing	5 Farm Crops
5 Arithmetic	Cereal Crops
Gymnasium and Personal Hygiene	5 Arithmetic
1 Social Training	Gymnasium and Personal Hygiene
5 Elective from the following:	1-5 Summer Home Projects
—	5 Elective from the following:
26	—
5 Blacksmithing	25
5 Farm Motors I	2 Spelling and Penmanship
5 Farm Mechanics	5 Carpentry
5 Industrial Geography	5 Farm Motors
1 Music	5 Industrial History
3 Typewriting I	1 Music
5 Shorthand	3 Typewriting I
4 Music	5 Shorthand
	4 Music

SECOND YEAR

Required of All

<i>Fall Term</i>	<i>Spring Term</i>
Credit Hours	Credit Hours
5 English	5 English
5 Livestock	5 Livestock
Stock Feeding	Stock Feeding
Stock Judging	Stock Judging
Poultry Production	5 Farm Crops
5 Farm Crops	Soils Management
Fruits and Vegetable Crops	2½ Farm Accounts
5 Forage Crops	2½ Forestry
Gymnasium	Gymnasium
5 Elective from the following:	1-5 Summer Home Projects
—	5 Elective from the following:
25	—
	25

- 5 Ancient History
- 5 Mechanical Drawing
- 3 Field Machinery
- 1 Music
- 3 Typewriting II
- 5 Shorthand
- 3 Advanced Carpentry
- 3 Beekeeping
- 4 Music

- 5 Bookkeeping
- 5 Modern History
- 1 Music
- 1 Parliamentary Law
- 3 Typewriting II
- 5 Shorthand
- 3 Farm Drawing
- 4 Music

THIRD YEAR
Required of All

Fall Term

Credit	Hours
5	English
5	Livestock Herd Management
	Poultry
5	Farm Crops Soil Fertility Gymnasium
2	Farm Marketing
3	Rural Sociology
5	Elective
<hr/>	
25	

Spring Term

Credit	Hours
5	English
5	Livestock Livestock Business Management
5	Farm Crops Farm Management Gymnasium
2	Farm Marketing
3	Rural Economics
5	Elective
<hr/>	
25	

ELECTIVE

Credit	Hours
5	Algebra
2	Meat Cutting
5	Civics
1	Music
8	Office Training
4	Music

Credit	Hours
5	Algebra
2	Meat Cutting
5	Physics
1	Music
8	Office Training
4	Music

CREDIT REGULATIONS REGARDING THREE-YEAR COURSE

In addition to the required work of the term, students must elect enough work to make a total of not less than 23 or more than 26 credit hours. Exceptions may be allowed by the Committee on Students' Work.

Students desiring to complete the business training work may elect such subjects in the second and third year in place of a required subject, upon conference with the Students' Work Committee.

Credit toward graduation will be allowed for work in debate, literary societies, school athletic teams, and other student activities, on a basis to be determined by the Students' Work Committee.

From one to four credits per term may be earned by approved work in instrumental or vocal music. A special fee will be charged for such courses. The same credit may be earned without the fee by membership in the orchestra by those who are competent for the work.

A class will not be maintained for less than six students.

ADVANCED AND COLLEGE PREPARATORY COURSES

The work offered in this course is arranged to fit young men to enter the College of Agriculture, Forestry, and state teachers colleges. It will cover a period of six months, beginning and closing at the same time as the regular school classes. Students capable of carrying satisfactorily all the subjects required will be granted a certificate.

Upon the completion of two summers of supervised work in addition to this course, graduates will be admitted to the College of Agriculture, Forestry, and to state teachers colleges.

Students from other schools who wish to prepare for college or university entrance may elect subjects from the school course which will meet the necessary requirements.

OUTLINE OF COURSE

Credit Hours		Credit Hours	
5	Elementary Algebra	5	Elementary Algebra
5	Plane Geometry	5	Plane Geometry
5	American Literature and Composition	5	American Literature and Composition
5	English Literature	5	English Literature
5	Comparative Agriculture	5	Comparative Agriculture

The Bulletin of the University of Minnesota

*Northwest School and Experiment
Station*

Crookston, Minnesota

*Announcement for the Year
1927-1928*



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1927							1928													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2	1	2	3	4	5	6	7	1	2	3	4	5	6	7
3	4	5	6	7	8	9	8	9	10	11	12	13	14	8	9	10	11	12	13	14
10	11	12	13	14	15	16	15	16	17	18	19	20	21	15	16	17	18	19	20	21
17	18	19	20	21	22	23	22	23	24	25	26	27	28	22	23	24	25	26	27	28
24	25	26	27	28	29	30	29	30	31	..	..	..	..	29	30	31	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
AUGUST							FEBRUARY							AUGUST						
..	1	2	3	4	5	6	..	..	..	1	2	3	4	..	..	..	1	2	3	4
7	8	9	10	11	12	13	5	6	7	8	9	10	11	5	6	7	8	9	10	11
14	15	16	17	18	19	20	12	13	14	15	16	17	18	12	13	14	15	16	17	18
21	22	23	24	25	26	27	19	20	21	22	23	24	25	19	20	21	22	23	24	25
28	29	30	31	..	..	..	26	27	28	29	..	..	..	26	27	28	29	30	31	..
..
SEPTEMBER							MARCH							SEPTEMBER						
..	..	..	..	1	2	3	..	..	..	..	1	2	3	..	..	..	..	..	..	1
4	5	6	7	8	9	10	4	5	6	7	8	9	10	2	3	4	5	6	7	8
11	12	13	14	15	16	17	11	12	13	14	15	16	17	9	10	11	12	13	14	15
18	19	20	21	22	23	24	18	19	20	21	22	23	24	16	17	18	19	20	21	22
25	26	27	28	29	30	..	25	26	27	28	29	30	31	23	24	25	26	27	28	29
..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	..	..	..	..	..	..
OCTOBER							APRIL							OCTOBER						
..	..	..	..	..	..	1	1	2	3	4	5	6	7	..	1	2	3	4	5	6
2	3	4	5	6	7	8	8	9	10	11	12	13	14	7	8	9	10	11	12	13
9	10	11	12	13	14	15	15	16	17	18	19	20	21	14	15	16	17	18	19	20
16	17	18	19	20	21	22	22	23	24	25	26	27	28	21	22	23	24	25	26	27
23	24	25	26	27	28	29	29	30	..	..	..	..	..	28	29	30	31	..	..	..
30	31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..
NOVEMBER							MAY							NOVEMBER						
..	..	1	2	3	4	5	..	..	1	2	3	4	5	..	..	..	..	1	2	3
6	7	8	9	10	11	12	6	7	8	9	10	11	12	4	5	6	7	8	9	10
13	14	15	16	17	18	19	13	14	15	16	17	18	19	11	12	13	14	15	16	17
20	21	22	23	24	25	26	20	21	22	23	24	25	26	18	19	20	21	22	23	24
27	28	29	30	..	..	..	27	28	29	30	31	..	..	25	26	27	28	29	30	..
..
DECEMBER							JUNE							DECEMBER						
..	..	..	..	1	2	3	..	..	..	..	1	2	..	..	..	..	..	..	1	
4	5	6	7	8	9	10	3	4	5	6	7	8	9	2	3	4	5	6	7	8
11	12	13	14	15	16	17	10	11	12	13	14	15	16	9	10	11	12	13	14	15
18	19	20	21	22	23	24	17	18	19	20	21	22	23	16	17	18	19	20	21	22
25	26	27	28	29	30	31	24	25	26	27	28	29	30	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	31	..	..	..	..	..

SCHOOL CALENDAR

1927-1928

1927			
June	20-23		Second Annual Women's Camp
October	3	Monday	Registration
October	4	Tuesday	Organization of classes
October	29	Saturday	Home Coming Day
November	11	Friday	Armistice Day exercises
November	24	Thursday	Thanksgiving Day
December	23	Friday	First term closes; Christmas recess begins
1928			
January	2	Monday	Registration of new students
January	3	Tuesday	Second term begins; organization of classes
February	6-10	Week	Northwest School Farmers' Week
March	23	Friday	School term closes
March	26-30	Week	Junior Short Course

COMMENCEMENT WEEK

March	17	Saturday	Interclass field meet
March	18	Sunday	Baccalaureate address
March	19	Monday	Intersociety declamatory contest
March	20	Tuesday	Superintendent's reception to graduating class
March	21	Wednesday	Musical recital and class play
March	22	Thursday	Class Day exercises and commencement

THE NORTHWEST SCHOOL AND STATION

FACULTY

Lotus D. Coffman, Ph.D., LL.D., President
William Watts Folwell, LL.D., President Emeritus
Walter C. Coffey, M.S., Dean of the Department of Agriculture

AT CROOKSTON

Austin A. Dowell, M.S., Superintendent
Arthur H. Larson, B.S., Preceptor, Registrar, Academic Subjects
Fanny B. Lippitt, B.S., Matron, Dining Hall, Foods and Nutrition
Retta Bede, B.S., Preceptress, Foods and Cookery
Vivian Sanders, Secretary
Kate Bedard, Accountant
Edward W. Avery, B.S., Public Speaking, Debate, Advanced Subjects
Helen Brown, B.A., Music and Vocal Training
Elmer R. Clark, B.S.A., Pure Seed Work and Home Projects
Ray S. Dunham, B.S., Farm Crops and Soils
Arnold M. Foker, Carpentry and Farm Engineering
DeEtte C. Genung, English, Assistant Preceptress
Laura Gerber, B.S., Clothing and Textiles, Assistant Preceptress
Fae Hughbanks, Business Training
Orville M. Kiser, B.S.A., Livestock
Delmar H. LaVoi, B.S.A., Livestock, Home Projects, Physical Training,
Assistant Preceptor
Thomas M. McCall, B.S.A., Horticulture
D. Austin Milligan, M.A., Farm Motors and Mechanics, Assistant Preceptor
Henry A. Pflughoeft, B.S., Extension in Boys' and Girls' Club Work
Alvey M. Pilkey, Poultry
Rose C. Polski, B.A., Piano
Severin Rishovd, Farm Motors and Mechanics
———, School Nurse, Home Nursing
Anne Simley, B.A., English
Grace M. Warne, B.A., English and Violin

GENERAL INFORMATION

LOCATION

The Northwest School of Agriculture is located at the Experiment Farm, one and one-half miles north of Crookston, Minnesota. There is a paved roadway between the school and the city, and regular auto bus service is maintained.

PURPOSES

The school was organized in 1906. It offers a practical course of study designed to fit young men and young women for successful farm life, and aims to give its students the necessary preparation for useful citizenship.

The work of the school aims to interpret for the young men and the young women from the farms, the life with which they are familiar. It gives reasons for the various farm operations, and makes a scientific basis for the proper management of the farm and the home.

TIME OF OPENING

The fall term of the Northwest School of Agriculture will open for registration on October 3, 1927, and classes will begin at 8:00 o'clock on Tuesday, October 4. The fall term closes on December 23, 1927.

The winter term will open for registration on January 2, and classes will begin at 8 o'clock on January 3, 1928. The winter term closes March 23, 1928.

THREE YEARS' COURSE

The course of study offered covers a wide range of subjects, and is largely technical in character. It is briefly outlined on pages 17 to 26. The regular course for both young men and young women requires three winters of six months each for completion.

The methods of instruction tend to educate students toward the farm instead of away from it, to develop in them a love for farm life by showing them its possibilities. In this respect the school has been very successful, as nearly all of its graduates continue agricultural pursuits.

ADVANCED COURSES

It has been found that the eighteen months of the long course is a very short time in which to give all the work that should be included in a satisfactory course. Therefore a fourth six months of work is offered. During this fourth session, graduates of the long course may elect to specialize in one of the lines of work listed below. They may at the same time choose from the elective lists subjects that they could not obtain during their first three sessions. The major lines of work suggested for boys are dairying, beef production, farm engineering, carpentry, advanced farm management, and academic subjects. The major lines for girls are dress-making, advanced home management, nursing, music, and business training.

COLLEGE PREPARATORY

Graduates of the Northwest School of Agriculture, who have completed two summers of supervised work on their home farms, one additional school year of six months, and one additional summer's work or the equivalent thereof, will be admitted to the College of Agriculture, Forestry, and Home Economics of the University of Minnesota and state teachers colleges.

DEPARTMENT OF MUSIC

For those who are interested, credit courses in piano and voice instruction are offered. Twelve half-hour and twelve group lessons per term are given, with special time for practice. Fees of \$7 per term for the lessons and \$2.50 per term for piano rental are charged. Special rooms are set aside for practice, making it possible to do good, thoro work. A class in musical theory meets once a week, and instruction is also given in the history of music, ear training, and the rudiments of harmony and interpretation.

WHEN TO COME

Students should not come before Monday, October 3, or Monday, January 2. Dormitories will not be open before that time and the first meal served in the dining hall will be at noon on those days.

HOW TO GET TO THE SCHOOL

Check all baggage to Crookston and bring checks to the school. A charge of 25 cents is made by the school for transporting trunks at the opening of school. The same charge is made for the return of the baggage at the close of school, provided it is ready to go on the days assigned. A charge of 50 cents is made for transporting trunks at any other time.

ADMISSION

Applicants who have completed a common school course will be admitted without examination and boys must have had six months' practical experience on a farm.

Applicants who have not completed the common school course should write to the registrar for further information.

Students more than twenty-one years of age who cannot pursue the full course, either from lack of time or proper preparation, may make special arrangements for taking such projects as will be most helpful to them.

Students from city or grade schools will not be admitted before finishing eighth grade work, or until their former school records have been passed upon by the superintendent. These records must be presented at least three weeks prior to the opening of school.

State High School Board certificates are accepted for work in English, physiology, algebra, geometry, and civics, or credits of 75 per cent or more received on state teachers' examinations.

ROOMS IN DORMITORIES

Old or new students planning to attend the School of Agriculture should reserve rooms in advance. Write early to the registrar, asking him to reserve a room in one of the dormitories. This may be done by paying a deposit fee of \$2 which will apply on the first month's rent. If the student is unable to enter school, the deposit may be reclaimed before September 15, after which time it is forfeited. Each dormitory room is furnished with two single beds, a dresser, table, and chairs. The rooms are all lighted by electric light and heated by steam. Preferences as to roommates should be stated early and will be considered as far as possible.

WHAT TO BRING

Each student should come provided with sheets, blankets, quilts, one bedspread, one pillow, three pillow cases, dresser scarf, towels, napkins, comb, brushes, one glass tumbler, and one teaspoon, and at least two night-gowns.

Each girl should bring with her, in addition to her ordinary supply of clothing, kimono and bedroom slippers, laundry bag, gymnasium suit, and gymnasium shoes. The kimono and bedroom slippers may be of any style and material; the laundry bag should be of washable material, large enough to hold the soiled clothes of one person, and made to hang on two closet hooks; the gymnasium suit should consist of a pair of black sateen bloomers and a white middie blouse. Standard pattern No. 9225 is recommended for the bloomers. A yard and a half of material 36 inches wide is required for the average size. Black gymnasium or tennis shoes complete this costume. For those who are unable to make the bloomers at home, assistance will be furnished at the school.

EXPENSES

Necessary expenses for the year do not exceed \$150. This amount does not include traveling and personal expenses.

Each student is required to pay for breakage of apparatus used in practical work, and for all damage done to school property.

Textbooks are furnished at a rental of \$2 per year to students who do not desire to purchase. A gymnasium fee of 25 cents per term is charged all students.

Music fees for private lessons are \$7 for each term. Piano rental is \$2.50 per term.

A fee of \$2.50 each term will entitle each student to attend all school functions, athletic contests, and games and entertainments.

It should be remembered that expenses for fees are for the entire term, and after the first month the only expenses are for board and room.

The cost to the student for board is the actual cost of maintaining the table (including management). Board is payable the first of each month in advance. *A surcharge of 10 per cent is added to all bills delinquent more than ten days. No deduction is made for board for any absence of less than five days. No room refunds will be made for any period of less*

than one month. If students are compelled to be absent for that length of time, they are allowed half rates, provided they make arrangements with the accountant before leaving.

On entering the school, each student should bring sufficient money to pay for one month's board and room, and to pay for his books and fees. This will amount to from \$30 to \$35.

The following expenses are charged to all students. Fees are payable at the time of registration, and board and room at the first of each month.

Registration fee for any part of school year.....	\$ 5.00
Non-residents of Minnesota	10.00
Deposits as guarantee of proper treatment of school property.....	5.00
Health fee per term, required of all students except those living at home.....	3.00
Board per week (price subject to change).....	4.00
Room per week, including flat laundry (price subject to change).....	1.25
Book rent, per term.....	1.00
Gymnasium fee .....	.25
Student privilege tickets for all school functions, athletic contests, and games and entertainments	2.50

Special fees in laboratory courses are as follows: blacksmithing, \$2 a term; carpentry, engineering, farm mechanics, cooking, sewing, chemistry, corn studies, or dairying, 50 cents each a term. A rental fee of \$1 a month is charged for the use of typewriters.

HEALTH SERVICE

The health fee collected from all students is used to maintain the Students' Health Service. A fully equipped hospital is maintained and a full time nurse is engaged during the school year. The health fee provides for physical examinations for all students and care by the nurse in case of sickness. *It does not provide for extra nurses or physicians in case of serious sickness, when such are necessary. A charge of 75 cents a day will be made for detention in the hospital after the first twenty-four hours.*

REQUIREMENTS FOR GRADUATION

1. *Boys' and girls' regular courses.*—The completion of the prescribed courses of study, including all the required work and enough elective work to make a total of 150 credit hours for the boys and 144 for the girls.

2. Honorable standing in deportment.

3. An essay of not less than one thousand words upon a topic connected with agriculture or home economics, typewritten on paper of approved size for binding and filing in the library.

4. For young men, practical experience in farm work during each of the two summers that come between the freshman and senior years. Students will register for the study of some definite farm problem to be studied each summer and report at stated intervals during the summer the progress made. A satisfactory standing in this summer work, or its equivalent in practical work done at the school, is required for graduation. Ten of the 150 credits are earned by home projects.

HOME LIFE ON THE CAMPUS

The life of the student while attending the school is subject to supervision. Students residing in the school dormitories are not allowed to leave the campus without permission of the preceptor or preceptress. The home life of each student is carefully guarded and everything is done to promote a healthful and moral atmosphere. The use of tobacco is strictly forbidden.

The preceptor of the School of Agriculture has charge of the boys in their dormitory and social life, and the preceptress has charge of the girls in their dormitory and social life, under such regulations as may be approved by the superintendent. Students are required to be correct in their habits, and to observe pleasantly all directions for their government.

From 8:15 a.m. to 4:30 p.m., students not at recitation or chapel are expected to be in their rooms or in the library, studying or reading; also after 7:30 in the evening. The rooms shall at all times be quiet, especially in the evening, so that no student may be disturbed.

Anyone not in accord with these restrictions, and not willing to lend a hand toward a strong moral growth, should not come to the School of Agriculture.

ASSEMBLY

On each school day at 11:40 a.m., the students assemble in the auditorium, a commodious room seating five hundred people. After the opening exercises, brief talks are given by the superintendent, members of the faculty, or invited guests.

During the year the list of speakers includes prominent men, state and national officials, business men, particularly those connected with the agricultural industries, professional men, prominent clergymen of all denominations, educators from other institutions, and successful farmers. The addresses are of great interest and value to the students.

LECTURE COURSE

During the school year a lecture and entertainment course, consisting of five lectures and musical programs, will be given at a low cost. It is hoped to provide high grade lectures and programs which will furnish a pleasant relaxation from school work and be instructive as well.

STUDENTS' LITERARY SOCIETIES

Societies for the purpose of improvement in elocution and debate, and for obtaining instruction in the form of lectures, give excellent opportunities for entertainment and culture. Practice in parliamentary procedure is given which will greatly benefit the students. Each student is expected to associate himself with one of these societies as early in his course as possible.

MUSICAL ORGANIZATION

A school band is maintained each year. A competent leader has charge of this work. A school orchestra, glee clubs, choruses, and quartets contribute greatly toward creating an interest in music.

STUDENTS' CHRISTIAN ASSOCIATIONS

Young Men's and Young Women's Christian associations have been formed, having for their objects social fellowship and moral and spiritual development. Bible classes will be held Sunday morning at 8:45. The associations are non-sectarian. Religious exercises are held at the school each Sunday evening at 7 o'clock. Various pastors and business men address the students at these meetings. The Christian associations conduct the exercises and secure the speakers.

RED RIVER AGGIE

The *Red River Aggie* is an annual published by the senior class of the school. The book gives an outline of all school and class activities, is fully illustrated, and contains, in addition to brief articles of student interest, a complete record of the development and growth of the institution.

THE NORTHWEST MONTHLY

The *Northwest Monthly* is published by the faculty of the school. It serves as a community publication, and is a medium by which former students and alumni are kept in touch with one another and with the school. It is also published to disseminate useful information and results of station work.

SCHOLARSHIP AND LOAN FUNDS

The Northwest School of Agriculture considers itself very fortunate in being able to present the following loan fund provisions. The donors have specified the purposes for which each may be used. The general purpose, however, is to enable the school to reach a large number, to provide the means of encouraging many to acquire the training which the school offers, and to stimulate greater effort in school work.

THE GILFILLAN TRUST FUND

This fund may be used by students of the Northwest School of Agriculture in accordance with the action of the Board of Regents taken September 26, 1916. The regulations governing the administration of the income from the fund may be learned by addressing the superintendent of the Northwest School of Agriculture, Crookston, Minnesota.

CALEB DORR CASH SCHOLARSHIP PRIZES

By a decision made in April, 1922, by the Board of Regents of the University of Minnesota, a part of the Dorr fund is now made available to the schools of agriculture. This fund consists of \$50,000 willed by the late Caleb Dorr, of Minneapolis, the income of which will be used to promote scholarship and student activity records. Further information regarding this fund as it applies to the Northwest School of Agriculture may be obtained by writing to the superintendent.

FAIRFAX-ANDOVER SOCIAL CLUB LOAN FUND

The Fairfax-Andover Social Club (a farm club near Crookston) provided \$150 to be used as a students' loan fund. This money will be loaned to students at 6 per cent interest as a temporary loan.

CLASS OF 1917 LOAN FUND

The class of 1917 has provided \$140 to be used as a students' loan fund. The interest from this fund shall be awarded annually to the student who makes the greatest progress in debating.

SPECIAL COURSES

A few students are unable to enter in the fall or unable to attend school for the three years. In order to provide for such students, the course of study for the first year has been so arranged that new students may take the regular work and complete a course of study, beginning January 2, 1928.

JUNIOR SHORT COURSE

The seventeenth annual Junior Short Course, from March 26 to March 30, 1928, is open to boys and girls from 12 to 20 years of age. With the exception of \$3 for board, there is no expense connected with the course. The course aims to deepen the interest of boys and girls in life on the farm. Special emphasis is placed on boys' and girls' club work. Instruction is given for the planning and carrying out of work in such projects and contests as gardening, corn and potato growing, pig, calf, and chicken raising, cooking, sewing, and canning. Illustrated lectures, moving pictures of educational value, games, singing, and excursions add interest and pleasure to the course.

NORTHWEST SCHOOL FARMERS' AND WOMEN'S WEEK

The exhibit of farm crops in connection with the course was the origin of the annual Red River Valley Winter Shows held at Crookston during the second week of February, which now includes farm crops, livestock, poultry, and industrial exhibits. A five days' meeting at this time held under the auspices of the Northwest School serves the purpose of the original short course.

WOMEN'S CAMP

The second annual Women's Camp will be held at the Northwest School June 20-23, 1927, to provide instruction and recreation for homemakers. Instruction in the form of demonstrations will be offered in home-making, community building, child training, music, and recreation.

EXPERIMENT STATION

The Northwest School and Station is now conducting extensive experiments in agronomy, soils, horticulture, animal husbandry, and agricultural engineering. Beginning with 1910 a special report has been issued each year describing the progress of the work. The annual report is mailed free upon application.

SCHOOL FARM

The farm comprises approximately 600 acres, and furnishes an extensive laboratory for the work of the school. Information concerning the methods employed on the farm is always available to the students. The classroom work is supplemented with actual practice either in the field or with crops grown on the farm.

STATION FLOCKS AND HERDS

The school now maintains an abundance of livestock, all of which is used for student work in the Animal Husbandry Department. Purebred Holstein, Guernsey, and Shorthorn cattle; grade and purebred Percheron horses; Shropshire sheep; Duroc Jersey hogs; White Leghorn, Barred Plymouth Rock, and Rhode Island Red chickens are maintained for station and school purposes. These furnish excellent opportunities for students to study intelligently the various courses in animal husbandry.

COURSES OF STUDY

BOYS' THREE-YEAR COURSE

Capital letters following the names of courses refer to descriptions given on pages 17 to 26.

FIRST YEAR

Required of All

<i>Fall Term</i>	<i>Spring Term</i>
Credit Hours	Credit Hours
5 English A	5 English A
5 Livestock*	5 Livestock*
Farm Dairying A	Study of Breeds H
Poultry B	Poultry B
5 Farm Crops*	5 Farm Crops*
Plant Life A	Cereal Crops A
5 Arithmetic A*	5 Arithmetic A*
Gymnasium and Personal Hygiene A	Gymnasium and Personal Hygiene A
1 Social Training C	1-5 Summer Home Projects
5 Elective from the following:	5 Elective from the following:
<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
26	25
5 Blacksmithing B*	2 Spelling and Penmanship E
5 Farm Motors I	5 Carpentry C*
5 Farm Mechanics G*	5 Farm Motors J
5 Industrial Geography A	5 Industrial History B
1 Music B	1 Music B
3 Typewriting I F	3 Typewriting I F
5 Shorthand C	5 Shorthand C
4 Music A	4 Music A

Students having a State Board certificate in arithmetic need not take that subject.

SECOND YEAR

Required of All

<i>Fall Term</i>	<i>Spring Term</i>
Credit Hours	Credit Hours
5 English B	5 English B
5 Livestock	5 Livestock
Stock Feeding E	Stock Feeding F
Stock Judging G	Stock Judging D
Poultry J	5 Farm Crops
5 Farm Crops	Soils Management D
Fruits and Vegetable Crops C	2½ Farm Accounts E
5 Forage Crops B	2½ Forestry D
Gymnasium	Gymnasium
5 Elective from the following:	1-5 Summer Home Projects
<hr style="width: 100%;"/>	5 Elective from the following:
25	<hr style="width: 100%;"/>
5 Ancient History C	25
5 Mechanical Drawing E*	5 Bookkeeping A
3 Field Machinery H	5 Modern History C
1 Music B	1 Music B
3 Typewriting II F	1 Parliamentary Law E
5 Shorthand D	3 Typewriting II F
3 Advanced Carpentry D	5 Shorthand D
3 Bookkeeping E	3 Farm Drawing F
4 Music A	4 Music A

* Will be offered both terms.

THIRD YEAR
Required of All

<i>Fall Term</i>	<i>Spring Term</i>
Credit Hours	Credit Hours
5 English C	5 English C
5 Livestock Herd Management C	5 Livestock Livestock Business Management D
5 Farm Crops Soil Fertility C Gymnasium	5 Farm Crops Farm Management F Gymnasium C
2 Farm Marketing C	2 Farm Marketing C
3 Rural Sociology B	3 Rural Economics A
5 Elective	5 Elective
25	25

ELECTIVE

5 Algebra B	5 Algebra B
2 Meat Cutting I	2 Meat Cutting I
5 Civics D	5 Physics A
1 Music B	1 Music B
8 Office Training B	8 Office Training B
4 Music A	4 Music A

CREDIT REGULATIONS REGARDING BOYS' 3-YEAR COURSE

In addition to the required work of the term, students must elect enough work to make a total of not less than 23 or more than 26 credit hours. Exceptions may be allowed by the Committee on Students' Work.

Students desiring to complete the business training work may elect such subjects in the second and third year in place of a required subject, upon conference with the Students' Work Committee.

Credit toward graduation will be allowed for work in debate, literary societies, school athletic teams, and other student activities, on a basis to be determined by the Students' Work Committee.

From one to four credits per term may be earned by approved work in instrumental or vocal music. A special fee will be charged for such courses. The same credit may be earned without the fee by membership in the orchestra by those who are competent for the work.

A class will not be maintained for less than six students.

COURSES OF STUDY

15

HOMEMAKERS' COURSE

FIRST YEAR
Required of All

<i>Fall Term</i>	<i>Spring Term</i>
Credit Hours	Credit Hours
5 English A	5 English A
3 Physiology and Public Health C	5 Arithmetic A*
4 Foods and Cookery A	2 Public Health C
3 Elementary Garment Making P	4 Foods and Cookery A
1 Drawing and Design M	3 Garment Making P
1 Music B	1 Music B
1 Social Training I	Physical Training D
Physical Training C	1.5 Summer Home Projects
6 Elective from the following:	5 Elective from the following:
<hr/> 24	<hr/> 25

General and Agricultural Electives

5 Industrial Geography A	3 Farm Dairying B*
5 Poultry L*	5 Industrial History B
4 Music A	4 Music A
5 Plant Life A	

Office Training Electives

2 { Spelling E	2 { Spelling E
} Penmanship E	} Penmanship E
5 Shorthand C	5 Shorthand C
3 Typewriting I G	3 Typewriting I G

SECOND YEAR
Required of All

<i>Fall Term</i>	<i>Spring Term</i>
Credit Hours	Credit Hours
5 English B	5 English B
4 Foods and Cookery B	3 House Planning and Furnishing J
2 Textiles R	2 Home Nursing E
4 Elementary Dressmaking O	3 Dressmaking N
2 Home Nursing E	1 Music B
1 Music B	Physical Training E
Physical Training E	1.5 Summer Home Projects
1 Costume Design L	10 Electives
5 Electives	<hr/> 24
<hr/> 24	

General and Agricultural Electives

5 Ancient History C	2 Laundering Q
5 Fruit and Vegetable Crops C	5 Modern History C
4 Music A	1 Parliamentary Law E
3 Beekeeping E	4 Music A
5 Mechanical Drawing E*	2½ Farm Forestry D

Office Training Electives

5 Shorthand D	5 Shorthand D
3 Typewriting II F	3 Typewriting II F
<hr/>	5 Bookkeeping A

* Will be offered both terms.

THIRD YEAR
Required of All

<i>Fall Term</i>	<i>Spring Term</i>
Credit Hours	Credit Hours
5 English C	5 English C
3 Home Management D	3 Institutional Management G
1 Art Needlework K	2 Dressmaking N
1 Music B	1 Music B
Physical Training E	Physical Training E
3 Rural Sociology B	3 Rural Economics A
11 Electives	10 Electives
—	—
24	24

General and Agricultural Electives

5 Soil Fertility C	2 Floriculture B
2 Household Accounts F	5 Farm Management F
2 Nutrition H	4 Music A
4 Music A	5 Physics A
5 Civics D	2 Meat Cutting I
2 Meat Cutting I	5 Algebra B
5 Algebra B	

Office Training Electives

2 Farm Marketing C	2 Farm Marketing C
8 Office Training B	8 Office Training B

ADVANCED AND COLLEGE PREPARATORY COURSES

The work offered in this course is arranged to fit young men and women to enter the College of Agriculture, Forestry, and Home Economics, and state teachers colleges. It will cover a period of six months, beginning and closing at the same time as the regular school classes. Students capable of carrying satisfactorily all the subjects required will be granted a certificate.

Upon the completion of two summers of supervised work in addition to this course, graduates will be admitted to the College of Agriculture, Forestry, and Home Economics and to state teachers colleges.

Students from other schools who wish to prepare for college or university entrance may elect subjects from the school course which will meet the necessary requirements.

OUTLINE OF COURSE

<i>Fall Term</i>	<i>Spring Term</i>
Credit Hours	Credit Hours
5 Elementary Algebra B	5 Elementary Algebra B
5 Plane Geometry	5 Plane Geometry
5 American Literature and Composition D	5 American Literature and Composition D
5 English Literature E	5 English Literature E
2 Comparative Agriculture D	2 Comparative Agriculture D

DESCRIPTION OF COURSES

AGRICULTURE

- A. Cereal Crops. Leading cereal crops, classes and varieties adapted to northwestern Minnesota, production and distribution, soil and climate adaptations, seed treatment, cultural practices, and control of diseases. Laboratory includes specimens of grain diseases and exercises in grain judging. Mr. Clark.
- B. Forage Crops. Grasses, legumes, root and tuber crops grown for livestock. Cultural directions. Laboratory work with dried and green specimens includes identification, characteristics, and habits of growth of the various crops. Mr. Dunham.
- C. Soil Fertility. A study of elementary chemistry and its application to soil and fertilizers. Laboratory experiments in elementary chemistry and soil tests. Mr. Dunham.
- D. Soil Management. Soil formation and classification. The principles of soil management are brought out in a study of soil moisture, pore space, organic matter, tillage, drainage, and crop rotations. Laboratory experiments with soils from students' farms. Mr. Dunham.
- E. Farm Accounts. Practical farm records and their uses for the Red River Valley farmer. Calculations involved in farm accounting. Special emphasis upon the requirements of the income tax law. Mr. Clark.
- F. Farm Management. Systems of farming; selection of farms; the planning of rotations suitable to the students' home farms and to farms operated under different systems. Cost of producing crops; marketing products; business methods applied to the farm. Mr. Dunham.

AGRICULTURAL ENGINEERING

- A. Agricultural Physics. Nature of matter and force, heat, light, sound, and electricity in their application to everyday use. Mr. Clark.
- B. Blacksmithing. Instruction is given in the management of the forge; in bending, shaping, and welding iron and steel; and tempering steel tools, thus familiarizing the student with operations necessary for blacksmith repair work on the farm. Mr. Foker.
- C. Carpentry. Care and use of tools taught by means of practical farm problems, methods of sharpening tools, practical application of the various carpentry tools. Mr. Foker.
- D. Advanced Carpentry. Continuation of carpentry with emphasis on building construction including foundation, framing, stair and rafter cutting, and selection of materials, and concrete work. Mr. Foker.
- E. Mechanical Drawing. Practice in lettering and emphasis on working drawings for the shop. Designing of small farm structures. Mr. Foker.

- F. Farm Drawing. Continuation of Mechanical Drawing. Specializing in the planning and arranging of various buildings on the farm. Attention is given to building materials, estimates of costs, and specifications. Mr. Foker.
- G. Farm Mechanics. Practical work in soldering, pipe fitting, babbiting, and bearing scraping; rope work, belt lacing, and harness repair. Mr. Milligan, Mr. Rishovd.
- H. Field Machinery. Care and adjustment of both horse- and tractor-drawn implements, including plows, disk harrows, binders, mowers, and other harvesting and belt machinery. Practical work in making adjustment and repairs. Mr. Milligan, Mr. Rishovd.
- I. Motors: Care and Operation. Principles, construction, and handling of stationary and traction gasoline engines, including timing, ignition, starting and lighting systems, carburetion, cooling, and lubrication. The student is given a thoro knowledge of the care and operation of the gas engine. Mr. Milligan, Mr. Rishovd.
- J. Motors: Auto and Tractor Repair. Practical work in overhauling and repairing automobiles and tractors, including complete motor and transmission overhauling; front and rear axle adjustment; and the common carburetor and electrical repairs which can be made in the farm shop. Mr. Milligan, Mr. Rishovd.

DAIRY AND ANIMAL HUSBANDRY

- A. Farm Dairying. A study of the principles and practices of producing dairy products, including a discussion of dairy barns, silos, herd management, milk production, and testing, including record keeping. Mr. Kiser.
- B. Farm Poultry. Poultry house construction. Feeds and feeding. Essentials for winter egg production. Killing and dressing fowls. Mr. Pilkey.
- C. Herd Management. Principles governing breeding and building up of herds, with special reference to the value of purebred sires. Problems of sanitation and disease. Mr. Kiser.
- D. Livestock Management. Study of breed associations, registration, pedigrees, advertising, sales, and markets. Mr. Kiser.
- E. Stock Feeding. The principles of plant growth as applied to the production of feeds. Physiological functions of the organs of digestion and circulation as applied to animal nutrition. Feeding standards, characteristics of various feeding stuffs, formulation of rations. Mr. Kiser.
- F. Stock Feeding. Prerequisite E. Feeding livestock under farm conditions. Consideration of experimental work and present practice. Practical feeding problems. Efficiency and economy in the feeding of rations. Mr. Kiser.
- G. Stock Judging. Attention is called to desirable and undesirable qualities in the various breeds. Instruction is given in comparative judging of breeds and classes of livestock. Mr. Kiser, Mr. LaVoi.

- H. Study of Breeds. The types and breeds of horses, beef and dairy cattle, sheep, and swine are studied as to origin, history, characteristics, adaptation, and general economic importance. This course is supplemented by practice in judging horses, cattle, sheep, and hogs. The station herds are used for this purpose. Mr. LaVoi.
- I. Meat Cutting. Slaughtering of hogs, sheep, and beeves. Judging a carcass. Study of meat cuts and meats. Mr. Kiser.
- J. Poultry Problems. Breeds and breeding of fowls. Selection and management of the laying flock, and the breeding of the flock. Natural and artificial incubation and brooding. Turkey, duck, and goose culture. Flock-culling practice. Mr. Pilkey.
- K. Poultry Diseases. Diseases of poultry, their cause, prevention, and treatment. Poultry marketing. Mr. Pilkey.
- L. Farm Poultry. Poultry on the farm. Poultry house construction. Feeds and feeding. Management of the laying flock. Natural and artificial incubation and brooding. Common diseases of the farm flock. Mr. Pilkey.

HORTICULTURE AND BEEKEEPING

- A. Plant Life. Taught with special reference to plants of interest to the northern Minnesota farmer. Seeds and plants of the common weeds are studied, classified, and identified. Special emphasis is placed upon various methods of weed eradication. Mr. McCall.
- B. Floriculture. Study of flowers, with special reference to planting, growing, and propagation. Considerable time spent on grouping and planting of ornamental flowers and shrubs, and making landscape planting plans. Station greenhouses supply material for laboratory work. Mr. McCall.
- C. Fruit and Vegetable Crops.
Fruit Growing.—Importance of farm orchard and small-fruit garden is emphasized. Field work consists of a study of orchard soils, planting and cultural methods, propagation, pruning, spraying, harvesting, marketing, selection of varieties of native and hardy fruits. Mr. McCall.
Vegetable Gardening.—The value of the home vegetable garden, preparation of the ground, and selection of plants and seeds are given attention. Includes tillage, rotation, transplanting, preparation and care of hotbeds, and insects dangerous to the garden. Mr. McCall.
Potato Culture.—The importance of the potato as a crop for Minnesota is recognized in this laboratory course. Includes the study of potato soils, seed selection, growing the crop, harvesting, storing, marketing, diseases and their control. Mr. McCall.
- D. Farm Forestry. Why, how, when, and where to plant windbreaks and wood lots is taught; also characteristics and adaptability of the more common trees; methods of propagation, and the conservation of planted and natural forests. Mr. McCall.
- E. Beekeeping. Value and importance of bees as a source of income for the farm, study of different races of bees, practical exercises in handling

of bees. Local apiaries furnish abundance of material for practical demonstrations. Mr. McCall.

ENGLISH

- A. Freshman English. Oral and written compositions, with particular attention to sentence structure. Punctuation and spelling. Letter writing. Drills for the purpose of eliminating errors. The reading of simple classics to illustrate fable, allegory, parable, myth, and ballad. Mrs. Genung.
Public Speaking.—One hour a week. Reading aloud, drilling upon articulation and enunciation, short talks on familiar subjects, public programs to enable the students to learn to speak clearly and easily before an audience. Mrs. Genung.
Debating.—One hour a week. Principles of argumentation, briefs, debating in class, in public programs, and in debating societies. Mr. Avery.
- B. Junior English. Practical business English. Paragraph and methods of paragraph development. Narration, description, and exposition in oral and written composition. Study of good literature as basis for composition work and means of increasing student's vocabulary. Miss Simley, Miss Warne.
Public Speaking.—Extemporaneous talks, longer discussions, and a little dramatic work. Miss Simley.
Debating.—A development and a continuation of the first year's work. Mr. Avery.
- C. Senior English. Study of whole composition with reference to principles of unity, coherence, and emphasis. Exposition studied in oral and written composition work. Reading of best English writers with view of increasing students' appreciation of good literature. Miss Simley.
Public Speaking.—The dramatization of scenes from literature studies, after-dinner speeches, and talks. Miss Simley.
- D. American Literature and Composition. Rhetoric, composition, and public speaking; study of the novel and the short story; the drama; the essay and the oration; narrative and lyric poetry; the history and development of American literature, with selected readings of each period. Miss Simley.
- E. English Literature. Study of the history and development of English literature, with selected readings of each period. Miss Simley.

INDUSTRIAL HISTORY AND CIVICS

- A. Industrial Geography. Study of climate, rainfall, location, and other geographical conditions affecting the primary industries. Mr. Avery.
- B. Industrial History. A study of the growth of industry, commerce, labor, population, and agriculture in the United States. Mr. Avery.

- C. Ancient and Modern History. A study of the world's history, with particular emphasis placed on the development of institutions, states, industries, and organizations that have influenced the progress of civilization. Mr. Larson.
- D. Civics. Legislative, judicial, and executive departments and their functions. School district, township, county, state, and national government. Mr. Clark.
- E. Parliamentary Law. The essentials of parliamentary practices as necessary in conducting public meetings effectively. Mr. Avery.

RURAL ECONOMICS AND SOCIOLOGY

- A. Rural Economics. Attention is given to the consideration of factors affecting agricultural production and farm products. Mr. LaVoi.
- B. Rural Sociology. The problems of rural communities, of rural health and sanitation, and of rural social institutions will receive attention. Mr. LaVoi.
- C. Farm Marketing. Fundamentals in connection with the problems confronting the farmer today in disposing of his products. Mr. Dowell.
- D. Comparative Agriculture. A study of the different systems of agriculture, marketing, rural credit facilities, and rural life of the principal agricultural countries of the world. Mr. Dunham.

HOME ECONOMICS

FOODS AND HOME MANAGEMENT

- A. Foods and Cookery. Elementary cooking. Classifications of foods and a study of the scientific principles underlying the cooking of the carbohydrate, fat, and protein foods; doughs and batters; beverages, desserts, and salads. Miss Bede.
- B. Food and Cookery. Advanced cooking. Canning and preserving; planning and serving meals. Miss Bede.
- C. Physiology and Public Health. Study of structure of human body; digestion, absorption, and metabolism of foods; fundamental principles of human nutrition. General principles of public hygiene and sanitation are included.
- D. Home Management. Distribution of family income; household accounts; purchasing supplies; planning and serving meals; relation of cost to income. Miss Lippitt.
- E. Home Nursing. Home care of the sick, sick room etiquette, care of children, first aid in emergencies, preparation and serving of food for the sick. Practical work is given in assisting the regular school nurse.
- F. Household Accounts. Housekeeping as a business, the average income, the budget and its apportionments, the economic and administrative responsibility of women in regulating and controlling the cost of living through judicious expenditure. Miss Bede.

- G. Institutional Management. Study of planning, purchasing, care, and preparation of food in quantity; organization and administration, and practice house work. Miss Lippitt.
- H. Nutrition. Simple problems of nutrition with caloric values and menus worked out for the adult man and woman, and children of different ages. Planning of family dietary, cost of dietaries, food for the sick and convalescent. Miss Lippitt.
- I. Social Training. A series of lectures on proper speech, table etiquette, care of children, first aid in emergencies. Practical work is given in assisting the regular school nurse. Miss Bede.
- J. House Planning and Furnishing. Location, construction, and planning of farm houses; heating, lighting, ventilating, and equipping house; artistic and economical furnishing with work on cost and schemes of furnishing, floor and wall coverings, curtains and pictures, for each room. Miss Bede.

CLOTHING

- K. Art Needlework. Review of principles of design and color harmony. Decorative stitches and use in original design. Artcraft work. Prerequisite, Drawing and Design. Miss Gerber.
- L. Costume Design. Principles of design as applied to dress. Special emphasis given to different types and figures. Prerequisite, Drawing and Design. Miss Gerber.
- M. Drawing and Design. Treats of the fundamental principles in designs and color harmony, with special emphasis on house furnishings. Miss Gerber.
- N. Dressmaking. Includes the more advanced problems. Underwear and dress for graduation are made in this course. Miss Gerber.
- O. Elementary Dressmaking. Pattern alterations; making of wool blouse, wool dress, underwear, afternoon or informal party dress, and infant's layette. Miss Gerber.
- P. Elementary Garment Making. Making of cooking apron and cap, underwear (including a slip), wash dress, and extra problems for those who have time. Hand stitches as applied to simple undergarments and household articles. Care of sewing machines. Use of commercial patterns. Miss Gerber.
- Q. Laundering. Care of laundry room and utensils, study of water, soap, starch, removal of stains, washing of woolen garments, ironing. Principles of dry cleaning. Miss Gerber.
- R. Textiles. Survey of processes concerned in the manufacture of cotton, wool, silk, and flax, and tests for adulteration and substitution. Miss Gerber.

MATHEMATICS

- A. Arithmetic. Drill for speed and accuracy; application of principles to everyday farm problems, as measurements of materials, extension, capacity, marketing of grain, stock, and products; purchase of ma-

- chinery and supplies; cash accounts, business forms, and interest. Mr. Avery.
- B. Algebra. This work covers *First Course in Algebra*, by Hawkes-Lubby-Teuton, or equivalent text, omitting ratio and proportion, graphical representation, and imaginaries. Mr. Larson.
- C. Geometry. The course in geometry covers Wentworth and Smith's *Geometry*, from Book I to Book VIII, or equivalent text, except the work in symmetry, maxima, and minima. Mr. Larson.

MUSIC

- A. Piano, Vocal, and Violin. *Piano*.—Instruction adapted to needs of each student. Technical exercises for development and control of the fingers, hands, and arms. Studies and compositions by best composers. A special fee is charged for this work. Miss Polski.
Voice.—Exercise in breathing and tone placing, for relaxing the throat, for formation of vowels and consonants, and for sight reading. Songs by American and foreign composers are studied. This work also requires a special fee. Miss Brown.
Violin.—Methods and studies adapted to the individual student. This course requires a special fee. Miss Warne.
Chorus Work.—A glee club, chorus, and quartets are organized during the year. Students with the best voices are admitted to these. No special fee is charged. Miss Brown.
- B. Music. In the regular course of study, there is offered one hour a week in music each year, consisting of work in ear training, vocal development; sight reading and chorus; and appreciation of music. Miss Brown.

PHYSICAL TRAINING

The aim of this department is to maintain the health of the students, to give outdoor exercise and deep breathing, to stimulate functional activity, to give co-ordination and control, and to form right habits of living.

MEN

- A. Personal Hygiene. Importance of proper care of human body. Special attention is given to foods, water, air, narcotics, cleanliness, clothing, exercise, first aid to injured, care of sick, and care of special organs of the body. Mr. LaVoi.
- B. Gymnasium. Required of all men not excused because of physical disability. Aims to inspire pupils with desire to reach and maintain physical efficiency. Calisthenics with dumb-bells, Indian clubs, etc. Games or running follow light apparatus work. Mr. LaVoi.
- C. Social Training. Lectures and demonstrations on social conventions of home, school, and public life.

WOMEN

- D. Physical Training. For freshman girls not having had gym. Exercises in correct posture and walking habits. Exercises to develop quick thinking and action. Simple folk dances. Miss Gerber.
- E. Physical Training. For junior, senior, and advanced girls. Exercises on light and heavy apparatus, and advanced folk dances. Miss Gerber.

BUSINESS TRAINING

- A. Bookkeeping. The principles of double entry bookkeeping are taught by means of class drills and the working out of model sets of books. In this course the student is made familiar with checks, notes, drafts, and other business papers. Miss Hughbanks.
- B. Office Training. This course, given the third year, combines the work of the shorthand and typewriting classes into one; and the student receives practical office work, including dictation and letter writing, filing, mimeographing, and secretarial training. Miss Hughbanks.
- C. Shorthand I. During the first year, the students complete the *Manual of Gregg Shorthand*, as well as many easy business letters. Miss Hughbanks.
- D. Shorthand II. The third semester of shorthand reviews the *Manual*, gives much new dictation material, including *Gregg Speed Studies*, and work from the *Gregg Writer*. The students' speed should be raised to 100 words a minute. Miss Hughbanks.
- E. Spelling and Penmanship. Practical drills closely related to work in other subjects, aiming to give proficiency in everyday requirements. Mr. Avery.
- F. Typewriting I and II. Proper use of the machine; accuracy in touch typing through finger drills, and writing of required exercises. Second year includes business letters and tabulating and executing legal documents. Forty to fifty words a minute required. Miss Hughbanks.

SUMMER HOME PROJECTS

AGRICULTURAL PROJECTS

1. Dairy Herd Management. Student assumes care of dairy herd on his home farm for at least six months, making regular reports in regard to feeding and management, and keeping accurate accounts of milk production, butterfat tests, feed consumed, etc. 5 credits. Mr. Kiser.
2. Pork Production. Care and feeding of one or more litters for six months, with complete records of feeding and care, cost of production, and returns. 3 to 5 credits. Mr. Kiser.
3. Sheep Raising. Care of farm flock for one season, with complete records of feeding and management. 1 to 2 credits. Mr. Kiser.
4. Potato Production. Production of one acre or more of potatoes for seed, and study of seed selection and treatment, control of diseases,

- cultural practices, cost of production, and financial returns. 3 to 5 credits. Mr. McCall.
5. Garden Production. Growing one-eighth acre or more of specified crops, with notes and cost records. 1 to 3 credits. Mr. McCall.
 6. Planting Windbreak. Practical application of principles taught in forestry course, in planting windbreak of at least one hundred trees on home farm. 3 to 5 credits. Mr. McCall.
 7. Corn Production. Production of one acre or more of a standard variety of corn for seed, following up-to-date methods of seed selection, curing, testing, and cultural operations as taught in the classroom. 3 to 5 credits. Mr. Dunham.
 8. Pure Seed Production. Production of one acre or more of a pure standard variety of wheat, oats, or barley, with special attention to preserving purity of seed and to producing high quality seed grain. 1 to 3 credits. Mr. Clark.
 9. Alfalfa. Growing of one acre or more of alfalfa, with records of labor and other production costs, yields, and notes on observations. 1 to 3 credits. Mr. Dunham.
 10. Farm Accounts. Includes the keeping of a complete system of financial accounts on the home farm, production cost, and other farm records for one season. 5 credits. Mr. Clark.
 11. Poultry Production. Feeding and care of a farm flock for egg production, with complete records of production and cost. 3 to 5 credits. Mr. Pilkey.
 12. Building Construction. Planning, locating, and constructing a garage, machine shed, poultry house, or other farm building, on the home farm. 1 to 3 credits. Mr. Foker.
 13. Tractor Operation. A study of the management and operation of the tractor on the home farm, including cost of fuel and oil, repairs, etc., and complete records of work done. 3 to 5 credits. Mr. Milligan.
 14. Baby Beef. Care and feeding of baby beef with records for cost of production. 5 credits. Mr. Kiser.
 15. Hogging-Off. The growing of corn for hogging-off, with records of cost of production and results. 2 to 3 credits. Mr. Kiser.
 16. Ton Litter. The keeping of records of production on litter of any breed of swine. 3 credits. Mr. Kiser.
 17. Community Service. The organization and promotion of community, social, or religious organizations. 5 credits. Mr. Dowell.

HOME ECONOMICS PROJECTS

1. Canning Fruit and Vegetables. The canning of not less than twelve quarts of vegetables and not less than twelve quarts of fruit, with records of methods used and costs. 2 credits. Miss Bede.
2. Canning Meat. The canning of not less than twelve quarts of meat by the "oven method," with notes and cost records. 1 credit. Miss Bede.

3. Preserving. The making of not less than six quarts of sweet or sour pickles, at least twelve glasses of jelly, and not less than six pints of preserves, jam, or conserve. 1 credit. Miss Bede.
4. Baking. Includes the baking of nine batches of yeast bread and six batches of quick breads, and reports on baking, time, and cost of materials. 2 credits. Miss Bede.
5. House Dress. Making a washable house dress for self or other member of the family. 1 credit. Miss Gerber.
6. Made-Over Dress. Making over a dress for self or other member of the family. 1 credit. Miss Gerber.
7. Table Linen. Hemming a half dozen table napkins and a lunch cloth by hand with damask or French hem. 1 credit. Miss Gerber.
8. Embroidery. Embroidering a lunch cloth or a three-piece dresser set or a buffet set on linen or Indian head. The design should be original and conventional. 1 credit. Miss Gerber.
9. Hemstitching. Hemstitching, either single or double, a half dozen handkerchiefs or a thirty-six inch square lunch cloth and four napkins. 1 credit. Miss Gerber.
10. Cooking and Serving. Cooking and serving six vegetables three times each. 1 credit. Miss Bede.
11. Cake Making. Making eight cakes, four sponge cakes and four butter cakes. 1 credit. Miss Bede.
12. Baking Cookies. Making twelve bakings of cookies, six of which are drop cookies and six rolled out. 1 credit. Miss Bede.
13. Desserts. Making and serving six hot desserts and six cold desserts. 1 credit. Miss Bede.
14. Pie Baking. Making twelve pies, six of which are two-crust pies, and six one-crust pies. 1 credit. Miss Bede.

SUMMARY OF ATTENDANCE

1926-27

Regular School Course	Men	Women	Total
Advanced	14	8	22
Seniors	36	16	52
Juniors	59	26	85
Freshmen	102	27	129
Special	5	7	12
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	216	84	300
Women's Camp, 1926.....	..	127	127
Junior Short Course, 1927.....	143	87	230
Cow Testers' Short Course.....	12	..	12
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	371	298	669

STUDENTS

1926-27

ADVANCED

Elmer Anderson, Clearbrook	Inger Lundin, Winger
Naomi Forder, Middle River	Henry Mackowiak, Crookston
Karrol Gandrud, Detroit Lakes	Clarence Nelson, Gary
Erling Gordon, Shevlin	Doris Olson, Fertile
Caroline Hruska, Lockhart	Edna Peterson, Grygla
*Arthur Johnson, Callaway	Arthur Ramse, McIntosh
Mathilda Kotrba, Erie	*Orlando Rudser, Leonard
Rose Kozojed, Thief River Falls	*Stanton Rudser, Leonard
Harry Lewis, Warroad	Wesley Sheldrew, Oregon City, Oregon
Victoria Lewis, Warroad	Joseph Skatvold, Twin Valley
Earl Luchau, Gary	Phinney Stenborg, Clearbrook

SENIORS

Arnold Aakre, Thief River Falls	Ralph Hamrick, Angus
Rolf Anderson, Fisher	*Ruby Hanson, Eldred
Sophie Breiland, Hazel	Selmer Harstad, Fertile
Ole Breivold, Wanke	Elmer Hedstrand, East Grand Forks
James Brown, Warroad	Myrtle Hetland, Shelly
*Adeline Bunes, Eldred	Melvin Hole, Dalton
G. Douglas Clark, Williams	Gladys Huartson, Gatzke
Harwood Connor, Stephen	Clarence Koznek, Warroad
Alfred Danielson, East Grand Forks	Clarence Krogstad, Fertile
Hannah Degerness, Gary	*Maurice Lillo, Oklee
Elsworth Dowers, Hiwood	Morriel Mortensen, Pencer
Annie Dunbar, Lancaster	Harold Nicholson, Orleans
Chester Engman, Hallock	*Vivian Olson, Thief River Falls
Alfred Erickson, Lengby	Randolph Ostlie, Montevideo
Ralph Erickson, Goodridge	Kenneth Parduhn, Cedar Bend
Melvin Flaskerud, Fosston	Loren Parkin, Euclid
Gunda Gullingsrud, Nielsville	Eldor Peterson, Angus
Clara Gunufson, Fertile	Ann Radniecki, Wanke

Ishmael Rynning, Kennedy
 Otto Saugen, Thief River Falls
 Glenn Smith, Bluffton
 Ruth Soltis, Tabor
 Lawrence Spears, Shooks
 Donald Spong, Oklee
 Olaf Stenborg, Clearbrook
 Arthur Stordahl, Gatzke

Edna Story, East Grand Forks
 Bennie Strickler, Euclid
 Nellie Strickler, Euclid
 Ivan Suchomel, Ogema
 Bessie Swenson, Crookston
 Ruth Thorsen, Gully
 Carl Widseth, Gonvick
 Russell Younggren, Northcote

JUNIORS

Lester Aase, Gatzke
 Lillian Bakken, Erskine
 Wilfred Bakken, Twin Valley
 Selma Beiswenger, Kratka
 Eugene Berberick, Erskine
 George Berggren, Greenbush
 Marie Bernath, Pembina, N.D.
 Oscar Bestland, East Grand Forks
 Esther Blair, Bagley
 Neil Boehmer, Glyndon
 Clifford Bryngelson, Callaway
 Elon Bryngelson, Callaway
 Laura Buck, Crookston
 Bennie Burk, Brooks
 Melvin Burk, Brooks
 Theodore Carlson, Hallock
 Harry Confer, Angus
 Oliver Dalos, Grygla
 Walter Danielson, Detroit Lakes
 Isabelle Dobias, Angus
 Paul Dobias, Angus
 Esther Engbretson, Clearbrook
 Elida Erickson, Clearbrook
 Irvin Flynn, Leonard
 Ethel Harris, Crookston
 Arnold Hendricks, Fertile
 Carl Hogenson, Winger
 Elmer Hokanson, Warroad
 Mayme Holub, Warren
 Sophie Hoper, Stephen
 Palma Hornseth, Thief River Falls
 Helen Hovland, Mentor
 Harold Johnson, Radium
 Joy Johnson, Middle River
 Lloyd Johnson, Fergus Falls
 Walter Johnson, Bantry, N.D.
 Rudie Johnstad, Beltrami
 Romaine Juhl, Crookston
 Louis Larson, Hazel
 Manley Larson, Twin Valley
 George Lee, Hendrum
 Glenn Lindquist, Wylie
 Garwin Lundberg, Kennedy

Edythe Martinson, Kennedy
 Vickie Maruska, Angus
 Clay Mellor, Brooks
 Julia Miller, Goodridge
 Gladys Moen, Shelly
 Alta Morrill, Browns Valley
 Erwin Nelson, Grygla
 Clara Ness, Wanke
 Ernest Newhouse, Crookston
 Harold Norseth, Gully
 Edward Novak, Angus
 Marvin Ofstedal, Fertile
 Telmer Olson, Waubun
 Oral Oraas, Clarkfield
 Anna Osmundson, East Grand Forks
 Viola Parduhn, Cedar Bend
 Lawrence Phillip, Germantown
 David Quesnell, Mentor
 Kenneth Rice, Bronson
 Harold Roadfeldt, Salol
 George Roisum, Bagley
 Erma Ross, Crookston
 Martin Rostvold, Grygla
 Albert Sandal, Syre
 Arthur Sandal, Syre
 Irene Schell, Pencer
 Harriet Skjerva, Hawley
 Lowell Spokely, Nielsville
 Clayton Stordahl, Gatzke
 Bernard Swanson, Fertile
 August Thorkelson, Middle River
 Chester Torgerson, Fergus Falls
 Erling Torgerson, Stephen
 Edwin Trandum, Mentor
 Willie Trandum, Mentor
 Willie Vaughn, Goodridge
 Esther Viker, Fertile
 Stanley Walker, Clearbrook
 Elmer Wardeberg, McIntosh
 Daniel Warnes, Stephen
 William Wollbeck, Stephen
 William Ystenes, Bejou

FRESHMEN

Olivine Amiot, Crookston
 Evelyn Bain, Baudette
 Herman Beiswenger, Kratka
 Alvin Berg, Duluth
 Cardiff Brekke, Nielsville
 Louis Brouillard, Crookston
 Eucharist Brule, Crookston
 Conrad Bursheim, Winger
 Walter Cantwell, Oklee
 Williamine Cenfield, Clinton
 Meldor Christianson, Fertile
 Harold Cordes, Henning
 Marian Dahlberg, Clearbrook
 Evelyn Dahlin, Argyle
 Leonard Dammann, Stephen
 Albert Davids, Bagley
 Orville Dock, Roseau
 Harold Dokken, Lockhart
 Vernon Downing, Fergus Falls
 August Eckstein, Wylie
 Earl Ellinger, Crookston
 Gordon Ellinger, Crookston
 Lawrence Elton, Hawley
 Henning Erickson, Twin Valley
 Selvin Erickson, Ross
 Ordean Estenson, Climax
 Harvey Estenson, Climax
 Estelle Filipi, Angus
 Joseph Flannagan, Red Lake Falls
 Mabel Fletcher, Bagley
 Orville Flikke, Shelly
 Torkel Forland, Hallock
 Arthur Froiland, Plummer
 Stanton Gandrud, Detroit Lakes
 Merrill Gordon, Hendrum
 Rudy Gordon, Badger
 Anna Hanson, Stephen
 Clarence Hanson, Mentor
 Florence Hanson, Mentor
 Hazel Hanson, Climax
 Sanna Hanson, Wanke
 Pearl Haugen, Middle River
 William Haukland, Bagley
 Anna Heddan, Stephen
 Arnold Helseth, Crookston
 Arthur Hemstad, Plummer
 Marvin Hervey, Oklee
 Leo Hipscher, Warroad
 Arthur Holm, Winger
 Irma Hoppe, Crookston
 Mervin Hough, Bagley
 Clarence Howard, Goodridge
 Carl Huartson, Gatzke
 Melvin Hyland, Erie
 Orville Ingebretson, Ulen
 Elmer Johnson, Erskine
 Harvey Johnson, Rollag
 Mary Johnson, East Grand Forks
 Tilmer Johnson, Plummer
 Kenneth Johnstad, Beltrami
 Oscar Kleven, Leonard
 Wilfred Knutson, Clearbrook
 Winton Knutson, Thief River Falls
 Madeline Kopecky, Angus
 Alma Krogstad, Fertile
 Carl Krohn, Viking
 Medore LaChance, Red Lake Falls
 Fordyce Larson, Ulen
 George Larson, Crookston
 Robert Larson, Crookston
 Arthur Leiran, Gatzke
 Max Leiser, Fertile
 Emma Letnes, Thief River Falls
 John Letnes, Thief River Falls
 Norman Lewis, Warroad
 William Lohn, Winger
 Lauritz Mikkelsen, Hawley
 Henry Mitchell, Crookston
 Helga Moe, East Grand Forks
 Elmer Mortensen, Pencer
 Magnus Mugaas, Gatzke
 Arnold Nakken, Newfolden
 Raymond Nelson, Hallock
 George Ness, Wanke
 Theodore Netland, Bagley
 Lawrence Newhouse, Crookston
 Oscar Norbom, Clearbrook
 Elias Nornes, Winger
 Gaylord Odegaard, Detroit Lakes
 Martin Odland, Verndale
 Charley Olson, Erskine
 Clifford Olson, Halstad
 Raymond Omberg, Hawley
 Lawrence Omundson, Thief River Falls
 John Pearson, Middle River
 Pearl Pearson, Middle River
 Alvin Peterson, Clearbrook
 Stanley Radniecki, Wanke
 Alfred Rasmussen, Crookston
 Robert Reed, Washkish
 May Rinerson, Ada
 Olivia Rinerson, Twin Valley
 Walter Ross, Crookston
 Lowell Ryden, Hallock
 Alvin Schell, Pencer
 Perry Sevald, Winger
 Sanford Sevald, Winger
 Ruth Sintak, Tabor
 Ralph Sorenson, Plummer
 Wesley Sorn, Hallock
 Johnny Stene, Halstad
 Juel Stephenson, Pelican Rapids
 Adolph Strande, Fergus Falls
 Peder Strommen, Climax

Hazel Thibodo, Drayton, N.D.
 Emmet Torkelson, Crookston
 Torger Torkelson, Stephen
 Bella Vigen, Fisher
 Joseph Viker, Fertile
 Raymond Voaklander, Warroad
 Beatrice Wangan, East Grand Forks
 Ernest Wangan, East Grand Forks

Howard Ward, Hallock
 Sigurd Wasley, Thief River Falls
 Lloyd Weaver, Crookston
 George Welter, Crookston
 Lynn Williams, Gatzke
 Bertha Windels, New York Mills
 Chester Yergens, McIntosh

SPECIAL

Russell Ash, St. Vincent
 Agnes Bakken, Maple Bay
 Harvey Cartwright, Shevlin
 Dorothy Foker, Crookston
 Joy Kiser, Crookston
 Agnes Larson, Wanke

Gladys Lee, Fosston
 Irving McKercher, St. Hilaire
 Barbara Miller, Crookston
 Henry Roningen, Pelican Rapids
 George Selvig, Crookston
 Helen Selvig, Crookston

* Graduate of advanced and senior classes.

The Bulletin
of the University of
Minnesota

West Central School and Station
Morris, Minnesota

Announcement for the Year
1927-1928



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SCHOOL CALENDAR

1927-28

1927

October	3	Monday	First term opens; registration
October	4	Tuesday	Organization of classes
November	5	Saturday	Visitors' Day
November	11	Thursday	Field Day
November	27	Thursday	Thanksgiving Day; a holiday
December	23	Saturday	First term closes; Christmas vacation begins

1928

January	2	Monday	Christmas vacation ends; second term opens; registration
January	3	Tuesday	Organization of classes
February	13	Monday	Special exercises (February 12, Lincoln's Birthday)
February	22	Wednesday	Washington's Birthday; (special exercises)
March	16	Friday	Commencement activities begin
March	22	Thursday	Junior-Senior-Alumni banquet
March	23	Friday	Commencement Day
March	26	Monday	Boys' and Girls' Club Week opens
March	29	Thursday	Boys' and Girls' Club Week closes
June	12	Monday	Short course for farm women opens
June	15	Friday	Short course for farm women closes

FACULTY

Lotus D. Coffman, Ph.D., LL.D., President of the University
Walter C. Coffey, M.S., Dean of the Department of Agriculture

AT MORRIS

ADMINISTRATION

Paul E. Miller, M.Agr., Superintendent
Edwin J. Volden, Registrar
Winnifred Tyner, Librarian
Gladys E. Hinson, Director of Dining Hall
Lucy A. Momsen, R.N., School Nurse
Margaret Stamness, Accountant
....., Secretary

AGRICULTURAL ENGINEERING

Albert C. Heine, Physics, Farm Mechanics, and Drainage
Alex B. Rolfe, Forge and Welding
....., Automotive Mechanics and Farm Shop
Julius Felt, Carpentry and Farm Structures

AGRONOMY

Roy O. Bridgford, B.S., Farm Crops and Soils
Allen W. Edson, B.S., Farm Management
Jens C. Jensen, Assistant in Agronomy

HORTICULTURE

John A. Anderson, B.S.A., Botany and Horticulture
Alfred H. Butters, Gardener

ANIMAL HUSBANDRY

Philip S. Jordan, B.S., Animal and Dairy Husbandry
Allen W. Edson, B.S., Poultry and Bees
Earl Robinson, Herdsman

HOME ECONOMICS

Gladys E. Hinson, Foods and Cookery
Gladys E. Nordeen, B.S., Foods and Home Management
Lucy A. Momsen, R.N., Nursing
Tone E. Halvorson, B.S., Dressmaking and Millinery
Emily C. Curtiss, B.S., Clothing and Applied Art

ASSOCIATED SUBJECTS

Theodore S. Long, B.A., English, Public Speaking
Georgia O. Moe, B.A., English, Mathematics
Dorothea Reiter, English, Physical Training
Edwin J. Volden, Mathematics
Glenn I. Prickett, B.A., History
Martin J. Sorflaten, B.A., Music
Edith McMillan, Business Training
Arletta H. Ness, Penmanship

GENERAL INFORMATION

PURPOSE

The West Central School of Agriculture was organized in 1910 as a division of the Department of Agriculture of the University of Minnesota. It was established primarily for the training of young men for the profession of farming and of young women for the profession of home making. It is a secondary school accepting students directly from the eighth grade and offers great opportunities to that large group of young people who desire intensive vocational training and who are limited as to the time they can give to the completion of their education. The work is planned and subjects are taught with the purpose of making the students efficient in their chosen vocations. The courses are sufficiently extended to give a fairly complete technical knowledge of the professions of farming and home making, and a working basis for the economic and sociological aspects of farm life. The technical courses are amply supplemented by cultural subjects designed to give the students a broad and liberal viewpoint and the necessary preparation for useful citizenship.

LOCATION

The school is admirably situated to serve the west central part of the state. It adjoins the city of Morris and is situated on a natural rise of ground overlooking the Pomme de Terre Valley. The campus, with its twenty buildings, beautiful lawns, and pleasant drives, is one of the beauty spots of this section.

ADMISSION

The school will admit any young man or woman who desires a technical training in agriculture and home economics. It is desirable that prospective students should have completed the eighth grade, altho in special cases those who have not completed eighth grade work will be admitted, and opportunity will be given to complete this work. Mature young men and women who have been out of school for one or more years and desire special training in agriculture and home economics will be admitted. In certain lines of work, high school subjects will be accepted for advanced credit. Students should correspond with the registrar, West Central School of Agriculture, Morris, before coming to the school, and make the necessary preliminary arrangements for registration.

TIME OF OPENING

The fall term of the School of Agriculture will open Monday, October 3, and close Saturday, December 23. The winter term will open Monday, January 2, and close Friday, March 23. The school work covers a period of six months, at a time when the student can best be spared from home.

ROOMS IN DORMITORY

Old or new students planning to attend the School of Agriculture should write early to the registrar asking him to reserve a room in one of the

dormitories. Students should reserve rooms in advance. This may be done by paying a deposit fee of \$2 which will apply on the first month's room rent. If the student is unable to enter school, the deposit may be reclaimed before September 15, after which time it is forfeited. Each dormitory room is furnished with two single beds, a dresser, table, chairs, curtains, bedspreads, pillows. Preference as to roommates should be stated early and will be considered as far as possible.

WHAT TO BRING

Each student should bring with him two comforts and blankets, towels, comb, brushes, one tumbler and teaspoon, bedroom slippers, and at least two nightgowns.

Each girl should bring with her in addition to her regular supply of clothing, kimona, apron, and bedroom slippers, laundry bag, gymnasium suit, and tennis shoes. The kimona and bedroom slippers may be of any style and material; the laundry bag should be of washable material, large enough to hold the soiled clothes of one person, and made to hang on two closet hooks; the gymnasium suit should consist of a pair of black sateen bloomers and a white middy blouse. The following patterns are recommended: Butterick 3436, McCall 2514, Standard 9225. Three and one-half yards of material 36 inches wide are required for the average size. For those who are unable to make the bloomers at home, assistance will be furnished at the school.

EXPENSES

Necessary expenses for the year do not exceed \$150, including board and room. This amount does not include traveling and personal expenses.

Each student is required to pay for breakage of apparatus used in practical work and for all damage done to school property.

Small fees to cover the cost of material used are charged for certain of the laboratory courses. The amount of the fee in each case will be found in the description of the course. These fees are subject to change.

Music fees for private lessons are \$7 for each term. Piano rental is \$2.50 per term.

It should be remembered that fees are for the entire term, and after the first month the only expenses are for board and room.

Board is payable the first of each month in advance. A surcharge of ten per cent is added to all bills delinquent more than ten days. No deduction is made for board for any absences of less than five days. No room rent refunds will be made for any period of less than one month. If students are compelled to be absent for that length of time they are allowed half rates provided they make arrangements with the manager of the dining hall before leaving. All students not residents of Morris are required to live in the dormitories and to board in the school dining hall. No increases will be made unless living costs necessitate an increase in the cost of board.

On entering the school each student should bring sufficient money to pay for one month's board and room, and to pay his fees. This will amount to from \$35 to \$45.

TABLE OF CHARGES

The following expenses are charged to all students. Fees are payable at the time of registration, and board and room on the first of each month.

Registration fee	\$5.00
Deposit as guarantee of proper treatment of school property.....	5.00
Post-office box per term.....	.20
Health fee per term, required of all students except those living at home.....	2.00
Book rental per term.....	1.50
Board per week.....	4.00
Room per week.....	1.25

HEALTH SERVICE

The health fee collected from all students is used to maintain the Students' Health Service. A fully equipped hospital is maintained and a full time nurse is engaged during the school year. The health fee provides for physical examinations for all students and care by the school nurse in case of illness. It does not provide for physicians' calls or extra nurses in case of serious sickness, where such are necessary, or extra costs caused by epidemics.

REGISTRATION

No student will be allowed to register for less than 23 credit hours of work except by special permission.

All fees must be paid or arranged for at the time of registration.

No student will be allowed to register after the second week of the term except by special permission.

CANCELLATION OF REGISTRATION

No student may drop a subject for which he is registered without special permission.

If a student is below grade in a subject at the time of cancellation, his record in that subject will be entered as a failure.

For each change in registration after the second week of school a charge of 25 cents will be made. All such changes must be on the proper form, which the student may obtain at the registrar's office. All changes in registration must be approved by the superintendent.

No laboratory fees will be returned unless the registration is cancelled in the registrar's office, within two weeks after the opening of school.

ABSENCES

No student will be admitted to class after an absence without a pass from the preceptor or preceptress. In case of sickness, passes will be obtained from the nurse.

All work lost through absence from class must be made up.

CLASSIFICATION

In order to be classified as a junior, a student must have not to exceed 12 credit hours less than the required number for the freshman year.

In order to be classified as a senior, a student must have not to exceed 10 credit hours less than the required number for the first two years.

MARKING SYSTEM

The passing mark is 75 on the scale of 100.

All grades are submitted to the registrar's office at the end of each month, in percentage.

A grade of I (incomplete) at the end of any month represents that the required work of that month has not been completed and that the mark has not been determined. This incomplete must be removed during the following month.

A grade of C (condition) at the end of a term represents that the required work of the course has not been completed and that the final mark has not been determined. The condition must be removed during the first month of the following term, otherwise it automatically becomes a failure.

Extension of time for the removal of conditions may be granted in special cases.

Students who have not been absent more than three times and who have obtained a grade of 90 or above in any subject will be excused from final examination in that subject. Three tardinesses constitute an absence.

ELIGIBILITY

The following rules will govern eligibility for all interscholastic athletic contests:

- A. The student must be enrolled in the school not less than two weeks before the contest.
- B. He shall be making grade in at least four subjects for which he is enrolled. These four subjects must total 20 credit hours.

REQUIREMENTS FOR GRADUATION

Completion of the prescribed course of study, including all required work and enough electives to make a total of 160 credit hours.

One summer of supervised home project work. Of the 160 credits necessary for graduation 5 must be home project work, and 10 will be allowed.

An honorable standing in department.

Payment of all accounts.

HOME LIFE IN THE DORMITORIES

The dormitory life of the students while attending the School of Agriculture is subject to supervision. Everything possible is done to promote a healthful, moral atmosphere.

The preceptors and preceptress have charge of students in their dormitories, and regulations enforced are for the good of all.

From 8:00 a.m. to 4:00 p.m. students are busy with their school work. From 4:00 to 6:00 p.m. is a recreation period in which students' time is at their own disposal. After 7:30 p.m. students are expected to be in their

rooms and to be quiet so that all may study undisturbed. Students are permitted to leave the campus in the evening only upon permission of the preceptors and preceptress. No firearms of any kind will be permitted in dormitories.

The use of profanity and tobacco is strictly forbidden.

Infraction of dormitory rules may be sufficient cause for dismissal from school. Complete dormitory rules and regulations are posted in each dormitory room.

DISCIPLINE

It is the aim of the administration to be firm, reasonable, and sympathetic. Any student who becomes antagonistic to the spirit of the school will be dismissed whenever the general welfare requires it. The school does not wish to undertake the problem of disciplining students who are not in sympathy with its purposes.

BUILDINGS AND EQUIPMENT

The physical plant now includes 11 modern brick and stone buildings which compose the educational group and 10 frame buildings which make up the farm group. The school group includes the girls' dormitory with facilities for 75 girls; 3 boys' dormitories with accommodations for 225 boys; Agricultural Hall, with stock judging pavilion, meat cutting, dairy, soils, chemistry, horticulture, botany, and farm crops laboratories, and classrooms for all agricultural work; Engineering Building with woodshop, forgeshop, farm mechanics laboratory, drafting room, and three lecture rooms; Music Hall, with two studios and numerous practice rooms. The Business Training Department is also located in this building and includes typewriting, shorthand, business training, and penmanship rooms; Dining Hall and Gymnasium, with large, modern dining room and gymnasium; a new, modern Students' Hospital and Health Service Building equipped with 27 beds, dispensary, and nurses' quarters; Home Economics Building with 2 food laboratories, 2 sewing laboratories, laundering laboratory, home management rooms, classrooms, and departmental offices; new Administration Building with auditorium, large library, business, registrar's, and administration offices; and Home Management Practice House to accommodate a unit of 10 people.

The equipment in all shops and laboratories is ample and sufficient for the most practical and efficient instruction.

The ten farm buildings give ample housing facilities for the herds, flocks, and farm equipment which are available for student use.

ASSEMBLY PERIOD

An assembly period is held each morning except Thursday throughout the school year. Students are required to attend these assembly exercises. It is the purpose of the school to secure prominent speakers to address the student body at these morning exercises. The assembly period is also used as a forum for public discussion of the many questions and announcements of importance to the student body. The various societies and organi-

zations also use this period for the promotion of their work. The Thursday morning period is used for conferences between instructors and students.

HOLIDAYS

Lincoln's and Washington's birthdays will be appropriately observed, but classes will be held as usual. On Thanksgiving Day no classes will be held, but school will continue as usual on the Friday and Saturday following.

STUDENTS' LITERARY SOCIETIES

Students are urged to join a literary society. These societies offer pleasure as well as profit. They afford a training in conducting meetings, parliamentary law, and public speaking obtainable in no other way.

The following societies hold regular weekly meetings during the school year: The Vincent Literary Society, the Agricola Literary Society, and the Ceres Club.

PROFESSIONAL CLUBS

An engineering club for boys especially interested in agricultural engineering and a livestock club for students interested in this branch of agriculture are open to all students. Interesting and instructive programs are given by these societies twice each month.

RELIGIOUS WELFARE

In maintaining the highest moral and religious atmosphere and in fostering the development of complete Christian manhood and womanhood—physical, intellectual, social, and spiritual—the student body and faculty have developed a close relationship with all of the downtown churches in Morris. Students affiliate with the churches of their preference and make them their church homes while attending school. In addition to this affiliation, religious services are held each Sunday on the school campus. These exercises are under the joint direction of the Faculty-Student Joint Religious Welfare Committee. The Young Women's Christian Association is represented on the campus by a strong and active organization.

MUSICAL ORGANIZATIONS

The school musical organizations include a large chorus, a boys' glee club, a girls' glee club, and a school orchestra. Students especially interested in music are urged to join these organizations and receive the training which they afford. The musical clubs appear at various school functions. A public concert recital is given at the close of the school year.

THE MOCCASIN

The *Moccasin* is an annual published by the senior class of the school. The book gives an outline of all school and class activities, is fully illustrated, and contains, in addition to brief articles of student interest, a record of development and growth of the institution.

WEST CENTRAL SCHOOL NEWS

The *West Central School News* is a quarterly published by the faculty of the school. It serves as a community publication, and is a medium by which former students and alumni are kept in touch with one another and with the school. It is also published to disseminate useful information and results of station work among its readers.

THE LUDDEN TRUST

The late Honorable John D. Ludden, of St. Paul, gave the University of Minnesota a sum of money to be held and invested by the University through its Board of Regents and the income thereof to be collected, received, and made available by the Board of Regents for the financial assistance of students attending the schools of agriculture in the University. The income from this fund is available to students of the West Central School of Agriculture. It is loaned to worthy and deserving students at the West Central School in amounts not to exceed \$75 to any one person in one year, at the rate of 5 per cent per annum. Students interested in securing a student loan should correspond with the superintendent of the West Central School of Agriculture.

THE DORR FUND

This fund consists of \$110,000 willed by the late Caleb Dorr, of Minneapolis, for the benefit of the Department of Agriculture of the University.

The income of \$20,000 of the fund is to be devoted to establishing and maintaining research fellowships in agriculture; the income from the remainder to be invested in scholarships, donations, and loans to worthy and needy students.

CALEB DORR CASH SCHOLARSHIP PRIZES

Cash prizes amounting to \$410 are available to the students attending the West Central School of Agriculture each year and are awarded as follows: A cash scholarship of \$50 is awarded to one girl and one boy from each of the three classes and one student selected at large from the entire school at the close of each regular school year. The money is to be used for defraying a portion of the student's school expenses the following year. The awards are made on class standings, as recorded by instructors for the year's work, and on student activities and deportment. The rating for student activities is based on the quality of leadership as indicated by a review of the activities participated in and the general deportment of the student during his attendance at school. The awards are made by a scholarship committee selected from the faculty. In addition to the above mentioned scholarships, prizes of \$15 each are awarded to the boy and the girl who have done the best student project work in any one year. Medals are also awarded to students who are members of the school debating teams, declamation teams, and judging teams.

INTERSCHOLASTIC ACTIVITIES

Each year the school is represented by two debating teams, declamation contests, stock and grain judging teams, which meet in interscholastic contests with similar institutions.

In athletics the school is represented by both football and basket-ball teams. These teams schedule games with high schools, colleges, and agricultural schools.

LIBRARY

The library is well equipped to supply the needs of the students. A large number of books have been selected to meet the requirements of the various departments. These, with the government and station reports, are available for use by instructors and students.

The librarian is always ready to give whatever assistance she can in directing students in the selection of the books they may need in the pursuit of their work.

EXPERIMENT STATION

The West Central School and Station is now conducting extensive experiments in agronomy, soils, horticulture, animal husbandry, and agricultural engineering. Beginning with 1915 a special report has been issued each year describing the progress of the work.

SCHOOL FARM

The farm comprises approximately 400 acres and furnishes an extensive laboratory for the work of the school. Information concerning the methods employed on the farm is always available to the students. The classroom work is supplemented with actual practice either in the field or with crops grown on the farm.

STATION FLOCKS AND HERDS

The school now maintains an abundance of livestock, all of which is used for student work in the Animal Husbandry Department. Purebred Holstein and Shorthorn cattle; Percheron horses; Shropshire sheep; Duroc Jersey hogs; White Leghorn and Barred Plymouth Rock chickens are maintained for station and school purposes. These furnish excellent opportunities for students to study intelligently the various courses in animal husbandry.

LONG COURSES

The regular courses cover a period of three sessions of six months each, beginning in October and closing in March. The long course for young men is so arranged as to make it possible for a student to select a large portion of his work in any one of the three lines: agronomy, animal husbandry, or agricultural engineering. The long course for young women permits of special training in home management, dressmaking, preparation for teaching, music, home nursing, public speaking, business training, etc. Both young men and young women may receive credit in music in connection with any of the courses. They may also choose academic subjects in the third and fourth years, preparatory to college entrance. The main emphasis of the institution is given to its long course, and all are urged to complete the three sessions.

ADVANCED COURSES

It has been found that many students desire an advanced year after completing the regular three-year course. To meet this demand a fourth year of six months of work is offered. During this advanced year, graduates of the long course may elect to specialize in one of the lines of work listed below. They may at the same time choose from the elective lists subjects that they could not obtain during their first three sessions. The major lines of work suggested for boys are dairying, beef production, farm engineering, carpentry, advanced farm management, and academic subjects. The major lines for girls are dressmaking, advanced home management, nursing, music, and business training.

COLLEGE PREPARATORY

Graduates of the West Central School of Agriculture who have completed two summers of supervised work on their home farms, one additional school year of six months, and one additional summer's work or the equivalent thereof, will be admitted to the University of Minnesota, to the state teachers colleges, and the high school teacher training departments.

DEPARTMENT OF MUSIC

For students desiring special courses in music, credit courses in both vocal and instrumental music are offered. Prospective students should refer to the description of the music courses on pages 26 and 27.

HOME PROJECT WORK

The purpose of this work is to promote and extend the technical work given in the classrooms and laboratories during the regular school sessions. The approved methods of agricultural practice are applied to some branch of the farming enterprise which the project is desired to cover. Reports are required throughout the season and the work is at all times in charge of supervisors who make the necessary visits to each student.

The projects for boys include swine management, corn growing, soybeans, market gardening, fruit growing, potato growing, incubation and brooding, management of the laying flock, dairying, bees, tractor operation, and farm accounts. For girls, projects include canning, bread making, foods and cookery, garment making, clothing repair, home furnishing, home management, and laundering.

BOYS' AND GIRLS' CLUB WEEK

During the week following the close of the regular school session, will be held the annual junior short course. This course is open to all boys and girls from twelve to twenty years of age. A charge of \$2.50 covers all expenses, including board and room for the entire week. Boys are given work in the machine shops, forge and woodwork shops, farm crops laboratories, and stock judging pavilion. The girls are given work in sewing, cooking, and home nursing. At the close of the week, contests in corn judging and stock judging will be held for the boys, and the winner of each contest will be given a free trip to the 1928 Minnesota State Fair.

For the girls, contests in bread making and canning are held, and appropriate prizes are awarded to winners. Special instructions will be given in all boys' and girls' club projects. Games, music, entertainments, and a special junior short course party will make the entire week one of special interest to all who attend. Special moving picture entertainments are given each evening. A special circular describing this short course will be ready for distribution in February, 1928.

SHORT COURSE FOR FARM WOMEN

An annual short course for farm women is held during the second week in June. The main object of this course is to provide a few days of rest and recreation for the women of the farms in west central Minnesota. Talks, lectures, and demonstrations along lines of interest to farm women will fill in part of the day. The large dormitory and dining hall will provide ample living accommodations, and part of each day will be given to rest and recreation. The fee for the entire course, including room and board, is \$4.

COURSES OF STUDY

Figures following the names of courses indicate the number of credit hours.

One credit hour is equivalent to one class period per week devoted to recitation or two such periods devoted to laboratory work.

A class period is forty-five minutes and a laboratory period is ninety minutes.

For description of the following courses see pages 19 to 27.

See page 12 for statement with reference to credit for home project work.

COURSES FOR BOYS

FRESHMAN YEAR

Required—first term	}	English I, 5 Farm Arithmetic, 5 or Farm Accounts, 3 Corn Growing, 5 Milk Testing, 1 Carpentry I, 2 Blacksmithing I, 2 Gymnasium, 1
Required—second term	}	English II, 5 Types and Breeds, 5 Carpentry II, 2 Stock Judging I, 1 Penmanship, 3 Gymnasium, 1
Eight credit hours must be chosen from this group during freshman year	}	Spelling and Penmanship, 3 Social Training, 1 Farm Records and Accounts, 3 Elementary Beekeeping, 3 Poultry Production, 3 Cereal Crops, 5 Horticulture, 5 Automotive Engineering, 6 Steam Tractors, 3 Automotive Electricity, 4 Farm Shop Work, 2 Blacksmithing II, 2 Piano, 2 Violin, 2 Chorus, 1 Orchestra, 1

COURSES OF STUDY

JUNIOR YEAR

Required—first term { English III, 5
Chemistry, 4
Feeds and Feeding, 5
Gymnasium, 1

Required—second term { English IV, 5
Physics I, 5
Gymnasium, 1

{ Bookkeeping I, 5
Garden and Orchard, 5
Corn and Grain Judging, 2
Mechanical Drawing, 2
Farm Drainage, 5
Stock Judging II, 1
Beef Production, 3
Advanced Shop Work, 2
Elementary Beekeeping, 3 } First term only

Subjects must be selected from this group or from electives not taken in freshman year to make a total of 25 credit hours with the required subjects for each term { Adv. Poultry Production, 3
Public Speaking, 3
Piano, 2
Violin, 2
Orchestra, 1
Glee Club, ½ } May be taken either term

{ Bookkeeping II, 5
Forage Crops, 2
Horticulture, 5
Farm Structures I, 2
Stock Judging III, 1
Dairy Production, 3
Gas Welding, 2
Incubation and Brooding, 3
Farm Management, 5 } Second term only

SENIOR YEAR

Required—first term	{ English V, 5 United States History, 5 Gymnasium, 1	
Required—second term	{ English VI, 5 Government, 5 Soils, 5 Gymnasium, 1	
Subjects must be selected from this group or from electives not taken in freshman or junior year to make a total of 25 credit hours with the required subjects for each term	{ Farm Structures II, 2 Pure Seed Production, 2 Agricultural Physics II, 5 Animal Breeding, 3 Bookkeeping I, 5 Farm Mechanics, 5 Commercial Law I, 5	} First term only
	{ Stock Judging IV, 2 Public Speaking, 3 Meats, 2 Adv. Poultry Production, 3 Piano, 2 Violin, 2 Orchestra, 1 Glee Club, ½	} May be taken either term
	{ Bookkeeping II, 5 Advanced Electricity, 3 Farm Marketing, 3 Animal Diseases, 3 Incubation and Brooding, 3 Bookkeeping III, 5 Commercial Law II, 5	} Second term only

Two credits shall be allowed for participation in the senior class play.
Two credits shall be allowed for participation in an interscholastic debate.
One credit shall be allowed for membership in an interscholastic athletic team and such members will be excused from gymnasium classes. Not more than seven special credits, including credits for play, debate, and musical organizations, shall count toward graduation.

COURSES FOR GIRLS

FRESHMAN YEAR

Required—first term	{ English I, 5 Garment Making I, 4 Foods and Cookery I, 3 Drawing and Design I, 1 Gymnasium, 1 Home Nursing I, 3 Social Training, 1
Required—second term	{ English II, 5 Garment Making II, 4 Foods and Cookery II, 3 Drawing and Design II, 1 Gymnasium, 1

COURSES OF STUDY

Eleven to 14 credit hours must be chosen from this group each term	{ General Science, 5 Home Accounts I, 3	} First term only	
			{ Home Nursing II, 3 Horticulture, 5 Home Accounts II, 3	} Second term only
	{ Laundering, 2 Poultry, 3 Beekeeping, 3 Glee Club, ½ Chorus, 1 Spelling and Penmanship, 3 Music (instrumental or vocal), 2	} Either term	
{ *Spelling and Penmanship, 5 Typewriting, 2			} Must be taken both terms

JUNIOR YEAR

Required—first term	{ Dressmaking, I, 3 Elementary Dietetics I, 3 English III, 5 Gymnasium, 1	
Required—second term	{ Dressmaking II, 3 English IV, 5 Gymnasium, 1 Elementary Dietetics II, 3	
Four to 9 credit hours must be chosen from this group each term or from electives not taken in freshman year	{ Home Furnishing, 3 Bookkeeping I, 5 Shorthand I, 5 Typewriting, 2 Chemistry I, 5 Applied Art I, 2	} First term only
	{ Public Speaking, 3 Poultry, 3 Beekeeping, 3 Glee Club, ½ Chorus, 1 Music (instrumental or vocal), 2	} Either term

SENIOR YEAR

Required—first term	{ English V, 5 United States History, 5 Dressmaking III, 3 Home Management Lecture, 2 Gymnasium, 1
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* Students taking business training electives will register in the five-hour course.

Required—second term	} English VI, 5 Government, 5 Dressmaking IV, 3 Gymnasium, 1					
Required—first or second term		} Home Management, 5				
Seven to 12 credit hours in this group or from electives not taken in junior year	} Nursing IV, 3 Geometry I, 5 Chemistry I, 5 Algebra I, 5 Bookkeeping I, 5 Business Training I, 3 Dictation I, 5 Commercial Law I, 5 Modern History I, 5 Applied Art I, 2		} First term only			
		} Chemistry II, 5 Algebra II, 5 Geometry II, 5 Horticulture, 5 Dictation II, 5 Commercial Law II, 5 Bookkeeping II, 5 Bookkeeping III, 5 Physics I, 5 Modern History II, 5 Applied Art II, 2		} Second term only		
					} Beekeeping, 3 Poultry, 3 Public Speaking, 3 Glee Club, ½ Chorus, 1 Music (instrumental or piano), 2 Typewriting, 2	} Either term

Through their choice of electives, girls may prepare themselves for one of several lines of work. At the time of registration, girls will be advised how to select their work so that it will prepare them for the vocation in which they are interested. They may prepare for business positions, for normal training work, for college entrance, or for nurses' training. A carefully planned course in home economics is the foundation of all the courses for girls.

COURSES FOR BOYS AND GIRLS

ADVANCED YEAR

Required—first term	} Plane Geometry I, 5 Elementary Algebra I, 5 English VII, 5 Modern History I, 5	
Required—second term		} Plane Geometry II, 5 Elementary Algebra II, 5 English VIII, 5 Modern History II, 5 Botany, 5

During the first term 5 credit hours of elective work may be selected.

DESCRIPTION OF COURSES

AGRONOMY AND FARM MANAGEMENT

- Corn Growing. A study of the corn plant; its botanical structure, relation to soil and climate; selection and testing; soil preparation; harvesting; disease, silage, varieties, and corn judging. Rec. 5 hrs.; 5 credits; fee, 50 cents.
- Cereal Crops. A study of the principal cereal crops. Seed selection; soil and cultural requirements; harvesting. Rec. 5 hrs.; 5 credits; fee, 50 cents.
- Corn and Grain Judging. Score card practice, commercial grading and judging work, with the object in view of making the student proficient in the judging and growing of purebred seed. Lab. 2, 2 hrs.; 2 credits; fee, 50 cents.
- Forage Crops. A study of the leguminous crops, clover, alfalfa, etc., pastures and meadows, and the annual forage crops. Cultural requirements of forage crops and their importance to the farm. Lab. 2, 2 hrs.; 2 credits.
- Pure Seed Production. Methods of breeding and growing purebred seed corn and grain on the farm. The course includes a study of certification and seed registration. Lab. 2, 2 hrs.; 2 credits; fee, 50 cents.
- Soils. This course is applied to the needs of western Minnesota. Soil formation; soil types, soil physics, soil chemistry, soil tillage, and the use of fertilizers are given chief attention. Rec. 3 hrs.; lab. 2, 2 hrs.; 5 credits; fee, \$1.
- Farm Management. A study of farm organization as related to types of farming, combinations of enterprises, crop rotation, soil management, field and farmstead arrangement, and the efficient use of the labor and equipment. Rec. 5 hrs.; 5 credits.
- Farm Records and Accounts. A study of farm accounts. The student keeps a practical set of books on the year's work, from the taking of the inventory to closing the accounts at the end of the year. Rec. 3 hrs.; 3 credits.
- Advanced Studies in Farm Management. Advanced work in some of the more important problems of farm management, including farm labor, cost of production, marketing, and similar subjects. Rec. 1 hr.; lab. 4, 2 hrs.; 5 credits.

MARKETING

- Farm Marketing. A study of the present systems of distributing farm products. Special study is made of co-operative laws and co-operative marketing institutions. Rec. 3 hrs.; 3 credits.

ANIMAL AND DAIRY HUSBANDRY

- Types and Breeds. Study of the history, development, characteristics, and adaptability of the various breeds of horses, cattle, sheep, and swine, Rec. 5 hrs.; 5 credits.

- Milk Testing. Principles of milk testing. The students are given a practical working knowledge of herd testing and record work. Lab. 1, 2 hrs.; 1 credit; fee, 50 cents.
- Stock Judging I. Study and practice in the use of score cards, showing the relation of the body structure to economical production, covering all classes of livestock. Lab. 1, 2 hrs.; 1 credit.
- Stock Judging II. Comparative judging of beef cattle, swine, and sheep. Lab. 1, 2 hrs.; 1 credit.
- Stock Judging III. Comparative judging of dairy cattle and horses. Lab. 1, 2 hrs.; 1 credit.
- Stock Judging IV. This course is given over to market classes of beef cattle, hogs, and sheep, and is combined with the meats course, many of the animals going directly from the judging ring to the killing room. Lab. 1, 4 hrs.; 2 credits.
- Meats. Practice in killing, cutting, and curing of meats with lectures and demonstrations. This course is combined with Stock Judging IV. Lab. 1, 4 hrs.; 2 credits.
- Feeds and Feeding. General composition of the animal body; composition and digestibility of feeds; feeding standards; methods of feeding. Rec. 5 hrs.; 5 credits.
- Animal Breeding. Theory and practice of animal breeding, including variation, heredity, selection, effect of purebred animals in improving types of stock and pedigrees. Rec. 3 hrs.; 3 credits.
- Animal Diseases. Causes, prevention, and cure of animal diseases, including emergency treatment. Rec. 3 hrs.; 3 credits.
- Beef Production. Production of beef cattle, both purebred and market stock, including from a practical standpoint, feeding and management of the herd, selection of breeding stock, and arrangement of buildings and yards. Rec. 3 hrs.; 3 credits.
- Dairy Production. An advanced course designed to fit a student for the successful management of a dairy herd. Rec. 3 hrs.; 3 credits.

POULTRY HUSBANDRY

- Poultry Production. Principles of general management, house construction, important commercial breeds and types, feeding and culling for egg production; common ailments and simple treatments. Rec. 2 hrs.; lab. 2 hrs.; 3 credits.
- Incubation and Brooding. A study of the best methods of incubation and brooding, natural and artificial, includes selection of breeds, eggs for incubation, feeding and care of chicks, how to avoid losses. Rec. 2 hrs.; lab. 1, 2 hrs.; 3 credits.
- Advanced Poultry Production. Practice in feeding and management, and marketing; a study of laying rations and keeping accounts. Each student will care for laying and fattening pen of poultry. Rec. 2 hrs.; lab. 2 hrs.; 3 credits.

BEE CULTURE

Elementary Beekeeping. Fundamentals of bee behavior throughout the cycle of the year. Fundamentals of beekeeping practice through the year. Modern equipment for beekeeping practice. Starting with bees, increase, moving, uniting, feeding. Rec. 3 hrs.; 3 credits.

AGRICULTURAL ENGINEERING

Carpentry I. Carpentry: care, use, and sharpening of tools; laying-off work; making of joints and framing, and work designed to be especially helpful in planning, framing and construction of farm buildings. Lab. 2, 2 hrs.; 2 credits; fee, \$1.25.

Carpentry II. Continuation of Course I. Lab. 2, 2 hrs.; 2 credits; fee, \$1.25.

Blacksmithing I. Blacksmithing; forging and welding of iron and steel, making and tempering of hand tools. Work designed to be especially helpful in the repair and operation of machinery. Lab. 2, 2 hrs.; 2 credits; fee, \$1.50.

Blacksmithing II. Continuation of Blacksmithing I. Lab. 2, 2 hrs.; 2 credits; fee, \$1.50.

Farm Shop Work. A course in simple sheet metal work, soldering, harness repair, rope work, belt lacing, use of taps and dies, pipe fitting, etc. Lab. 2, 2 hrs.; 2 credits; fee, \$2.

Farm Drainage. Practice with level and chain; work in leveling, ditching, location, laying tile, running lines, figuring areas, staking out buildings, mapping, and estimating costs. Rec. 3 hrs.; lab. 2, 2 hrs.; 5 credits.

Farm Structures I. Design, location, and erection of farm buildings; study of proper pitches; roof trusses, barn frames; estimates of costs. Working models are made in the shop from these plans. Lab. 2, 2 hrs.; 2 credits.

Farm Structures II. A continuation of Farm Structures I. Designing of buildings needed on the home farm, and the working out of a general plan that will meet the builder's requirements. Lab. 2, 2 hrs.; 2 credits.

Automotive Engineering. A study of internal combustion engines with emphasis placed on tractor, truck, and automotive engines. A careful study of carburetion, ignition, lubrication, and cooling systems. Practice is given in the repair and adjustment of all automotive equipment. Rec. 3 hrs.; lab. 8 hrs.; 6 credits; fee, \$1.50.

Automotive Electricity. An elementary course in electricity, with its application to starting, lighting, and ignition systems for automotive engines. Part of the time is devoted to a study of farm lighting equipment. Rec. 3 hrs.; lab. 2 hrs.; 4 credits; fee, 50 cents.

Advanced Electricity. Prerequisites: Automotive Electricity, Physics I and II. The course is designed for students who care to go a little deeper into the study of electricity than is permissible under Automotive Electricity. Rec. 2 hrs.; lab. 2 hrs.; 3 credits; fee, 50 cents.

- Steam Tractors. A study of the construction, operation, and repair of the steam traction engine. The course leads to the state examinations for engineer's license. Rec. 2 hrs.; lab. 2, 3 hrs.; 4 credits; fee, 50 cents.
- Mechanical Drawing. Principles of drafting, lines, lettering, views of objects, making of working drawings, interpretation of drawings. Lab. 4 hrs.; 2 credits.
- Oxyacetylene Welding. A study of the properties of the various metals, treatment of metals, preheating, annealing, practice with torch on actual problems. Rec. 1 hr.; lab. 2 hrs.; 2 credits; fee, \$2.
- Advanced Carpentry. Preparation aiming to bring together in applied way earlier elements of course with such topics as designing and estimating. Final credit dependent upon eight months of actual work under approved carpenter. Lab. as arranged.
- Farm Mechanics. Selection, use, and care of farm machinery. Farm lighting, heating, plumbing, ventilation, and sewerage disposal systems. A study is made of properties of sand, gravel, and cement, with practice in proportioning and mixing concrete, hand tool, tempering, and lathe practice. Rec. 3 hrs.; lab. 4 hrs.; 5 credits.

HORTICULTURE AND BOTANY

- Agricultural Botany. A study of flowering plants, molds, mushrooms, rots or decays, and yeast. Rec. 3 hrs.; lab. 2, 2 hrs.; 5 credits; fee, 50 cents.
- Garden and Orchard. Planning, planting, culture, value, and management of the orchard and garden on the general farm. Rec. 5 hrs.; 5 credits.
- Horticulture. A general course including the principles of growing vegetables, fruits, flowers, and ornamental plantings. The work is taught with special emphasis upon application of the principles to the student's home conditions. Rec. 5 hrs.; 5 credits.

ENGLISH

- English I. Reading, spelling, and a brief review of the principles of grammar. Considerable time is devoted to oral reports. Short written theme required. Rec. 5 hrs.; 5 credits.
- English II. Continuation of English I. Letter writing in connection with simple sentence and paragraph structure. Several selections are memorized. Rec. 5 hrs.; 5 credits.
- English III. Letter writing and spelling continued. Standard books and selections of interest are read. The outline is used extensively in oral and written work. Rec. 5 hrs.; 5 credits.
- English IV. A continuation of English III. Rec. 5 hrs.; 5 credits.
- English V. Advanced work in written composition of a narrative type. An appreciation of good literature is cultivated by extensive reading. Rec. 5 hrs.; 5 credits.
- English VI. Reading and advanced composition of descriptive and argumentative types continued. Rec. 5 hrs.; 5 credits.

English VII. English literature. History of English literature with readings from masterpieces. Rec. 5 hrs.; 5 credits.

English VIII. English literature. Continuation of English VII. Rec. 5 hrs.; 5 credits.

English IX. Public speaking. Drill in voice exercise, platform department, and memorized selections for expression; extemporaneous speaking. Rec. 3 hrs.; 3 credits.

MATHEMATICS

Farm Arithmetic. Training in simple mathematical processes, applications of principles to problems requiring measurements of material, extension, capacity. Practical applications to farm and home life. Assists in the mathematics of the technical school course. Rec. 5 hrs.; 5 credits.

Home Accounts I. For girls. Similar to farm accounts for boys except that application is made to home instead of farm work. Rec. 3 hrs.; 3 credits.

Home Accounts II. A continuation of Home Accounts I. 3 hrs.; 3 credits.

Algebra I. Designed to cover the usual first year academic credit work in elementary algebra. Rec. 5 hrs.; 5 credits.

Algebra II. Continuation of Course I. Rec. 5 hrs.; 5 credits.

Plane Geometry I. Planned to cover usual academic course in plane geometry. Rec. 5 hrs.; 5 credits.

Plane Geometry II. Completion of Plane Geometry I. Rec. 5 hrs.; 5 credits.

PHYSICAL TRAINING

Gymnasium (Girls). All students will be required to take gymnasium work during their entire residence at the school. Girls will be organized into classes for exercise, calisthenics, and games. 1 credit.

Gymnasium (Boys). Gymnasium is required of all boys who live in school dormitories. The gymnasium with its facilities is kept open every afternoon and evening for the use of students. 1 credit.

SOCIAL SCIENCE

Modern History I. Designed to give the student a general outlook upon civilization in the making, and to show what nations and men have helped civilization in its onward course. Rec. 5 hrs.; 5 credits.

Modern History II. Continuation of Course I. Rec. 5 hrs.; 5 credits.

American History. Designed to present in a clear, concise, and connected manner the main events in the history of the American people. Rec. 5 hrs.; 5 credits.

Government and Law. Local, state, and national governmental forms and practices. A brief study of common contracts, deeds, mortgages, etc. Rec. 5 hrs.; 5 credits.

General Science. This course deals with five topics: air, water, food, protection, and the work of the world. Each topic deals with a series of projects. Rec. 5 hrs.; 5 credits.

PHYSICS

Agricultural Physics. A simple and practical course in physics. The work includes the mechanics of solids, fluids, heat, and sound with a few assignments from the subjects of light and electricity. Rec. 5 hrs.; 5 credits.

Physics II. A continuation of Physics I. Rec. 5 hrs.; 5 credits.

CHEMISTRY

General Chemistry. A general introductory course in chemistry treating of the fundamental principles necessary for an understanding of common daily phenomena. Rec. 3 hrs.; lab. 2, 2 hrs.; 5 credits.

Food and Household Chemistry. Application of general principles of chemistry to food and its uses and to household problems such as textiles, dyeing, soaps and other cleansing agents. Rec. 3 hrs., lab. 2, 2 hrs.; 5 credits; fee, \$1.

Agricultural Chemistry. A general introductory course preparatory for later work in agronomy and animal husbandry. Rec. 2 hrs.; lab. 2, 2 hrs.; 4 cred; fee, \$1.50.

HOME ECONOMICS

FOODS AND HOME MANAGEMENT

Foods and Cookery I. The purpose of this course is to give experience in meal preparation, to develop scientific principles of cookery, general proportions, practical skill, and standards for finished products. Lab. 3, 2 hrs.; 3 credits; fee, \$1.

Foods and Cookery II. A continuation of Course I including the study of batters and doughs, including popovers, griddle cakes, muffins, cake, puddings, pies, and bread. Lab. 3, 2 hrs.; 3 credits; fee, \$1.

Elementary Dietetics I. A study of the needs of the body, planning of dietaries, menus, serving, meal planning, and the actual serving of meals to small groups. Lab. 3, 2 hrs.; 3 credits; fee, \$1.50.

Elementary Dietetics II. A continuation of Course I. Lab. 3, 2 hrs.; 3 credits; fee, \$1.50.

Home Management. Study of dietaries, problems in management, and actual management of a dining room and kitchen. Rec. 2 hrs.; lab. 5 days per capita; 7 credits; fee, 75 cents.

Laundering. Includes care of laundry room and utensils, study of water, soap, starch, removal of stains, washing of woolen garments, ironing; also the principles of dry cleaning. Lab. 2; 2 credits.

Social Training (Girls). Subject-matter includes proper speech, table etiquette, and dress; also conversation and social correspondence. Rec. 1 hr.; 1 cred.

Social Training (Boys). Subject-matter includes introductions, social poise, relationship of boys and girls, duties of host, table etiquette, and dress. Rec. 1 hr.; 1 credit.

CLOTHING AND RELATED ART

All materials for the clothing courses must be selected in consultation with the instructor. Students are requested not to bring material from home unless previous arrangements have been made with the instructor.

- Garment Making I. An apron, a holder, a chemise, and a slip are made in this course. Problems in darning and patching are required. Various kinds of material and their wearing qualities, simple decorative trimmings, and cost of finished garments are discussed. Lab. 4, 2 hrs.; 4 credits.
- Garment Making II. A study of cotton and linen dress fabrics; making of a wash dress and a middy blouse; simple problems in decorative needlework; clothing budget. Lab. 4, 2 hrs.; 4 credits.
- Drawing and Design I. Principles of design and color harmony with emphasis upon design as expressed in clothing, house furnishing, and articles in common use. Lab. 1, 2 hrs.; 1 credit.
- Drawing and Design II. Application of principles to costume design. Lab. 1, 2 hrs.; 1 credit.
- Elementary Dressmaking I. Includes the planning and making of a wool dress. Lab. 3, 2 hrs.; 3 credits.
- Elementary Dressmaking II. An infant's layette and an afternoon or informal party dress are required in this course. Lab. 3, 2 hrs.; 3 credits.
- Advanced Dressmaking I. A silk dress is made in this course. Materials are purchased under the direction of the instructor. Lab. 3, 2 hrs.; 3 credits.
- Advanced Dressmaking II. Includes the making of underwear and dress for graduation. Lab. 3, 2 hrs.; 3 credits.
- Millinery I. Design and color harmony in hats, alterations of frames, making and trimming of simple hats. Lab. 2, 2 hrs.; 2 credits; fee, \$1.25.
- Textiles. Study and identification of standard fabrics and textile fibers; tests for adulterations in fabrics; clothing in relation to health; the clothing budget. Rec. 2 hrs.; lab. 1, 2 hrs.; 3 credits; fee, \$1.
- Home Furnishing. Location of farm buildings, types of farm dwellings, study of house plans, choice of site, exposure, plumbing, heating, interior finish, walls, floors, furniture, curtains, pictures. Rec. 1 hr.; lab. 2, 2 hrs.; 3 credits.
- Applied Art I. Application of the principles of design to the making and decorating of useful household furnishings. Lab. 2, 2 hrs.; 2 credits.
- Applied Art II. Continuation of Course I with more advanced work. Lab. 2, 2 hrs.; 2 credits.

HOME NURSING

- Home Nursing I. Structure and functions of the human body and personal hygiene. Rec. 3 hrs.; 3 credits.
- Home Nursing II. Continuation of Course I, including First Aid. Rec. 3 hrs.; 3 credits.
- Home Nursing III. Communicable diseases, equipment for nursing in the home, and preparation and serving of food for the sick. Rec. 3 hrs.; 3 credits.
- Home Nursing IV. Hygiene of maternity, parental care; infant nutrition and care. Rec. 3 hrs.; 3 credits.

MUSIC

All courses in music except group organizations include a group of twelve private lessons and daily supervised practice periods. Music Hall is equipped with several private practice rooms and all students registered for music courses are assigned the use of the practice rooms. The fees charged in connection with the various courses pay for the private lessons and the use of piano for practice purposes.

- Piano I. Exercises for hand position and rhythm; two-, three-, and five-finger exercises; major scales. Studies: Gurlitt, *Technic and Melody*; Tapper, *First Piano Book, or Graded Studies*, Grade I. Solos: Tapper, Sartorio, etc. 2 credits; fee, \$9.50.
- Piano II. Exercises for hand and arm control; thumb exercises, major scales; transpositions of five-finger exercises, two- and three-finger exercises. Studies: Streabog's *Twelve Very Easy Studies*, Czerny's *Anthology* Vol. I. Solos: *Graded Pieces*, Grade II. 2 credits; fee, \$9.50.
- Piano III. Scale with different rhythms, one and two notes, 80 mm., broken chords. Studies: Concone's *Twenty-four Melodious Studies*; Tapper's *Graded Studies*, Grade III; Czerny's *Anthology*, Vol. II. Solos: Beethoven, Heller, etc. 2 credits; fee, \$9.50.
- Piano IV. Scales with different touches, one, two, three, and four notes, 80 mm.; Herz exercises, arpeggios; block chords with pressure and drop arm. Foote; first year Bach; Czerny; wrist and forearm studies. Solos: Grade III; Mozart; Sonatinas. 2 credits; fee, \$9.50.
- Piano V. Lynne's *Key Circle Exercises*, Book I. Heller, *Opus 47*; first-year Bach. Solos: easy sonatas by Haydn and Mozart. *Graded Pieces*, Grades III and IV; Tapper, *Graded Pieces*, Grade III. 2 credits; fee, \$9.50.
- Piano VI. Studies: Schmitt finger exercises; major and minor scales, hands separate, legato and staccato in varied rhythms; octave studies. Solos: pieces by Schumann, Mendelssohn, Jenson, etc. Easier Beethoven works. 2 credits; fee, \$9.50.
- Vocal Course. Graded course in voice culture and art of singing by Fred-eric Haywood is the basis for this with selections from the following studies: Marzo, Sieber, Concone, Marchesi, Panoika, Spicker, with suitable solos in each grade. Fee, \$7.
- Violin Course. Methods and studies by Grun, Fischel, Sevcik, Dancla, Kayser, Kreutzer, Rode, Fiorillo, and solos adapted to each grade. Fee, \$7.
- Cornet Course. School and studies by Herbert Clark. Also Arban, Shoenbruck, international method with solos. Fee, \$7.
- Clarinet Course. Methods by Klose or Lazarua. Also solos. Fee, \$7.
- Other Band and Orchestral Instruments. Carefully arranged courses in each instrument. Cello, trombone, saxophone, snare drum, etc.
- Harmony and Counterpoint. Part of each lesson period devoted to playing and correcting exercises from suitable text, as Shepard, Chadwick, Foote and Spalding, Clark; or an intensive course in harmony and composition may be taken through private lessons.
- Chorus. A large assembly chorus will be organized at the first of the year, rehearsing daily. This chorus will furnish music for the morning exercises and special occasions, and will give concerts during the year.

- Music Analysis. For piano students. Pupils will analyze a large amount of standard music material, giving the student a clear insight into the structural features of great compositions.
- Musical Theory and Appreciation. Purpose is to study history, form, and beauty of musical composition. An acquaintance with the great music of the orchestra and its individual instruments through solos and records.
- Orchestra. Two orchestras, one for beginners and one for advanced students, are organized at the beginning of the school year. Credit is given for membership in these organizations.

BUSINESS

- Spelling and Penmanship I (General). Five hours drill per week in spelling and penmanship. This course is open to all students. Rec. 5 hrs.; 3 credits.
- Business Spelling and Penmanship I (Business training students). Daily drill and individual instruction in penmanship; daily drill in spelling, the use and meaning of words, and rules for spelling. Rec. 5 hrs.; 5 credits.
- Business Spelling and Penmanship II. Continuation of Course I. Rec. 5 hrs.; 5 credits.
- Typewriting. Taught throughout the course. Provides individual instruction in the use of the machine. Memorization of the keyboard and graded lessons are used. Each lesson must be done correctly before the student is advanced. 2 to 5 credits; fee, \$2.50.
- Shorthand I. Gregg system supplemented with speed studies is used. Rec. 5 hrs.; 5 credits.
- Shorthand II. Continuation of Course I. Rec. 5 hrs.; 5 credits.
- Dictation I. When students are capable of taking ordinary dictation and transcribing their notes on the typewriter, they are given office work to do and thus gain experience while still at school. 5 hrs.; 5 credits.
- Dictation II. Continuation of Course I. 5 hrs.; 5 credits.
- Business Training I. Duplicating and mimeographing, filing and indexing, business ethics. Rec. 5 hrs.; 5 credits.
- Business Training II. Continuation of Course I. Rec. 5 hrs.; 5 credits.
- Bookkeeping I. Purpose of accounts and principles of account classification; capital and revenue; accruals; principles of valuation; depreciation; preparation and interpretation of balance sheets, income accounts, and other business statements. Rec. 5 hrs.; 5 credits.
- Bookkeeping II. Continuation of Course I. Rec. 5 hrs.; 5 credits.
- Bookkeeping III. Continuation of Courses I and II. Rec. 5 hrs.; 5 credits.
- Commercial Law I. This course aims to give the student a better knowledge of his rights, privileges, and limitations as a citizen of the United States. A thoro study is made of contracts, negotiable instruments, sales, real estate, and right of master and servant. Rec. 5 hrs.; 5 credits.
- Commercial Law II. Continuation of Course I. Rec. 5 hrs.; 5 credits.

UNIVERSITY OF MINNESOTA
WEST CENTRAL SCHOOL OF AGRICULTURE

Please read the bulletin carefully, noting the paragraphs headed Admission, Time of Opening, Rooms in Dormitories, What To Bring, and Expenses. If you plan to enter the school, fill out the application blank below and mail it to the registrar, West Central School of Agriculture, Morris, Minnesota. Send with this application \$2 made payable to the West Central School for a room reservation in one of the dormitories. This \$2 will be applied on your first month's expenses on entering school. In case your application is received after all space has been assigned, you will be so notified. In case you cannot enter school after making application, you should notify the registrar as soon as possible. If this is done prior to fifteen days before the opening of school, the money will be returned, otherwise it will not. Students are strongly urged to reserve rooms in advance.

One hundred fifty dollars will pay the entire expenses for six months.
.....

Mail the following application to the registrar, West Central School of Agriculture, Morris, Minnesota:

To the Registrar:
West Central School of Agriculture,
Morris, Minnesota.

I am enclosing \$2 for a room reservation in one of the dormitories.
I wish to room with the following person.....
.....(state preference if any). I expect
to enter school about.....

Name

Home address: R. F. D. Post-office.....

The Bulletin
of the University of
Minnesota

The Law School
Announcement for the Years
1926-1928



Vol. XXIX No. 43 July 28 1926

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THE ASSOCIATION OF AMERICAN LAW SCHOOLS

The Association of American Law Schools was organized in 1900 for the purpose of improving legal education. Membership is dependent on maintaining the standards set by the association. These standards have been advanced from time to time as conditions warranted. At present they are substantially the same as those approved by the American Bar Association stated below. The association now includes 64 of the 167 law schools in the United States. The University of Minnesota Law School has been a member of the association since it was organized.

THE AMERICAN BAR ASSOCIATION STANDARDS FOR ADMISSION TO THE BAR

The following resolution was adopted by the American Bar Association, September 1, 1921. It was approved by a national conference of state and local bar associations, February 24, 1922, and by the Minnesota State Bar Association, September 1, 1922.

"(1) The American Bar Association is of the opinion that every candidate for admission to the bar should give evidence of graduation from a law school complying with the following standards:

(a) It shall require as a condition of admission at least two years of study in a college.

(b) It shall require its students to pursue a course of three years' duration if they devote substantially all of their working time to their studies, and a longer course, equivalent in the number of working hours, if they devote only part of their working time to their studies.

(c) It shall provide an adequate library available for the use of the students.

(d) It shall have among its teachers a sufficient number giving their entire time to the school to insure actual personal acquaintance and influence with the whole student body.

The Council on Legal Education and Admission to the Bar is directed to publish from time to time the names of those law schools which comply with the above standards and of those which do not and to make such publications available so far as possible to intending law students."

The University of Minnesota Law School is approved by the Council.

UNIVERSITY CALENDAR

1926-27

1926

Fall Quarter

September	16	Thursday	Payment of fees closes, except for new students
September	16-18		Entrance examinations (for removal of entrance deficiencies)
September	17-20		Registration of all new students entering the freshman class
September	20-24		Examinations for removal of conditions Registration period ¹
September	21-25		Freshman week
September	24	Friday	Payment of fees for new students closes
September	24-25		Necessary changes in registration
September	27	Monday	Fall quarter classes begin, 8:30 ² a.m.
October	21	Thursday	Senate meeting, 4:30 p.m.
November	2	Tuesday	General Election Day; a holiday
November	11	Thursday	Armistice Day; a holiday
November	20	Saturday	Homecoming Day
November	25	Thursday	Thanksgiving Day; a holiday
December	2	Thursday	State Day Convocation
December	15-18		Final examination period
December	16	Thursday	Commencement Convocation Senate meeting, 4:30 p.m.
December	18	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	22	Wednesday	Payment of fees closes for all students in residence fall quarter ³

Winter Quarter

December	27-29		Entrance examinations
December	30-31		Registration days for new students ¹ Necessary changes in registration

¹ Registration subsequent to the date specified will necessitate the approval of the dean. See also penalty fees for late registration, page 9.

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 8:00 in the Medical School and at 8:15 at University Farm.

³ New students must pay fees on dates announced for registration.

1927

January	3	Monday	Christmas vacation ends, winter quarter classes begin, 8:30 ² a.m.
February	12	Saturday	Lincoln's Birthday; a holiday
February	17	Thursday	Charter Day Convocation Senate meeting, 4:30 p.m.
February	22	Tuesday	Washington's Birthday; a holiday
March	16-19		Final examination period
March	17	Thursday	Payment of fees closes for all students in residence winter quarter ³
March	19	Saturday	Winter quarter ends, spring vacation begins, 5:20 p.m.

Spring Quarter

March	21-23		Entrance examinations
March	25-26		Registration days for new students ¹ Necessary changes in registration
March	28	Monday	Spring vacation ends, spring quarter classes begin, 8:30 ² a.m.
April	15	Friday	Good Friday; a holiday
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	8-11		Final examination period
June	11	Saturday	Spring quarter closes, 5:20 p.m.
June	12	Sunday	Baccalaureate service
June	13	Monday	Fifty-fifth annual commencement

Summer Session

June	17-18		Summer Session first term begins, registration and payment of fees
June	20	Monday	Classes begin, 8:00 a.m.
July	4	Monday	Independence Day; a holiday
July	30	Saturday	Registration and payment of fees for second term closes
August	1	Monday	Second term classes begin
September	3	Saturday	Second term Summer Session closes

¹ Registration subsequent to the date specified will necessitate the approval of the dean. See also penalty fees for late registration, page 9.

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 8:00 in the Medical School and at 8:15 at University Farm.

³ New students must pay fees on dates announced for registration.

FACULTY

Lotus Delta Coffman, Ph.D., LL.D., President
William Watts Folwell, LL.D., President Emeritus
Everett Fraser, B.A., LL.B., Dean and Professor of Law
Cephas D. Allin, M.A., LL.B., Professor of Political Science
Wilbur H. Cherry, B.A., LL.B., Professor of Law
Henry J. Fletcher, LL.M., Professor of Law
Thomas C. Lavery, B.A., LL.B., Professor of Law
Henry L. McClintock, Ph.B., LL.B., S.J.D., Assistant Professor of Law
*R. Justin Miller, B.A., LL.B., J.D., Professor of Law
James Paige, M.A., LL.M., Professor of Law
Henry Rottschaefer, B.A., J.D., S.J.D., Professor of Law
Ernest C. Carman, LL.B., Instructor in Practice
Edwin H. Chapman, LL.B., Instructor in Practice
Ralph H. Dwan, B.A., LL.B., S.J.D., Instructor in Law
Robert Kingsley, M.A., LL.B., Instructor in Law
Maynard E. Pirsig, B.A., LL.B., Instructor in Practice

PROFESSORIAL LECTURER

Homer B. Dibell, B.A., LL.B., Associate Justice of the Supreme Court of
Minnesota

SPECIAL LECTURERS

Charles W. Bunn, B.S., St. Paul
Bert Fesler, Duluth, Judge of the District Court
Edward Lees, Commissioner of the Supreme Court of Minnesota
Hugh V. Mercer, LL.M., D.C.L., Minneapolis
George W. Strong, LL.B., Minneapolis

* Absent on leave, 1926-27.

GENERAL INFORMATION

OBJECT AND METHOD OF INSTRUCTION

The Law School of the University of Minnesota was established in 1888.

The object of the Law School is to provide a thoro training in the law and to prepare students for practice in any jurisdiction where the Anglo-American legal system prevails. Particular emphasis is laid upon the statutes, the special doctrines of law, and the rules of practice that obtain in the state of Minnesota.

Instruction is given by the use of the "case system." This method of teaching law, which has been approved by experience and which is now employed in the leading law schools of the country, has the twofold merit of enabling the student to acquire a thoro and practical knowledge of legal principles, and to become familiar with those processes of legal reasoning which have determined the form and character of our jurisprudence, and will govern its future development.

The faculty is composed chiefly of resident professional law teachers who devote their entire time and energy to teaching. The courses in practice are taught by men experienced in practice at the Minnesota bar. In addition, courses of lectures on special topics are given by distinguished lawyers and judges, selected primarily from the bar of Minnesota.

ADMISSION

Regular Students

Candidates for admission to the Law School must have completed at least two years of work with an average, for all work completed, one grade above the passing mark in the College of Science, Literature, and the Arts of the University of Minnesota, or some other accredited college or university. The minimum requirement is 90 credits and 90 honor points. Such candidates may be admitted upon presenting their diplomas or other credentials showing the completion of such college work to the registrar of the University. Altho two years of college education satisfy the Law School's entrance requirements, prospective law students are urgently advised to take a full college course or at least the combined six-year course leading to the degrees of bachelor of arts and bachelor of laws.

Special Students

A limited number of applicants who are twenty-three years of age or over and have preliminary education sufficient at least to entitle them to admission to the College of Science, Literature, and the Arts¹ may, on petition to the faculty, be admitted to the Law School as special students. The petitioner should state his age, education, grades, occupation since leaving school, reason for not qualifying as a regular student, and all other matter

¹ These requirements are stated in full in the current bulletin of the College of Science, Literature, and the Arts.

that will aid the faculty in determining his fitness for the study of law. No one whose failure to qualify as a regular student is due to lack of honor points will be admitted as a special student. Special students can qualify for bar examinations, but cannot qualify for a degree.

ADVANCED STANDING

No credit is given for time spent in private reading or for study in a law office. The candidate for graduation must spend three years in residence, either at this Law School or at some other school which is a member of the Association of American Law Schools. A student coming from such other law school must have the preliminary education required for admission to this school and must spend at least one year in attendance at this school before he can qualify for a degree. Advanced standing will be given only to students with satisfactory records, and credit may be withdrawn because of poor work in this school. Candidates should forward a transcript of their record in both pre-legal and law work. Attorneys-at-law who have been admitted to practice in the state of Minnesota and who have had two years of academic work in college, may enter the third year law class without examination upon presentation to the registrar of their certificates of admission to the bar, and shall be entitled to the degree of bachelor of laws upon satisfactorily completing such courses, aggregating 35 credits (one year's work), as the law faculty may designate.

REGISTRATION

New students should register on or before the opening of the school year.¹ Such students will not be permitted to enter the Law School at any other time unless entitled to advanced standing. Lectures in all subjects begin promptly on the opening day of the term, and those who join their classes later will necessarily be seriously handicapped in their work. No student will be admitted to classes unless he registers within ten days after the opening of the year, except by special action of the faculty and for good cause shown. (See Tuition and Other Fees, post page 9.)

COMBINED SIX-YEAR COURSE LEADING TO DEGREES OF BACHELOR OF ARTS AND BACHELOR OF LAWS

A student in the College of Science, Literature, and the Arts of this University who has by the end of his junior year secured not less than 135 credits selected in accordance with the regulations of that college and 135 honor points, may take during his senior year the first year law course, and upon its completion receive the degree of bachelor of arts. Upon completion of the work of the remaining two years in law, such student will receive the degree of bachelor of laws, thus obtaining both degrees in six years. Several Minnesota colleges also permit students who have completed three years' work to transfer to this Law School and accept the first year of law in completion of their requirements for their B.A. degree.

¹ See page 9 for the provisions as to penalty for late registration.

RECOMMENDED PRE-LEGAL COURSES

Students in the University preparing to enter the Law School register in the College of Science, Literature, and the Arts. They should follow a course that will qualify them to go on to the bachelor of arts degree should they later so desire. The following course is recommended by the faculty of the Law School:

- | | |
|--------------------------------|----------------------------|
| 1. Latin, 0 to 20 credits | 4. Political Science 1 |
| 2. Rhetoric, English A-B-C | 5. Philosophy 2, and 50-51 |
| 3. Natural science, 10 credits | 6. History 31-32 and 33-34 |
| | 7. Economics 3-4 |

Other subjects recommended for pre-legal students are Psychology 1-2; Public Speaking 45-46, 55-56-57; Economics 1-2, 54, 143-144, and 167-168; History 146-147, and 116-117-118; Philosophy 1, 3, 124, and 129; Political Science 7, 11, 15, 121-122, 123, and 161.

ELECTIVES IN OTHER DEPARTMENTS OF THE UNIVERSITY

Students in the Law School may be permitted, after completion of the work of the first year, and under proper regulations to elect, without extra charge, courses offered in other departments of the University, provided that such election does not interfere with their law studies; but such election of courses in other departments may be made only with permission of the law faculty. Among the subjects which may be profitably selected are English composition, English and American constitutional history, public speaking and debating, political science, economics, and sociology.

LIBRARIES

The library of the Law School contains forty-two thousand volumes, including all the American reports, state and federal, Interstate Commerce and other commission reports, nearly all the English, Australian, New Zealand, Indian, and Canadian reports, the English, federal, and state statutes (with a few exceptions), the standard digests, encyclopedias, legal periodicals, and textbooks. To this collection substantial additions, particularly in foreign law, are constantly being made. Further library facilities are afforded by the generous action of the Bar Association of Minneapolis in granting to the students the free use of its library located in the Court House. Besides the University and Bar Association libraries, the State Law Library, located at the Capitol in St. Paul, is accessible to students.

STATE AND UNITED STATES COURTS

The University is located within easy reach of both the federal and state courts. The United States courts are in session in St. Paul and Minneapolis during the greater part of the school year. The Supreme Court of Minnesota, sitting at St. Paul, the district courts of Ramsey and Hennepin counties, and the municipal courts of St. Paul and Minneapolis are open and in session almost constantly, and afford the student abundant opportunity for witnessing the trial of actual cases and hearing the argument of appeals.

EXPENSES

Careful estimates of the expenses of a student attending the Law School, together with other general information useful to students, are to be found in the bulletin of general information, to be had upon application to the registrar of the University.

FEES

Tuition fees (per quarter)	
Residents of Minnesota.....	\$30.00
Non-residents	40.00
Tuition fees (per credit hour)	
Residents of Minnesota.....	2.75
Non-residents	3.75
Deposit* (first quarter only).....	5.00
Health fee (per quarter).....	2.00
Minnesota Union or Shevlin Hall (per quarter).....	1.00
Special fees:	
Examination for removal of conditions.....	1.00
Special examinations	5.00
Penalty Fees:	
<i>Registration penalties.</i> —A penalty fee for late registration, late change of registration, or late payment of fees shall be two dollars (\$2) and one dollar (\$1) additional for each day of delay after classes begin, provided that no student shall pay more than twelve dollars (\$12) of penalty in any given quarter.	

SUMMER SESSION

A limited amount of work is offered by the Law School faculty during the summer quarter. The quarter is divided into two terms, and the work of each term is complete in itself. This summer work is designed to enable students to lighten the burden of the regular academic year, or to supplement the course required for the bachelor's degree. Credits may be applied towards the bachelor of laws degree, and excess credits earned in the third year may be applied towards the master of laws degree. The work offered is only for students who have had at least one year of law work. No work is offered for persons beginning law study. The courses will be announced in a separate bulletin, which will be sent on application.

MINNESOTA LAW REVIEW

The *Minnesota Law Review* is a legal periodical published by the faculty and students of the Law School. There are seven regular issues each year, from December to June, inclusive, containing leading articles by law teachers, judges, and lawyers, and notes and comments on recent cases prepared by students in the school. Eighteen students are elected to the editorial board of the *Review* from the junior and senior classes upon recommendation of

* The following charges are made against the general deposit for each student in addition to such charges as may be incurred for lockers, library penalties, laboratory breakage, etc.:

<i>Minnesota Daily</i> , per quarter.....	\$0.50
Post-office box, per quarter.....	.20
<i>University Address Book</i>.....	.35

the faculty on the basis of scholarship. Membership on the board is an honor, and an opportunity for training in legal research of the highest value. Law offices prefer graduates who have been members of the board. Work done on the *Review* is given weight by the faculty in awarding honors in the Law School. The *Review* is the official journal of the Minnesota State Bar Association, and is sent to all members of the association.

INQUIRIES

Further particulars as to any phase of the work of the Law School not given herein, or in the bulletin of general information, will be cheerfully given upon request. Communications addressed at any time to the dean of the Law School of the University of Minnesota, Minneapolis, Minnesota, will receive prompt attention.

DEGREES AND COURSES OF STUDY

The curriculum leading to the degree of bachelor of laws covers a period of three academic years. To qualify for graduation, a student must complete the entire work of the first and second years and the required work of the third year, together with a sufficient number of electives to aggregate 12 hours of work during each term of the third year.

Students, unless they be of exceptional ability and industry, who find it necessary to devote a considerable portion of their time and energy to work not connected with their law studies are strongly advised to limit their work in the Law School to not more than ten hours in the classroom per week, and thus extend the period of their study of law over four years. The credit hour tuition fee enables students to extend the period of study at slight additional expense.

No student, unless permitted by special action of the faculty, will be allowed to carry more than the regularly prescribed work for the year, or proportional work for any term.

Attendance upon all special lectures scheduled is required; and all students in the Law School may be required to serve as jurors or witnesses in any proceedings before the practice court.

A course leading to the degree of master of laws may be taken under the direction of the Graduate School of the University. Candidates must have completed two years of college work, and the work required for the first law degree in a school which is a member of the Association of American Law Schools. No specific course of study is required, but the course elected must be approved by an adviser. Subjects in the curriculum of the Law School not counted towards the first degree may be elected and additional work in subjects already studied. The candidate may also elect studies in the social sciences in the College of Science, Literature, and the Arts, and in the School of Business. The candidate must complete eight year hours of classroom work and prepare a thesis that will be accepted for publication in the *Minnesota Law Review*. The course may be shaped to secure a more extensive survey of the law and related subjects, or to give a more thoro training in some special branch.

All the courses offered by the Law School are given between the hours of 8:30 a.m. and 5:30 p.m.

A student who is absent from the school two consecutive years must satisfy the requirements in force when he returns.

FIRST YEAR COURSES

Contracts. Offer and acceptance; consideration; contracts under seal; the Statute of Frauds; rights of beneficiaries and assignees; joint and several contracts; conditions; illegality; impossibility; and discharge of contracts. Williston, *Cases on Contracts* (2 ed.) Three hours. Mr. Lavery.

- Property I. Real and personal property distinguished; possessory rights, liens, pledges; title to personal property by accession, confusion, gift, and finding. Theory of feudal land tenure; rights incident to ownership; profits; easements; licenses; covenants running with land. Warren, *Cases on Property*. Three hours. Mr. Fraser.
- Torts. General principles underlying law of civil liability for wrongful conduct; specific wrongs of deceit, defamation, malicious prosecution, interference with contracts and trade, etc. Casebook to be announced. Three hours. Mr. Paige.
- Common Law Actions and Equity I. The several forms of action at common law. Relation of forms of action to substantive law. Introduction to equity. Cook and Hinton, *Cases on Common Law Pleading*. Ames, *Cases on Equity Jurisdiction*, Vol. I. Two hours. Mr. McClintock.
- Criminal Law and Procedure. The common and statutory law of crimes; criminal procedure. Mikell, *Cases on Criminal Law and Criminal Procedure* (2 ed.). Two hours. Mr. Kingsley.
- Agency. Principal and agent, master and servant—their rights and obligations, mutually and as to third persons. Mechem, *Cases on Agency* (2 ed.). Two hours. Mr. Rottschaefer.

SECOND YEAR COURSES

- Constitutional Law. Nature of American constitutional system; legislative, executive, and judicial departments; fundamental rights; due process of law; police power; taxation; eminent domain; the Federal government and its general powers; interstate commerce. Hall, *Cases on Constitutional Law*. Two hours. Mr. Rottschaefer.
- Equity II. Nature of equity jurisdiction; injunctions; bills of peace; interpleader; specific performance; bills for account. 1926-27, Cook, *Cases on Equity*, Vols. I and II; 1927-28, Ames, *Cases on Equity*, Vols. I and II. Two hours. Mr. McClintock.
- Private Corporations. The nature, creation, and citizenship of corporations; *ultra vires* contracts and acts; stock issues; rights and liabilities of stockholders, officers and agents of corporations; rights of creditors. Richards, *Cases on Private Corporations* (2 ed.). Two hours. Mr. Lavery.
- Property II and Decedents' Estates. (1) Titles and conveyancing; the execution of deeds and estates created thereby; executive sales and priorities; actions concerning real property. Dibell, *Cases on Real Property*. (2) Testamentary capacity; execution, revocation, and republication of wills; descent; probate of wills and administration of estates. Dibell, *Cases on Wills and Descent*. Two hours. Mr. Dibell.
- Negotiable Instruments. Formal and essential requirements of negotiable instruments, and the nature of the liability of the respective parties thereto; acceptance; endorsement; transfer; presentment; notice of dishonor; the Negotiable Instruments Law. Colson's Huffcutt, *Cases on Negotiable Instruments*. Two hours. Mr. Paige.

- Sales. Contracts resulting in the transfer of title to personal property, and the special rights and remedies of the buyer and seller. Williston, *Cases on Sales* (2 ed.). Two hours. Mr. Fletcher.
- Trusts. Nature and incidents of the trust relationship; methods of creating trusts; rights and obligations of trustees and beneficiary; constructive trusts, charitable trusts. Scott, *Cases on Trusts*. Two hours. Mr. Dwan.
- Brief Making and Drafting. Practical exercises in the writing of briefs and in the preparation of legal documents. Examination of abstracts of title. One hour. Mr. Cherry.

THIRD YEAR COURSES

- Practice and Practice Court (required). This course deals with the various proceedings in an action from the commencement thereof, through trial and appellate courts, to final satisfaction of judgment, including work in the practice course. Sunderland, *Cases on Trial and Appellate Practice* (1924 edition). Three hours. Mr. Cherry, Mr. Carman, Mr. Pirsig.
- Evidence (required). Burden of proof; judicial notice; admission and exclusion of evidence; competency, privilege, and examination of witnesses; hearsay rule and recognized exceptions; opinions and conclusions; circumstantial evidence; best evidence rule; parole evidence rule. Hinton, *Cases on Evidence*. Two hours. Mr. Cherry.
- Pleading. Common Law and Code Pleading (required). Demurrers, pleas, replications, departure, new assignment, amendment, set-off and counterclaim. Relation of code to common law pleading, parties, splitting and joinder of causes, the complaint, answer, demurrer, reply, motions, bills of particulars, amendment, and aider. Cook and Hinton, *Cases on Common Law Pleading*. Hinton, *Cases on Code Pleading* (2 ed.). Two hours. Mr. Dwan.
- Property III. Conditional and future interests in land: reversion and remainders; executory limitations by way of use and devise; powers; rule against perpetuities; conditions in restraint of alienation. Minnesota restrictions on future interests and trusts. Kales, *Future Interests*, American Casebook Series, and selected cases. Two hours. Mr. Fraser.
- Conflict of Laws. The rules applied by courts in enforcing rights acquired under the law of a sister state or a foreign country. Lorenzen, *Conflict of Laws* (2 ed.). Two hours. Mr. McClintock.
- Mortgages. Legal and equitable mortgages of realty and chattels; rights of mortgagor and mortgagee at law and in equity; foreclosure, redemption, extension, assignment, and discharge of mortgages. Dibell, *Cases on Mortgages*. One hour. Mr. Dibell.
- International Law. (1) International Relations in Time of Peace; territorial jurisdiction; jurisdiction on the high seas; nationality. (2) International Relations As Modified by War; measures short of actual war; effect of war as between enemies; relation between belligerents and neutrals. Scott, *Cases on International Law*. Two hours. Mr. Allin.

- Damages.** Exemplary damages; nominal damages; direct and consequential damages; elements of injury; function of court and jury; liquidated damages; entire and prospective damages: limitations of interest; aggravation and mitigation. Special applications. Beale, *Cases on Damages* (3 ed.). Two hours, half year. (Not given in 1926-27.)
- Insurance.** Nature and requisites of the contract; premiums and assessments; insurable interests; concealment; representations and warranties; waiver and estoppel; rights under the policy; beneficiaries, assignees, and creditors; construction of the policy. Vance, *Cases on Insurance*. Two hours, first half year. Mr. Lavery.
- Municipal Corporations.** Legislative control; officers and agents; power to incur indebtedness, to pass ordinances, to grant franchises, to levy taxes, to issue securities, to own and operate public utilities; municipal liability for torts. Casebook to be announced. Two hours, second half year. Mr. Kingsley.
- Public Utilities.** Origin of common callings, peculiar duties and liabilities incident thereto, the modern law applicable to those engaged in public service, particularly common carriers, with special reference to the Interstate Commerce Act and similar state statutes. Textbook to be announced. Two hours, half year. Mr. Rottschaefer. (Not given in 1926-27.)
- Taxation.** This course deals only with the legal questions arising in connection with the assessment of property and the levying and collection of taxes. Textbook to be announced. Two hours, first half year. Mr. Rottschaefer.
- Partnership.** The nature and formation of the partnership relation; the rights and liabilities of the partners, both *inter se* and as to third parties. Gilmore, *Cases on Partnership*. Two hours, second half year. Mr. Paige.
- Suretyship.** The surety distinguished from the guarantor, the guaranty insurer, and the endorser; surety's defenses against creditors; surety's rights to subrogation, indemnity, contribution, and exoneration; creditor's rights to surety's securities. Ames, *Cases on Suretyship*. Two hours, first half year. Mr. Fletcher.
- Quasi Contracts.** Nature and scope of quasi contracts, benefits voluntarily conferred by mistake, in partial performance of a contract, in the absence of a contract; benefits conferred under duress; waiver of tort. Thurston, *Cases in Quasi Contracts*. Two hours, half year. (Not given in 1926-27.)
- Bankruptcy.** Origin, history, and nature of the bankruptcy law; jurisdiction of the courts; acts of bankruptcy; practice; receivers; claims, preferences; assets, trustees; liens; adverse claimants; summary jurisdiction; crimes, composition, discharge. Selected cases. Two hours, second half year. Mr. Fletcher.
- Persons.** Marriage and divorce; parent and child; guardian and ward; property law peculiar to the marriage relation; rights and liabilities of persons under the disabilities of coverture, infancy, insanity, etc. Paige, *Cases on Domestic Relations*. Two hours, first half year. Mr. Kingsley.

Jurisprudence. Nature and purpose of jurisprudence; schools of jurisprudence; the end of law; its nature; its sources, forms, and modes of growth; its scope and subject-matter; analysis of fundamental legal conceptions; relation of existing law. Textbook to be announced. Two hours, second half year. Mr. Rottschaefer.

WORK IN PRACTICE

Members of the third year class, in addition to classroom instruction in practice, engage in the exercises of the practice court. Each student is assigned a number of cases in which he is required to draw the necessary pleadings, to see to the service of process and pleadings, and to prepare for and conduct the trial. In at least one of the cases so assigned, the student must take steps to secure or oppose a provisional or extraordinary remedy. Each student also serves as a witness in several cases. The trial is followed by a discussion of the conduct of the case, led by the instructor who has acted as judge.

Students prepare three sets of papers, which include all papers ordinarily used in the prosecution and defense of a civil action in the District Court and on appeal to the Supreme Court. The papers are explained and discussed in class.

Members of the third year class are required to serve as assistants in the office of the Legal Aid Society and to attend at the office of the society during the periods assigned for such service.

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.

INFANTRY COURSES

No.	Title	Hour	Day	Bldg.	Instructor
51f-52w	First Year Adv. Course.....	II	MWF	A	Ar
		III	MWF	A	Ar
		VI	MWF	A	Ar
		VIII	MWF	A	Ar
		I, II	TThS	A	Ar
		III, IV	TThS	A	Ar
		VI, VII	TTh	A	Ar
		VIII, IX	TTh	A	Ar

* Must be legally eligible for enrolment in R.O.T.C. Consult P.M.S.&T.

THE LAW SCHOOL

No.	Title	Hour	Day	Bldg.	Instructor
53s	First Year Adv. Course.....	VII, VIII,			
		IX	T or W	A	Ar
54f-55w	Second Year Adv. Course.....	IV	TS	A	Ar
		II	MWF	A	Ar
		III	MWF	A	Ar
		VI	MWF	A	Ar
		VIII	MWF	A	Ar
		I, II	TThS	A	Ar
		III, IV	TThS	A	Ar
		VI, VII	TTh	A	Ar
		VIII, IX	TTh	A	Ar
		56s	Second Year Adv. Course.....	VII, VIII,	
IX	T or W			A	Ar
IV	TS			A	Ar

ATTENDANCE FOR 1925-26

Third year class.....	79
Second year class.....	98
First year class.....	124
Total	<u>301</u>

The Bulletin
of the University of
Minnesota

The Medical School
Announcement for the Years
1927-1929



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1927							1928													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2	1	2	3	4	5	6	7	1	2	3	4	5	6	7
3	4	5	6	7	8	9	8	9	10	11	12	13	14	8	9	10	11	12	13	14
10	11	12	13	14	15	16	15	16	17	18	19	20	21	15	16	17	18	19	20	21
17	18	19	20	21	22	23	22	23	24	25	26	27	28	22	23	24	25	26	27	28
24	25	26	27	28	29	30	29	30	31	..	..	..	..	29	30	31	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
AUGUST							FEBRUARY							AUGUST						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	1	2	3	4	5	6	..	..	..	1	2	3	4	..	..	..	1	2	3	4
7	8	9	10	11	12	13	5	6	7	8	9	10	11	5	6	7	8	9	10	11
14	15	16	17	18	19	20	12	13	14	15	16	17	18	12	13	14	15	16	17	18
21	22	23	24	25	26	27	19	20	21	22	23	24	25	19	20	21	22	23	24	25
28	29	30	31	..	..	..	26	27	28	29	..	..	..	26	27	28	29	30	31	..
..
SEPTEMBER							MARCH							SEPTEMBER						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	1	2	3	..	..	..	1	2	3	..	..	..	..	..	1		
4	5	6	7	8	9	10	4	5	6	7	8	9	10	2	3	4	5	6	7	8
11	12	13	14	15	16	17	11	12	13	14	15	16	17	9	10	11	12	13	14	15
18	19	20	21	22	23	24	18	19	20	21	22	23	24	16	17	18	19	20	21	22
25	26	27	28	29	30	..	25	26	27	28	29	30	31	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	..	..	..	..	..	..
OCTOBER							APRIL							OCTOBER						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	..	1	1	2	3	4	5	6	7	..	1	2	3	4	5	6
2	3	4	5	6	7	8	8	9	10	11	12	13	14	7	8	9	10	11	12	13
9	10	11	12	13	14	15	15	16	17	18	19	20	21	14	15	16	17	18	19	20
16	17	18	19	20	21	22	22	23	24	25	26	27	28	21	22	23	24	25	26	27
23	24	25	26	27	28	29	29	30	..	..	..	..	..	28	29	30	31	..	..	..
30	31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	1	2	3	4	5	..	..	1	2	3	4	5	..	..	..	..	1	2	3
6	7	8	9	10	11	12	6	7	8	9	10	11	12	4	5	6	7	8	9	10
13	14	15	16	17	18	19	13	14	15	16	17	18	19	11	12	13	14	15	16	17
20	21	22	23	24	25	26	20	21	22	23	24	25	26	18	19	20	21	22	23	24
27	28	29	30	..	..	..	27	28	29	30	31	..	..	25	26	27	28	29	30	..
..
DECEMBER							JUNE							DECEMBER						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	1	2	3	..	..	..	..	1	2	..	..	..	..	..	1		
4	5	6	7	8	9	10	3	4	5	6	7	8	9	2	3	4	5	6	7	8
11	12	13	14	15	16	17	10	11	12	13	14	15	16	9	10	11	12	13	14	15
18	19	20	21	22	23	24	17	18	19	20	21	22	23	16	17	18	19	20	21	22
25	26	27	28	29	30	31	24	25	26	27	28	29	30	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	31	..	..	..	..	..

UNIVERSITY CALENDAR

1927-28

Fall Quarter

1927			
September	15	Thursday	Payment of fees closes, except for new students
September	15-17		Entrance examinations (for removal of entrance deficiencies)
September	16-19		Registration of all new students entering the freshman class
September	19-23		Examinations for removal of conditions Physical examinations Registration period, ¹ colleges of Science, Literature, and the Arts, and Education
September	20-24		Freshman week
September	22-23		Registration days ¹ for all colleges not included above
September	23	Friday	Payment of fees for new students closes
September	26	Monday	Fall quarter classes begin, 8:30 ² a.m. Fall semester extension classes ³ begin
October	20	Thursday	Senate meeting, 4:30 p.m.
October	22	Saturday	Homecoming Day
November	11	Friday	Armistice Day; a holiday
November	24	Thursday	Thanksgiving Day; a holiday
December	1	Thursday	State Day Convocation
December	14-17		Final examination period
December	15	Thursday	Commencement Convocation Senate meeting, 4:30 p.m.
December	17	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	21	Wednesday	Payment of fees closes for all students in residence fall quarter ⁴

Winter Quarter

December	27-29		Entrance examinations
1928			
January	2-3		Registration days for new students in the College of Science, Literature, and the Arts

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty for late registration, page 47 of the 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 the appropriate committee of the college concerned permitting registration at a later date.

² First hour classes begin at 8:15 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.

THE MEDICAL SCHOOL

January	3	Tuesday	Registration day for new students in all other colleges
January	4	Wednesday	Christmas vacation ends, winter quarter classes begin, 8:30 ^a a.m.
January	28	Saturday	First semester extension classes close
January	30	Monday	Second semester extension classes begin
February	13	Monday	A holiday (February 12, Sunday, Lincoln's Birthday)
February	16	Thursday	Charter Day Convocation Senate meeting, 4:30 p.m.
February	22	Wednesday	Washington's Birthday; a holiday
March	14-17		Final examination period
March	15	Thursday	Commencement Convocation Payment of fees closes for all students in residence winter quarter ¹
March	17	Saturday	Winter quarter ends, spring vacation begins, 5:30 p.m.
<i>Spring Quarter</i>			
March	19-21		Entrance examinations
March	23-24		Registration days for new students in all colleges
March	26	Monday	Spring vacation ends, spring quarter classes begin, 8:30 ^a a.m.
April	6	Friday	Good Friday; a holiday
May	10	Thursday	Cap and Gown Day Convocation
May	17	Thursday	Senate meeting, 4:30 p.m.
May	26	Saturday	Second semester extension classes close
May	30	Wednesday	Memorial Day; a holiday
June	6-9		Final examination period
June	9	Saturday	Spring quarter closes, 5:20 p.m.
June	10	Sunday	Baccalaureate service
June	11	Monday	Fifty-sixth annual commencement
<i>Summer Quarter</i>			
June	15-16		Summer Session first term begins, registration and payment of fees
June	18	Monday	Classes begin, 8:00 a.m.
July	4	Wednesday	Independence Day; a holiday
July	28	Saturday	Registration and payment of fees for second term closes
July	30	Monday	Second term classes begin
September	1	Saturday	Second term Summer Session closes

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty for late registration, page 47 of the 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 the appropriate committee of the college concerned permitting registration at a later date.

² First hour classes begin at 8:15 at University Farm.

THE MEDICAL SCHOOL

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Paul Fesler, Superintendent, with rank of Department Head.

Division of Nursing Instruction

Associate Professor Marion L. Vannier, R.N., Director; Assistant Professors Bessie Baker, B.S., R.N., Katherine E. Dougherty, R.N., Dorothy Kurtzman, R.N., Olena Ordahl, R.N.; Instructors Esther Andreasen, R.N., Lana M. Babcock, R.N., Helen I. Erickson, R.N., Eva Gregerson, Lois M. Hurlbutt, B.S., Margaret M. Ingersoll, R.N., Deborah M. MacLurg, R.N., B.S., Mary F. Madigan, B.S., R.N., Ada Marie Olson, R.N., Gertrude I. Thomas, Barbara Thompson, R.N., Edna Zavitz; Assistants Hannah Burggren, R.N., Agnes Fleming, R.N., Jean Carrie Hawley, R.N., Helen Tilden, R.N.

Division of Hospital Dentistry

Associate Professor William A. Grey, D.D.S., Director; Assistant Professors Harold C. Hillman, D.D.S., Daniel E. Ziskin, D.D.S.; Instructors Irwin A. Epstein, D.D.S., Harry Levin, D.D.S., Paul G. Lilja, D.D.S., Carl J. E. Omeron, D.D.S., Clayton A. Swenson, D.D.S.; Assistants Henry Bjorndahl, D.D.S., Oscar Bjorndahl, D.D.S., Daniel R. Clark, D.D.S., Joseph T. Cohen, D.D.S., George F. Lindig, D.D.S., Hugh B. Ruettell, D.D.S.

*THE MEDICAL SCHOOL**Division of Hospital Social Service*

Instructors Marion A. Tebbets, B.A., Director; Mary C. Smith, B.A.

Division of Radiology

Associate Professor Leo G. Rigler, B.S., M.D., Director; Assistant Professor Robert G. Allison, M.D.; Teaching Fellows Malcolm Hanson, M.D., Harry Hillstrom, B.S., M.D.

MILITARY SCIENCE AND TACTICS, R.O.T.C.

Assistant Professor Kent Nelson, M.D., Colonel, Medical Corps, U.S.A.

CONTRIBUTING DEPARTMENTS**PHYSICAL CHEMISTRY**

Professor Frank H. MacDougall, Ph.D.; Assistant Professor Nelson W. Taylor, Ph.D.

AGRICULTURAL BIOCHEMISTRY

Professors Ross A. Gortner, Ph.D., Head; Leroy S. Palmer, Ph.D.; Associate Professor John J. Willaman, Ph.D.; Assistant Professor Cornelia Kennedy, Ph.D.; Instructor W. Martin Sandstrom, M.S.

ZOOLOGY

Professors William A. Riley, Ph.D., Head; Hal Downey, Ph.D., Charles P. Sigerfoos, Ph.D.; Assistant Professor Adolph Ringoen, Ph.D.

GENERAL INFORMATION

The Medical School is conducted on the four-quarter system. Beginning students are received at the opening of the fall quarter. Students with advanced standing may be received at the beginning of any quarter for work for which they are prepared, provided there is a vacancy.

REQUIREMENTS FOR ADMISSION

Ninety quarter credits of college work, carrying 90 honor points, and including rhetoric, 9 credits; chemistry, 20 credits; physics, 12 credits; and zoology, 12 credits; a reading knowledge of French or German; subject to detailed requirements and rules governing limited registration. A candidate's record also must show a number of honor points in rhetoric, chemistry, physics, and biology equal to the total number of credits in these subjects taken collectively.

1. *Rhetoric*: 9 quarter (6 semester) credits. At Minnesota this requirement is met by Rhetoric 4-5-6 (9 credits) or by English-Rhetoric A-B-C (15 credits).

2. *Chemistry*: 20 quarter (13 semester) credits, including general chemistry, qualitative and quantitative analysis, and organic chemistry with laboratory work. At Minnesota, Courses 4-5 (or 1, 2, 3) 11, 27, 31-32 are necessary. Students are advised to take chemistry in high school.

3. *Physics*: 12 quarter (8 semester) credits, covering mechanics, sound, heat, light, electricity, and magnetism, with proper laboratory work. At Minnesota, Courses 1 and 2, 21 and 22, 31 and 32, 41 and 42 (a total of 16 credits) meet the requirement. Students are advised to complete them all, but, if desired, Course 35 may be substituted for 31 and 32. See bulletin of the College of Science, Literature, and the Arts for description of these courses and statement of prerequisites.

4. *Zoology*: 12 quarter (8 semester) credits, including proper laboratory work. At Minnesota, Zoology 5-6-7, meets this requirement.

5. *Foreign language*: Sufficient high school or college training to insure a reading knowledge of French or German medical literature. This requirement is fulfilled as regards French:

(a) By passing any two of Courses 8, 9, 10 in Scientific French in the Department of Romance Languages of this University or by acceptable courses covering similar work done elsewhere;

or (b) By passing an examination conducted by the Department of Romance Languages. The minimum preparation demanded for admission to this examination is 15 credits of French with an average mark of C, or satisfactory equivalent.

The language requirement is fulfilled as regards German:

(a) By passing in Course 31-32, Department of German, in this University or by acceptable credits covering similar work done elsewhere;

or (b) By passing an examination in Scientific German conducted by the Department of German. The usual requirement for admission to this examination is two college years of German, or satisfactory equivalent.

Advised Subjects

Pre-medical students are advised to secure preparation in some or all of the following: Latin (high school or college), mathematics, psychology, sociology, drawing, comparative anatomy, additional work in biology and chemistry. A still broader cultural background is advisable if the student can devote the time and money to longer pre-professional study. See the combined B.A.-M.D. course in the bulletin of the College of Science, Literature, and the Arts.

UNCLASSED STUDENTS

Students prepared for particular courses in departments of the Medical School may be admitted as unclassified students. Such students receive subject credit for courses satisfactorily completed but are not entitled to time credit toward the bachelor or doctor of medicine degree.

SPECIAL STUDENTS

The term "special student" is applied to a medical graduate who desires to register for a time in the Medical School but who does not wish to work toward an advanced degree.

REGISTRATION LIMITED

On account of the limited capacity of the school, the incoming (third year or freshman) class will be limited to one hundred. Application blanks may be obtained from the dean's office.

The last day for receiving applications for the freshman year will be June 15. If college work was done elsewhere than at the University of Minnesota, detailed credentials, showing subjects, credits, and marks, must be presented by July 1.

Subject to recommendations as to character, ability, and personal qualities, candidates will be accepted in the order of their scholastic rating as indicated by the record of their previous work. The entire one hundred candidates will be accepted as soon after July 1 as possible. Candidates will be notified of their acceptance or rejection by July 15.

Accepted applicants will receive a bill for a preliminary fee of \$10. This must be paid within ten days, in order to hold a place in the limited registration. The above fee will not be returnable should the student fail to enter.

Other qualifications being equal, residents of Minnesota will be given preference in selecting students for the Medical School.

The fifth and sixth (junior and senior) years are limited to such numbers as can be provided with good training in the clinics connected with the school. Division A begins the work of the fifth year in the summer quarter. Divisions B, C, and D in the fall quarter. Students desiring to enter the junior year from other schools should bear these facts in mind in making applications for admission.

ADMISSION WITH ADVANCED STANDING

Honorably dismissed students of Class A medical schools may be received into advanced classes provided vacancies occur. Such a student must submit credentials covering pre-medical and medical studies, showing that the student had the pre-medical requirements and has maintained the standard of scholarship required in this school.

As a rule notebooks and other evidences of laboratory work must be presented. The amount of advanced standing in any subject to be granted a student from another school is decided by the respective department in conference with the Students' Work Committee. Subject credit, but not legal time credit, may be given for studies pursued other than in medical schools.

For six- and seven-year combined courses in Science or Arts and Medicine, see the bulletin of the College of Science, Literature, and the Arts.

FEES

The quarterly fee in the Medical School is \$60 for residents of Minnesota and \$70 for non-residents, payable at the beginning of each quarter. No fee is charged in the Medical School for the final hospital or advanced laboratory year.

In addition to tuition, each student is charged an incidental fee of \$5 each quarter.

A deposit of \$10 each year is required as a caution fee, against which certain charges are made. Any balance remaining from this deposit will be returned to the student at the close of each year.

Students who take less than the regular course of study may arrange their fees at the rate of \$2.50 (non-residents \$3) for each weekly clock hour per quarter.

Repetition of work in course demands the repetitional payment of fees.

A fee of \$1 is payable for a condition examination; and one of \$5 for a special examination.

A graduation fee of \$10 is charged for each degree conferred.

Registration penalties.—The penalty fee for late registration, late change of registration, or late payment of fees will be \$2, and \$1 additional for each day of delay after classes begin, provided that no student shall pay more than \$12 of penalty in any given quarter.

Fees as listed above will be charged in the academic year 1927-28, but are subject to change on reasonable notice thereafter.

MICROSCOPES

Each student must be provided, by purchase or rental, and throughout the entire four-year course, with a microscope of approved quality and equipment.

In the fifth and sixth years each student is required to provide himself with a hemocytometer, a head mirror, and a stethoscope of approved form.

THE SUMMER SESSION

A full summer quarter is conducted in the Medical School. Courses offered in summer include junior and senior schedules, and also a repetition of most of the freshman and sophomore courses given in the regular year.

For courses of instruction offered and schedule of fees for special courses see bulletin of the Summer Session.

MARKING SYSTEM AND SCHOLARSHIP RULES

See bulletin boards for rules on marking and scholarship.

PHYSICAL EXAMINATIONS AND PROPHYLACTIC
INOCULATION

Registration in the Medical School in particular quarters is not complete until the student has undergone certain physical examinations, tests, and vaccinations. See bulletin boards for rules on this subject.

CLINICAL OPPORTUNITIES

THE UNIVERSITY HOSPITAL AND DISPENSARY

The University Hospital includes the Elliot Memorial Building, the Cancer Institute, and the Todd Memorial Hospital, and has a capacity of 300 beds.

During the year 1927-28 important additions will be made to the University Hospital. A children's pavilion erected from the Eustis bequest, an outpatient or dispensary building, and a students' health building will be constructed at a total cost of \$900,000. About one hundred beds will be added.

AFFILIATED HOSPITALS

The Minneapolis General Hospital and the Ancker Hospital of St. Paul are closely affiliated with the Medical School. One half of their clinical service is under the direction of the faculty. The combined resources of these two hospitals total some 1,400 beds.

The State Hospital for Crippled and Deformed of over 200 beds at Phalen Park, St. Paul, and the Hennepin County Tuberculosis Sanatorium at Glen Lake, an institution of over 400 beds, are used for clinical instruction.

The Wilder Dispensary, St. Paul, is used regularly for required and elective section clinics.

Certain elective section clinics are held in other institutions, as Pillsbury House, Margaret Barry House, Wells Memorial House, Emanuel Cohen Community Center, the South Town Clinic, and the Salvation Army Rescue Home.

MILITARY SCIENCE AND TACTICS

There is a Medical Reserve Officers' Training Corps in connection with the Medical School to which the Army Medical Corps details an officer to serve as professor. See the departmental statement of this department.

THE GRADUATE SCHOOL IN MEDICINE

The Graduate School includes the opportunities for study and research offered by the Mayo Foundation for Medical Education and Research, at Rochester, Minnesota, as well as those of the Medical School at Minneapolis.

Further information may be found in the announcement of the Graduate School or in the circular of information on graduate work in medicine.

Fellowships in the pre-clinical sciences pay \$900 the first year, \$1200 the second year, and \$1500 the third year. A Bachelor's degree is prerequisite to these fellowships. In the clinical departments the stipends are \$800 the first year, \$900 the second year, and \$1,000 the third year. The M.D. degree and a year of internship are prerequisite to clinical fellowships. About 175 fellowships are available each year at Rochester and Minneapolis.

OTHER COURSES

The School of Nursing and courses in public health, including work for public health nurses, are conducted in the Medical School. Short courses for physicians and a course for embalmers are conducted by the Extension Division, in the Medical School. A course in medical technology is conducted jointly by the College of Science, Literature, and the Arts, and the Medical School. A course for dietitians is conducted in the University Hospital. Circulars descriptive of any of these courses will be sent on request.

CURRICULUM

THE CURRICULUM FOR THE M.B. DEGREE OPTIONAL COURSES OF STUDY

Candidates for the M.B. degree may:

- a. Pursue the regular curriculum outlined below, or
- b. Follow the regular curriculum with modifications in the direction of special work in some particular department. Such students may register, if desired, during certain quarters in the Graduate School; and such registration, if major work is done in a Medical School department, may be transferred later to the Medical School to count toward a medical degree. Such students may qualify for advanced degrees such as M.S. and Ph.D. See paragraph on irregular course students.

REGULAR CURRICULUM

DEPARTMENTAL HOURS

	Clock hours		Clock hours
Physical Chemistry	99	Medicine	873
Anatomy, gross and microscopic...	693	Surgery	440
Bacteriology	176	Obstetrics	233
Physiology, including Physiologic Chemistry	418	Pediatrics	238
Pathology	362	Ophthalmology and Oto-Laryngology	94
Preventive Medicine and Public Health	45	Roentgenology	11
Pharmacology	176	Extra departmental	22
		Elective	198
		Total	4,078

ARRANGEMENT OF COURSES

Department and Course	Third (Freshman) Year			Fourth (Sophomore) Year		
	1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	5th qtr.	6th qtr.
Anat. 5, 6, 7 (Dissection)....	15	15	..	..	..	..
Anat. 103 (Histology).....	15	..	..	..
Anat. 107 (Embryology).....	9	..	..	..
Chem. 143 (Physical Chem.)*	9	..	..	..	..	..
Physiol. 100-101 (Physiol. Chem.)	..	9	9	..	..	..
Bact. 51 (Gen. Bact.)*.....	..	9	..	..	..	..
Anat. 111 (Neurology).....	9	..	..
Physiol. 103-104 (Physiology)	12	8	..
Bact. 101 (Spec. Bact.).....	7	..	..
Path. 101-102 (Pathology)...	15	15
Pharm. 102-104 (Gen. & Exp. Pharm.)	2	9
Med. 20, 21 (Phys. Diag.)...	3	3
Surg. 20 (Bandaging).....	1	..	..
Ped. 20 (Ped. Diag.).....	1
Electives, optional
Total clock hours per week.	24	33	33	29	28	28

* Half the class takes physical chemistry in the winter and general bacteriology in the fall.

PLAN OF CLINICAL CURRICULUM: JUNIOR AND SENIOR YEARS

In order to utilize the clinical facilities of the school throughout the year the junior and senior classes are each divided into four divisions of not more than 32 students each, known as A, B, C, and D.

Division A will begin junior work in the summer quarter succeeding their sophomore year. They will attend six quarters consecutively and may be candidates for the M.B. degree at the December commencement.

Division B will begin junior studies in the fall quarter following their sophomore year, will attend six quarters consecutively, and may be candidates for the M.B. degree at the March commencement.

Divisions C and D will begin junior studies in the fall after the sophomore year. Division C will take a vacation in the next succeeding summer and Division D in the next succeeding fall quarter. Both these divisions may be candidates for the M.B. degree at the June commencement.

Students who have successfully completed the work of the first two years of the medical course are given a choice of these divisions in the order of their scholarship ranking, subject to the right of the Students' Work Committee, for sufficient reason, to place a given student in such division as will best foster his educational interests. A student may change from one division to another only on petition approved by the Students' Work Committee.

In the junior year all regular students take certain required courses and clinics. This program may be deviated from only by petition approved by the Students' Work Committee. In addition junior students will select one of the following options:

1. A year's work, six hours a week, in one of the Medical School departments. This option is intended to aid candidates for the M.S. and Ph.D. degrees and students who intend to specialize as medical teachers and investigators. Permission of the department of choice is required.

2. A year's work, six hours a week, in Public Health. This is for students who are interested in public health administration or who wish to emphasize the new health work in their practice or to engage in health teaching. The details of this option will be published later.

3. A sequence of electives, six hours a week, extending through the junior year by quarters. The available sequences will be posted for student choice before registration in each quarter.

4. A sequence of section clinics at the Ancker Hospital, St. Paul, and the Minneapolis General Hospital. This sequence will cover six hours a week. Schedules will be posted before registration.

In the senior year the course consists of clerkships and dispensary work, together with certain lectures. Students interested in investigative problems in medical science or in public health may by petition approved by the proper department head and the Students' Work Committee substitute such other work as may be agreed upon.

In the senior year each student will have a six weeks' clerkship in obstetrics and gynecology, a six weeks' clerkship in pediatrics, and either (a) a thirteen weeks' clerkship in medicine and an eleven weeks' clerkship in surgery, or (b) an eleven weeks' clerkship in medicine and a thirteen weeks' clerkship in surgery. The clerks on long clerkships are responsible for histories and physical examinations at the hospitals during vacation between quarters. See special schedule of clerkships.

The approximate order of studies for the respective divisions of the junior and senior classes is given in the preceding table.

IRREGULAR COURSE STUDENTS

While the course of studies in this school is arranged on the traditional four-year plan, it is believed by the faculty that a rigid class system is not desirable and that many students will find it wise to extend their medical education over a longer period. It is to be understood that the required courses set forth only the minimum fundamental information in the various branches of medical science and only the minimum of clinical experience with which a graduate may begin to practice. Attention is directed to the elective courses scheduled in the various departments and to the opportunities offered by the Graduate School. Able students are urged to undertake advanced work and research in some chosen field, to the end alike of advancing medical knowledge and of preparing themselves to fill teaching positions or to carry the investigative spirit into their medical practice. The dean and department heads will advise with such students on the progress of their studies, and will assist ambitious students to lay out a program suitable to their needs. Petitions for reasonable substitutions in the required curriculum will be approved.

REQUIREMENTS FOR THE B.S. DEGREE

a. Completion of the pre-medical college work in accordance with the requirements for admission to the Medical School.

b. Completion of the required courses in Anatomy, Bacteriology, Physiology, Pharmacology (except 105, 106, 108), and Pathology (except 109).

c. The gaining of not less than 90 honor points in pre-clinical courses, not less than 80 of which shall be in the required courses.

REQUIREMENTS FOR THE M.B. DEGREE

Good moral character; compliance with the admission requirements; the attainment of the degree of bachelor of arts or bachelor of science, to which one year in medicine for the Arts degree, and two years in medicine for the Science degree, may contribute; the completion of a full four-year period of work in the Medical School in compliance with the scholarship rules are the essentials for the bachelor of medicine degree.

CURRICULUM FOR THE M.D. DEGREE

Students who have attained the M.B. degree may qualify for the M.D. degree.

a. By completion of one year of internship in a hospital approved by the Internship Committee, or

b. By completion of one year's work of advanced character in an approved laboratory, or

c. By an approved year of advanced study or work in public health.

The degree M.D. *cum laude* is granted to a student who in addition to the above requirement presents an acceptable thesis and stands high in his studies.

COURSES FOR PHYSICIANS

Physicians who desire to attend medical lectures and clinics for a limited period of time may obtain a visitor's ticket from the dean. They may enter for regular lecture and clinical courses in the Medical School upon payment of the usual Medical School fees. They may arrange for special courses of study in anatomy, physiology, experimental surgery, cadaver surgery, pathology, bacteriology, pharmacology, etc., as the facilities of the department will permit.

LIBRARY

The medical library is among the best in this country. It is housed in the General Library Building.

GIFTS AND MEMORIALS

The Elliot Memorial Hospital was built through gifts of \$120,000 from the heirs of Dr. Adolphus F. Elliot and part state funds toward the building, and \$42,000 from various Minneapolis citizens for the site.

The George Chase Christian Memorial Cancer Institute was erected through a gift of \$250,000 from Mrs. Christian, through the Citizens' Aid Society of Minneapolis.

The Todd Memorial pavilion was erected in part by gifts from Mrs. F. C. Todd, Mrs. E. C. Gale, and Mrs. Emery Mapes and in part by state funds. This building is a memorial to Dr. Frank C. Todd, professor of ophthalmology and oto-laryngology in the Medical School, who died while in the army medical service in 1918.

The sum of \$1,500,000 has been donated to the Medical School by William Henry Eustis, of Minneapolis, for the erection and endowment of a hospital and convalescent home for disabled children. The hospital proper will be a part of the University Hospital group on the campus. The convalescent home will be built on a site donated by Mr. Eustis on the West River Drive.

The Medical School is in need of other facilities such as a nurses' dormitory, women's hospital, urologic hospital, psychopathic hospital, and endowment funds for research and the maintenance of hospital beds. These needs should appeal to philanthropic friends of medical education.

PRIZES

Certain prizes are granted for special work in the Medical School. See the bulletin of special information and the Medical School bulletin boards.

DESCRIPTION OF COURSES*

ANATOMY

Departmental Office, Institute of Anatomy

REQUIRED COURSES

- 1w. Anatomy for Embalmers. 55 hours. Dr. Erdmann and assistants.
- 2f,s. Elementary Anatomy. School of Nursing. 44 hours; 3 credits.†
Dr. Fisher.
- 3w. Elementary Anatomy. For dental nurses. 33 hours; 3 credits. Dr. Fisher.
- 4s. Human Anatomy. For students in physical education. 66 hours; 4 credits. Dr. Erdmann.
- 5f,su-6w,su. Gross Human Anatomy. Dissection, including osteology. Every student required to dissect lateral half of the body. Third year medical students. 330 hours; 18 credits. Dr. Jackson, Dr. Erdmann, Dr. Fowler, and assistants.
- 9f,su. Systematic Anatomy. Pre-junior dental students. 110 hours; 5 credits. Dr. Jackson, Dr. Miller, and assistants.
- 10w,su. Anatomy of the Head and Neck. Pre-major dental students. Prerequisites, Course 9; 110 hours; 5 credits. Dr. Miller and assistants.
- 14s,su. Histology and Embryology. Pre-junior dental students. Prerequisites: Courses 9-10; 143 hours; 8 credits. Dr. Lee, Dr. Rasmussen, and assistants.
- 103s,su. Human Histology. Microscopic study in the various tissues and organs. Third year medical students. Prerequisite: Course 5-6; 165 hours; 9 credits. Dr. Lee, Dr. Rasmussen, and assistants.
- 107s,su. Human Embryology. Development of the human body. Third year medical students. Prerequisite: Course 5-6. 99 hours; 6 credits. Dr. Scammon and assistants.
- 111f,su. Human Neurology. A study of the central nervous system and sense organs. Fourth year medical students. Prerequisites: Courses 103, 107. 99 hours; 6 credits. Dr. Rasmussen, Dr. Lee, and assistants.

ELECTIVE COURSES

- 43s. Applied Anatomy. Relationships, with reference to clinical applications. Medical students. Prerequisite: Course 5-6. 33 hours; 1½ credits. Dr. Erdmann.

* The letters f, w, s, and su indicate that the corresponding courses are offered in the fall, winter, spring, and summer quarters, respectively. Numbers joined by hyphens indicate that the course is continued through more than one quarter. Letters separated by commas indicate the repetition of the course in corresponding quarters.

† Credits, as stated in this bulletin, are on the quarter system; they are comparable with semester credits upon a ratio of three to two.

- 45f-46w.* Special Dissections. Dissections of special regions, including preparation of museum specimens. Prerequisite: Course 5-6. 33 hours; 1 credit. Dr. Erdmann.
- 115w. History of Anatomy. Lectures. 11 hours; 1 credit. Dr. Miller.
- 121f. Anatomical Technique. Microtechnique, reconstruction, and museum methods, etc. 66 hours; 3 credits. Dr. Lee.
- 126f,w. Advanced Histology. A study of special preparations, including practice in the identification of unknown specimens. Prerequisite: Course 103. 33 hours; 1 credit. Dr. Lee.
- 129f-130w-131s.* Topographic Anatomy. Based upon a study of serial cross sections of the human body. Prerequisite: Course 5-6. 33 hours (or more); 2 credits (or more). Dr. Jackson.
- 133f,su. Anatomy of the Fetus and Child. A survey of prenatal and post-natal development. Prerequisites: Courses 5-6, 107. 33 hours; 3 credits. Dr. Scammon.
- 134w. Anatomy of the New-Born. A detailed laboratory study of the anatomy of the new-born. Prerequisite: Course 133, or equivalent. 66 hours; 3 credits. Dr. Scammon.
- 135f,su. Physical Development of Childhood. Lectures, with study of illustrative material. Primarily for students in the College of Education. 22 hours; 2 credits. Dr. Scammon.
- 137f-138w-139s.* Implantation and Placentation. Fourth, fifth, or sixth year medical, or graduate students. Prerequisite: Course 107, or equivalent; 66 hours; 3 credits. Dr. Lee.
- 148f,w,s.* X-Ray Anatomy. Lectures and demonstrations. Prerequisite: Course 5-6; 11 hours; 1 credit. Dr. Rigler.
- 149w. Experimental Neurology. A study of the morphology of the central nervous system as determined by experimental methods. Prerequisite: Course 111. 66 hours; 3 credits. Dr. Rasmussen.
- 150f,w. Seminar in Neurology. Study of the literature on selected phases of human neurology. Prerequisite: Course 111. Hours and credits arranged. Dr. Rasmussen.
- 151s. Morphology and Significance of the Endocrine System. Gross and microscopic structure with functional relations of the endocrine organs. Prerequisite: Courses 103, 107. 66 hours; 3 credits. Dr. Rasmussen.
- 152f,w. Prosection. Preparation of special dissections to be used for demonstrations in human gross anatomy. Prerequisite: Course 5-6. Hours and credits arranged. Dr. Jackson, Dr. Miller.
- 153f-154w-155s-156su.* Advanced Anatomy. Advanced work, largely individual in character, in gross anatomy, histology, embryology, or neurology. Hours and credits arranged. Dr. Jackson, Dr. Lee, Dr. Rasmussen, Dr. Scammon, Dr. Miller.
- 157w. Developmental Anatomy of the Head. Prerequisites: Courses 103, 107. 66 hours; 3 credits. Dr. Scammon.

* These courses may be taken continuously through three or four quarters or in any one quarter.

- 160f-161w-163su.* Seminar in Human Growth. A study with graphic analysis of data on human physical development. Prerequisite: Course 135, or equivalent. Hours and credits arranged. Dr. Scammon.
- 201f-202w-203s-204su.* Research in Anatomy. Research work in gross or microscopic anatomy, neurology, histology, or embryology. Hours and credits arranged. Dr. Jackson, Dr. Lee, Dr. Rasmussen, Dr. Scammon.
- 205f-206w-207s.* Anatomical Seminar. Presentation and discussion of research work in progress in the department, together with reviews of current anatomical literature. 11 hours; 1 credit. Dr. Jackson.

BACTERIOLOGY AND IMMUNOLOGY

Departmental Office, Millard Hall

REQUIRED COURSES

- 1f,w,s. Elementary Bacteriology. For home economics and nursing students and others. 66 hours; 4 credits. Mrs. Green.
- 51su,f,w,s. General Bacteriology. Culture media; methods of staining and identification; principles of sterilization and disinfection; examination of air, water, milk; relation of bacteriology to the industries. Prerequisites: 10 credits in chemistry and 10 credits in biology. 99 hours; 5 credits. For medical students, fall, TTh VI, VII, VIII, IX; winter, MWF I, II, III; for dentists, fall, MWF I, II, III; for Agriculture and Home Economics, fall, winter, spring, MWF VI, VII, VIII. Dr. Henrici, Dr. Green, Mrs. Green, Mr. Halvorson.
- 52s. Special Bacteriology for Dental Students. Prerequisite: general bacteriology. 44 hours; 3 credits. Dr. Green and assistants.
- 101f,su. Special Bacteriology. The pathogenic bacteria, especially in relation to definite diseases; principles of infection and immunity. Fourth year medical students and others. Prerequisite: general bacteriology. 77 hours; 4 credits. TThS I, II. Dr. Larson and assistants.

ELECTIVE COURSES

- 103w. 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. 5 credits. MWF I, II, III. Dr. Skinner.
- 114s. The Higher Bacteria. Study of morphology, cultivation, and classification of actinomycetes, yeasts, and molds. Prerequisites: general and special bacteriology. 66 hours; 3 credits. Dr. Henrici.
- 116w. Immunity. Laws of hemolysis. Quantitative relationship between antigen and antibody. Wasserman reaction. Opsonins. Vaccines. Precipitin reactions. Blood grouping. Abderhalden reaction. Anaphylaxis. 66 hours; 3 credits. Dr. Larson.

* These courses may be taken continuously through three or four quarters or in any one quarter.

- 117s. Pathogenic Protozoa. Study of parasitic Protozoa of man, including spirochaets; their morphology and life-history; cultural methods. Prerequisites: general and special bacteriology; Animal Biology 144-145-146. 66 hours; 3 credits. Dr. Larson.
- 118w. Morphology and Taxonomy of Bacteria. Cytology of bacteria; consideration of morphological, biochemical, and immunological characters as data for classification. Prerequisites: general and special bacteriology. 66 hours; 3 credits. Dr. Henrici.
- 119w. Bacteriological Chemistry. Microphysics of bacteria. Inorganic and organic constituents. Permeability of cells. Metabolism of bacteria. Enzymes of micro-organisms. Pigments. Prerequisites: general and special bacteriology; physiologic or phytochemistry. 66 hours; 4 credits. Dr. Green and assistant.
- 120s. Continuation of 119f. Bacteriolysants. Protein poisons. Bacterial toxins. Phagocytosis, application of quantitative laws to disinfection, hemolysis, and immune reactions. Cataphoresis. Stability of bacterial suspensions. Protein chemistry of immune reactions. 4 credits.
- 121w. Industrial Bacteriology. A study of the bacteriology of water, milk, canned fruits, vegetables, and meat products. Lecture and lab. 3 credits; TTh I-II. Mr. Halvorson.
- 122s. Industrial Bacteriology (cont.) The bacteriology of fermentation industries, manufacture of alcohol, butyl alcohol, acetone, lactic and acetic acids. Bacteriology of tanning, flax retting, sugar industries. Lecture and lab. 3 credits; TTh I-II. Mr. Halvorson.
- 150f-151w or 150w-151s. Advanced Bacteriology. Opportunity of working out special problems. Prerequisites: general and special bacteriology. Limited to ten students. Arrange credits. Dr. Larson, Dr. Henrici, Dr. Green, Mr. Halvorson, Dr. Skinner.
201. Research in Bacteriology. Graduate students of the necessary preliminary training may elect research, either as majors or minors, in bacteriology. Hours and credits arranged. Dr. Larson, Dr. Henrici, Mr. Halvorson, Dr. Skinner.
- 203f,w,s. Seminar in Bacteriology. 1 credit. Staff.

PATHOLOGY

Departmental Office, 110, Institute of Anatomy

REQUIRED COURSES

- 4f. Pathology for Students in Dentistry. 165 hours; 9 credits. Dr. Clawson, Dr. Guttman, Dr. Lufkin, Dr. McGregor.
- 101w. Pathology. Part I. The general principles governing pathologic changes. Fourth year medical students. Prerequisites: histology, embryology, and special bacteriology. 165 hours; 9 credits. Dr. Bell, Dr. Clawson, Dr. McCartney, Dr. Guttman, Dr. Lufkin, Dr. MacGregor.

- 102s. Pathology. Part II. The pathologic processes of infectious diseases; the special pathology of organs, systems of organs, and tissues of the body. Fourth year medical students. Prerequisites: Pathology, Part I. 165 hours; 9 credits. Dr. Bell, Dr. Clawson, Dr. McCartney, Dr. Guttman, Dr. Lufkin, Dr. McGregor.
- 109su,f,w,s. Clinical Pathological Conference. Presentation of clinical data and pathologic specimens from selected cases with discussion of diagnosis. 11 hours in each quarter. Required in two quarters, senior year. Elective for others. Dr. Bell.

ELECTIVE COURSES

- 104su,f,w,s. Autopsies. Fifth and sixth year medical students. Staff.
- 106f,w,s. Pathologic Technique. Methods of preparation of microscopic and gross specimens; practice with freezing microtome, embedding methods, stains, museum specimens, etc. Hours and credits arranged.
- 108f,w. Diagnosis of Tumors. Prerequisite: Pathology 102. 44 hours each quarter; 2 credits. One period clinical demonstrations; one period laboratory work. TTh, 3:00-5:00. Dr. Bell, Dr. McCartney, Dr. Campbell.
110. Histopathology of Skin. Dr. H. E. Michelson.
111. Neuropathology. Dr. J. C. McKinley.
112. Pathology of the Eye, Ear, Nose, and Throat. Dr. Camp.
- 116s,su. Tumor Clinic. 22 hours. Dr. Bell, Dr. Campbell.
201. Research. Graduate students, of the necessary preliminary training, may elect research, either as major or minor in pathology. Hours and credits arranged.

PHARMACOLOGY

Departmental Office, Millard Hall

REQUIRED COURSES

- 1w,su. Elementary Pharmacology. A brief study of drugs for nurses and others. 33 hours; 3 credits. Mr. Wright.
- 2s. Therapeutics and Toxicology for Students in Pharmacy. 33 hours; 3 credits. Dr. Brown.
- 4w. Dental Pharmacology. 44 hours; 4 credits. Dr. Brown, Dr. Bieter.
- 6w. Experimental Pharmacology. For dental students. 22 hours; 1 credit. Dr. Brown, Dr. Bieter.
- 101w. Introduction to Pharmacology. Pharmaceutical preparations; dosage; principles of prescription writing; relation of chemical structure to the action of drugs. Fourth year medical students. 22 hours; 2 credits. Dr. Hirschfelder, Dr. Brown.
- 102s. General and Experimental Pharmacology. Part I. A detailed study of drugs important in medical practice. Exercises illustrating the preparation and actions of medicines. Fourth year medical students. Lect. 33 hours, lab. 66 hours; 6 credits. Dr. Hirschfelder, Dr. Brown, Dr. Bieter, Mr. Wright.

- 105su,w. General Pharmacology. Part II. Same as Course 102 in continuation. Fifth year medical students. 22 hours; 2 credits. Dr. Hirschfelder, Dr. Brown.
- 106f. General Pharmacology. Part II. Same as Course 102 in continuation. Fifth year medical students. 22 hours; 2 credits. Dr. Hirschfelder, Dr. Brown.
- 108su,f. Prescription Writing. The principles of prescription writing. Fifth year. 11 hours; 1 credit. Dr. Brown.

ELECTIVE COURSES

- 109f,w,su. Pharmacological Problems. Experimental study of special topics in pharmacology, with a review of the literature. Hours and credits arranged. Dr. Hirschfelder, Dr. Brown, Dr. Bieter.
- 110f,su. Detection of Poisons. Hours and credits arranged. Dr. Brown.
- 201f,w,s. Seminar in Physiology and Pharmacology. Reviews of recent literature. 11 hours; 1 credit. Staff.
- 203su,f,w,s. Research in Pharmacology. Open to graduate and advanced students. Hours and credits arranged. Dr. Hirschfelder, Dr. Brown.
- 204w.* Advanced Pharmacology. Collateral reading and discussion of the relation of chemical structure to pharmacological action. Limited to 4 graduate students. 11 hours; 1 credit. Hours and registration arranged. Dr. Hirschfelder, Dr. Brown.
- 205w.* General Discussions in Pharmacology. With collateral readings. Limited to 6 advanced students. 11 hours; 1 credit. Time to be arranged. Dr. Hirschfelder, Dr. Brown.
- See Med. 50 for Therapeutic Conference. Dr. Berglund, Dr. Hirschfelder.

PHYSIOLOGY

Departmental Office, Millard Hall

REQUIRED COURSES

- 1f,s. Physiologic Chemistry and Physiology for Nurses. 132 hours; 7 credits. Dr. Greisheimer and others.
- 4w,s,su. Human Physiology. For academic and home economics students. 5 credits; lect., rec., and dem. MTWFS IV; lab. Th I, II, III. Dr. Greisheimer or Dr. Loucks, and assistants.
- 5w,s,su. Human Physiology. Same as Course 4 without laboratory work. Pharmacy students. 4 credits.
- 57f,su.† Physiologic Chemistry. For academic, dentistry, physical education students, and others. 66 hours; 4 credits; lect. TThS I; lab. A, T II, III, IV; lab. B, W VI, VII, VIII, and others. Dr. Pettibone and assistants.

* Permission required.

† Courses 57, 58-59 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, nor for both 4 and 58-59.

- 58w,su-59s,su.† Human Physiology. For academic, dental, and physical education students, and others. 66 hours; 4 credits each quarter. Program same as 57. Dr. Lyon, Dr. King, Dr. Loucks, and assistants.
- 100su,w-101su,s. Physiologic Chemistry. Mineral, carbohydrate, fat, and protein metabolism in health and disease. Third year medical students and others. Prerequisite: organic chemistry and physics. 99 hours; 6 credits each quarter; lect. MWF IV; lab. A. TTh I, II, III, lab. B, FS I, II, III. Dr. McClendon, Dr. Pettibone, Dr. Gregory, and assistants.
- 103su,f. Physiology of Cells, Muscle, Nerve, Blood, Circulation, Respiration, Digestion. Fourth year medical students and others. Prerequisites: organic chemistry and animal biology. 132 hours; 8 credits; Lect. and rec. MF IV, MTWF VI; lab. A, MW VII, VIII, IX, lab. B, W II, III, IV, F I, II, III. Dr. Scott, Dr. Lyon, Dr. Greisheimer, Dr. King, Dr. Loucks, and assistants.
- 104w,su. Physiology of the Nervous System and Special Senses, Metabolism, Nutrition, and Excretion. Fourth year medical students and others. Prerequisite: Course 103, or organic chemistry and neurology. 88 hours; 7 credits; lect. MWFS IV; lab. A, M VI, VII, VIII, lab. B, F VI, VII, VIII. Dr. Scott, Dr. Lyon, Dr. Greisheimer, and assistants.
- 105f. Roentgen Rays, Light, and Radium. The physical and physiological basis of physical therapy. Fifth year medical students. 11 hours; 1 credit. Dr. Stenstrom.

ELECTIVE COURSES

- 108f. Seminar in Physiologic Optics. For graduate and medical students. Prerequisite: Courses 104 or equivalent. 18 hours; 1½ credits. Dr. Lyon.
- 109w. Seminar in Physiology of the Senses. For graduate and medical students. Prerequisite: Course 104 or equivalent. 18 hours; 1½ credits. Dr. Lyon.
- 113su,f,w,s. 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. Prerequisites: Courses 103, 104, or equivalent. 66 hours; 3 credits each quarter or arranged. Dr. Scott, Dr. Greisheimer, Dr. King, Dr. Loucks.
- 114w-115s. Applied Physiology. The application of physiology to the interpretation of symptoms and signs of abnormal function. Prerequisite: Courses 103, 104, or equivalent. 3 credits each quarter. Dr. Greisheimer.
- 131w. Advanced Physiology of Muscle, Blood, Circulation, and Digestion. Alterations due to physiologic conditions. Conference and laboratory work. Prerequisite: Physiology 103. 66 hours; 3 credits. Dr. Scott.

† Courses 57, 58-59 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, nor for both 4 and 58-59.

- 135f,w,s. Conference on Physiology, with qualified students. 11 hours; 1 credit. Dr. Scott.
- 153f,w,s,su. Problems in Physiologic Chemistry. Special work arranged by instructors with qualified students. May be taken one or more quarters. Prerequisite: Course 100-101. Hours and credits arranged. Dr. McClendon, Dr. Pettibone, Dr. Gregory.
- 155f,156w,157s. Pathological Chemistry. Blood chemistry of diabetes and nephritis. Basal metabolism, deficiency diseases. Prerequisite: Course 100-101. 66 hours, 3 credits each quarter. Dr. McClendon, Dr. Gregory (with co-operation of Dr. Fahr).
- 163w. Metabolism. Lectures and laboratory work on special phases of metabolism. Prerequisite: Physiology 101. Lectures may be taken alone; number of students unlimited. 22 hours; 2 credits. Laboratory course limited to ten students. 33 hours; 1 credit. Dr. Pettibone.
- 201f,w,s. Seminar in Physiology and Pharmacology. For instructors and advanced students. 11 hours; 1 credit. Dr. Scott, Dr. Hirschfelder, and staff.
- 202f,w,s,su. Advanced Experimental Physiology. Prerequisites: Physiology 103 and 104. Hours and credits arranged. Dr. Scott.
- 203f,w,s,su. Research in Physiology. Hours and credits arranged. Dr. Scott, Dr. Lyon, Dr. Greisheimer, Dr. King.
- 204f,w,s,su. Research in the Physics and Physiology of Radiation. Hours and credits arranged. Dr. Stenstrom.
- For electives in the practical aspects of radiology and allied subjects offered by Dr. Stenstrom, see Hospital Department.
- 205f,w,s,su. Research in Physiologic Chemistry. Hours and credits arranged. Dr. McClendon, Dr. Pettibone, Dr. Gregory.
- 206s. Seminar in History of Physiology and Related Sciences. 11 hours; 1 credit. Dr. Lyon.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

REQUIRED COURSES

- 2w. First Aid. (See bulletin of Physical Education.)
- 3f,w,s. Personal Hygiene and Elementary Sanitation. (See Science, Literature, and the Arts bulletin.)
- 5f. Elementary Preventive Medicine for Nurses. (See Nursing bulletin.)
- 12s. Hygiene and First Aid to the Sick and Injured. (See Engineering bulletin.)
- 52f,w,s. Health Care of the Family. (See Home Economics bulletin.)
- 53f,su. Elements of Preventive Medicine. (See Public Health bulletin.)
- 58w,su. Maternal and Child Hygiene. (See Public Health bulletin.)
- 59w. Social Hygiene. (See Public Health bulletin.)
- 60w. The Tuberculosis Problem. (See Public Health bulletin.)
- 61w. Mental Hygiene. (See Public Health bulletin.)
- 62f,su. Principles of Public Health Nursing. (See Public Health bulletin.)
- 63w. Special Fields in Public Health Nursing. (See Public Health bulletin.)

- 64f,w,s,su. Field Practice in Infant Welfare Nursing. (See Public Health bulletin.)
- 65f,w,s,su. Field Practice in School Nursing. (See Public Health bulletin.)
- 66f,w,s,su. Field Practice in County Nursing. (See Public Health bulletin.)
- 67f,w,s,su. Field Practice in a Tuberculosis Sanatorium. (See Public Health bulletin.)
- 68f,w,s,su. Field Practice in Visiting Nursing. (See Public Health bulletin.)
- 70f,w,su. Home Nursing and Child Care. (See Public Health bulletin.)
- 100f. Preventive Medicine and General Hygiene. Personal and public factors which favor occurrence of disease among individuals and communities; modes of transmission and importance of environment in the spread of disease. Physicians' responsibilities in health work. Medical students. 33 hours; 3 credits. Dr. Diehl, Dr. Myers, Dr. Lees.
- 101f,w,s,su. Public Health Administrative and Field Work. Demonstrations of health agencies at work; boards of health, laboratories, filtration, pasteurization, and garbage disposal plants. Presentation of actual health problems. Groups of 10 to 15 medical students for 6 weeks. Prerequisite: 55. 12 hours; 1 credit. Staff.

ELECTIVE COURSES

- 4s. Increasing the Span of Human Life. (See Science, Literature, and the Arts bulletin.)
- 50f,w,su. Public and Personal Health. (See Science, Literature, and the Arts bulletin.)
- 73w. Occupational Hygiene and Disease. (See Science, Literature, and the Arts bulletin.)
- 80w,su. Child Health and Educational Hygiene. (See Education bulletin.)
- 102w. Sanitation. (See Public Health bulletin.)
- 103s. Public Health Bacteriology. (See Public Health bulletin.)
- 104f,w,s,su. Epidemiology. (See Public Health bulletin.)
- 106f,w,s. Public Health Administration. (See Public Health bulletin.)
- 107s. Sanitary Surveys. For medical students. Conferences, practical field work, and report on a specified survey. Of particular value to practitioners who may be called upon to serve as local health officers. Prerequisite: 53 or 100. 48 hours; 2 credits. Dr. Diehl.
200. Research. (See Public Health bulletin.)

MEDICINE

REQUIRED COURSES

1. Courses for Nurses. (See Nursing School bulletin.)
19. Clinical Medicine for Dentists. (See Dental College bulletin.)
- 20w,21s. Introductory Physical Diagnosis. Lectures and practical work on the examination of the normal body. This is followed during the second quarter by lectures on the pathological variations and signs combined with assignment of the students to hospital wards for the examination of selected cases. Fourth year, winter and spring quarters. 66 hours. Dr. Berglund, Dr. Fahr, Dr. Myers, and others.

- 22f,w,s. Divisional Dispensary Clinics. Conducted in the University Dispensary. Fifth year. 22 hours; MWF 2:00-2:50. Each section attending two clinics a week; total per student, 66 hours. Dispensary staff.
- 23su,w,24f,s. Systematic studies in the field of internal medicine exclusive of neurology, guided and supervised by tutors. Osler's *Practice of Medicine* is the textbook. Other literature is assigned. Prerequisite: Med. 20, 21. Fifth year. 66 hours. Dr. Gardner, Dr. Beard, Dr. Lepak, Dr. Nathanson, Dr. Oerting, Dr. Peppard, Dr. Reuben Johnson, Dr. Lindquist.
- 25su,f,w. Physical Diagnosis and Case Taking. Individual work, a junior and a senior work together; histories, physical examinations, and provisional diagnoses on assigned dispensary patients under supervision of instructors. In sections at University and Wilder dispensaries. Fifth year. 66 hours.
- 26su,s. Clinical Chemistry and Microscopy. Methods of laboratory examination for diagnostic purposes. Prerequisites: pathology, physiologic chemistry. Fifth year. 66 hours. Dr. Berglund, Dr. Downey, Dr. Medes.
- 27su,f,w,s. Physical Diagnosis and Therapy. Conducted with sections in the following dispensary clinics: (1) general medicine; (2) heart clinic; (3) chest clinic; (4) metabolism; (5) gastro-intestinal clinic; (6) dermatology and syphilis. Includes Course 47. Sixth year. 110 hours per student.
- 29su,f,w,s. Class Clinic in Medicine. Conducted in the University Hospital. Fifth year. 11 hours each quarter; 33 hours total. Hospital staff. T 11:00-11:50. Dr. White and others.
- 30su,f,w,s. Class Clinic in Medicine. University Hospital. Sixth year. 22 hours per quarter; total per student, 66 hours. TTh 8:00-8:50. Hospital staff.
- 31s. Mouth Infections. The typical infections of the oral cavity and their causal relations to disease. 7 hours. Dr. Hartzell.
- 32s. Medical Jurisprudence. Principles of law, rules of evidence, and duties of physicians in medico-legal cases. 15 hours. Dr. Sweeney.
- 33su,f,w,s. Clinical Clerkship in Medicine. Individual work in the medical wards of the University Hospital, taking and recording of case histories, making of physical examinations and of provisional diagnoses. Clerks are held responsible for history and course of disease as well as a detailed knowledge of the treatment given to patients assigned them. The entire forenoon during week days. Portions of the class will be assigned for three weeks in Division of Nervous and Mental Diseases, under Dr. McKinley (same as Course 44). Three weeks are spent in resident clerkship at the Glen Lake Sanatorium. Sixth year. 275 hours. Dr. Berglund, Dr. Ulrich, and staff.
- 33x^ssu,f,w,s. Same as 33 at the Minneapolis General Hospital. Dr. Fahr, Dr. Peppard, and staff.

ELECTIVE COURSES

51. Clinics in Medicine. Bedside studies at Ancker Hospital, St. Paul. Not less than 3 nor more than 16 students. Dr. Hall, Dr. Lepak, Dr. Oerting, Dr. Drake, Dr. Herrmann.
53. Advanced Physical Diagnosis. Minneapolis General Hospital. Not less than 3 nor more than 6 students. Dr. Peppard.
54. Graphic Recording and Functional Diagnosis of Cardiovascular Diseases. A study of the use of the polygraph and electrocardiograph. Not less than 3 nor more than 6 students. Dr. O. S. Hansen, Dr. Ziskin.
56. Clinical Studies in Metabolism. Limited to 6 students. Dr. McKinlay.
57. Advanced Physical Diagnosis of the Chest. Practical dispensary work on tuberculous patients. Not less than 3 nor more than 6 students. Dr. Weisman.
- 58s. Diagnosis and Treatment of Diseases of the Lungs. Three lectures per week. Two periods per week (hospital wards and dispensary) devoted to physical and X-ray examinations and application of modern therapeutic measures. Lectures taken with or without hospital work. Sophomores, juniors, and seniors. Hours and credits arranged. Dr. Myers.
59. Physical Signs in Pulmonary Tuberculosis. Tuberculosis Pavilion, Ancker Hospital, St. Paul. 4 to 6 students. Dr. Geer.
102. The Respiratory Organs in Health and Disease. Designed for students desiring training in preparation of scientific and clinical papers for publication. Each student selects a problem pertaining to some part of the respiratory tract, which he pursues independently or in collaboration with instructor. One or more quarters. Limited to 6 students. Dr. Myers.
103. Chemical Problems of Disease. For specially prepared students. Sophomores, juniors, or seniors. Hours, problems, and credits arranged. Dr. Berglund.

DIVISION OF NERVOUS AND MENTAL DISEASES

REQUIRED COURSES

- 40w. Neurology and Neurologic Diagnosis. Lectures on methods of examination and the diseases of the nervous system. Fifth year. 33 hours. Dr. Hamilton, Dr. Hammes, Dr. McKinley, Dr. Morrison.
- 41f,s. Psychiatry. Methods of modern psychiatry; lectures on the various mental disorders. Fifth or sixth year. 22 hours. Dr. Hamilton.
- 42su,f,w,s. Clinical Neurology and Psychiatry. Section clinics in nervous and mental diseases at the Ancker Hospital, St. Paul. A part of course in required clinics. Fifth year. 17 hours. Dr. Hammes, Dr. Hengstler, Dr. Whitmore, Dr. Kamman, Dr. Ruhberg.
- 42x. Same as 42, at the Minneapolis General Hospital. Dr. Morrison and others.
- 44su,f,w,s. Physical Diagnosis and Case Taking. Sections of the class in neurology in the University Hospital. Part of Course 33. Dr. Hamilton, Dr. McKinley, and staff.

ELECTIVE COURSES

81. Syphilitic Nervous Affections. Referring particularly to dementia paralytic and tabes dorsalis. Limited to six students. Dr. Hammes.
85. Externship in Nervous and Mental Diseases. University Hospital. Prerequisite: Medicine 33. Arranged. Dr. Hamilton and staff.
123. Pathology of the Nervous System. The anatomy and pathology of the nervous system and their correlation with clinical signs and symptoms. Not less than 5 students. Same as Pathology 111. Carry soph. honor point credit. Dr. McKinley.
124. Advanced Neuropathology. Individual gross and microscopic studies on existing preparations in neuropathology. Limited to two students. Prerequisite: Pathology 101 and 102. Dr. McKinley.
125. Problems in Neuropathology. The student will be assigned a topic for special study. Limited to 2 students. Prerequisite: Pathology 102. Dr. McKinley.
126. Clinical Assistantship, in nervous and mental diseases in the Out-Patient Department. Sixth year. Open to two students. Dr. McKinley, Dr. Michael.

DIVISION OF DERMATOLOGY

REQUIRED COURSES

- 46w. Course in Dermatology. Clinical lectures upon the common skin diseases and syphilis, including diagnosis and treatment. Fifth year. 33 hours. Dr. Michaelson.
- 47su,f,w,s. Physical Diagnosis and Therapy. Section of the class in dermatology and syphilis, in the Dispensary at the University and at the Minneapolis General Hospital; part of Course 27. Dr. Michelson, Dr. Irvine, Dr. Boreen, Dr. Gager, Dr. Turnacliff.

ELECTIVE COURSES

91. Night Clinics in Dermatology and Syphilis in the Out-Patient Department. Open to six students in clerkship division in each quarter. Dr. Turnacliff.
92. Ward Clinics in Dermatology. Conducted in City and County Hospital, St. Paul. Limited to six students. Dr. Freeman, Dr. Gager.
150. Histopathology of the Skin. Clinical and pathologic phases will be exemplified. Prerequisite: Pathology 102. Same as Pathology 110. Dr. Michelson, Dr. Gager.
151. Assistantship in Dermatology, in the Out-Patient Department. Open to two students in each quarter. Dr. Irvine, Dr. Boreen, Dr. Gager, Dr. Turnacliff.
152. Assistantship in Dermatology, in the Out-Patient Department, General Hospital. Open to two students in each quarter. Dr. Sweitzer.
153. Seminar in Dermatology. Hours to be arranged. Dr. Michelson and others.

OBSTETRICS AND GYNECOLOGY

Departmental Office, Institute of Anatomy

REQUIRED COURSES

1. Obstetric Nursing. See Nursing School bulletin. Dr. Litzenberg and others.
2. Gynecologic Nursing. See Nursing School bulletin. Dr. Litzenberg and others.
- 20f. Obstetrics. The physiology of pregnancy, labor, and the puerperium. Fifth year medical students. 33 hours. Dr. Litzenberg and others.
- 21f. Obstetrics. The pathology of pregnancy, labor, and the puerperium. Prerequisite: Course 20. Fifth year medical students. 33 hours. Dr. Litzenberg and others.
- 22su,s. Operative Obstetrics. A study of operative obstetrics. Prerequisites: Courses 20 and 21. 11 hours. Dr. LaVake, Dr. Swanson, Dr. Solhaug.
- 23su,f. Gynecology. A study of diagnostic methods in diseases of women. Fifth year medical students. 11 hours. Dr. Litzenberg, Dr. Barry.
- 24w. Gynecology. A study of diseases of women. Prerequisite: Course 23. 22 hours. Dr. Litzenberg, Dr. Barry.
- 25su,f,w,s. Obstetrics and Gynecology Clinic. The pathology of pregnancy, labor, and the puerperium, and of diseases of women. Prerequisites: Courses 20, 21, 22, 23, 24. Required of seniors during two quarters; elective for others. 44 hours. Dr. Litzenberg and staff.
- 26su,f,w,s. Clinical Clerkship in Obstetrics and Gynecology. Study of assigned patients in University Hospital and out-patient service in "The District" and Salvation Army Home; case histories; physical examinations, laboratory examinations; parturition clinics; operations; manikin demonstrations and bedside clinics. 75 hours. Dr. Litzenberg and staff.
- 26xsu,f,w,s. Part of 26 at Minneapolis General Hospital. Dr. Adair and staff.
- 27su,f,w,s. Clinics in Obstetrics and Gynecology. University Dispensary. Part of required section clinics, clerkship period. 25 hours. Dr. LaVake and staff.
- 29su,f,w,s. Clinic in Obstetrics and Gynecology. Minneapolis General Hospital Dispensary. Sixth year, 12 hours. Dr. LaVake. Dr. Maland, Dr. Simons.

ELECTIVE COURSES*

50. Gynecologic Clinic. Diagnosis and treatment of diseases of women. Wilder Dispensary, St. Paul. Four students. Dr. Barry, Dr. Bicek, Dr. Hartley, Dr. Rumpf.
51. Gynecologic Clinic. Diagnostic and operative clinic in diseases of women. Ancker Hospital, St. Paul. Dr. Barry, Dr. Hammond.

* Elective courses in this department are usually repeated each quarter. See quarterly programs for hours and credits.

52. Obstetric Clinic. The diagnosis and treatment of obstetric conditions. Ancker Hospital, St. Paul. Dr. Barry, Dr. Schulze, Dr. Hartley.
53. Clinic in Obstetrics and Gynecology. Minneapolis General Hospital. Dr. Adair, Dr. LaVake, Dr. Maland, Dr. Simons.
54. Applied Anatomy of the Pelvis. The anatomy of the female generative organs using anatomical specimens, models, and the patient for demonstration. University Dispensary. Dr. LaVake.
55. Prenatal Clinics. Antepartum care of pregnant women at the various prenatal stations; limited to one student at each station. Dr. Maland, Dr. Simons, and others.
56. Pathologic Obstetrics. Minneapolis General Hospital. Demonstration of abnormal obstetric cases and operative procedure. One clinic each week. Limited to six senior students. Dr. Adair and staff.
57. Operative Gynecology. Demonstrations of gynecological operations and postoperative treatment. Limited to six senior students. Dr. Adair.
201. Advanced Obstetrics and Gynecology. Required of first year fellows. Dr. Litzenberg, Dr. Adair, and associates.
202. More advanced subjects. Required of second year fellows. Dr. Litzenberg, Dr. Adair, and associates.
203. Still more advanced. Third year fellows. Dr. Litzenberg, Dr. Adair, and associates.
204. Seminar. A weekly conference for fellows and graduate students. Dr. Litzenberg.
205. Research. Clinical and laboratory research upon problems in obstetrics and gynecology. Required of third year fellows, who must complete a satisfactory thesis during the year. Staff.

OPHTHALMOLOGY AND OTO-LARYNGOLOGY

Departmental Office, 138 Millard Hall

REQUIRED COURSES

- 20w. Ophthalmology. Lectures and demonstrations. Fifth year. 18 hours. Dr. Burch.
- 21w,s. Laryngology and Rhinology. Lectures and demonstrations. Fifth year. 15 hours. Dr. F. J. Pratt, Dr. Phelps.
- 22s. Otology. Lectures and demonstrations. Fifth year. 11 hours. Dr. Newhart.
- 23su,f,w,s. Clinic in Diseases of the Eye. Diagnosis and treatment of cases, University Dispensary, part of required section clinics, clerkship period. 25 hours. Dr. Clark, Dr. Macnie, Dr. Strout, Dr. Camp.
- 24su,f,w,s. Clinic in Diseases of the Ear, Nose, and Throat. Diagnosis and treatment, University Dispensary; part of required section clinics, clerkship period, 25 hours. Dr. Newhart, Dr. Phelps, Dr. F. J. Pratt, Dr. J. A. Pratt, Dr. Hanson, and assistants.

ELECTIVE COURSES*

50. Clinic in Diseases of the Eye. The examination of patients, diagnosis, and supervised treatment. Credit 50 hours. MWF or TThS 1:00-2:30. University Dispensary. Dr. Camp, Dr. Clark, Dr. Macnie, Dr. Strout, and assistants.
51. Clinic in Diseases of the Ear, Nose, and Throat. The examination of patients, diagnosis, and supervised treatment. Credit 50 hours. MWF or TThS 1:00-2:30. University Dispensary. Dr. Newhart, Dr. Phelps, Dr. F. J. Pratt, Dr. J. A. Pratt, Dr. Hanson, and assistants.
52. Clinic in Diseases of the Eye. TThS 1:00-2:30. Wilder Dispensary, St. Paul. Credit 50 hours. Dr. Fulton, Dr. Grant.
53. Clinic in Diseases of the Ear, Nose, and Throat. TThS 1:00-2:30. Wilder Dispensary, St. Paul. Credit 50 hours. Dr. Connor.
54. Didactic and Practical Instruction in Refraction. MTThF 8:00-9:30. Credit arranged. University Dispensary. Dr. Lewis, Dr. Fink.
121. Operative Clinics in Eye, Ear, Nose, and Throat. University Hospital. Limited to ten students. TF, 3:00-4:30. Credit 17 hours. Dr. Burch, Dr. Newhart, Dr. Camp, Dr. Clark, Dr. Macnie, Dr. Strout.

PEDIATRICS

Departmental Office, Millard Hall

REQUIRED COURSES

- 20s. Physical Diagnosis in Children. Special diagnostic methods applied to pediatrics. Conducted in sections of fourth year class. 11 hours. Dr. Swanson.
- 21w-22s. Diseases of Children. Diseases peculiar to, or distinctive of, children. Fifth year. 55 hours. Dr. Schlutz and others.
- 24xf,w,s,su. Same as 24. Ancker Hospital, St. Paul. Dr. A. Stewart, Dr. General Hospital. Sections of one division each quarter. Fifth year. 17 hours. Dr. Platou.
- 24xf,w,s,su. Same as 24. Ancker Hospital, St. Paul. Dr. A. Stewart, Dr. Colby, Dr. Critchfield, Dr. Hedenstrom.
- 26f,w,s,su. Out-Patient Pediatric Clinic. Practical study of the diseases of children. University Dispensary. Sections of senior class, 50 hours. Dr. C. A. Stewart and others.
- 26xf,w,s,su. Part of 26. Minneapolis General Hospital. Dr. Siperstein and others.
- 27f,w,s,su. Clinical Clerkship in Pediatrics. The observation and study of patients in the University Hospital; case histories; physical examinations and provisional diagnoses; treatment. One division of senior class each quarter. Each student 6 weeks. 65 hours. Dr. Schlutz, Dr. Swanson, and staff.

* Usually repeated each quarter.

- 27x f, w, s, su. Part of 27, at Minneapolis General Hospital. Dr. Huenekens, Dr. Moriarty, and others.
- 28 f, w, s, su. Infant Welfare Clinic. Required of sections of one division of senior class each quarter. 6 hours. 19 Millard Hall. Dr. Lippman.
- 29 f, w, s, su. Amphitheater Clinic in Pediatrics. Required of one division of senior class each quarter; elective for others as 102. 17 hours. Dr. Schlutz and others.
120. Clinic in Child Guidance. Offered two quarters a year. Required of two divisions of senior class each quarter offered; elective for others. 17 hours. Dr. ———

ELECTIVE COURSES*

- 51 f, w, s, su. Clinic in Pediatrics. Conducted at the Minneapolis General Hospital. Fifth year. 17 hours. Dr. Huenekens, Dr. Anderson, Dr. Lippman.
- 52 f, w, s, su. Same as 51. Ancker Hospital, St. Paul. Dr. Ramsey, Dr. Birnberg, Dr. Critchfield, Dr. Hagaman, Dr. Shannon.
53. Contagious Diseases. 17 hours. Conducted at Ancker Hospital, St. Paul. Dr. C. A. Stewart, Dr. Colby, Dr. Critchfield, Dr. Hedenstrom.
55. Course in Infant Feeding. Conducted at various places. Dr. Anderson, Dr. Colby, Dr. Shannon, Dr. Siperstein, Dr. Stoesser.
59. General Pediatrics Including Skin Diseases. Two to four students per day. 66 hours or arrange; TThS 1:00-3:00. (By arrangement students may take this course only one or two days a week with corresponding credit.) Wilder Dispensary. Dr. Colby and others.
60. Diseases of the Heart. Two to four students. Lymanhurst. Dr. Seham.
61. Clinic in Pediatrics. Four to six students. Minneapolis General Hospital. Dr. Taylor.
101. Intubation and Tracheotomy, with training upon the cadaver. Dr. Platou.
102. Amphitheater Clinic in Pediatrics. Same as 29. Elective for juniors and seniors not in pediatric clerkship. Dr. Schlutz and others.
103. Clinic in Pediatrics. Same as 23. Conducted at the University Hospital and the Minneapolis General Hospital. Dr. Schlutz, Dr. Huenekens, and others.
104. Contagious Diseases. Advanced study. Dr. Platou.
105. Rare and Unusual Diseases of Infancy and Childhood. Limited to 10 students. A lecture course. 11 hours. Dr. C. A. Stewart.
117. Pediatric Clinic. Out-Patient Clinic. Dr. C. A. Stewart and others.
120. Same as 120 above.
129. Pediatric Seminar. Dr. Schlutz and staff.
200. Advanced Study of Diseases of Infants and Children.
202. Research in Diseases of New-Born.

* Electives in Pediatrics are usually repeated each quarter.

204. Research in Physiology of New-Born.
 206. Research in Diseases of Infants and Growing Children.
 208. Research in Physiology of Infants and Growing Children.
 210. Research in Anatomy of Infants and Growing Children.

DEPARTMENT OF SURGERY

REQUIRED COURSES

- 20f. Bandaging. Instruction and practice. Fourth year. 11 hours. Pre-requisite: Gross Anatomy. Dr. Regnier.
 21su,f. Principles of Surgery. A study of the various surgical inflammations and processes; pathology and treatment. Principles underlying general surgical procedures. Lectures and demonstrations. Fifth year. 22 hours. Dr. Wangensteen, Dr. Campbell.
 22f. General Surgery. The diseases and injuries of tendons, fasciae, bursae, blood vessels, nerves, brain, and meninges. Lectures and demonstrations. Fifth year. 22 hours. Dr. Law.
 23w-24s. Regional Surgery. The practical surgery of the anatomical regions of the body; head, neck, thorax, abdomen, and extremities. Lectures and demonstrations. Fifth year. 44 hours. Dr. Strachauer, Dr. Ritchie, Dr. Schwyzer, Dr. Wilcox.
 25s. Fractures and Dislocations. Lectures and demonstrations. Sixth year. 22 hours. Dr. Law, Dr. Daugherty.
 26su,w. Diagnostic Clinic. A series of clinics on the diagnosis of surgical conditions as presented in the Out-Patient Department. 22 hours to each division. Dr. Johnson, Dr. McKinney.
 28su,f,w,s. Clinical Clerkships. The personal study of assigned patients; case histories, laboratory examinations, provisional diagnoses, with suggestions as to therapy; attendance at operation of such studied cases and observation of post-operative management. Practical instruction in anesthesia. 200 hours. University Hospital. Staff.
 28xsu,f,w,s. Part of 28 at Minneapolis General Hospital. Dr. Zierold and staff.
 29su,f,w,s. Minor Surgery Clinics. Sections daily in the Out-Patient Department; a part of required clinics. 17 hours. Dr. Bratrud, Dr. Hayes, Dr. McKinney.

ORTHOPEDIA

REQUIRED COURSES

- 40f,w,s. Orthopedic Surgery. A course of clinical lectures, demonstrations, and operations conducted in each quarter, with divisions of the junior class, at the Hospital for Crippled and Deformed Children, Phalen Park. 22 hours. Dr. Chatterton, Dr. Cole.
 41su,f,w,s. Orthopedic Clinic. A study of orthopedic conditions and treatment, conducted in the Out-Patient Department; a part of required section clinics. 11 hours. Dr. Giessler, Dr. Henry.

- 42f,s. Orthopedic Surgery. A course of lectures covering orthopedic conditions in the adult; lantern slides and demonstrations. 11 hours.
Dr. E. S. Geist, Dr. Reed.

UROLOGY

REQUIRED COURSES

- 46w. Genito-Urinary Diseases. The etiology, diagnosis, and treatment of this group of diseases. A course of lectures. Sixth year. 18 hours.
Dr. F. R. Wright.
- 47su,f,w,s. Genito-Urinary Clinic. The observation, examination, and treatment of patients in the Out-Patient Department; a part of required section clinics. 17 hours. Dr. Wright, Dr. Kremer, Dr. Wethall.

ELECTIVE COURSES*

52. Cadaver Surgery. The technique and performance of the various standard operations upon the cadaver. Dr. Campbell.
53. Animal Surgery. A course which offers instruction in the technique of the operating room. Dr. Zierold.
54. Proctology. A clinical course conducted in the Out-Patient Department. Dr. Fansler.
55. Diagnostic and Operative Clinics. Conducted at the University Hospital. Dr. Strachauer, Dr. Johnson, Dr. Law, Dr. Ritchie, Dr. Wangensteen, Dr. Dunn, Dr. Campbell.
56. Diagnostic and Operative Clinics. Conducted at the Minneapolis General Hospital. Dr. Corbett, Dr. Wilcox, Dr. Zierold, Dr. F. A. Olson, Dr. Robitshek, Dr. Regnier.
57. Diagnostic and Operative Clinics. Conducted at the Ancker Hospital. Dr. Colvin, Dr. Abbott, Dr. Jones, Dr. Culligan, Dr. Hauser, Dr. E. S. Geist.
60. Urologic Clinic. Conducted at the Minneapolis General Hospital. Dr. Owre, Dr. Kremer.
61. Orthopedic Clinic. Conducted in the Out-Patient Department. Dr. Giessler, Dr. Henry.
62. Urologic Diagnosis and Cystoscopy. A course conducted at the Ancker Hospital. Hours and credits arranged. Dr. Foley.
63. Orthopedic Clinic. Conducted at the Shriners' Hospital. Dr. Cole, Dr. Reed.
65. Problems in Animal Surgery. Fifth and sixth years. Four students. Hours and credits arranged. Dr. Wangensteen, Dr. Zierold.
114. Urologic Diagnosis and Cystoscopy. Hours and credits arranged. Dr. Thomas.

HOSPITAL DEPARTMENT

DIVISION OF NURSING INSTRUCTION

For courses of instruction, see Nursing School bulletin

* Usually repeated each quarter.

DIVISION OF DIETETICS

For courses see Nursing School bulletin and special circular.

DIVISION OF HOSPITAL DENTISTRY

50f,w,s. Hospital Dental Practice, in the University Hospital, University Dispensary, and Minneapolis General Hospital. For students of Medicine or Dentistry. Hours and credits arranged. Dr. Grey, Dr. Hillman, Dr. Ziskin, Dr. Epstein, Dr. Levin, Dr. Lilja, Dr. C. J. E. Omeron, Dr. Swanson, Dr. H. Bjordahl, Dr. O. Bjordahl, Dr. Clark, Dr. Lindig, Dr. Ruettell.

DIVISION OF HOSPITAL SOCIAL SERVICE

- 60f,w,s,su. Principles and Practices of Hospital Social Work. 2-4 credits. Hours arranged. Miss Tebbets, Miss Smith, and assistants.
- 61f,w,s,su. Field Work (H.E. 156). Practical work in respective specialized fields available for home economics students. Limited to groups of eight. 3 credits. Section I. Th VI, VII, VIII, and three hours to be arranged. Dr. A. H. Beard, Miss Smith.
- 62s. Relationships of Personnel of Hospital and Dispensary. Lectures covering backgrounds, aims, and interdependence of groups. Emphasis on social, psychological, and ethical factors. 1 credit. Hours arranged. Miss Smith.
- 63s. Occupational Therapy. Lectures covering history, development, and relationships; institutional values. 1 credit. Hours arranged. Dr. Mariette, Miss Tebbets, and others.
- 64s. Hospitals and Hospital Economics. Types of hospitals; hospital management; budgetary relations; hospital working group. 1 credit. Hours arranged. Miss Tebbets, Miss Smith.
- 65f,w,s,su. Application of Principles and Practices of Hospital Work. Selected medical-social problems as related to other professional groups. Open to nurses and medical students. 2 to 4 credits. M III, and hours arranged. Miss Tebbets, Miss Smith, and assistants.

DIVISION OF RADIOLOGY

REQUIRED COURSE

79su,w. Roentgenology and Radiation Therapy. Lectures and demonstrations. Fifth year medical students. 22 hours. Dr. Rigler, Dr. Stenstrom.

ELECTIVE COURSES

80. Roentgen Diagnosis for Medical Clerks. Part of Med. 33. Dr. Rigler.
81. Radiation Therapy for Surgical Clerks. Part of Surg. 28. Dr. Stenstrom.
85. Plate Reading. Hours and credit arranged. Dr. Rigler.
86. X-Ray Technique. Hours and credit arranged. Dr. Rigler.
87. X-Ray Anatomy. Same as Anatomy 148. 11 hours; 1 credit. Dr. Rigler.

- 90f. Fundamentals of Radiology. Same as Physiology 105. 11 hours; 1 credit. Dr. Stenstrom.
- 91w. Roentgen and Radium Therapy. 11 hours. Dr. Stenstrom.
- 92s. Physical Therapy. 11 hours. Dr. Stenstrom.
- 95f,w,s,su. Clinic in Roentgen Therapy. Fifth or sixth year students. 11 hours each quarter. Dr. Stenstrom.
200. Research Problems in Roentgenology. Hours and credits arranged. Dr. Rigler.
204. Research Problems in Biophysics (same as Physiology 204). Hours and credits arranged. Dr. Stenstrom.

DEPARTMENT OF MILITARY SCIENCE AND TACTICS, R.O.T.C.

This department contributes elective courses to the Medical School and leads to a certificate of proficiency in military science and tactics—medical, which qualifies for appointment and commission in the Medical Officers Reserve Corps, U. S. Army. The course is progressive and as a whole is intended also to aid the student in his preparation for citizenship.

- B-1f. Elements of Military Science. An introductory course to familiarize the student with the more necessary fundamentals of military science and organization of the Medical Department. For freshmen only. 33 hours; 3 credits. Col. Nelson.
- B-2s. Medical Tactics. A theoretic course in organization and tactics, preparatory to completion of this training by practical work in camp. For sophomores only. 33 hours; 3 credits. Col. Nelson.
- A-1w. Military Hygiene and Sanitation. A theoretic course in the essentials of military hygiene and sanitation, to supplement the practical training in camp and in the Department of Public Health and Preventive Medicine. For juniors only. 33 hours; 3 credits. Col. Nelson.
- A-2f. Medical Administration. A theoretic and practical course to train the student in medico-military administration with special reference to hospitals and hospitalization methods and also includes surgical and medical diseases peculiar to war, methods of gas defense, and miscellaneous medico-military subjects. For seniors only. 33 hours; 3 credits. Col. Nelson.
- A-1su. Field Service. A practical course at an army camp in hygiene and sanitation, medical tactics, administration, drill command, of six weeks' duration. Summer quarter following sophomore year. 180 hours. Col. Nelson.

EXTRA-DEPARTMENTAL INSTRUCTION

1. History of Medicine. Fifth year. 11 hours.
2. Ethics, Economics, Social Relations. Sixth year. 11 hours.

THE SCHOOL OF CHEMISTRY
DEPARTMENT OF PHYSICAL CHEMISTRY

(Required course in the Medical School)

110f,w. Physical Chemistry. Designed chiefly for medical and biological students. Four credits per quarter. Prerequisite: 7. Mr. Taylor.

For other courses in chemistry which may be elected for credit in the Medical School see bulletin of the School of Chemistry.

AGRICULTURAL BIOCHEMISTRY

(Contributing elective courses to the Medical School)

111f-112w. Biochemistry. Advanced course dealing with the colloidal state, and the chemistry of proteins, carbohydrates, glucosides, tannins, fats, acids, enzymes, and pigments, and their physicochemical relations to the vital processes involved in growth and nutrition. Prerequisites: organic chemistry and animal biology (1 year). Three credits each quarter. Lect. MWF III; . . . Th VI. Dr. Gortner.

113f-114w-115s. Biochemical Laboratory Methods. A laboratory course paralleling the lectures in 111-112, using recent methods for the investigation of biologically important compounds, with especial reference to the detection and estimation of such compounds in cells or tissues. Prerequisite: Quantitative Analysis, parallel 111-112. Two credits each quarter. T VI, VII, VIII; Th VII, VIII, IX. Dr. Sandstrom.

116w. Advanced Animal Nutrition. Lectures and assigned readings on recent developments in animal nutrition, covering the field of proteins, mineral metabolism, vitamins, and the relation of nutrition to disease. TTh III. Dr. Palmer, Dr. Kennedy.

206f. Colloids. Lectures dealing with the colloidal state, the preparation and properties of colloidal solutions, and the relation of these to biochemical processes. Prerequisites: Course 111-112, or Physical Chemistry. Three credits. MWF II. Dr. Gortner.

207f. Enzymes. Lectures dealing with the nature of enzyme action, including methods of preparation and investigation of enzymes, their physical and chemical properties and their methods of action. Prerequisites: Course 111-112, or physiologic chemistry. Three credits. MWF III. Dr. Willaman.

208w. Proteins. Lectures on the composition, structure, biochemical reactions, and functions of the proteins and amino acids. Prerequisite: Course 111-112, or advanced organic chemistry. Three credits. MWF II. Dr. Gortner.

DEPARTMENT OF ZOOLOGY

(Contributing elective courses to the Medical School)

- 44s. Animal Parasites and Parasitism. An introductory course treating of the origin and biological significance of parasitism and of the structure, life history, and economic relations of parasites exclusive of the insects. 3 credits. WF VI, VII, VIII. Dr. Riley.
- 45w. Relation of Insects to Disease. The causation and transmission of disease by insects and other arthropodes. Life-history, habits, and methods of control of homonoxious species. 3 credits. WF VI, VII, VIII. Dr. Riley.
- 107s. Protozoology. Lectures, reference, and laboratory work on the structure and life history of Protozoa. Special reference is paid to the relations of the Protozoa to disease of animals. 5 credits. MTWThF I, II. Dr. Sigerfoos.
- 144f-145w-146s. Animal Parasites and Parasitism. Lectures and laboratory work. Origin and biological significance of parasitism, and the structure, life-history, and economic relations of representative parasites. Second term devoted primarily to relations of insects to diseases of man and animal. 3 credits each quarter. WF VI, VII, VIII. Dr. Riley.
- 154f,w-155s. Hematology. Primarily for medical students, but open to others with proper qualifications. Lectures and laboratory work on the blood and blood forming organs of man and animals. 3 credits each quarter. TTh VII, VIII, IX. Dr. Downey.
- 181f-182w. Embryology. A survey of the principles of animal development dealing with fundamental invertebrate and vertebrate types. Lectures, reference, and laboratory work. 3 credits each quarter. TTh VI, VII, VIII. Dr. Ringoen.
- 183s. Genetics and Eugenics. Facts and theories of heredity and application to man. 3 credits. TS IV; Th V.

The Bulletin
of the University of
Minnesota

The School of Nursing
Announcement for the Years
1927-1929



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UNIVERSITY CALENDAR

1927-28

1927

Fall Quarter

September	15	Thursday	Payment of fees closes, except for new students
September	15-17		Entrance examinations (for removal of entrance deficiencies)
September	16-19		Registration of all new students entering the freshman class
September	19-23		Examinations for removal of conditions Physical examinations Registration period, ¹ colleges of Science, Literature, and the Arts, and Education
September	20-24		Freshman week
September	22-23		Registration days ¹ for all colleges not included above
September	23	Friday	Payment of fees for new students closes
September	26	Monday	Fall quarter classes begin, 8:30 ² a.m. Fall semester extension classes ³ begin
October	20	Thursday	Senate meeting, 4:30 p.m.
October	22	Saturday	Homecoming Day
November	11	Wednesday	Armistice Day; a holiday
November	24	Thursday	Thanksgiving Day; a holiday
December	1	Thursday	State Day Convocation
December	14-17		Final examination period
December	15	Thursday	Commencement Convocation Senate meeting, 4:30 p.m.
December	17	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	21	Wednesday	Payment of fees closes for all students in residence fall quarter ⁴

Winter Quarter

December	27-29		Entrance examinations
1928			
January	2-3		Registration days for new students in the College of Science, Literature, and the Arts
January	3	Tuesday	Registration day for new students in all other colleges

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, general information bulletin, page 47.

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 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.

January	4	Wednesday	Christmas vacation ends, winter quarter classes begin, 8:30 ² a.m.
January	28	Saturday	First semester extension classes close
January	30	Monday	Second semester extension classes begin
February	13	Monday	A holiday (February 12, Sunday, Lincoln's Birthday)
February	16	Thursday	Charter Day Convocation Senate meeting, 4:30 p.m.
February	22	Wednesday	Washington's Birthday; a holiday
March	14-17		Final examination period
March	15	Thursday	Commencement Convocation Payment of fees closes for all students in residence winter quarter ¹
March	17	Saturday	Winter quarter ends, spring vacation begins, 5:30 p.m.

Spring Quarter

March	19-21		Entrance examinations
March	23-24		Registration days for new students in all colleges
March	26	Monday	Spring vacation ends, spring quarter classes begin, 8:30 ² a.m.
April	6	Friday	Good Friday; a holiday
May	10	Thursday	Cap and Gown Day Convocation
May	17	Thursday	Senate meeting, 4:30 p.m.
May	26	Saturday	Second semester extension classes close
May	30	Wednesday	Memorial Day; a holiday
June	6-9		Final examination period
June	9	Saturday	Spring quarter closes, 5:20 p.m.
June	10	Sunday	Baccalaureate service
June	11	Monday	Fifty-sixth annual commencement

Summer Quarter

June	15-16		Summer Session first term begins, registration and payment of fees
June	18	Monday	Classes begin, 8:00 a.m.
July	4	Wednesday	Independence Day; a holiday
July	28	Saturday	Registration and payment of fees for second term closes
July	30	Monday	Second term classes begin
September	1	Saturday	Second term Summer Session closes

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, general information bulletin, page 47.

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 at University Farm.

THE SCHOOL OF NURSING

MARION L. VANNIER, R.N., Director

From the date of its organization in 1909 to the year 1921, the School of Nursing of the University of Minnesota, the pioneer in the movement toward the university education of the nurse, had a slow, steady growth, the comparatively small capacity of its teaching hospital limiting its possibilities of practical instruction to a comparatively small body of students.

In the year 1921, overtures were made to the University by the Charles T. Miller Hospital, of St. Paul, with a capacity of 200 beds; by the Minneapolis General Hospital, with approximately 750 beds; and by the Northern Pacific Beneficial Association Hospital, with 200 beds, to entrust to the University the education of their students and to place their nursing services, together with that of the University Hospital, at the command of the school as the practical laboratories for the more complete and varied training of students in larger numbers. These overtures were accepted by the Board of Regents of the University of Minnesota and the greater School of Nursing was organized something over two years ago. Since that time its registration has materially increased and bids fair to grow greatly during the ensuing year. A class is entered in fall and spring quarters of each year.

The course of study in the School of Nursing covers a period of three years. The first two quarters are devoted to preliminary courses of instruction. These studies are conducted in the science departments of the Medical School, the Department of Physical Education, the Department of Drawing and Descriptive Geometry in the College of Engineering, and the associated hospitals. All courses are conducted by members of the university faculty. Examinations are held at the close of each quarter and must be satisfactorily passed to permit of advancement.

In the second quarter of the preliminary period, students are admitted to one or another of the associated hospitals for practical training in nursing service.

Upon the successful completion of the preliminary course, and with due consideration of their general fitness, students are admitted to the full hospital services. In the succeeding two and one-half years a graded system of hospital education is conducted, during which the students serve in the various departments of nursing service afforded by the associated hospitals and in the University and General Hospital dispensaries.

Undergraduate courses of lectures, recitations, and demonstrations are given by members of the university faculty in each department, including the superintendents of, and instructors in, nursing in each of the associated hospitals, who also have faculty rank. At the close of each quarter, examinations are held in both practical and theoretical work.

In the encouragement of a still higher measure of education for students of nursing, the University offers a combined course in the College

of Science, Literature, and the Arts, and in the College of Education and the School of Nursing, covering a period of five years and leading to the joint degrees of bachelor of science and graduate in nursing.

In co-operation with the Department of Preventive Medicine and Public Health the School of Nursing assists in conducting courses in Public Health Nursing and, with the similar co-operation of the College of Education, courses in Nursing Education.

The School of Nursing is a part of the Medical School and is controlled through its Administrative Committee. The director of the school is responsible to the dean of the Medical School.

GENERAL INFORMATION

THE ASSOCIATED HOSPITALS

The ownership or control of several teaching hospitals enables the University to offer the best opportunities of education alike in medicine and in nursing.

While the associated hospitals and the School of Nursing are interdependent, each serving the purposes of the others, the faculty looks upon the hospitals as the teaching laboratories of the nurse in which her interests, together with those of the medical student body, are primary considerations.

By the association of several hospitals with the University School, in the interests of nursing education, it is possible to give students the advantage of practical service with free patients, per diem patients, and private patients; and to add to the regular graded work experience in the care of contagious diseases, tuberculosis, and a large number of accident and emergency cases.

UNIVERSITY RELATIONS

The School of Nursing has its teaching headquarters at the University, with offices in Millard Hall. This building is situated on the medical division of the new university campus, which includes within it both the hospital and laboratory buildings. These occupy the high bluffs overlooking the east bend of the Mississippi River.

The Elliot Memorial Building stands upon the bank of the river and commands a beautiful prospect. This building, provided principally by a gift from the estate of Dr. and Mrs. A. F. Elliot, is the first of the permanent hospital group. The service building connects with the west wing of the Elliot Memorial. The Frank C. Todd Memorial Clinic in Ophthalmology and Oto-Laryngology has been provided, in part, by gifts from Mrs. Frank C. Todd, Mrs. Edward C. Gale, and Mrs. Emery Mapes and, in part, by university appropriations. The Cancer Institute is the object of a gift of \$250,000, through the Citizens' Aid Society, at the instance of Mrs. George Chase Christian. The entire hospital now has about three hundred beds.

The Charles T. Miller Hospital, one of the associated group of hospitals, situated in St. Paul, is a beautiful and thoroly modern building, housing fifty free patients and one hundred and fifty private beds.

The Minneapolis General Hospital is supported by taxation and has some six hundred beds, principally for the use of the indigent sick. It enters large numbers of accident and emergency cases and acute diseases.

The Northern Pacific Beneficial Association opened in the fall of 1921 its new model hospital building situated within St. Paul in the midway district. It cares for the sick among employees and the families of employees of the railway system, the name of which it bears.

THE OUT-PATIENT DEPARTMENT SERVICE

The dispensary is the Out-Patient Department of the University Hospital. It is conveniently located in Millard Hall in the block adjoining the hospital.

Students of the School of Nursing enjoy opportunities of clinical observation in the Out-Patient Department and are assigned, during their junior and senior years, to its nursing service.

The dispensary of the Minneapolis General Hospital is also available for study and training to the students of the school.

THE LIBRARIES

The medical libraries of the University contain 19,000 bound volumes, 45,200 unbound volumes, monographs, reprints, etc., and 276 current periodicals.

The general University Library also is open to students of all schools. The library catalogs a number of works selected with reference to the needs of students of the School of Nursing.

REQUIREMENTS FOR ADMISSION

Applications for admission to the School of Nursing should be made in writing to the director. Blanks are furnished on request. Educational credentials should accompany the application. All applicants must meet personally the enrolment committee of the school. Notices of enrolment meetings will be sent to each applicant. A class is entered at the opening of fall and spring quarters.

Applicants must state age and residence, and present credentials of graduation from a four-year high school of the first grade or its equivalent by examination. Candidates who wish to enter by examination should consult the bulletin of general information for list of subjects and dates of examinations. While a high school diploma is a prerequisite to admission, preference will be given to women of superior preliminary training. Applicants must be not less than eighteen nor more than thirty-five years of age. Eighteen-year-old applicants will be admitted only when they give assurance of sufficient maturity. They must submit satisfactory evidence to the committee of physical and mental fitness and good character, and will undergo a general physical examination by the school physicians. References are required, one of these to be from former high school teachers.

Women over twenty-one years old, who are not high school graduates, may be admitted as unclassified students. Regular classification will be accorded such students at the end of one year provided their work has been satisfactory.

Information and application blanks may be had upon request, of the director of the School of Nursing, Millard Hall, University of Minnesota, Minneapolis.

REGISTRATION AND FEES

Upon acceptance of the candidate by the enrolment committee, registration is made at the office of the registrar of the University. Fees approximating \$40 cover the preliminary course of instruction and are payable at the office of the university cashier. Students supply their own textbooks and stationery. Housing and board are provided in the associated hospitals at no cost to the student. No fees are charged during the remaining two and one-half years of the course. Uniforms are furnished by the hospitals

and, after the first three months, laundry is done without charge. Clothing, other than the hospital uniform dress, students provide for themselves.

A vacation of two weeks is allotted, in succession, to each nurse in each year at her own living expense.

Graduates of other schools for nurses, in good standing, or matriculants of these schools, having the required entrance qualifications, will be admitted to the preliminary course of instruction upon the conditions of entrance cited above and upon payment of the prescribed fee. Upon successfully passing the examinations in this course, they are granted a certificate of proficiency, which, if they are matriculants of any other school, is submitted to the superintendent in charge.

PLAN OF INSTRUCTION

The entire course of instruction in the School of Nursing covers a period of three years and, successfully pursued, leads to the degree of graduate in nursing conferred, upon recommendation of the faculty, by the Board of Regents of the University of Minnesota.

All matriculants are required to take the preliminary course of instruction and to pass examinations at its close. The faculty reserves the right to pass upon the general fitness of the student to enter the hospital services at the close of the preliminary period.

In the last half of the first year and the first half of the second year, the student is assigned to duty and receives instruction in the men's and women's medical and surgical wards of the associated hospitals. In the second half of the second year and throughout the third year, she is assigned to special duty in the obstetrical, gynecological, and children's wards, in the operating rooms, and in special departments of practice.

The practical work of each year is accompanied by courses of lectures and demonstrations conducted by members of the faculty. Examinations conclude each of these courses.

AFFILIATED SCHOOLS

Students from affiliated schools or from those of recognized standing and of general requirements equivalent to those of the University of Minnesota, who have completed two years of study and are graduates of such schools, will be admitted to the third year of the School of Nursing as affiliated students, so far as housing capacity will permit. Upon successful completion of the work of the third year they will receive a certificate.

This affiliated third year course is planned especially for those students whose training has been in schools allied to hospitals of exclusively surgical or other special character.

COURSE IN PUBLIC HEALTH NURSING FOR GRADUATE NURSES

The course in Public Health Nursing is given under the direction of the Department of Preventive Medicine and Public Health, in co-operation with the School of Nursing. It covers a period of nine months, or a full academic year, divided into three quarters. The satisfactory completion of

SCHOOL OF NURSING

the nine-month course, or the minimum of forty-five credits, in certain prescribed subjects, is necessary to secure the certificate in public health nursing. See Public Health bulletin.

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

During the first five quarters in this course the student is registered in the College of Science, Literature, and the Arts. This period is followed by ten quarters during which the student is registered in the University School of Nursing. The last three quarters of the fifth year are devoted to elective work in the College of Science, Literature, and the Arts, or the College of Education, in preparation either for teaching and supervision of nursing work or for public health nursing. Students should consult Miss Vannier, director of the School of Nursing, concerning their registration in the first two years.

In either course, the following subjects are required in the first two years:

FIRST YEAR					
FALL QUARTER		WINTER QUARTER		SPRING QUARTER	
	Credits		Credits		Credits
Rhet. A†	5	Rhet. B†	5	Rhet. C†	5
Bot. 1	5	Bot. 2	5	Anat. 2	3
Chem. 6	5	Chem. 7	5	Chem. 8‡	5
	—		—	Elect.	3
Total	15	Total	15	Total	16

SECOND YEAR					
FALL QUARTER		WINTER QUARTER		SPRING QUARTER*	
	Credits		Credits		Credits
An. Biol. 1	5	An. Biol. 2	5	Phys. 4	5
Psy. 1	3	Psy. 2	3	Ed. Psy.	3
Hist.	5	Hist.	5	Bact. 51	5
Rhet. 18§ or 12.	3	Rhet. 19§ or 13.	3	Hist. of Nurs.	1
	—		—	Theory of Diet.	1
Total	16	Total	16	Lettering	1
				Total	16

The regular S., L. and A. requirements in the matter of gymnasium and personal hygiene must be met.

THIRD AND FOURTH YEARS

Students are registered in the School of Nursing during the third and fourth years, which consist of four quarters each, summer, fall, winter, and spring.

† Nine credits in rhetoric and a 6-cred. elective may be substituted.

‡ Chem. 9 and 10 and a 5-cred. elective may be substituted if the student has had high school chemistry.

§ Public Speaking 41-42 may be substituted for Rhetoric 18 and 19.

* Registration in the spring quarter is in the School of Nursing.

The theoretical and practical work of the first summer quarter includes metrology, pharmacology, hospital economics, and nursing practice, with general work in the wards for a portion of each day under supervision.

In the succeeding quarters the student is assigned to graded services and to lecture and recitation courses in the associated hospitals.

FIFTH YEAR

If the student elects Public Health Nursing the last three quarters of the fifth year are taken in the College of Science, Literature, and the Arts. The program must be approved by the director of the Public Health Nursing Course and by the assistant dean for the Senior College. The following credits are required for the work of the last three quarters in the Public Health Nursing Course:

	Credits
Sociology	10
Public Health (theory)	15
Public Health (field)	14
Child Welfare Institute (child training).....	3
Electives	6

If the student elects Nursing Education the last three quarters are taken in the College of Education. Upon satisfactory completion of the work a high school teacher's certificate is granted in addition to the degrees of graduate in nursing and bachelor of science. The following curriculum is outlined for the senior year:

FALL QUARTER	WINTER QUARTER	SPRING QUARTER
Credits	Credits	Credits
Tech. of Teach. 3	Spec. Methods 5	Prac. Teach. 5
Sociol. I 5	The High School 3	Hosp. Admin. 4
Ed. Soc. 3	Hosp. Prac. Teach. ... 2	Electives 5
Hist. of Ed. 5	Electives 5	
Total..... 16	Total..... 15	Total..... 14

PRELIMINARY COURSES OF INSTRUCTION

SCIENTIFIC COURSES

ANATOMY

- 2f,s. Elementary Anatomy. The general properties and development of tissue cells; the development of the human embryo. The description and demonstration of the osseous, muscular, nervous, circulatory, respiratory, excretory, and reproductive systems. Forty-four hours. Mr. Watkins, Dr. Fisher.

PHYSIOLOGY

- 1f,s. General and Physiologic Chemistry. (a) A brief study of physical and chemical laws; of the composition of matter, chemical compounds, chemical and energy changes; of the ionic theory; of gases and solutions. (b) The physiologic chemistry of gases, water, salts, carbohydrates, fats and proteins; of the nutritive media, of digestive fluids and digestion, of metabolism, of excretion and excretory products. 36 hours. Dr. Greisheimer.
- 1Af,s. Elementary Physiology. Functional properties of tissue cells; the material bases of the body; the nutritive media; the physiology of nerve and muscle; of the nervous system; the vascular mechanism; respiration, digestion, excretion, and metabolism. Sixty-three hours. Dr. Greisheimer and others.

PHARMACOLOGY

- 1w,su. Elementary Pharmacology. A study of the history, uses, classification, and preparation of drugs; definition of descriptive terms; systems of weights and measures; methods of administration, principles of dosage, etc. Forty-four hours. Dr. Potter.
- 14w,su. Metrology. Systems of weights and measures; equivalents; solutions; dosage. Eleven hours. Miss Erickson.

BACTERIOLOGY

- 1f,s. Elementary Bacteriology. The principles and technique of general bacteriology. Studies in the morphologic and biologic characters of the common bacteria. Preparation of culture media. Disinfectants and disinfection. Bacteriology of water and food products. Sixty-six hours. Mrs. Green.

PRACTICAL COURSES

LETTERING

- 69f,w,s,su. Exercises in Lettering. For training the nurse in the making of records and the charting of clinical observations; the accurate forming of letters in plain, single stroke types and special clinical characters. Eleven hours.

PRINCIPLES OF NURSING

- 1f,s. History of Nursing. A study of nursing history to cultivate an understanding and appreciation in nursing traditions and ideals, and of the people and influences that have brought the profession to its present status. Eleven hours. Miss Baker.

- 2w,su. Nursing Ethics. This course deals with the present scope of nursing; the attitude of the nurse towards various problems, the patient, the physician, and other nurses. Hospital etiquette; the principles of self-government. Eleven hours.
- 3w,su. Personal Hygiene. A study of the conditions governing the health of the individual. Ideals and conceptions of health. Ethical and economic aspects of hygiene. Responsibility of the nurse in health preservation and disease prevention. Eleven hours. Dr. Norris, Mrs. Kurtzman.

HOSPITAL ECONOMICS

- 5w,su. A Study of Hospitals and Hospital Departments. The general principles of hospital and household economics. Hospital buildings; construction, heating, lighting, and plumbing. Equipment and operation of service rooms, kitchens, special departments. Hospital supplies; household chemicals. Eleven hours.

PRACTICAL DIETETICS

- 10f,s. Foodstuffs. A course of practical exercises and lectures upon foods; their definition, classes, forms; food values; food composition; energy values; caloric index; selection of dietaries; balanced rations; market conditions. Eleven hours. Miss Thomas.
- 11w,su. The Preparation of Food. Methods of cooking; effect on food values; percentages of loss; treatment of various classes of foods; of typical foods; enhancement of food values; mechanical methods of preparation; raw foods. Forty-eight hours.

PRINCIPLES AND PRACTICE OF NURSING

- 15-21f,w,s,su. Courses of lectures, demonstrations, and practical exercises. Eighty hours.
15. The Environment of the Patient. The care of room, ward, service room, bath, lavatory, serving room, linen room, bed and bedding, detail of bed making.
16. Admission and General Care of the Patient. The bed, bath, and toilet; preparation of the patient for the night; prevention of bedsores, stiffness, and cramping of muscles; care of mouth, teeth, and hair; special devices for comfort.
17. Observation and Examination of the Patient. How and what to observe; temperature, pulse, respiration; feces, urine, sputum. Preparation of patient for routine examination; methods of assisting examiner; the doctor's order book; value of bedside records; detail and technique of record.
18. Methods and Mechanisms of Treatment. Preparation of solutions; application of heat and cold; counter irritants; enemata; vaginal douche; catheterization; lavage, gavage, gastric expression. Baths; reduction of temperature; sedative baths; baths and packs to produce sweating; local baths; medicated baths.
19. The Preparation of Patients for Operation. Details of preparation; the ether bed; post-operative care of patient.

20. Medicines. The medicine case; medicine trays; system of giving medicines; method of preparing and giving hypodermic injections; method of giving inhalations; methods of giving drugs by inunction.
21. Infectious Diseases. Precautions of care; details of disinfection; care of typhoid fever cases; venereal diseases.

MASSAGE

23. Demonstrations and class practice in the general manipulation of the body tissues and in those general movements which have the value of passive exercise for the sick or convalescent. Fifteen hours.

ELEMENTS OF PATHOLOGY

28. The Principles of Pathology. Deviations from the normal in the more common diseases. A brief consideration of the normal and pathologic blood and excretions of the body. Eighteen hours.

SURGERY AND SURGICAL NURSING

29. Surgical Technique. Principles of sterilization; inflammation; wounds; necessity for asepsis, and how obtained; dressings. Pre-operative and post-operative care of patients. Eight hours.
30. The Care of Surgical Cases. Anesthesia and anesthetics. Surgical emergencies; complications and infections. Special surgical conditions. Thirty hours.
31. Bandaging. Demonstrations and practical exercises in the uses and methods of application of bandages of all forms. Ten hours.

MEDICINE AND MEDICAL NURSING

32. Diseases of Circulatory System and Blood. Respiratory system; gastrointestinal tract and accessory digestive glands. Disorders of metabolism. Medical emergencies.
 33. General Nursing Care. Diet, drugs, rest. Observation of symptoms. Recording intake and output of fluids. Isolation and prevention of infection.
 34. Infectious and Contagious Diseases. Typhoid fever. Typhus. Dysentery. Hookworm. Malaria. Yellow fever. Tetanus and rabies.
 35. General Nursing Care. Protection of nurse and public. Health regulations. Care of room and patient.
- Courses Nos. 32 to 35 cover 32 hours.

TUBERCULOSIS

36. Study of Tuberculosis. Cause, prevalence, prevention, curability. Classification; localization. Emergencies. Treatment in home and sanatorium. Care of tuberculosis; prevention of infection; treatment of emergencies; hemoptysis. Fresh air treatment; out-of-door sleeping. Dietary, rest, exercise. 11 hours.

THE DIETETIC MANAGEMENT OF DISEASE

37. The Dietary of Disease. The conditions of digestion, absorption, assimilation, and metabolism in disease; the influence of age, sex, and previous

nutrition; the relation of food and water supply to functional inactivity, tissue loss, and elimination.

38. The Dietetic Management in Special Diseases. The dietary of continued fevers; gastro-intestinal disorders; respiratory disorders; disorders of nutrition; renal diseases, cardiac disorders, and diabetes.

Courses 37 and 38 cover a period of ten hours.

GYNECOLOGY

39. Gynecological Nursing, including Obstetrics and Gynecology 2. A study of terms and definitions bearing upon the nursing of pelvic diseases; preparation of gynecological patients for examination and for operation; general care of gynecological cases; special modes of treatment. Eight hours.

PEDIATRICS AND THE NURSING OF INFANTS AND CHILDREN

40. Junior Pediatric Nursing. The Normal Child. Conditions of growth and development; breast feeding; artificial feeding; mixed feeding; preparation of foods in laboratory; general care and nursing. Psychology of childhood. Social aspects of children's diseases. Seventeen hours.
41. Senior Pediatric Nursing. Diseases of Digestive Tract. Disorders of respiratory system. Diseases of circulatory system; of genito-urinary tract. Nervous disorders. Constitutional diseases. Syphilis; gonorrhoea.
42. Contagious Diseases. Diphtheria; scarlet fever; smallpox; chickenpox; whooping-cough; measles; mumps; meningitis; poliomyelitis.

Courses Nos. 41 to 42 cover a period of 21 hours.

OBSTETRICS

44. Junior Obstetrical Nursing, including Obstetrics and Gynecology 1. Lectures and demonstrations of the anatomy and physiology of the female pelvis; the physiology of pregnancy; its accidents; the physiology of parturition; the nursing of labor. 11 hours.
- 44a. Senior Obstetrical Nursing. Complications: post-partem hemorrhage, puerperal fever; puerperal convulsions; puerperal insanity. 13 hours.

PREVENTIVE MEDICINE

45. Elementary Preventive Medicine. Including Preventive Medicine 5. A descriptive course tracing the development and growth of public health with special reference to the past fifty years and a consideration of the various phases of preventive medicine in the present day. Twelve hours.

DISEASES OF THE SKIN

46. The Nursing Care of the Skin. A course upon methods of treatment of disorders of the skin in general occurrence. Twelve hours.

NERVOUS AND MENTAL DISEASES

47. The Nursing of Nervous and Mental Conditions. Insanity; its common forms and symptoms; principles of care of insane patients. Epilepsy;

its manifestations and care. Neurasthenia, hysteria; their recognition and distinctive features; their nursing; their rest cure. Fifteen hours.

DISEASES OF THE EYE, EAR, NOSE, AND THROAT

48. The Eye, Ear, Nose, and Throat. Anatomy and physiology. General and local care; use of applications, douches, etc. Recognition and care of foreign bodies. Prevention and treatment of ophthalmia neonatorum. Pre-operative and post-operative care. Twelve hours.

SPECIAL THERAPEUTICS

49. Special Methods of Treatment. Special forms of therapy, requiring the services of the nurse. The X-ray in the diagnosis and treatment of disease. The use of vaccines and sera. Oral hygiene. Six hours.

SOCIAL RELATIONS

50. Professional Problems. Social and civic status of nurses. Professional ethics and etiquette. Nursing education; legislation; organizations. 15 hours.

Bulletin *of the University of* Minnesota

The College of Dentistry
Announcement for the Year
1927-1928



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1927							1928													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2	1	2	3	4	5	6	7	1	2	3	4	5	6	7
3	4	5	6	7	8	9	8	9	10	11	12	13	14	8	9	10	11	12	13	14
10	11	12	13	14	15	16	15	16	17	18	19	20	21	15	16	17	18	19	20	21
17	18	19	20	21	22	23	22	23	24	25	26	27	28	22	23	24	25	26	27	28
24	25	26	27	28	29	30	29	30	31	..	..	..	..	29	30	31	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
AUGUST							FEBRUARY							AUGUST						
..	1	2	3	4	5	6	..	..	..	1	2	3	4	..	..	..	1	2	3	4
7	8	9	10	11	12	13	5	6	7	8	9	10	11	5	6	7	8	9	10	11
14	15	16	17	18	19	20	12	13	14	15	16	17	18	12	13	14	15	16	17	18
21	22	23	24	25	26	27	19	20	21	22	23	24	25	19	20	21	22	23	24	25
28	29	30	31	..	..	..	26	27	28	29	..	..	..	26	27	28	29	30	31	..
..
SEPTEMBER							MARCH							SEPTEMBER						
..	..	..	..	1	2	3	..	..	..	..	1	2	3	..	..	..	..	..	..	1
4	5	6	7	8	9	10	4	5	6	7	8	9	10	2	3	4	5	6	7	8
11	12	13	14	15	16	17	11	12	13	14	15	16	17	9	10	11	12	13	14	15
18	19	20	21	22	23	24	18	19	20	21	22	23	24	16	17	18	19	20	21	22
25	26	27	28	29	30	..	25	26	27	28	29	30	31	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	..	..	..	..	..	..
OCTOBER							APRIL							OCTOBER						
..	..	..	..	..	..	1	1	2	3	4	5	6	7	1	2	3	4	5	6	
2	3	4	5	6	7	8	8	9	10	11	12	13	14	7	8	9	10	11	12	13
9	10	11	12	13	14	15	15	16	17	18	19	20	21	14	15	16	17	18	19	20
16	17	18	19	20	21	22	22	23	24	25	26	27	28	21	22	23	24	25	26	27
23	24	25	26	27	28	29	29	30	..	..	..	..	..	28	29	30	31	..	..	..
30	31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER						
..	..	1	2	3	4	5	..	..	1	2	3	4	5	..	..	..	..	1	2	3
6	7	8	9	10	11	12	6	7	8	9	10	11	12	4	5	6	7	8	9	10
13	14	15	16	17	18	19	13	14	15	16	17	18	19	11	12	13	14	15	16	17
20	21	22	23	24	25	26	20	21	22	23	24	25	26	18	19	20	21	22	23	24
27	28	29	30	..	..	..	27	28	29	30	31	..	..	25	26	27	28	29	30	..
..
DECEMBER							JUNE							DECEMBER						
..	..	..	..	1	2	3	..	..	..	..	1	2	..	..	..	..	..	..	1	
4	5	6	7	8	9	10	3	4	5	6	7	8	9	2	3	4	5	6	7	8
11	12	13	14	15	16	17	10	11	12	13	14	15	16	9	10	11	12	13	14	15
18	19	20	21	22	23	24	17	18	19	20	21	22	23	16	17	18	19	20	21	22
25	26	27	28	29	30	31	24	25	26	27	28	29	30	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	31	..	..	..	..	..

UNIVERSITY CALENDAR

1927-28

Fall Quarter

1927			
September	15	Thursday	Payment of fees closes, except for new students
September	15-17		Entrance examinations (for removal of entrance deficiencies)
September	16-19		Registration of all new students entering the freshman class
September	19-23		Examinations for removal of conditions Physical examinations Registration period, ¹ colleges of Science, Literature, and the Arts, and Education
September	20-24		Freshman week
September	22-23		Registration days ¹ for all colleges not included above
September	23	Friday	Payment of fees for new students closes
September	26	Monday	Fall quarter classes begin, 8:30 ² a.m. Fall semester extension classes ³ begin
October	20	Thursday	Senate meeting, 4:30 p.m.
October	22	Saturday	Homecoming Day
November	11	Friday	Armistice Day; a holiday
November	24	Thursday	Thanksgiving Day; a holiday
December	1	Thursday	State Day Convocation
December	14-17		Final examination period
December	15	Thursday	Commencement Convocation Senate meeting, 4:30 p.m.
December	17	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	21	Wednesday	Payment of fees closes for all students in residence fall quarter ⁴

Winter Quarter

December	27-29		Entrance examinations
1928			
January	3	Tuesday	Registration day for new students in all colleges
January	4	Wednesday	Christmas vacation ends, winter quarter classes begin, 8:30 ² a.m.
January	28	Saturday	First semester extension classes close
January	30	Monday	Second semester extension classes begin
February	13	Monday	A holiday (February 12, Sunday, Lincoln's Birthday)
February	16	Thursday	Charter Day Convocation Senate meeting, 4:30 p.m.
February	22	Wednesday	Washington's Birthday; a holiday
March	14-17		Final examination period

March	15	Thursday	Commencement Convocation Payment of fees closes for all students in residence winter quarter ¹
March	17	Saturday	Winter quarter ends, spring vacation be- gins, 5:30 p.m.

Spring Quarter

March	19-21		Entrance examinations
March	23-24		Registration days for new students in all colleges
March	26	Monday	Spring vacation ends, spring quarter classes begin, 8:30 ² a.m.
April	6	Friday	Good Friday; a holiday
May	10	Thursday	Cap and Gown Day Convocation
May	17	Thursday	Senate meeting, 4:30 p.m.
May	26	Saturday	Second semester extension classes close
May	30	Wednesday	Memorial Day; a holiday
June	6-9		Final examination period
June	9	Saturday	Spring quarter closes, 5:20 p.m.
June	10	Sunday	Baccalaureate service
June	11	Monday	Fifty-sixth annual commencement

Summer Quarter

June	15-16		Summer Session first term begins, reg- istration and payment of fees
June	18	Monday	Classes begin, 8:00 a.m.
July	4	Wednesday	Independence Day; a holiday
July	28	Saturday	Registration and payment of fees for second term closes
July	30	Monday	Second term classes begin
September	1	Saturday	Second term Summer Session closes

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, page 6.

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 8:00 in the Medical School and at 8:15 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.

ADMINISTRATIVE OFFICERS

Lotus Delta Coffman, Ph.D., LL.D., President

William Watts Folwell, LL.D., President Emeritus

Frederick J. Wulling, Phm.G., Phm.D., LL.M., Ph.M. *causa honoris*, Dean
of the College of Pharmacy, Professor of Pharmacology, and Director
of the University Medicinal Plant Gardens

THE COLLEGE OF DENTISTRY

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Professor of Prosthetic Dentistry and Orthodontia, and Chairman
of the Department of Dentistry

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Andrew T. Rasmussen, Ph.D., Professor of Neurology
Shirley, P. Miller, Ph.D., Assistant Professor of Anatomy
Carol A. Fisher, Ph.D., Instructor in Anatomy

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Winford P. Larson, M.D., Professor of Bacteriology and Immunology
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Robert G. Green, M.A., M.D., Associate Professor of Bacteriology and
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Arthur T. Henrici, M.D., Professor of Bacteriology and Immunology
Beryl S. Green, M.A., Instructor in Bacteriology and Immunology
H. Orin Halvorson, B.S., Ch.E., Instructor in Bacteriology and Immunology

DENTISTRY

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Rudolph W. Delton, D.D.S., Assistant Professor of Prosthetic Dentistry
and Orthodontia
George D. Estes, D.D.S., Assistant Professor of Operative Dentistry
Carl O. Flagstad, D.D.S., Professor of Prosthetic Dentistry and Orthodontia
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Henry S. Godfrey, D.M.D., Professor of Operative Dentistry

- Robert O. Green, D.D.S., Professor of Operative Dentistry
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 Lee A. Harker, D.D.S., Assistant Professor of Oral Anatomy and Pros-
 thetic Dentistry
 Raymond R. Henry, D.D.S., Assistant Professor of Operative Dentistry
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 of Oral Hygiene and Pathology
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 of the Division of Operative Dentistry
 Oscar A. Weiss, D.M.D., Professor of Prosthetic Dentistry and Ortho-
 dontia and Chairman of the Division of Orthodontia
 Amos S. Wells, B.A., D.D.S., Professor of Crown and Bridge Work and
 Chairman of the Division of Crown and Bridge Work

Lehman Wendell, B.S., D.D.S., Assistant Professor of Orthodontia and
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F. Denton White, D.D.S., Professorial Lecturer of Oral Hygiene and
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Charles A. Wiethoff, D.D.S., Professor of Oral Surgery
Daniel E. Ziskin, D.D.S., Assistant Professor of Oral Surgery
Joseph O. Baker, D.D.S., Instructor in Orthodontia
Daniel R. Clark, D.D.S., Instructor in Oral Hygiene and Pathology
Fred H. Hayes, D.D.S., Instructor in Oral Surgery
Harold G. Heckler, D.D.S., Instructor in Prosthetic Dentistry
Paul G. Lilja, D.D.S., Instructor in Oral Diagnosis
George W. Lundberg, D.D.S., Instructor in Operative Dentistry
Lester C. McCarthy, D.D.S., Instructor in Crown and Bridge Work
Dorothea Radasch, D.D.S., Instructor in Oral Hygiene and Pathology
John F. Sprafka, D.D.S., Instructor in Operative Dentistry
Fred C. Thiers, D.D.S., Instructor in Operative Dentistry
A. L. Thomas, D.D.S., Instructor in Orthodontia
Cora L. Ueland, M.A., Instructor in Oral Hygiene and Pathology and
Supervisor of the School for Dental Hygienists
Reuben A. Ulvestad, D.D.S., Instructor in Prosthetic Dentistry
Andrew J. Weiss, Instructor in Prosthetic Dentistry
Harold C. Wittich, D.D.S., Instructor in Operative Dentistry

LECTURERS

Frank E. Burch, M.D., F.A.C.S., Professor of Ophthalmology and Oto-
Laryngology and Head of the Department of Ophthalmology and
Oto-Laryngology
George E. Fahr, B.S., M.D., Professor of Medicine
Boyd S. Gardner, D.D.S., Associate Professor of Dental Surgery, Mayo
Foundation
Edwin L. Gardner, B.S., M.D., Associate Professor of Medicine
Arthur S. Hamilton, B.S., M.D., Professor of Nervous and Mental
Diseases, in charge of Division of Nervous and Mental Diseases
Olga S. Hansen, B.S., M.D., Assistant Professor of Medicine
Jennings C. Litzenberg, B.S., M.D., F.A.C.S., Professor of Obstetrics and
Gynecology and Head of the Department of Obstetrics and Gynecology
Robert I. Rizer, M.D., F.A.C.P., Assistant Professor of Medicine
David F. Swenson, B.S., Professor of Philosophy
S. Marx White, B.S., M.D., F.A.C.P., Professor of Medicine

METALLOGRAPHY

Oscar E. Harder, Ph.D., Professor of Metallography
Ralph L. Dowdell, Met.E., Ph.D., Assistant Professor of Metallography
Ludwig J. Weber, Ch.E., Ph.D., Instructor in Metallography

MILITARY SCIENCE AND TACTICS

Frederic H. Bockoven, Major, Dental Corps. U.S.A., Assistant Professor
of Military Science and Tactics

PATHOLOGY

Elexious T. Bell, B.S., M.D., Professor of Pathology
 Benjamin J. Clawson, M.D., Ph.D., Professor of Pathology
 James S. McCartney, Jr., B.A., M.D., Assistant Professor of Pathology

PHARMACOLOGY

Arthur D. Hirschfelder, B.S., M.D., Professor of Pharmacology
 Edgar D. Brown, Phm.D., M.D., Associate Professor of Pharmacology
 Raymond N. Bieter, B.S., M.D., Instructor in Pharmacology

PHYSIOLOGY

Elias P. Lyon, Ph.D., M.D., LL.D., Professor of Physiology
 Esther M. Greisheimer, Ph.D., M.D., Assistant Professor of Physiology
 Jesse F. McClendon, Ph.D., Professor of Physiology
 Chauncey J. V. Pettibone, Ph.D., Associate Professor of Physiologic
 Chemistry
 Frederick H. Scott, Ph.D., M.B., D.Sc., Professor of Physiology
 Raymond L. Gregory, M.A., Instructor in Physiology
 Milo M. Loucks, B.S., Instructor in Physiology

SURGERY

Arthur C. Strachauer, M.D., F.A.C.S., Professor of Surgery and Head
 of the Department of Surgery
 Owen H. Wangenstein, M.D., Ph.D., Assistant Professor of Surgery
 Orwood J. Campbell, B.S., M.D., Instructor in Surgery

SPECIAL TEACHERS IN EXTENSION WORK

Adolph R. Ringoen, Ph.D., Assistant Professor of Animal Biology
 Richard E. Scammon, Ph.D., Professor of Anatomy
 Wilson D. Wallis, Ph.D., Professor of Anthropology
 Berne G. De Vries, D.D.S., F.A.C.D., Lecturer in Orthodontia
 Esther N. Farrand, B.S., D.D.S., Lecturer in Orthodontia

Rodney M. West, B.A., Registrar, University of Minnesota, Secretary of
 the Faculty, College of Dentistry, University of Minnesota

GENERAL INFORMATION

COURSES OFFERED

FIVE-YEAR COURSE

The College of Dentistry unites with the College of Science, Literature, and the Arts in offering a five-year course consisting of two years in Arts and three years in Dentistry, leading to the degree of doctor of dental surgery.

COMBINED COURSE IN MEDICINE AND DENTISTRY

A combined course leading to the degree of bachelor of medicine and doctor of dental surgery is being considered by the dental and medical faculties. At the present time no statement can be made as to the time required to secure both degrees. Students contemplating such a course are advised to complete the admission requirements for the Medical School and the first two years of medical science in that school. Further information may be obtained from the Administrative Board of the Medical School and the dental faculty.

REQUIREMENTS FOR ADMISSION

On account of the limited capacity of the college not more than ninety pre-juniors can be admitted. Application for admission should be in the examiner's office not later than July 1. Residents of Minnesota will be given prior consideration for vacancies existing at the date of their application. 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.

Applicants for admission must present two years of collegiate work (ninety quarter, or sixty semester, credits) in science, literature, and the arts, completed at this or some other recognized college or university.

The minimum requirements for admission include nine quarter (six semester) credits in English (rhetoric); twelve quarter (eight semester) credits in animal biology; twenty quarter (thirteen and one-third semester) credits in chemistry (including general inorganic, qualitative analysis, 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 (shop practice) and drawing; six quarter (four semester) credits in psychology; five quarter (three and one-third semester) credits in bacteriology; 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 Mathematics 4 or 6):

1. Animal Biology 5-6-7, twelve quarter credits
2. Chemistry 4-5, 11, 6-7, twenty quarter credits
3. Mathematics 4, four quarter credits; or Mathematics 6, five quarter credits
4. Physics 3-4, and one of 23-24, 33-34, 43-44, eight quarter credits
5. Freshman English A-B-C, fifteen quarter credits; or Composition for Technical Students 4-5-6, nine quarter credits
6. Drawing 41-42-43, six quarter credits
7. Mechanical Engineering 11-12-13, six quarter credits
8. Psychology 1-2, six quarter credits
9. Bacteriology 51, five quarter credits
10. 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.

ADMISSION TO ADVANCED STANDING

Students from other dental colleges whose standards are fully equivalent to those of this institution, may be received into advanced classes provided vacancies occur. Such students must make formal application on the blank provided, and must submit credentials covering pre-dental and dental studies. Such credentials must show that the student had the required pre-dental subjects and has maintained the standard of scholarship required of students of this college.

As a rule notebooks and other evidences of laboratory work must be presented. The amount of credit to be granted a student from another school is decided by the heads of the respective departments in conference with the Students' Work Committee. Subject credit, but not legal time credit, may be given for studies pursued other than in dental schools.

Students desiring advanced standing at the University of Minnesota should have a transcript of their record sent to the university examiner by the registrar of the college previously attended.

Students from foreign dental schools (not including Canadian schools) who are not graduates, will not be given credit in any course, except after examination.

REQUIREMENTS FOR GRADUATION

A candidate for the degree of doctor of dental surgery must be twenty-one years of age, of good moral character, and, after satisfying all the requirements for admission to the college, must have complied with all the rules and regulations of the college and obtained regular credit for all subjects of the entire course.

RECOGNITION

The Board of Dental Examiners in all states requiring a five-year course of study, in addition to fifteen units of secondary school education, for the degree of doctor of dental surgery, recognizes our graduates and admits them to examination.

On the recommendation of the Board of Examiners in Dental Surgery, the Council of the Royal College of Surgeons, in London, has added the College of Dentistry of the University of Minnesota to the list of dental schools recognized by the college. This recognition implies that the Royal College of Surgeons will exempt graduates in dental surgery of the University of Minnesota from the preliminary science examination for the license in dental surgery, and they will be admitted to the first and second professional examinations on producing the required certificates of study.

SUMMER SESSION

A summer session of six or eleven weeks is offered in the departments of Anatomy, Bacteriology and Immunology, Chemistry, Dentistry, Pathology, Pharmacology, and Physiology. For detailed statements, see Summer Session bulletin.

FEES

Tuition fee (per quarter):	
Residents of Minnesota	\$60.00
Non-residents	70.00
Clock hour tuition fee (unclassified students, auditors, and others carrying less than full work):	
Residents of Minnesota	2.50
Non-residents	3.00
Deposit (first quarter only)	10.00
Military deposit (required of all students taking military drill)	10.00
Incidental fee	5.00
Special fees:	
Examination for removal of conditions	1.00
Examinations for credit (after the first quarter in residence)	5.00
Special examinations	5.00
Laboratory deposit (required of students registered for courses in chemistry)	5.00

REGISTRATION PENALTIES

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

COURSES OF STUDY

FOR STUDENTS WHO WERE ADMITTED TO THE COLLEGE OF DENTISTRY
BEFORE THE FALL QUARTER OF 1927

	Fall Quarter		Winter Quarter		Spring Quarter		Total	
	Crs.	Hrs.	Crs.	Hrs.	Crs.	Hrs.	Crs.	Hrs.
SOPHOMORE YEAR								
Anatomy, Hist. & Embry. . . . .	..	..	8	143	..	..	8	143
Bacteriology, Gen. & Spec.	5	99	..	..	3	44	8	143
Chemistry, Physiologic	4	66	..	..	..	..	4	66
Crown and Bridge Work . . . . .	..	..	..	..	3	99	3	99
Operative Dentistry	2½	82½	2½	82½	1	33	6	198
Orthodontia . . . . .	..	..	..	..	3	99	3	99
Physiology . . . . .	..	..	4	66	4	66	8	132
Prosthesis	3	99	3	99	..	..	6	198
	<hr/> 14½ = 346½		<hr/> 17½ = 390½		<hr/> 14 = 341		<hr/> 46 = 1078	
JUNIOR YEAR								
Crown and Bridge Work	2	66	2	66	2	66	6	198
Diagnosis, Oral . . . . .	..	..	1	11	..	..	1	11
Hygiene, Gen. and Oral	2	22	..	..	..	..	2	22
Metallography . . . . .	..	..	..	..	2	33	2	33
Operative Dentistry	4	110	4	110	4	110	12	330
Pathology, Gen. & Spec.	9	165	..	..	..	..	9	165
Pathology, Oral . . . . .	..	..	..	..	3	33	3	33
Periodontia . . . . .	..	..	1	33	..	..	1	33
Pharmacology . . . . .	..	..	5	66	..	..	5	66
Prosthesis	1	11	3	77	3	77	7	165
Surgery, Oral . . . . .	..	..	2	22	1	33	3	55
Surgery, Principles of . . . . .	..	..	..	..	2	22	2	22
	<hr/> 18 = 374		<hr/> 18 = 385		<hr/> 17 = 374		<hr/> 53 = 1133	
SENIOR YEAR								
Crown and Bridge Work	3	77	4	110	5	143	12	330
Diagnosis, Gen. & Oral	1	11	1	33	..	..	2	44
Operative Dentistry	5	143	5	143	5	143	15	429
Orthodontia	2	44	2	44	2	44	6	132
Periodontia	1	33	..	..	..	..	1	33
Prosthesis	2	66	2	66	2	66	6	198
Surgery, Oral	3	55	2	22	1	11	6	88
Thesis and Seminar . . . . .	..	..	1	11	2	22	3	33
	<hr/> 17 = 429		<hr/> 17 = 429		<hr/> 17 = 429		<hr/> 51 = 1287	

COURSES OF STUDY

FOR STUDENTS WHO ARE ADMITTED TO THE COLLEGE OF DENTISTRY
BEGINNING WITH THE SUMMER OR FALL QUARTER OF 1927

	Fall Quarter		Winter Quarter		Spring Quarter		Total	
	Crs.	Hrs.	Crs.	Hrs.	Crs.	Hrs.	Crs.	Hrs.
PRE-JUNIOR YEAR								
Anatomy, Gross	5	110	5	110	..	..	10	220
Anatomy, Hist. & Embry. ..	..	..	..	..	8	143	8	143
Anatomy, Oral	3	66	3	66	..	..	6	132
Chemistry, Physiologic ..	4	66	..	..	..	..	4	66
Physiology .....	..	..	4	66	4	66	8	132
Prosthesis	4	110	4	110	4	110	12	330
	<hr/>		<hr/>		<hr/>		<hr/>	
	16	= 352	16	= 352	16	= 319	48	= 1023
JUNIOR YEAR								
Bacteriology, Special	3	44	..	..	..	..	3	44
Crown and Bridge Work ..	..	..	3	99	3	99	6	198
Diagnosis, Gen. & Oral ..	..	..	..	..	2	22	2	22
Metallography .....	..	..	..	..	2	33	2	33
Operative Dentistry	5	143	4	110	4	110	13	363
Oral Hyg. & Periodontia ..	..	..	3	66	1	22	4	88
Oral Surgery .....	..	..	..	..	1	22	1	22
Orthodontia .....	..	..	..	..	1	33	1	33
Pathology, Gen. & Spec. ...	6	110	..	..	..	..	6	110
Pharmacology .....	..	..	4	55	..	..	4	55
Prosthesis	2	66	2	66	2	66	6	198
	<hr/>		<hr/>		<hr/>		<hr/>	
	16	= 363	16	= 396	16	= 407	48	= 1166
SENIOR YEAR								
Crown and Bridge Work ..	2	44	3	77	4	110	9	231
Diagnosis, Gen. & Oral ..	3	55	..	..	..	..	3	55
Operative Dentistry	5	143	5	143	4	110	14	396
Orthodontia	2	44	2	44	2	44	6	132
Pathology, Oral .....	..	..	1	11	1	11	2	22
Prosthesis	2	66	2	66	2	66	6	198
Surgery, Oral	2	44	1	33	1	33	4	110
Surgery, Principles .....	..	..	2	22	..	..	2	22
Thesis and Seminar and Miscellaneous Lectures ..	..	..	..	..	2	22	2	22
	<hr/>		<hr/>		<hr/>		<hr/>	
	16	= 396	16	= 396	16	= 396	48	= 1188

DESCRIPTION OF COURSES

EXPLANATIONS

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

ANATOMY

- 9f,su. Systemic Anatomy. Lectures and recitations on the gross morphology of the various systems of the body. Laboratory work upon human and mammalian material. Special emphasis laid upon human osteology. 9 hours a week. 5 credits. Offered to pre-juniors. Prerequisite: Animal Biology 5-6-7. Dr. Jackson, Dr. Miller, and assistants.
- 10w,su. Anatomy of the Head and Neck. Dissection of the human head and neck, with lectures and recitations. 9 hours a week. 5 credits. Offered to pre-juniors. Prerequisites: Animal Biology 5-6-7, Anatomy 9. Dr. Miller and assistants.
- 14w,su. Histology and Embryology. Minute structure and development of the tissues and organs of the body, with special emphasis upon the teeth and digestive tract. Lectures, recitations, and laboratory work. 12 hours a week. 8 credits. Offered to sophomores¹ and pre-juniors. Prerequisites: Animal Biology 5-6-7, Anatomy 9-10. Dr. Lee, Dr. Rasmussen, and assistants.

BACTERIOLOGY AND IMMUNOLOGY

- 51f,w,s,su. General Bacteriology. Preparation of culture media; morphology of bacteria; methods of staining and identification; anaerobic bacteria; principles of sterilization and disinfection; examination of air, water, milk; relations of bacteria to industries. 99 hours. 51f, special division for dental students. 5 credits. Offered to sophomores.¹ Prerequisites: 10 credits in chemistry, 10 credits in biology. Dr. Green and assistants.
- 52s. Special Bacteriology. Concept of infection; pathogenic bacteria; general consideration of the oral flora; bacteriology of the stomatitides, dental caries, alveolar abscess and pyorrhea; systemic infections secondary to bacterial diseases of the mouth and teeth. 44 hours. 3 credits. Offered to sophomores¹ and juniors.² Prerequisite: Bacteriology 51. Dr. Green and assistants.

DENTISTRY

(Courses for students admitted under the 1-4 curriculum.)

NOTE.—Courses numbered from 21 to 30 are sophomore courses; those from 31 to 40 are junior courses; those from 41 to 50 are senior courses.

¹ Students admitted under the 1-4 curriculum.

² Students admitted under the 2-3 curriculum.

DIVISION OF CROWN AND BRIDGE WORK

- 23s. Crown and Bridge Work. A technic course. Lectures, demonstrations, and laboratory work including all the more important forms of crowns and bridges. 99 hours. 3 credits. Prerequisite: Oral Anatomy 11-12-13. Dr. Wells, Dr. Reynolds, Dr. E. A. Nelson, Dr. McCarthy.
- 31f-32w.† Crown and Bridge Work. A technic course. Lectures, demonstrations, and laboratory work including all the more important forms of crowns and bridges. 132 hours. 4 credits. Prerequisite: Crown and Bridge 23. Dr. Wells, Dr. Reynolds, Dr. E. A. Nelson, Dr. McCarthy.
- 33s. Crown and Bridge Work. A clinical course covering the simpler forms of crowns and bridges. 66 hours. 2 credits. Prerequisite: Crown and Bridge 23. Dr. Wells, Dr. Brekhus, Dr. Pagenkopf, Dr. H. C. Nelson, Dr. Otto, Dr. Roll.
- 41f-42w-43s.† Crown and Bridge Work. A course of 33 lectures and 297 clinical hours, covering the entire field of crown and bridge work. 12 credits. Prerequisite: Crown and Bridge 31-32, 33. Dr. Wells, Dr. Brekhus, Dr. Pagenkopf, Dr. H. C. Nelson, Dr. Otto, Dr. Roll, Dr. Vehe, Dr. Tinker.

DIVISION OF ORAL DIAGNOSIS

- 32w. Oral Diagnosis. A consideration of the methods in oral diagnosis with special emphasis on the application of the X-ray. 11 hours. 1 credit. Dr. Brekhus, Dr. Knight, Dr. Waldron, Dr. Montelius, Dr. Wahlquist, Dr. Lilja.
- 41f-42w.† Oral Diagnosis. (1) A study of patients entering the clinic to determine the conditions of the teeth and surrounding tissues and advise medical measures. (2) A study of selected cases from a medical point of view, aiming to correlate the condition of the teeth with the patient's state of health. 11 lecture hours, 33 clinical hours. 2 credits. Prerequisite: Oral Diagnosis 32. Dr. Brekhus, Dr. Knight, Dr. Waldron, Dr. Montelius, Dr. Wahlquist, Dr. Lilja.

DIVISION OF OPERATIVE DENTISTRY

- 21f-22w-23s.† Operative Dentistry. A course of lectures, recitations, demonstrations, and laboratory work. 198 hours. 6 credits. Prerequisite: Oral Anatomy 11-12-13. Dr. R. O. Green, Dr. Butter, Dr. Sprafka.
- 31f-32w-33s.† Operative Dentistry. A course of 33 lecture and recitation hours and 297 clinical hours. 12 credits. Prerequisites: Operative Dentistry 21-22-23, Histology and Embryology 14. Dr. Shellman, Dr. Cox, Dr. Butter, Dr. Estes, Dr. Parker, Dr. Sprafka, Dr. Thiers.
- 41f-42w-43s.† Operative Dentistry. A course of 33 lecture and recitation hours and 396 clinical hours. 15 credits. Prerequisite: Operative Dentistry 31-32-33. Dr. Walls, Dr. Godfrey, Dr. Green, Dr. Little, Dr. Maybury, Dr. Pattridge, Dr. Vehe, Dr. Freeburg, Dr. Henry, Dr. Thom, Dr. Lundberg, Dr. Wittich.

COLLEGE OF DENTISTRY

DIVISION OF ORTHODONTIA

- 23s. Orthodontia. A course of lectures, recitations, and laboratory work in the making of regulating appliances. 99 hours. 3 credits. Dr. Lawton, Dr. Delton, Dr. Wendell.
- 41f-42w-43s.† Orthodontia. A course of lectures, recitations, and clinical work. Every student is required to treat at least one case of irregularity of the teeth. 33 lecture and recitation hours and 99 clinical hours. 6 credits. Prerequisites: Orthodontia 23, Operative Dentistry 31-32-33. Dr. O. A. Weiss, Dr. Flagstad, Dr. Lasby, Dr. Rudolph, Dr. Baker, Dr. Thomas.

DIVISION OF ORAL HYGIENE AND PATHOLOGY

- 31f. Oral Hygiene. Lectures and recitations on general and oral hygiene. 22 hours. 2 credits. Prerequisite: bacteriology. Dr. Wahlquist.
- 32w,s. Periodontia. An intensive demonstration and practice course in the causes, treatment, and prevention of gingivitis and dental periclasia and in the prevention of dental caries. Special attention is paid to diagnosis and to systemic complications. 33 hours. 1 credit. Prerequisite: Operative Dentistry 31. Dr. Waldron, Dr. R. E. Johnson, Dr. Clark, Dr. Radosch.
- 33s. Oral Pathology. Lectures and recitations on the special pathology of the teeth and other oral tissues. 33 hours. 3 credits. Prerequisites: bacteriology and pathology. Dr. Waldron, Dr. Clark.
- 41f,s. Periodontia. A continuation of Course 32. 33 hours. 1 credit. Prerequisite: Periodontia 32. Dr. Waldron, Dr. R. E. Johnson, Dr. Clark, Dr. Radosch.

DIVISION OF ORAL SURGERY

- 32w-33s.† Oral Surgery. Principles underlying general surgical procedure; development and application of anesthesia chiefly as applied to face, mouth, and jaws. General considerations in the extraction of teeth, and the removal of foci of infection. 22 lecture and recitation hours and 33 clinical hours. 5 credits. Prerequisite: Pathology 4. Dr. Griffith, Dr. Maves, Dr. Wiethoff, Dr. MacGibbon, Dr. Waldron, Dr. Hermann, Dr. Ziskin, Dr. Hayes, Dr. E. W. Nelson.
- 41f-42w-43s.† Oral Surgery. A course of lectures, recitations, and demonstrations covering the diagnosis, treatment, and dental relationship of diseases and conditions of the mouth, jaws, throat, eyes, ears, nose, and face. 33 lecture and recitation hours. 3 credits. Prerequisite: Oral Surgery 32-33. Dr. Waldron.
- 44f-45w.† Oral Surgery. Diagnosis and treatment of surgical diseases of the face, mouth, and jaws. Practice in local and general anesthesia. Consideration of types of patients and complications. 22 lecture and recitation hours and 33 clinical hours. 3 credits. Dr. Griffith, Dr. Maves, Dr. Waldron, and assistants.

DIVISION OF PROSTHETIC DENTISTRY

- 21f-22w. Prosthetic Dentistry. A course of lectures, recitations, and laboratory work covering the principles of metallic dentures. 198 hours. 6 credits. Prerequisite: Prosthetic Dentistry 11-12-13. Dr. Lawton, Dr. Delton, Dr. Wendell.
- 31f-32w-33s.† Prosthetic Dentistry. A course of lectures and recitations covering the subject of prosthetic dentistry in preparation for clinical work. 33 hours. 1 credit. Prerequisite: Prosthetic Dentistry 21-22. Dr. O. A. Weiss.
- 35w-36s.† Prosthetic Dentistry. Clinical practice in denture work. 132 hours. 6 credits. Prerequisite: Prosthetic Dentistry 21-22. Dr. Lasby, Dr. Flagstad, Dr. Jernall, Dr. Ulvestad.
- 41f-42w-43s.† Prosthetic Dentistry. A course of clinical work in prosthesis, cleft palate, and facial restorations. 198 hours. 6 credits. Prerequisites: Prosthetic Dentistry 31-32-33 and 35-36. Dr. Lasby, Dr. Flagstad, Dr. O. A. Weiss, Dr. Jernall, Dr. Ulvestad, Mr. A. J. Weiss.

THESIS AND SEMINAR

- 42w-43s.† A thesis, seminar, and lecture course in the theory and practice of medicine and dentistry, applied economics, jurisprudence, psychology, ethics, etc. 33 hours. 3 credits. Dr. W. F. Lasby, Chairman, Dr. Burch, Dr. Hamilton, Dr. Litzenberg, Mr. Swenson, Dr. S. Marx White, Dr. Fabr, Dr. Boyd S. Gardner, Dr. E. L. Gardner, Dr. Hansen, Dr. Rizer.

DENTISTRY

(Courses for students admitted under the 2-3 curriculum.)

NOTE.—Courses numbered from 50 through 59 are pre-junior courses; those from 60 through 79 are junior courses; those from 80 through 100 are senior courses.

DIVISION OF CROWN AND BRIDGE WORK

- 71w-72s.† Crown and Bridge Work. A technic course. Lectures, demonstrations, and laboratory work including all the more important forms of crowns and bridges. 198 hours. 6 credits. Prerequisite: Oral Anatomy 50-51-52. Dr. Wells, Dr. Reynolds, Dr. McCarthy, Dr. E. A. Nelson.
- 90f-91w-92s.† Crown and Bridge Work. A course of 33 lectures and 198 clinical hours, covering the entire field of crown and bridge work. 9 credits. Prerequisite: Crown and Bridge 71-72. Dr. Wells, Dr. Brekhus, Dr. Pagenkopf, Dr. H. C. Nelson, Dr. Otto, Dr. Roll, Dr. Vehe, Dr. Tinker.

DIVISION OF ORAL ANATOMY

- 50f-51w-52s. Oral Anatomy. Lectures and recitations on anatomy and nomenclature of teeth, and such laboratory work as drawing, dissecting, modeling, and carving of the teeth. Special attention given the physiological function of tooth form and its practical application. 22

lecture and recitation hours, 110 laboratory hours. 6 credits. Dr. Damon, Dr. Rudolph, Dr. Cooperman, Dr. Harker.

DIVISION OF ORAL DIAGNOSIS

- 75s. Oral Diagnosis. A consideration of the methods in oral diagnosis with special emphasis on the application of the X-ray. 11 hours lecture and 11 hours clinic. 2 credits. Dr. Brekhus, Dr. Knight, Dr. Waldron, Dr. Montelius, Dr. Lilja, Dr. Wahlquist.
- 93f. Oral Diagnosis. (1) A study of patients entering the clinic to determine the conditions of the teeth and surrounding tissues and advise medical measures. (2) A study of selected cases from a medical point of view, aiming to correlate the condition of the teeth with the patient's state of health. 11 lecture hours, 44 clinical hours. 3 credits. Prerequisite: Oral Diagnosis 75. Dr. Brekhus, Dr. Knight, Dr. Waldron, Dr. Montelius, Dr. Lilja, Dr. Wahlquist.

DIVISION OF OPERATIVE DENTISTRY

- 60f. Operative Dentistry. A course of lectures, recitations, demonstrations, and laboratory work. 143 hours. 5 credits. Prerequisite: Oral Anatomy 50-51-52. Dr. R. O. Green, Dr. Butter, Dr. Sprafka.
- 61w-62s.† Operative Dentistry. A course of 22 lecture and recitation hours and 198 clinical hours. 8 credits. Prerequisites: Operative Dentistry 60, Histology and Embryology 14. Dr. Shellman, Dr. Cox, Dr. Butter, Dr. Estes, Dr. Parker, Dr. Sprafka, Dr. Thiers.
- 80f-81w-82s.† Operative Dentistry. A course of 33 lecture and recitation hours and 363 clinical hours. 14 credits. Prerequisite: Operative Dentistry 60-61-62. Dr. Walls, Dr. Godfrey, Dr. Green, Dr. Little, Dr. Maybury, Dr. Pattridge, Dr. Vehe, Dr. Freeburg, Dr. Henry, Dr. Thom, Dr. Lundberg, Dr. Wittich.

DIVISION OF ORTHODONTIA

- 69s. Orthodontia. A course of lectures, recitations, and laboratory work in the making of regulating appliances. 33 hours. 1 credit. Dr. Lawton, Dr. Delton, Dr. Wendell.
- 87f-88w-89s.† Orthodontia. A course of lectures, recitations, and clinical work. Every student is required to treat at least one case of irregularity of the teeth. 33 lecture and recitation hours and 99 clinical hours. 6 credits. Prerequisites: Orthodontia 69, Operative Dentistry 60-61-62. Dr. O. A. Weiss, Dr. Flagstad, Dr. Lasby, Dr. Rudolph, Dr. Baker, Dr. Thomas.

DIVISION OF ORAL HYGIENE AND PATHOLOGY

- 77w. Oral Hygiene. Lectures and recitations on general and oral hygiene. 11 hours. 1 credit. Prerequisite: bacteriology. Dr. Wahlquist.
- 78w-79s. Periodontia. An intensive demonstration and practice course in the causes, treatment, and prevention of gingivitis and dental periclasia and in the prevention of dental caries. Special attention is paid to diagnosis and to systemic complications. 77 hours. 3 credits. Prerequisite: Operative Dentistry 60. Dr. Waldron, Dr. R. E. Johnson, Dr. Clark, Dr. Radosch.

98w-99s. Oral Pathology. Lectures and recitations on the special pathology of the teeth and other oral tissues. 22 hours. 2 credits. Prerequisites: bacteriology and pathology. Dr. Waldron, Dr. Clark.

DIVISION OF ORAL SURGERY

- 76s. Oral Surgery. Principles underlying general surgical procedure; development and application of anesthesia chiefly as applied to face, mouth, and jaws. General considerations in the extraction of teeth, and the removal of foci of infection. 11 lecture and recitation hours and 11 clinical hours. 1 credit. Prerequisite: Pathology 4. Dr. Griffith, Dr. Maves, Dr. Wiethoff, Dr. MacGibbon, Dr. Waldron, Dr. Hermann, Dr. Ziskin, Dr. Hayes, Dr. E. W. Nelson.
- 95f-96w.† Oral Surgery. Diagnosis and treatment of surgical diseases of the face, mouth, and jaws. Practice in local and general anesthesia. Consideration of types of patients and complications. 22 lecture and recitation hours and 55 clinical hours. 3 credits. Dr. Griffith, Dr. Dr. Maves, Dr. Waldron, and assistants.
- 97s. Oral Surgery. A course of lectures, recitations, and demonstrations covering the diagnosis, treatment, and dental relationship of diseases and conditions of the mouth, jaws, throat, eyes, ears, nose, and face. 33 lecture and recitation hours. 1 credit. Prerequisite: Oral Surgery 76. Dr. Waldron.

DIVISION OF PROSTHETIC DENTISTRY

- 53f-54w-55s. Prosthetic Dentistry. A course of lectures, recitations, and laboratory work covering the use of impression materials and the different processes of plate work. 44 lecture and recitation hours. 286 laboratory hours. 12 credits. Dr. Damon, Dr. Rudolph, Dr. Cooperman, Dr. Harker.
- 63f-64w-65s.† Prosthetic Dentistry. A course of lectures and recitations covering the subject of prosthetic dentistry in preparation for clinical work. 33 hours. 1 credit. Prerequisite: Prosthetic Dentistry 53-54-55. Dr. O. A. Weiss.
- 66f. Prosthetic Dentistry. A course of lectures, recitations, and laboratory work covering the principles of metallic dentures. 55 hours. 2 credits. Prerequisite: Prosthetic Dentistry 53-54-55. Dr. Lawton, Dr. Delton, Dr. Wendell.
- 67w-68s.† Prosthetic Dentistry. Clinical practice in denture work. 110 hours. 3 credits. Prerequisite: Prosthetic Dentistry 53-54-55. Dr. Lasby, Dr. Flagstad, Dr. Jernall, Dr. Ulvestad.
- 83f-84w-85s.† Prosthetic Dentistry. A course of clinical work in prosthesis, cleft palate, and facial restorations. 198 hours. 6 credits. Prerequisites: Prosthetic Dentistry 63-64-65 and 67-68. Dr. Lasby, Dr. Flagstad, Dr. O. A. Weiss, Dr. Jernall, Dr. Ulvestad, Mr. A. J. Weiss.

THESIS AND SEMINAR

- 100s. A thesis, seminar, and lecture course in the theory and practice of medicine and dentistry, applied economics, jurisprudence, psychol-

ogy, ethics, etc. 22 hours. 2 credits. Dr. W. F. Lasby, Chairman, Dr. Burch, Dr. George E. Fahr, Dr. Hamilton, Dr. Litzenberg, Mr. Swenson, Dr. S. Marx White, Dr. Boyd S. Gardner, Dr. E. L. Gardner, Dr. Hansen, Dr. Rizer.

METALLOGRAPHY

159s. Dental Metallography. Lectures, recitations, and demonstrations, taking up the most important metals with special reference to those used in dentistry and the study of dental alloys from the standpoint of metallography. 33 hours. 2 credits. Offered to juniors. Mr. Harder, Mr. Dowdell, Mr. Weber.

MILITARY SCIENCE AND TACTICS

BASIC COURSE

A Basic Course in Military Science and Tactics is offered in each of the first two years of the pre-dental course. The course consists of didactic work supplemented by such practical exercises and drill as may be required to meet the standard required of all physically fit male students, who are citizens of the United States, enrolled in the University.

ADVANCED COURSE

The Advanced Course is offered in the junior and senior years to such students as have satisfactorily completed the Basic Course and have been selected by the professor of military science and tactics and the dean of the Dental College. A satisfactory completion of the Advanced Course is a requisite for graduation for all students who elect this course unless relieved by proper authority. All Advanced Course students are required to attend one summer camp. They will receive the pay of an enlisted man of the seventh grade for the period of the camp and commutation of rations throughout the two academic years of their Advanced Course and one vacation intervening. All students who satisfactorily complete the Advanced Course will be recommended for a commission as first lieutenant, Dental Section, Reserve Officers Corps.

Elements of Military Science. This course covers such instruction in citizenship, government, history, and organization of the military establishment as will awaken the student to an appreciation of his responsibilities and fit him to continue in the Advanced Course if he so elects. Lectures and conferences. 33 hours.

Tactics. This course will cover so much of medical department tactics in the field, and related subjects as may be properly considered in the allotted time. Lectures, conferences, and exercises. 33 hours.

Hygiene and Sanitation. This entire course will be devoted to a consideration of application of the rules of hygiene and sanitation in the army under varying conditions. Lectures. 33 hours.

Hospitalization and Medical Department Administration. The entire time allotted will be devoted to the organization and administration of hospitals, clinics, offices, etc., and to a consideration of public health measures. Lectures and exercises. 33 hours.

PATHOLOGY

- 4f. General and Special Pathology. Circulatory disturbances, metabolic changes in cells and tissues, pigment deposits, inflammations and tumors. Pathology of selected diseases, tumors, and lesions with reference to those affecting mouth and dental structures. Exercises in gross and microscopic diagnosis. 165 hours. 9 credits. Offered to juniors. Prerequisites: Gross Anatomy 9-10. Histology and Embryology 14. Dr. Clawson and assistants.

PHARMACOLOGY

- 4w. Pharmacology. The history, origin, nature, pharmacal preparations, and use of drugs, including the discussion of their physiologic, pharmacologic, and therapeutic actions. 44 hours. 4 credits. Offered to juniors. Dr. Brown.
- 6w. Experimental Pharmacology Laboratory exercises upon the chemical composition and mode of action of typical drugs upon man and animals, primarily for students in dentistry. One exercise per week. 22 hours. 1 credit. Offered to juniors. Dr. Hirschfelder, Dr. Brown, Dr. Bieter.

PHYSIOLOGY

- 57f,su. Physiologic Chemistry. An intermediate course. The components of the animal body; foods, digestion, the excreta and metabolism. 66 hours. 4 credits. Offered to sophomores¹ and pre-juniors. Prerequisites: Biology 1-2 or 5-6-7; Chemistry 1-2-3 or 4-5. Dr. Pettibone and assistants.
- 58w,su-59s,su. Physiology. An intermediate course in the physiology of muscle, nerve, blood, circulation, digestion, the nervous system and special senses; respiration, metabolism, nutrition, and excretion. 132 hours. 8 credits. Offered to sophomores¹ and pre-juniors. Prerequisites: Biology 1-2 or 5-6-7; Chemistry 1-2-3 or 4-5. Dr. Lyon, Dr. Scott, Dr. Greisheimer, Mr. Loucks, and assistants.

SURGERY

- 52s. Principles of Surgery. A study of the various surgical inflammations and processes; pathology and treatment. Principles underlying general surgical procedure as applied in dental practice. 22 hours. 2 credits. Offered to juniors¹ and seniors.² Dr. Wangenstein, Dr. Campbell.

GRADUATE WORK

Graduate work and opportunities for research are open in certain fields of dentistry to properly qualified students.

The qualifications for admission to graduate work in this field are a baccalaureate degree from an acceptable college or university, and the

¹ Students admitted under the 1-4 curriculum.

² Students admitted under the 2-3 curriculum.

dental degree from this or any other approved college of dentistry. Such qualified students desiring graduate work will pursue courses of study in accordance with the regulations of the Graduate School. They may elect majors and minors for the graduate degree from the graduate courses in anatomy, embryology, histology, neurology, pathology, bacteriology, chemistry, physiology, and physiologic chemistry. The material for investigation along dental lines in these various subjects is available from the dental clinic, the medical dispensary, the University Hospital, and the Mayo Clinic, at Rochester, Minnesota, through the Mayo Foundation for Medical Education and Research. The Mayo Foundation offers several fellowships in dentistry similar to fellowships in other specialties on the foundation.

No special bulletin is issued for this work. The interested student will find the general conditions and the courses in the above fields set forth in the bulletin on graduate work in medicine.

DENTAL HYGIENISTS' COURSE

A course for dental hygienists consisting of two years' work requiring for admission, graduation from an accredited high school, and leading to the degree of graduate dental hygienist.

PRACTITIONERS' COURSES

In order to enlarge its educational field and to fill a want that has found expression among practitioners, the College of Dentistry through the General Extension Division offers from time to time a series of courses in crown and bridge work, oral diagnosis, operative dentistry, orthodontia, prosthetic dentistry, periodontia, oral hygiene, oral surgery, and similar subjects. These courses are confined to graduate dentists.

There is also an opportunity for a dentist to come into the College of Dentistry for clinical courses at any time of the year by registering through the General Extension Division. The courses which may be taken in from one to two weeks at any time during the school sessions are: crown and bridge work, oral diagnosis, operative dentistry, prosthetic dentistry, periodontia, and oral surgery.

Registration and payment of fees may be arranged for in advance by correspondence, or by personal interview through the General Extension Division.

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

The School for Dental Hygienists
Announcement for the Year
1927-1928



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1927							1928													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2	1	2	3	4	5	6	7	1	2	3	4	5	6	7
3	4	5	6	7	8	9	8	9	10	11	12	13	14	8	9	10	11	12	13	14
10	11	12	13	14	15	16	15	16	17	18	19	20	21	15	16	17	18	19	20	21
17	18	19	20	21	22	23	22	23	24	25	26	27	28	22	23	24	25	26	27	28
24	25	26	27	28	29	30	29	30	31	..	..	..	..	29	30	31	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
AUGUST							FEBRUARY							AUGUST						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	1	2	3	4	5	6	..	..	..	1	2	3	4	..	..	..	1	2	3	4
7	8	9	10	11	12	13	5	6	7	8	9	10	11	5	6	7	8	9	10	11
14	15	16	17	18	19	20	12	13	14	15	16	17	18	12	13	14	15	16	17	18
21	22	23	24	25	26	27	19	20	21	22	23	24	25	19	20	21	22	23	24	25
28	29	30	31	..	..	..	26	27	28	29	..	..	..	26	27	28	29	30	31	..
..
SEPTEMBER							MARCH							SEPTEMBER						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	1	2	3	..	..	..	..	1	2	3	..	..	..	..	..	..	1
4	5	6	7	8	9	10	4	5	6	7	8	9	10	2	3	4	5	6	7	8
11	12	13	14	15	16	17	11	12	13	14	15	16	17	9	10	11	12	13	14	15
18	19	20	21	22	23	24	18	19	20	21	22	23	24	16	17	18	19	20	21	22
25	26	27	28	29	30	..	25	26	27	28	29	30	31	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	..	..	..	..	..	..
OCTOBER							APRIL							OCTOBER						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2	1	2	3	4	5	6	7	..	1	2	3	4	5	6
3	4	5	6	7	8	9	8	9	10	11	12	13	14	7	8	9	10	11	12	13
10	11	12	13	14	15	16	15	16	17	18	19	20	21	14	15	16	17	18	19	20
17	18	19	20	21	22	23	22	23	24	25	26	27	28	21	22	23	24	25	26	27
24	25	26	27	28	29	30	29	30	..	..	..	..	..	28	29	30	31	..	..	..
30	31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	1	2	3	4	5	..	..	1	2	3	4	5	..	..	..	..	1	2	3
6	7	8	9	10	11	12	6	7	8	9	10	11	12	4	5	6	7	8	9	10
13	14	15	16	17	18	19	13	14	15	16	17	18	19	11	12	13	14	15	16	17
20	21	22	23	24	25	26	20	21	22	23	24	25	26	18	19	20	21	22	23	24
27	28	29	30	..	..	..	27	28	29	30	31	..	..	25	26	27	28	29	30	..
..
DECEMBER							JUNE							DECEMBER						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	1	2	3	..	..	..	..	..	1	2	..	..	..	..	..	..	1
4	5	6	7	8	9	10	3	4	5	6	7	8	9	2	3	4	5	6	7	8
11	12	13	14	15	16	17	10	11	12	13	14	15	16	9	10	11	12	13	14	15
18	19	20	21	22	23	24	17	18	19	20	21	22	23	16	17	18	19	20	21	22
25	26	27	28	29	30	31	24	25	26	27	28	29	30	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	31	..	..	..	..	..

UNIVERSITY CALENDAR

1927-28

Fall Quarter

1927			
September	15	Thursday	Payment of fees closes, except for new students
September	15-17		Entrance examinations (for removal of entrance deficiencies)
September	16-19		Registration of all new students entering the freshman class
September	19-23		Examinations for removal of conditions Physical examinations Registration period, ¹ colleges of Science, Literature, and the Arts, and Education
September	20-24		Freshman week
September	22-23		Registration days ¹ for all colleges not included above
September	23	Friday	Payment of fees for new students closes
September	26	Monday	Fall quarter classes begin, 8:30 ² a.m. Fall semester extension classes ³ begin
October	20	Thursday	Senate meeting, 4:30 p.m.
October	22	Saturday	Homecoming Day
November	11	Friday	Armistice Day; a holiday
November	24	Thursday	Thanksgiving Day; a holiday
December	1	Thursday	State Day Convocation
December	14-17		Final examination period
December	15	Thursday	Commencement Convocation Senate meeting, 4:30 p.m.
December	17	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	21	Wednesday	Payment of fees closes for all students in residence fall quarter ⁴

Winter Quarter

December	27-29		Entrance examinations
1928			
January	2-3		Registration days for new students in the College of Science, Literature, and the Arts

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, page 10.

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 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.

SCHOOL FOR DENTAL HYGIENISTS

January	3	Tuesday	Registration day for new students in all other colleges
January	4	Wednesday	Christmas vacation ends, winter quarter classes begin, 8:30 ² a.m.
January	28	Saturday	First semester extension classes close
January	30	Monday	Second semester extension classes begin
February	13	Monday	A holiday (February 12, Sunday, Lincoln's Birthday)
February	16	Thursday	Charter Day Convocation Senate meeting, 4:30 p.m.
February	22	Wednesday	Washington's Birthday; a holiday
March	14-17		Final examination period
March	15	Thursday	Commencement Convocation Payment of fees closes for all students in residence winter quarter ¹
March	17	Saturday	Winter quarter ends, spring vacation begins, 5:30 p.m.

Spring Quarter

March	19-21		Entrance examinations
March	23-24		Registration days for new students in all colleges
March	26	Monday	Spring vacation ends, spring quarter classes begin, 8:30 ² a.m.
April	6	Friday	Good Friday; a holiday
May	10	Thursday	Cap and Gown Day Convocation
May	17	Thursday	Senate meeting, 4:30 p.m.
May	26	Saturday	Second semester extension classes close
May	30	Wednesday	Memorial Day; a holiday
June	6-9		Final examination period
June	9	Saturday	Spring quarter closes, 5:20 p.m.
June	10	Sunday	Baccalaureate service
June	11	Monday	Fifty-sixth annual commencement

Summer Quarter

June	15-16		Summer Session first term begins, registration and payment of fees
June	18	Monday	Classes begin, 8:00 a.m.
July	4	Wednesday	Independence Day; a holiday
July	28	Saturday	Registration and payment of fees for second term closes
July	30	Monday	Second term classes begin
September	1	Saturday	Second term Summer Session closes

¹ New students must pay fees on dates announced for registration.² First hour classes begin at 8:15 at University Farm.

DENTAL HYGIENISTS' LAW ENACTED BY THE
LEGISLATURE OF THE STATE OF MINNESOTA,
SESSION 1927

SECTION 1. That Sections 5764, 5765, 5766 and 5767, General Statutes 1923, be amended to read as follows:

SECTION 5764. Any woman of good moral character, being a graduate of an accredited high school or its equivalent, who is a graduate of a training school for dental hygienists requiring a course of not less than two academic years, and approved by the board of dental examiners, or who is a graduate of a training school for nurses and has received at least three (3) months' clinical training in dental hygiene in any approved training school for dental nurses, may upon payment of Ten Dollars (\$10.00) be examined by said board on the subjects considered essential by it for a dental hygienist. Such examination may, in the discretion of the board, be conducted by a part of the members of the board. If the applicant in the opinion of the board, successfully passes said examination, she shall be registered and licensed as a dental hygienist. Any woman of good moral character and twenty (20) years of age or more, who before January 1, 1928, shall register her name with the state board of dental examiners, may upon showing five (5) years' actual experience in the office of a licensed dentist, and upon complying with such requirements and passing such examinations as the board of dental examiners shall require, be licensed as a dental hygienist.

SECTION 5765. Any licensed dentist, public institution or school authorities may employ such licensed dental hygienist. Such dental hygienist may remove lime deposits, accretions and stains from the exposed surfaces of the teeth, and administer gas, ether, and anesthesia, as applied to dentistry but shall not perform any other operation on the teeth or tissues of the mouth. She may operate in the office of any licensed dentist or in any public institution, or in the schools, under the general direction or supervision of a licensed dentist. The board of dental examiners may suspend or revoke, with power to reinstate, the license of any licensed dentist who shall permit any dental hygienist operating under his supervision, to perform any operation other than that permitted under the provisions of this section, and it may also suspend or revoke, with power of reinstatement, the license of any dental hygienist violating the provisions of this act, the procedure to be followed in the case of such suspension, revocation or reinstatement shall be the same as that prescribed by law in the case of suspension, revocation or reinstatement of a licensed dentist.

SECTION 5766. Before the first of May in each year every licensed dental hygienist shall pay to the board of dental examiners a license fee of three dollars (\$3.00) and in default of such payment, the board may upon hearing and upon thirty (30) days' notice revoke the license of the hygienist in default; but the payment of such fee on or before the time of

hearing, with such additional sum not exceeding five dollars (\$5.00) as may be fixed by the board, shall excuse the default. The board may collect such fee by suit.

SECTION 5767. Any dental hygienist duly licensed to practice as such in another state having and maintaining an equal standard of laws regulating the practice of dental hygienists with this state, and who is of good moral character and is desirous of removing to this state, and deposits in person with the board of dental examiners a certificate from the examining board of the state in which she is licensed, certifying to the fact of her being licensed and that she is of good moral character and professional attainments, may upon the payment of a fee of Twenty Dollars (\$20.00) at the discretion of the board, be granted a license to practice in this state without further examination. As to any person so applying and who has been licensed in a state not maintaining an equal standard of laws within this state, the board may license such persons upon the payment of the fee above provided for, furnishing the same evidence as to licensing, good moral character, and professional attainments, and passing such further examinations as the board of dental examiners shall deem necessary.

Approved April 1, 1927.

SCHOOL FOR DENTAL HYGIENISTS

FACULTY*

- Lotus Delta Coffman, Ph.D., LL.D., President
William Watts Folwell, LL.D., President Emeritus
William F. Lasby, B.A., D.D.S., Acting Dean of the College of Dentistry
and School for Dental Hygienists, Professor of Prosthetic Dentistry
Cora L. Ueland, D.H., Director of the School for Dental Hygienists and
Instructor in Oral Hygiene
Anne Dudley Blitz, M.A., Dean of Women
Edward E. Nicholson, M.A., Dean of Student Affairs
Ruth E. Boynton, B.S., M.D., Assistant Professor of Preventive Medicine
and Public Health
Peter J. Brekhus, B.A., D.D.S., Professor of Crown and Bridge Work
and Oral Diagnosis and Chairman of the Division of Oral Diagnosis
F. Stuart Chapin, Ph.D., Professor of Sociology, Chairman of the Depart-
ment of Sociology, and Director of the Training Course for Social
and Civic Work
George M. Damon, D.D.S., Professor of Prosthetic Dentistry and Oral
Anatomy and Chairman of the Division of Oral Anatomy
Harold S. Diehl, M.A., M.D., Associate Professor of Preventive Medicine
and Public Health, Director of the University Health Service and of
the Department of Preventive Medicine and Public Health
Richard M. Elliott, Ph.D., Professor of Psychology and Chairman of the
Department of Psychology
Esther M. Greisheimer, Ph.D., M.D., Assistant Professor of Physiology
Charles A. Griffith, D.D.S., Professor of Oral Surgery and Chairman of
the Division of Oral Surgery
Lee A. Harker, D.D.S., Assistant Professor of Oral Anatomy
Clarence M. Jackson, M.S., M.D., LL.D., Professor of Anatomy and Head
of the Department of Anatomy
Raymond E. Johnson, D.D.S., Assistant Professor of Oral Hygiene and
Pathology
Ray R. Knight, B.A., M.D., Professor of Oral Roentgenology and Physical
Diagnosis
Winford P. Larson, M.D., Professor of Bacteriology and Immunology and
Head of the Department of Bacteriology and Immunology
Elias P. Lyon, Ph.D., M.D., LL.D., Professor of Physiology and Head
of the Department of Physiology
Shirley P. Miller, Ph.D., Assistant Professor of Anatomy
J. Anna Norris, M.D., Professor of Physical Education for Women and
Director of Health and Physical Education for Women

* In this roster the head of the department in which instruction is given is listed as well as the actual teacher of the course, since in each case the content and arrange-
ment of the course is worked out in co-operation with the head.

- Frank M. Rarig, M.A., Professor of Public Speaking
Russel A. Stevenson, Ph.D., Dean of the School of Business
Joseph M. Thomas, Ph.D., Professor of English and Chairman of the
Department of English
Harold F. Wahlquist, B.S., D.D.S., Assistant Professor of Dentistry
Carl W. Waldron, M.D., D.D.S., L.D.S., F.A.C.S., Professor of Oral
Surgery and Oral Pathology and Chairman of the Division of Oral
Hygiene and Pathology
Amos S. Wells, B.A., D.D.S., Professor of Crown and Bridge Work, and
Chairman of the Division of Crown and Bridge Work
Daniel E. Ziskin, D.D.S., Assistant Professor of Oral Surgery
Marbury Duryea, B.A., B.S., M.D., Instructor in Preventive Medicine and
Public Health
Carol A. Fisher, Ph.D., Instructor in Anatomy
Hally J. Fisher, R.N., Instructor in Preventive Medicine and Public Health
Beryl S. Green, M.A., Instructor in Bacteriology and Immunology
Harold G. Heckler, D.D.S., Instructor in Prosthetic Dentistry
Dorothy Radusch, D.D.S., Instructor in Oral Hygiene and Pathology
F. Denton White, D.D.S., Lecturer in Oral Hygiene and Pathology

GENERAL INFORMATION

PURPOSE

The School for Dental Hygienists has been established primarily to fill the need for workers in the public schools, hospitals, mercantile and industrial institutions, and dental offices to do dental prophylaxis work and to teach the hygiene of the mouth—in other words to do preventive dental work which has not been possible in the organization of dentistry up to the present and which is recognized to be one of the great physical needs of the times. As thoro a background of scientific and cultural subjects as is possible in the time of the course is included to give students that professional education and point of view without which they would be mere technicians and quite unsafe to turn loose on the public in the semi-independent capacity which the nature of their work demands. The course includes training in all branches of dental office assisting and should make graduates easily adaptable to the general and special needs of the private dental offices should that be the field of work selected.

The course requires two years of thirty-three weeks each and leads to the degree of graduate dental hygienist (G.D.H.). The incorporation of this work in the University makes it possible to give all the subjects of the curriculum in the appropriate departments of the University, thus assuring a university contact to the student and instruction under the best auspices.

The first year's work deals mostly with preliminary science courses and dental technic and corresponds to some extent with the year course given at other schools. The second year is designed to prepare the student particularly for work in the public schools and clinics where the worker must be largely on her own responsibility and must be able to take an active part in oral hygiene work with the public.

TIME AND PLACE

The course of study in the School for Dental Hygienists for the school year 1927-28 will begin September 27, 1927. Registration days are September 24 and 25. The work is done in the various university buildings housing the respective departments excepting that done in the schools of the Twin Cities in the second year. The fall quarter is the only time at which beginning students will be admitted. Rules for the guidance of students are printed in a separate booklet.

REGISTRATION

Applicants for admission may obtain credential blanks from the office of the registrar or from the director of the school, Cora L. Ueland, College of Dentistry, University of Minnesota. These should be filled out and sent by the principal or superintendent of the high school or preparatory school to the registrar's office.

All applications should be filed before August 15 at which time a committee will pass upon the candidates whose credentials are satisfactory, choosing the twenty-five best prepared to enter upon the career of dental

hygiene as shown by their credentials. Those not included in the best twenty-five will be placed upon the waiting list to be notified in order of merit of any vacancy existing in the class. In case twenty-five have not applied by August 15 all properly accredited applicants will be included and the class filled as applications come in. Notification of acceptance or rejection will not be sent before August 15 but applicants will be informed whether their credentials are satisfactory as they come in. On receipt of notice of acceptance a preliminary fee of ten dollars (\$10) must be sent as a guaranty of the candidate's intention to enter and in order that a place may be held. This will be applied on the first quarter's tuition fee and is not refundable.

For further information in regard to registration and to the general requirements for admission to the University, application may be made for the bulletin of general information.

REQUIREMENTS FOR ADMISSION

The School for Dental Hygienists requires for admission, graduation from an approved high school or other preparatory school on the accredited list.

Preference will be given to women of superior preliminary training. Applicants must be not less than eighteen nor more than thirty-five years of age. They must be able to pass a satisfactory general physical examination by the school physician. The beginning class is limited to twenty-five students.

FEEES

Preliminary fee (to be applied on tuition fee of first quarter).....	\$10.00
Tuition fee (per quarter)	25.00
Deposit (first quarter only).....	10.00
Incidental fee	4.00
Special fees:	
Examination for removal of conditions	1.00
Examination for credit (after first six weeks in residence).....	5.00
Special examinations	5.00
Graduation fee	10.00

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

Part time fees.—Students not registered for the full course will be charged tuition at the rate of \$2 per credit.

ADVANCED STANDING

Graduates of approved training schools for nurses who are also graduates of accredited high schools will be admitted for advanced standing in the School for Dental Hygienists, and should be able to complete the remainder of the work required for the degree of graduate dental hygienist in one college year. Graduate nurses will be given permission to enter the school for one quarter's work to qualify them according to the law to take

the state board examination for a license to practice dental hygiene. Such students will not be candidates for the degree of graduate dental hygienist and will be given university credit only in so far as it would apply if sufficient work to qualify for the degree were taken later.

INSTRUMENTS

The University will furnish the larger pieces of equipment needed for the work in the clinic and laboratories but the students must furnish their own uniforms, caps, operating instruments, and supplies. These instruments and supplies will be needed at the beginning of the freshman year. They will cost approximately sixty dollars. Some few textbooks will be required, also a manikin fee of \$6.

PRIZES

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 that student graduating from the School for Dental Hygienists who has maintained the highest scholastic average and who has completed her entire course at the University of Minnesota.

The Louise C. Ball prize.—Annually Louise C. Ball, B.A., D.D.S., who founded the courses in oral hygiene in New York City, July 10, 1916, at Columbia University, will give a prize of forty dollars in gold to the student in the graduating class writing the best essay on "Preventive Dentistry."

COURSE OF STUDY, YEAR 1927-28

FRESHMAN YEAR

Course Number	Subject	Department	Fall Quarter Hours* Credits†	Winter Quarter Hours Credits	Spring Quarter Hours Credits	Total Hours Credits	Prerequisites	Instructor
1f,s	Elementary Physiology and Physiologic Chem.	Physiology	99 7			99 7	None	Dr. Greisheimer
20f-21w-22s	Dental Prophylaxis	Dentistry	77 3	66 2	33 1	176 6	None	Miss Ueland
7f-8w-9s	Oral Anatomy	Dentistry	44 2	44 2	44 2	132 6	None	Dr. Harker
4f-5w-6s	Prosthetic Dentistry	Dentistry	44 2	44 2	44 2	132 6	None	Dr. Harker
1f-2w-3s	Elem. Physical Training	Physical Education	33 0	33 0	33 0	99 0	None	Ar. by Dr. Norris
4f	Preliminary Hygiene	Physical Education	11 0			11 0	None	Dr. Norris
26f	Anesthetics	Dentistry	11 1			11 1	None	Dr. Griffith
3w	Elementary Anatomy	Anatomy		33 3		33 3	None	Ar. by Dr. Jackson
27w-28s	Surgical Assisting	Dentistry		11 ½	33 1	44 1½	None	Ar. by Dr. Griffith
32w-33s	Dental Assisting	Dentistry		22 1	33 1	55 2	None	Miss Ueland
29w	Dental Laboratory	Dentistry		66 2		66 2	Oral Anat. 7f	Ar. by Dr. Wells
6w	Principles of Dentistry	Dentistry		22 1		22 1	None	Ar. by Miss Ueland
34w-35s	Dental Roentgenology	Dentistry		11 ½	33 1	44 1½	None	Dr. Lilja
95Nw-96Ns	Office Practice	Business		22 1	22 1	44 2	None	Ar. by Miss Ueland
1f,w,s,su	Elementary Bacteriology	Bacteriology			66 4	66 4	None	Miss Krogh
10s	Oral Hygiene Education	Dentistry			11 1	11 1	None	Dr. White
40s	Foods, Nutrition, & Health	Dentistry			11 1	11 1	None	Miss Ueland
	Total		319 15	374 15	363 15	1056 45		

SENIOR YEAR

Af-Bw-Cs	English	English	55 5	55 5	55 5	165 15	None	Ar. by Mr. Thomas
23f-24w-25s	Dental Prophylaxis	Dentistry	33 1	33 1	33 1	99 3	Proph. 20-21-22	Miss Ueland
1f-2w	General Psychology	Psychology	33 3	33 3		66 6	None	Ar. by Mr. Elliott
31f	Oral Hygiene	Dentistry	22 2			22 2	Physio. 1 & Bact. 1	Ar. by Dr. Waldron
11f-12w	Ed. Work in Schools	Dentistry	33 1	33 1		66 2	P.H. Ed. 10s	Ar. by Miss Ueland
1f,w,s	Introduction to Sociology	Sociology		55 5		55 5	None	Ar. by Mr. Chapin
41s	Public Speaking	English			33 3	33 3	Eng. A	Ar. by Mr. Rarig
42w-43s	Thesis and Seminar (Dietetics)	Dentistry		11 1	11 1	22 2	None	Ar. by Dr. Lasby
52f,w,s	Health Care of the Family	Hygiene			55 3	55 3	Physio. 1 & Bact. 1	Miss Fisher
40s	Oral Pathology	Dentistry	33 3			33 3	Physio. 1 & Bact. 1	Dr. Radusch
	Total		209 15	220 16	187 14	596 45		

* Hours mean actual hour periods spent in class.

† A credit means approximately three hours a week for a quarter. This may be three hours of laboratory or clinic time without time spent in outside preparation or one hour in recitation requiring approximately two hours in outside preparation.

DESCRIPTION OF COURSES

ANATOMY

- 3w. Elementary Anatomy. A brief survey of human gross anatomy including a brief introduction to histology, followed by a more detailed study of the anatomy of the oral region. Recitations and demonstrations. Four hours a week for one quarter. Dr. Fisher.

BACTERIOLOGY AND IMMUNOLOGY

- 1f,w,s,su. Elementary Bacteriology. The principles and technic of general bacteriology. Studies of the morphologic and biologic characters of the common bacteria. Preparation of culture media. Disinfectants and disinfection. Bacteriology of water and food products. Six hours a week for one quarter. Miss Krogh.

BUSINESS

- 95Nw. Office Practice. A study of the most approved practices relative to the conduct of an office; appliances, accounts, records, correspondence, filing systems. Two hours a week for one quarter.
- 96Ns. Office Practice. A continuation of Course 95Nw. Two hours a week for one quarter.

DENTISTRY

ORAL ANATOMY

- 7f-8w-9s. Oral Anatomy. A course of lectures and recitations on the anatomy and nomenclature of the teeth and such laboratory work as drawing, dissection, modeling, and carving of the teeth. Special attention is given to the physiological function of tooth form and its practical application. Four hours a week for three quarters. Dr. Harker.

CROWN AND BRIDGE

- 29w. Dental Laboratory. A technic course in the manipulation of investments, waxes, metals, and porcelain including simple bridge construction as used in the dental office laboratory. Six hours a week for one quarter. Dr. Heckler.

ORAL DIAGNOSIS

- 34w-35s. Dental Roentgenology. Lectures, demonstrations, readings, and quizzes in the elements of dental roentgenology. Training in the operation of X-ray equipment and in producing X-ray films. One lecture hour, three practice hours a week for one quarter. Dr. Waldron and assistants.

ORAL HYGIENE AND PATHOLOGY

- 40s. Oral Pathology. An abbreviated course on special pathology of teeth and other oral tissues, including systemic manifestations of oral disease. Introduced by a brief study of general pathology. The common diseases of childhood are also studied. Three hours a week for one quarter. Dr. Radusch.
- 20f-21w-22s. Dental Prophylaxis. Theory and practice in the technic and application of dental prophylaxis and oral hygiene. The work is introduced by practice on manikins after which it is done in the dental infirmary. Seven hours a week first quarter, six hours the second, and three hours the third. Miss Ueland.
- 23f-24w-25s. Dental Prophylaxis. A continuation of Prophylaxis 20-21-22. In this course particular attention is paid to physical defects both outside and in the oral cavity which may be prevented or corrected. Teaching oral hygiene is emphasized. Three hours a week for three quarters. Miss Ueland.
- 10s. Oral Hygiene Education. A recitation course in the preparation and delivery of talks on oral hygiene for various groups and occasions. One hour a week for one quarter. Dr. White.
- 11f-12w. Educational Work in Schools. Demonstrations and practical work in oral hygiene in the schools. Three hours a week for two quarters. Dr. White and associates.
- 31f. Oral Hygiene. Lectures and recitations dealing with the causes and prevention of dental diseases especially as related to general physiology and hygiene. Two hours a week for one quarter. Dr. Wahlquist.
- 40s. Foods, Nutrition, and Health. A course of lectures, covering the study of proper foods, balanced diet, and the value of both in relation to good health. One hour a week for one quarter. Miss Ueland.

ORAL SURGERY

- 26f. Anesthetics. Lectures and practice in administering general anesthetics. Two hours a week for a quarter. Dr. Griffith.
- 27w-28s. Surgical Assisting. Lectures and practice in assisting in oral surgical operations. One hour a week for the first quarter. Three hours a week for the second quarter. Dr. Griffith and members of the Oral Surgery staff.

PROSTHETICS

- 4f-5w-6s. Prosthetic Dentistry. Course of lectures, recitations and laboratory work covering impression materials and their manipulation; making of study models; and important laboratory phases of denture construction. Four hours a week for three quarters—one lecture hour and three laboratory hours per week. Dr. Harker.

THESIS AND SEMINAR, MISCELLANEOUS LECTURES, ETC.

- 42w-43s. A thesis, seminar, and lecture course in the theory and practice of medicine and dentistry, applied economics, jurisprudence, psychology, and ethics. One hour a week for two quarters. Dr. Lasby.

- 6w. Principles of Dentistry. A course of lectures on the principles of operative dentistry, crown and bridge, prosthetics, and orthodontia by which an understanding and appreciation may be gained of the problems involved in each subject. Two hours a week for one quarter. Arranged by Miss Ueland.
- 32w-33s. Dental Assisting. A course of lectures, demonstrations, and practice in assisting the dentist at the chair. A study of dental equipment, instruments, and drugs is included. Two hours a week for the winter quarter, three hours a week for the spring quarter. Arranged by Miss Ueland.

ENGLISH

- Af-Bw-Cs. English. The study of the fundamental principles of composition; training in the art of writing; a historical survey of the classics of English literature. Five hours a week for three quarters. Arranged by Mr. Thomas.
- 41s. Public Speaking. Fundamentals of effective speaking; breathing, voice production, enunciation, and action; delivery of extracts from the works of well-known writers and speakers; principles underlying speech making applied in both oral and written compositions. Three hours a week for one quarter. Arranged by Mr. Rarig and staff.

PHYSICAL EDUCATION FOR WOMEN

- 1f-2w-3s. Elementary Physical Training. Lighter forms of gymnastics, apparatus work, orthopedic exercise, folk dancing, indoor and outdoor games. Individual health consultations. Arranged by Dr. Norris and staff.
- 4f. Preliminary Hygiene. One lecture a week. The most essential aspects of the care of personal health. Dr. Norris.

PHYSIOLOGY AND PHYSIOLOGIC CHEMISTRY

- 1f,s. Elementary Physiology and Physiologic Chemistry. The functional properties of tissue cells; the material basis of the body; the nutritive media; the physiology of nerve and muscle, of the nervous system, the vascular mechanism, respiration, digestion, excretion, and metabolism. This course is preceded by a chemistry course which serves as a foundation for physiology. Nine hours a week for one quarter. Dr. Greisheimer.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

- 52f,w,s. 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. Five hours a week for one quarter. Dr. Duryea, Miss Fisher.

PSYCHOLOGY

1f-2w. General Psychology. An introductory survey of psychology; its material, fundamental laws, applications, and relations to other sciences. Two lectures, one recitation per week for two quarters. Arranged by Mr. Elliott and staff.

SOCIOLOGY AND SOCIAL WORK

1f,w,s. Introduction to Sociology. A study of the origin and development of human societies; various agencies which have determined the type of social life; social organization, institutions, and progress; bearing of sociology upon other social sciences and arts. Five hours a week for one quarter. Arranged by Mr. Chapin and staff.

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

The School of Mines

Part I

Announcement of Courses for the Years
1926-1928



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FACULTY

CHEMISTRY

Professors Paul H. M.-P. Brinton, Ph.D., M. Cannon Sneed, Ph.D.; Assistant Professors Norville C. Pervier, Ph.D.; Landon A. Sarver, Ph.D.; Instructor Gladstone B. Heisig, M.S., M.A.

DRAWING AND DESCRIPTIVE GEOMETRY

Professor William H. Kirchner, B.S.; Assistant Professor Howard D. Myers, B.S. in C.E.; Instructor Orrin W. Potter, E.M.

ELECTRICAL ENGINEERING

Professors George D. Shepardson, M.A., M.E., D.Sc., William T. Ryan, E.E.; Assistant Professor George W. Swenson, M.S. (E.E.).

EXPERIMENTAL ENGINEERING

Mathematics and Mechanics

Professor William E. Brooke, B.C.E., M.A.; Instructor Charles Boehnlein, B.S., M.E.

Mechanical Engineering

Professors John J. Flather, Ph.B., M.M.E., Charles F. Shoop, B.S.; Instructor George L. Tuve, B.S., M.E.

GEOLOGY AND MINERALOGY

Professors William H. Emmons, Ph.D., Frank F. Grout, Ph.D., Clinton R. Stauffer, Ph.D.; Assistant Professors John W. Gruner, Ph.D., George M. Schwartz, Ph.D., George A. Thiel, Ph.D.; Instructor Ira S. Allison, Ph.D.

GERMAN

Professor Carl Schlenker, B.A.; Assistant Professors James Davies, Ph.D., George Lussy, Ph.D.

METALLURGY

Professor William R. Appleby, M.A., Peter Christianson, B.S., E.M., Oscar E. Harder, Ph.D., Levi B. Pease, M.S.; Instructors R. W. Allard, Met.E., Ralph L. Dowdell, Met.E., M.S., Erwin H. Kersten, E.M., Ludwig J. Weber, Ch.E., Ph.D.

MILITARY SCIENCE AND TACTICS

Professor Bernard Lentz, Major, Infantry; Assistant Professors Kent Nelson, Lieutenant Colonel, Medical Corps, Ray C. Hill, Major, Infantry, Frederick H. Bockoven, Major, Dental Corps, Don F. Pratt, Captain, Infantry, Wilton B. Persons, Captain, Signal Corps, Arthur R. Walk, Captain, Infantry, Nyal L. Adams, Captain, Coast Artillery Corps, William F. Rehm, Captain, Infantry, Julian H. Gist, Captain, Infantry, Myron J. Conway, Lieutenant, Infantry, John F. Cassidy, Lieutenant, Coast Artillery Corps; Instructors, Alfred Brandt, Master Sergeant, Harry E. Strider, Master Sergeant, Aubrey R. Dunkum, Staff Sergeant, John Coop, Sergeant, Ernest R. Mylk, Sergeant.

MINE PLANT AND MECHANICS

Professor Elting H. Comstock, M.S.; Assistant Professors Anders J. Carlson, C.E., M.S., James C. Sanderson, Ph.D.

MINING

Professor Walter H. Parker, E.M.; Instructor Alex M. Gow, E.M.

MINING ENGINEERING

Professor Edwin M. Lambert, M.E.

PHYSICS

Professors Henry A. Erikson, Ph.D., Anthony Zeleny, Ph.D.; Associate Professor Louallen F. Miller, Ph.D.

ROMANCE LANGUAGES

Professors Everett W. Olmsted, Ph.D., Litt.D., Head; Irville C. LeCompte, Ph.D., Colbert Searles, Ph.D.; Associate Professors Francis B. Barton, Docteur de l'Université de Paris, Ruth S. Phelps, Ph.D., Edward H. Sirich, Ph.D.

GENERAL INFORMATION

The School of Mines was established by the Board of Regents in 1888, upon recommendation of the general faculty of the University. The buildings and laboratories of the school are located on the main campus of the University. The mining districts of Minnesota are within a few hours, by rail, of Minneapolis. The heartiest co-operation exists between the various mine managements and the school, so that the mining properties are at all times open to parties from the school for observation and study trips. Practical surveying, geological field work, and underground work are carried on in one or more of the districts. Students in the School of Mines have, therefore, all the advantages afforded by a large university combined with ample opportunity for field observation and experience.

The School of Mines occupies the new building provided by the Legislature of 1913. In the basement are the assay and electrometallurgical laboratories, together with machinery room, instrument room, balance room, furnace rooms, and necessary storerooms. On the first floor are the administrative offices, the offices and lecture rooms of the departments of Metallurgy and Mine Plant and Mechanics. On the second floor are the offices, lecture rooms, and drafting rooms of the Department of Mining, the ore dressing laboratory, and the library of the school. On the third floor are the offices, laboratories, and lecture rooms of the Department of Metallography, Department of Mining Engineering, junior drafting room, dark rooms, blue printing room, and offices and computing rooms for the branch of the experiment station serving the Tax Commission.

DEGREES

In the School of Mines there are three regular courses of study, viz., Mining Engineering, Mining Engineering specializing in Geology, and Metallurgy, leading to the degree of engineer of mines (E.M.), engineer of mines in geology (E.M. [Geology]), and metallurgical engineer (Met.E.) respectively.

The degree of metallurgical engineer may be conferred upon a candidate who received the degree of engineer of mines in four years, and vice versa, provided such candidate completes an additional year's work at the school and presents a suitable thesis.

Students in the College of Science, Literature, and the Arts, in the College of Engineering and Architecture, and in the School of Chemistry, who contemplate taking a degree in this school after completing their course, are recommended to select their electives with reference to as full a preparation as possible for the technical work of the course they propose to enter.

CLASSIFICATION OF SUBJECTS

The work falls under the following subdivisions, supplemented by thoro courses in mathematics, mechanics, surveying, physics, chemistry, and the necessary theory and practice of structural, mechanical, and electrical engineering.

(a) *Geology*—to determine the location of the ore. (b) *Mineralogy*—to determine its nature. (c) *Assaying*—to determine whether or not it has value for treatment. (d) *Mining engineering*—to furnish material for treatment. (e) *Mine plant*—to provide the physical equipment for mining and treating the ore. (f) *Ore testing*—to determine best methods of treatment. (g) *Ore dressing*—to furnish products for metallurgical treatment. (h) *Metallurgy*—to smelt and refine ores and ore dressing products; reduction to metals. (i) *Metallography*—to study metals and their alloys.

EXPERIMENT STATION

The School of Mines Experiment Station was established in 1911 and is maintained to promote the development of the mining and mineral resources of the state; to assay specimens of ores, rocks, clays, and minerals; to make such assays free of charge for private parties subject to such regulations as the Board of Regents may deem necessary; to make mining and metallurgical experiments in the treatment of such substances and in the utilization of mining and metallurgical by-products; to investigate methods of mining and the use of explosives; to undertake such other mining and metallurgical problems as may seem desirable; to make all ore estimates for the Tax Commission, and to do such other work along the lines above outlined as may be requested by other state departments. Cooperation has been effected with the United States Bureau of Mines, the United States Geological Survey, the Minnesota Geological Survey, and the School of Chemistry.

The experiment station is prepared to assist citizens interested in these lines of work, and to assay specimens of ore, rocks, clays, and minerals found within the state, free of charge.

In submitting samples the sender must state the exact location in which each sample was found, giving all possible additional information. This information, together with results of any test or analysis, will be on file and available to the public at the office of the station. Citizens desiring free assay privileges must agree to give accredited representatives of the School of Mines Experiment Station and of the Geological Survey access to the property should they desire to visit the same for purposes of examination and geological study.

Correspondence will receive prompt attention, but consultations generally prove more satisfactory.

Each sample should be numbered for identification and bear the name and address of the sender. All shipments must be delivered to the Minnesota School of Mines, charges prepaid. Shipping tags will be furnished upon request.

Address all communications to William R. Appleby, Director, Minnesota School of Mines Experiment Station, the University of Minnesota, Minneapolis, Minnesota.

ADMISSION

The courses leading to the degrees of engineer of mines, engineer of mines (in geology), and metallurgical engineer may be completed in four years.

Freshmen will be divided into two sections as follows:

- a. Those entering with credits in higher algebra and solid geometry.
- b. Those entering without credits in higher algebra and solid geometry.

Students in section b will carry a special course in mathematics during their freshman year.

Details as to admission and entrance requirements, description of subjects accepted for admission, and list of fees and expenses will be found in the bulletin of general information, which will be sent to any address upon application to the registrar, the University of Minnesota, Minneapolis.

UNCLASSSED STUDENTS

No unclassified students will be admitted to the School of Mines.

ADMISSION TO ADVANCED STANDING

Students who desire to obtain advanced standing must present their applications and certificates to the department concerned, obtain a written statement from the department, showing the exact credit allowed, and present this to the Enrolment Committee of the School of Mines.

FEEES

Tuition fees (per quarter)	
Residents of Minnesota	\$30.00
Non-residents	40.00
Incidental fee (per quarter)	4.00
Deposit (first quarter only)	5.00
Military deposit (required of all students taking drill)	10.00
Special fees	
Examination for removal of condition	1.00
Examination for credit (after the first six weeks in residence)	5.00
Special examinations	5.00
Chemistry deposit	5.00
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 two dollars (\$2) and one dollar (\$1) additional for each day of delay after classes begin, provided that no student shall pay more than twelve dollars (\$12) of penalty in any quarter.

COST OF FIELD TRIPS

The approximate cost of the field trips is \$150 for the northern trip taken at the end of the sophomore year and \$225 for the western trip taken at the end of the junior year.

GRADUATION

Students completing courses of study to the satisfaction of the faculty are entitled to receive the appropriate degrees. Any person may undergo, at suitable times, examination in any subject. If such person pass in all the studies and exercises of a course, he is entitled to the appropriate degree, provided that at least the full year be spent at the University before such degree shall be granted, and provided the examination in every case be held before a committee of the faculty appointed for that purpose.

Seniors must be in regular attendance at all classes until after the final examination for the third quarter. Irregular attendance will debar a student from entering all final examinations.

THESIS

The thesis work is intended to bring in review and connect the work in mining and metallurgy, geology and mineralogy, mechanical and electrical engineering, mathematics and mechanics.

It has been found that this purpose is most satisfactorily accomplished by assigning to each student a project, embracing the prospecting, development, and equipment of a group of mining claims, for candidates for the degree of engineer of mines; the investigation of a problem in mining geology, for candidates for the degree of engineer of mines (in geology); and the investigation of a metallurgical problem, for candidates for the degree of metallurgical engineer.

As much latitude as possible will be allowed the student in the choice of type of deposit and location. He must select a suitable project during the summer preceding the senior year. Outlines are furnished setting forth the lines of investigation necessary to obtain the required data. The junior field work affords ample opportunity therefor.

Prior to the reopening of field work at the School of Mines, Monday, September 20, 1926, each student is required to submit to the department concerned an outline embodying the principal features of the project, together with the topographic map and a sufficient number of photographs to represent clearly the locality. Unless this outline is submitted when due and is accepted by the department, final registration for the first semester, senior year, will not be permitted.

All preliminary work must be done and final work on the project must be under way by December 1. On April 7 the text of the thesis must be completed and submitted for final approval. Completed work (typewritten and bound) together with all tracings and one set of clear blue prints therefrom must be in and accepted not later than April 27. Theses will not be accepted or examined after these dates. Unless the above conditions are complied with no student can expect to graduate with his class.

These theses shall become the property of the school.

SPECIAL NOTES

Students failing to receive a quarter mark of 75 per cent in any subject shall have the privilege of a supplementary examination before the opening of the following year.

Each student must obtain from the registrar his average in all subjects and present himself for supplementary examinations, according to the program to be found in a booklet on examinations issued during the summer.

Failure of the registrar to notify a student of deficiencies will not be accepted as a reason for neglecting to report for necessary supplementary examinations. Students failing to report for supplementary examinations will be compelled to take work over in class as in case of failures.

Students failing to pass supplementary examinations will become members of the succeeding class and must register for those subjects in which they have failed. They may take in addition other subjects not more than one year in advance of their class, with the exception of mining, mining engineering, and metallurgical courses, based upon requirements of the various courses and daily program. They may also take certain electives in other colleges provided suitable arrangements can be made.

Students failing to receive a quarter mark of 65 per cent in any subject shall not be allowed to pursue any dependent subject except by permission of the faculty. A student may be permitted to take the dependent subject conditionally for six weeks, at the end of which time he must have a passing grade in the subject if he is to continue it for the remainder of the quarter.

The faculty may exclude students from attending classes in any subject upon recommendation of the department concerned.

All students must report in time to make suitable arrangements with departments concerned in case of conflicts in program.

Students failing to present themselves for final examination for any quarter will be given zero on the examinations.

Students whose absences in any quarter exceed 20 per cent of the scheduled class hours will not be permitted to take examinations without special permission of the faculty.

Sophomores and juniors who, at the end of the winter quarter, are deficient in 10 hours or more of any subject, or who, at the end of the spring quarter examination period for sophomores and juniors are deficient in any subject of the preceding year will not be eligible to take the spring field trip unless declared eligible by a special vote of the faculty. Sophomores who are deficient in one or more quarters of surveying will not be eligible for the sophomore field trip unless recommended for the trip by the Department of Mining Engineering and declared eligible by the faculty.

All subjects elected in other colleges become part of the School of Mines curriculum. All students are required to receive credits in these subjects before graduation.

During the academic year students will be held responsible for the receipt of official communications sent to them through the university post-office. During the summer vacation they will be held responsible for the receipt of such communications sent to the home address given on registration blank for the preceding academic year, unless formal notification of their correct address is filed with the registrar and the dean.

DESCRIPTION OF COURSES

EXPLANATION OF COURSE NUMBERS

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

CHEMISTRY

14. General Inorganic Chemistry. A study of the general laws of chemistry and of the non-metals, the metals, and their compounds.
15. General Inorganic Chemistry. A continuation of Course 14.
16. Qualitative Analysis. Laboratory work in systematic qualitative analysis with lectures on solutions, ionization, chemical and physical equilibrium, oxidation and reduction, etc.
28. Quantitative Analysis. A short introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems are assigned and attention given to proper laboratory practice.
123. Advanced Analytical Chemistry. Analytical methods for the determination of the common constituents of iron ore, iron, and steel are discussed and compared, with emphasis upon the general principles involved. Typical problems are assigned for laboratory practice.
124. Advanced Analytical Chemistry. A survey of the methods of analytical chemistry applied to the analysis of minerals and ores. Typical procedures for laboratory practice serve as a basis for discussion of more general methods.

DRAWING

11. Engineering Drawing. Sketching, lettering, representation, elements of drafting, details of machines and structures, interpretation of working drawings.
12. Engineering Drawing. Continuation of Course 11. The elements of general drafting, mechanical drawing as a language. Lines, views, dimensions, standards, signs, abbreviations, and explanatory notes.
13. Engineering Drawing. Continuation of Course 12. The elements of general drafting. Maps and sketches. Brush and pen conventions.
14. Descriptive Geometry. Projection; central and special cases, principles and application, representation of lines, planes, and solids, and of their relations; tangencies, intersections, and developments. Recitations, lectures, and solution of problems.
15. Drafting. Graphics, machine drafting, and structural drafting. Instruction in drafting room methods.

ELECTRICAL ENGINEERING

41. Electric Power. Elementary principles of continuous currents. Continuous current generators and motors. Elementary principles of alternating currents. Alternating current generators, transformers, and motors. Measurement of power. Elementary principles of transmission and distribution. Lectures, recitation, laboratory work.

EXPERIMENTAL ENGINEERING

MATHEMATICS AND MECHANICS

144. Materials-Testing Laboratory. Investigation of physical properties of metals and engineering materials; wood, cement, ropes, etc., supplemented by lectures and materials of construction and methods of testing. Mining and metallurgical engineers.

MECHANICAL ENGINEERING

84. Elementary General Laboratory. Calibration of gages, anemometers, and gas meters. Physical tests of lubricating oils. Calibration of transmission dynamometer. Properties of steam; separating and throttling calorimeters; indicator and planimeter practice; valve setting. Tests of simple steam engine and steam pump.
181. Advanced General Laboratory. Tests of steam engines, steam turbines, gas engines, air compressors, fans, and blowers. Steam boiler trial. Calibration of V-notch weir. Tests of centrifugal pump, Pelton wheel, and hydraulic reaction turbine.

GEOLOGY AND MINERALOGY

1. General Geology. A synoptical treatment of materials of the earth and of geological processes. Physiographic, dynamic, and structural geology.
2. Historical Geology. The sequence of events in geologic history, with special reference to North America.
19. Elements of Paleontology. An introduction to the study of fossil organisms. Lectures supplemented by field excursions.
- 23-24-25. Elements of Mineralogy. The crystal systems; morphological, physical, chemical characters of minerals; occurrence, genesis, and uses of minerals; classification and description of common minerals; rock minerals, and common rocks. Determinative work in the laboratory, blowpipe analysis, sight identification.
61. Blowpipe Analysis. The determination of minerals by systematic blowpipe analysis.
65. Crystallography. Study of crystal models and space groups. Crystal drawings and measurements. Projections and mathematical calculations.
73. Economic Geology. Study of non-metallic minerals of economic value, and discussions 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 district of Minnesota. Involves preparation of geologic maps and written reports.
- 91-92-93. Index Fossils of North America. A study of fossil forms with special reference to those of geologic importance; faunas and their correlation.
101. Sedimentation. Origin and structure of sedimentary deposits; the interpretation of these in relation to paleogeography. Lectures and assigned readings.
105. Rock Study. The occurrence and genesis of igneous, sedimentary, and metamorphic rocks; their mineral and chemical composition; their structure, texture, and alteration. The classification and methods of identification and description of rocks.
106. Petrography. The identification and study of minerals and rocks by optical methods; the study of igneous rocks, crystalline schists, and metamorphic rocks. The origin and classification of rocks.
111. Ore Deposits. The nature, distribution, and genesis of ore deposits of the United States; relations of ore deposits to geologic structure; the deformation and superficial alteration of ore deposits.
112. Geology of Petroleum. The nature, origin, and accumulation of petroleum; discussion of the various oil fields of the world.
113. Problems in Ore Deposits. Field excursions, map work, lectures on field and laboratory methods.
115. Applied Geology. The application of methods to laboratory, library, and field problems in geology.
- 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. The use of geologic bibliographies and literature.
- 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 of ores and other mineral associations. Practical problem in mining and geology settled by microscopic and optical examinations.
- 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.

150. Field Geology. Detailed, systematic work conforming with standards of official surveys. Preparation of geologic maps, structure sections, reports; paragenesis of ores and their relations to geologic structures. Field for 1927, Black Hills, South Dakota. Reports to be written week before college opens in fall.
- 151-152-153. Advanced General Geology. Geologic processes and their results; development of the North American continent.
- 166-167. Mineralography. Methods of studying opaque minerals and the application of the methods to problems in ore genesis and history.
246. Pre-Cambrian Geology. The problems of pre-Cambrian correlation and structure; the pre-Cambrian stratigraphy of North America. (Given in alternate years.)

GERMAN

- 24-25-26. Beginning for Miners. Pronunciation, grammar, conversation; selected reading in easy prose.
27. Narrative Prose for Chemists. Reading, grammar review.
- 28-29. Chemical German. Selections from more difficult works on chemistry.

METALLURGY

1. Assaying. The determination of values of ores, metallurgical products by the fire method. Lectures and recitations.
2. Assay Laboratory. Practical determination of gold, silver, lead, and tin by the fire method.
3. General Metallurgy. Combustion, fuels, refractory materials, furnaces and fluxes. Lectures and recitations.
4. Metallurgy of Pig Iron. General principles of iron blast furnace practice. Construction of furnace, handling of stock, and products; principles of regulation. Lectures and recitations.
5. Metallurgy of Wrought Iron and Steel. General principles involved in the production of wrought iron and steel. Lectures and recitations.
106. Metallurgy of Base Metals. Lead, copper, zinc, and mercury. Consideration of smelting methods and principles involved in refining. Lectures and recitations.
107. Metallurgy of Base Metals. Continuation of Course 106.
108. Metallurgy of the Precious Metals. Principles involved and methods used in the extraction of gold, silver, and other precious metals. Lectures and recitations.
109. Metallurgy of Base Metals. Short course for mechanical engineers. Special consideration is given to the mechanical appliances.
109. Metallurgy of Base Metals. Short course for electrical engineers. Special consideration is given to electrical appliances. Lectures and recitations.
110. Ore Dressing. Crushing, sizing, classification, and concentration of ores. Lectures and recitations.
111. Ore Dressing. Continuation of Course 110.

112. Ore-Dressing Laboratory. Practical examination of ores and the use of ore-dressing machinery.
113. Ore-Dressing Laboratory. Practical problems in ore dressing.
114. Ore-Dressing Laboratory. Continuation of Course 113.
115. Ore-Dressing Laboratory. Short course in the laboratory use of ore-dressing machinery.
116. Field Work in Metallurgy. Study of metallurgical operations at smelters and mills. Detail reports are required covering plants visited.
117. Advanced Metallurgy. Metallurgical calculations to determine heat balance and heat distribution. Lectures and laboratory work.
118. Advanced Metallurgy. Design of furnaces; conferences; and laboratory work.
119. Ore Testing. General principles involved in determining the best method of extraction, including amalgamation, concentration, cyanidation, roasting, etc. Lectures and recitations.
120. Ore-Testing Laboratory. Practical determination of extraction and distribution of values in mill and metallurgical products. Methods of calculation.
121. Special Problems in Ore Testing. Continuation of Course 120. Practical determinations for regulating metallurgical operations.
122. Special Problems in Ore Testing. Continuation of Course 121.
123. Electrometallurgy. Application of electricity to production of heat for smelting ores and refining metals. Costs of fuel and electricity for heating, relative efficiencies of electric and fuel furnaces. Construction of high temperature furnaces and commercial plants.
124. Thesis in Metallurgy. Conferences to select suitable problem together with preliminary laboratory work on problem selected.
125. Thesis in Metallurgy. Continuation of Course 124.
126. Thesis in Metallurgy. Continuation of Course 125.
150. 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.
151. Advanced Metallography for Electrical Engineers. Continuation of 150. Study of iron and steel, alloy steels, metals and alloys used in electrical engineering practice. Special problems for outside reading and for research. Laboratory work.
- 153-154-155. Metallography. (Long course for metallurgical engineers.) Theory of metallic alloys. Metallographic technique. Properties of metals and alloys. Metallography of iron and steel and commercial alloys. Technical metallography. Laboratory work.
156. 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.

157. Advanced Metallography for Mechanical Engineers. Continuation of 156. Metallography of alloy steels, tool steels, high speed tool steels, and important non-ferrous alloys; metallography applied to engineering practice and specifications. Outside reading and special reports. Laboratory work.
159. Dental Metallography. Study of the dental alloys from the standpoint of metallography. Lectures, recitations, and demonstrations, taking up the most important metals and alloys, with special reference to those used in dentistry.
160. Metallography for Chemical Students. Metallography, including constitution diagrams, preparation and standardization of thermocouples, preparation and thermal analysis of alloys, their microscopic examination and making photomicrographs; typical alloy systems such as iron-carbon (steel and cast iron); some non-ferrous alloys. Laboratory work.
161. Advanced Metallography for Chemical Students. Metallography and heat treatment of iron and steel, including alloy steels, commercial uses of various steels, and engineering specifications. Laboratory work.
162. Advanced Metallography for Chemical Students. Metallography of the non-ferrous metals with a study of the constitution diagrams, properties, and uses of important commercial alloys. Laboratory work.
163. Advanced Metallography. Seminar work on recent advances in metallography. Lectures and recitations, with outside reading and special reports. May be accompanied by laboratory work.
164. Advanced Metallography. Advanced consideration of the structures, properties, and uses of metals and alloys. May be accompanied by laboratory work.
165. Advanced Metallography. Technical metallography as applied to the automotive industry. Lectures and special reports. May be accompanied by laboratory work.
- 163-164-165. Laboratory. Laboratory work on special problems in ferrous, non-ferrous, and X-ray metallography.
- 201-202-203. Advanced Metallography for Graduate Students. Intended primarily for research work.

MILITARY SCIENCE AND TACTICS

1. First Year Basic Course, R.O.T.C.
2a, 2b. Second Year Basic Course, R.O.T.C., Infantry and Coast Artillery.
3a, 3b. First Year Advanced Course, R.O.T.C., Infantry and Coast Artillery.
4a, 4b. Second Year Advanced Course, R.O.T.C., Infantry and Coast Artillery.

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.

MINE PLANT AND MECHANICS

1. Algebra and Solid Geometry. Equations, involution and evolution, theory of exponents, surds, quadratic equation, theory of logarithms, determinants. Demonstrations of most important theorems of solid geometry. Volumes, approximate volumes, prismoidal formula, etc.
2. Algebra. Functions, functional notation, factor and remainder theorems, factors and values of functions, development of functions, progressions, series, theory of equations, permutations and combinations, theory of logarithms, determinants.
3. Algebra. Continuation of Course 1. Functions, functional notation, factor and remainder theorems, factors and values of functions, development of functions, progressions, series, theory of equations, permutations and combinations.
4. Trigonometry. Trigonometric ratios, right triangles, definitions of trigonometric functions, analytic relations, trigonometric equations, etc., solution of spherical triangles.
5. Analytical Geometry. Systems of co-ordinates, loci, equations, properties of straight lines, transformation of co-ordinates, equations and properties of conics, equations of second degree, higher plane curves, space co-ordinates, point, plane, quadric surfaces, etc., empirical equations, graphic algebra.
- 6-7-8. Calculus. Differentiation, elementary forms, geometric applications, rates, successive differentiation, maxima and minima, expansion of functions, intermediate forms, partial derivatives, change of variable, elementary integration, undetermined coefficients, rationalization, formulas of reduction, some differential equations of mechanics.
- 51, 52, 53. Elementary Technical Mechanics. Elementary principles of mechanics and their application to technical problems of mining.
- 109-111. Mechanics. Composition and resolution of forces, laws of equilibrium, practical applications, rectilinear motion, circular motion, curvilinear motion in general, dynamics of rigid bodies, impact, work, and energy.
110. Mechanics of Materials. Mechanical and elastic properties of materials of construction; beams, columns, shafts, hollow cylinders and spheres, rollers, plates; theory of internal stress; reinforced concrete.
- 112-113-114. Mine Plant. Discussion of the machinery and appurtenances employed in the equipment of mines. Air compression, rock drills, me-

- chanical features of hoisting, pumping, ventilation, underground transportation. Electricity applied to mining.
- 115-116. Metallurgical Plant. Power, air, and water supply for metallurgical plants.
117. Hydraulics and Water Power. Laws of the equilibrium, pressure and flow of liquids, hydrographs and mass diagrams, estimate of power to be developed at a power site, design of dams and hydroelectric plants, theory of water wheels and turbines, speed control, power house equipment, transmission.
118. Engineering Construction. Theory of structures, loading, analytic and graphic resolution of stresses in framed structures, stresses in mining structures, design of mining structures.
- 119-120. Mine Plant Design. A study of power possibilities, costs, etc., and designs of a power plant, surface equipment, and structures for a mine.

MINING

21. Introductory Mining. Introductory mining course, preparatory to sophomore field trip.
130. First Aid. Course in first aid to the injured, given by the staff of the United States Bureau of Mines car.
131. Exploration. United States Mining Law, prospecting, exploration, borrowing, explosives, drilling, and blasting.
132. Tunneling. Tunneling, drifting, shaft sinking, raising, and mining methods.
133. Elementary Mining. Short course in mining for metallurgists.
134. Mining Methods. Underground mining methods and support of underground excavations.
135. Practical Mining. Study of mining operations. Mine plant and mining work in one or more mining camps.
139. Practical Mining. Study of mining operations, mine plant and mining work in one or more mining camps.
140. Mine Rescue. Course in mine rescue, given by the staff of the United States Bureau of Mines car.
141. Mine Administration. Mine examination and reports. Amortization. Mining corporations, capitalization, stocks and bonds. Contracts and specifications. Accident prevention. State mining codes. Mining law and court interpretations.
142. Mining Methods. Coal mining and preparation. Mine gases. Placer and hydraulic mining and dredging. Quarrying.
143. Mine Management. Accounting. Sanitation. Welfare work, labor, compensation laws.
144. Thesis. Preparatory work on the mining thesis.
145. Thesis. Preparation of an original thesis on some mining project, covering the exploration and development of a mining property.
146. Thesis. Completion of thesis project.

MINING ENGINEERING

- 1-2-3. Mine Surveying. Theory and problems in mine surveying, including land subdivision, stadia measurements, triangulation, railroad curves and cross sections, computation of areas by co-ordinates; differential leveling, topographic map reading, solar observations, shaft plumbing, underground traversing and leveling.
4. Field Work. Practice in general plane surveying during the month of May. Practice in underground surveying during the first three weeks of June. This work is given on the iron ranges of Minnesota.
- 105-106-107. Mine Mapping. Mine mapping in accordance with prevalent practice in mining districts. Ore and stripping estimates and mine maps based on Mesabi Range practice.

PHYSICS

3. Elements of Mechanics and Sound. Mechanics of solids, fluids, wave motion, and sound. A study of the simpler fundamental principles. First part of the general course, 3, 23, 33, 43. Course 4 should be taken in conjunction with this course.
4. Elements of Mechanics and Sound Laboratory. Measurements in the mechanics of solids, fluids, wave motion, and sound; the laboratory part supplementing Course 3. One two-hour session in the laboratory a week.
23. Heat. A study of the principles underlying heat phenomena. Course 24 should be taken in conjunction with this course.
24. Heat Laboratory. The laboratory part supplementing Course 23. One two-hour session in the laboratory a week.
43. Magnetism and Electricity. A study of the principles underlying magnetic and electric phenomena. Course 44 should be taken in conjunction with this course.
44. Electrical Laboratory. The laboratory part supplementing Course 43. One two-hour session in the laboratory a week.

ROMANCE LANGUAGES

FRENCH

- 1-2. Beginning French.
- 3-4. Intermediate French.
- 21-22-23. General Survey of French Literature. Outline of French literature from 1600 to the present. Reading of representative texts.

SPANISH

- 1-2. Beginning Spanish.
- 3-4. Intermediate Spanish.
- 65-66-67. Spanish Literature. Outline of Spanish literature from 1500 to the present. Reading of representative texts.

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

The School of Mines and Metallurgy
Part II
Announcement of Program for the Year
1927-1928



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FRESHMAN WEEK

Every student entering any department of the University for the first time as a freshman in the fall of 1927 is required to be here throughout the week before the opening of classes. Every new freshman must present himself at the registrar's office either Friday, September 16, Saturday, September 17, or Monday, September 19, to begin the process of registration. Those coming later than 5:00 p.m. Monday, September 19, will be subject to the usual penalty for late registration. See Penalty Fees, page 47 of the bulletin of general information.

During the week September 20 to 24, in addition to carrying out their registration, freshmen will meet for lectures on such subjects as how to study, the use of the library, important university and college regulations, and will visit the library, the scientific laboratories, and other points of interest to them in connection with their choice of studies and of their future occupations.

During this week there will be the usual physical examinations and psychological tests and such other examinations as will enable the faculty to place the students in classes for which they are best fitted.

The general purpose of the Freshman Week is to help the student to make a good start on his work and to adjust himself to the new and perplexing conditions of university life.

NOTICE THAT ATTENDANCE THROUGHOUT FRESHMAN WEEK IS A REQUIREMENT

It is recommended that as many as possible present themselves for registration on Friday, September 16, in order to avoid the inconvenience and delay incident to the congestion on the last day.

1927							1928													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2	1	2	3	4	5	6	7	1	2	3	4	5	6	7
3	4	5	6	7	8	9	8	9	10	11	12	13	14	8	9	10	11	12	13	14
10	11	12	13	14	15	16	15	16	17	18	19	20	21	15	16	17	18	19	20	21
17	18	19	20	21	22	23	22	23	24	25	26	27	28	22	23	24	25	26	27	28
24	25	26	27	28	29	30	29	30	31	..	..	..	..	29	30	31	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
AUGUST							FEBRUARY							AUGUST						
..	1	2	3	4	5	6	..	..	..	1	2	3	4	..	..	..	1	2	3	4
7	8	9	10	11	12	13	5	6	7	8	9	10	11	5	6	7	8	9	10	11
14	15	16	17	18	19	20	12	13	14	15	16	17	18	12	13	14	15	16	17	18
21	22	23	24	25	26	27	19	20	21	22	23	24	25	19	20	21	22	23	24	25
28	29	30	31	..	..	..	26	27	28	29	..	..	..	26	27	28	29	30	31	..
..
SEPTEMBER							MARCH							SEPTEMBER						
..	..	..	..	1	2	3	..	..	..	1	2	3	..	..	..	..	1	2	3	
4	5	6	7	8	9	10	4	5	6	7	8	9	10	2	3	4	5	6	7	8
11	12	13	14	15	16	17	11	12	13	14	15	16	17	9	10	11	12	13	14	15
18	19	20	21	22	23	24	18	19	20	21	22	23	24	16	17	18	19	20	21	22
25	26	27	28	29	30	..	25	26	27	28	29	30	31	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	..	..	..	..	..	..
OCTOBER							APRIL							OCTOBER						
..	..	..	..	..	..	1	1	2	3	4	5	6	7	..	1	2	3	4	5	6
2	3	4	5	6	7	8	8	9	10	11	12	13	14	7	8	9	10	11	12	13
9	10	11	12	13	14	15	15	16	17	18	19	20	21	14	15	16	17	18	19	20
16	17	18	19	20	21	22	22	23	24	25	26	27	28	21	22	23	24	25	26	27
23	24	25	26	27	28	29	29	30	..	..	..	..	..	28	29	30	31	..	..	..
30	31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER						
..	..	1	2	3	4	5	..	..	1	2	3	4	5	..	..	..	..	1	2	3
6	7	8	9	10	11	12	6	7	8	9	10	11	12	4	5	6	7	8	9	10
13	14	15	16	17	18	19	13	14	15	16	17	18	19	11	12	13	14	15	16	17
20	21	22	23	24	25	26	20	21	22	23	24	25	26	18	19	20	21	22	23	24
27	28	29	30	..	..	..	27	28	29	30	31	..	..	25	26	27	28	29	30	..
..
DECEMBER							JUNE							DECEMBER						
..	..	..	..	1	2	3	..	..	..	..	1	2	..	..	..	..	..	..	1	
4	5	6	7	8	9	10	3	4	5	6	7	8	9	2	3	4	5	6	7	8
11	12	13	14	15	16	17	10	11	12	13	14	15	16	9	10	11	12	13	14	15
18	19	20	21	22	23	24	17	18	19	20	21	22	23	16	17	18	19	20	21	22
25	26	27	28	29	30	31	24	25	26	27	28	29	30	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	31	..	..	..	..	..

UNIVERSITY CALENDAR

1927-28

1927		<i>Fall Quarter</i>	
September	15	Thursday	Payment of fees closes, except for new students
September	15-17		Entrance examinations (for removal of entrance deficiencies)
September	16-19		Registration of all new students entering the freshman class
September	19	Monday	Seniors School of Mines and Metallurgy report for completion of field work.
September	19-23		Examinations for removal of conditions Physical examinations Registration period, ¹ colleges of Science, Literature, and the Arts, and Education
September	20-24		Freshman week
September	21	Wednesday	Juniors School of Mines and Metallurgy report for completion of field work.
September	22-23		Registration days ¹ for all colleges not included above
September	23	Friday	Payment of fees for new students closes
September	26	Monday	Fall quarter classes begin, 8:30 ² a.m. Fall semester extension classes ³ begin
October	20	Thursday	Senate meeting, 4:30 p.m.
October	22	Saturday	Homecoming Day
November	11	Friday	Armistice Day; a holiday
November	24	Thursday	Thanksgiving Day; a holiday
December	1	Thursday	State Day Convocation
December	14-17		Final examination period
December	15	Thursday	Commencement Convocation Senate meeting, 4:30 p.m.
December	17	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	21	Wednesday	Payment of fees closes for all students in residence fall quarter ⁴

Winter Quarter

December	27-29		Entrance examinations
1928			
January	2-3		Registration days for new students in the College of Science, Literature, and the Arts

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, page 47 of the 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 8:15 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.

January	3	Tuesday	Registration days for new students in all other colleges
January	4	Wednesday	Christmas vacation ends, winter quarter classes begin, 8:30 ¹ a.m.
January	28	Saturday	First semester extension classes close
January	30	Monday	Second semester extension classes begin
February	13	Monday	A holiday (February 12, Sunday, Lincoln's Birthday)
February	16	Thursday	Charter Day Convocation Senate meeting, 4:30 p.m.
February	22	Wednesday	Washington's Birthday; a holiday
March	14-17		Final examination period
March	15	Thursday	Commencement Convocation Payment of fees closes for all students in residence winter quarter ²
March	17	Saturday	Winter quarter ends, spring vacation begins, 5:30 p.m.
<i>Spring Quarter</i>			
March	19-21		Entrance examinations
March	23-24		Registration days ³ for new students in all colleges
March	26	Monday	Spring vacation ends, spring quarter classes begin, 8:30 ¹ a.m.
April	6	Friday	Good Friday; a holiday
May	10	Thursday	Cap and Gown Day Convocation
May	17	Thursday	Senate meeting, 4:30 p.m.
May	26	Saturday	Second semester extension classes close
May	30	Wednesday	Memorial Day; a holiday
June	6-9		Final examination period
June	9	Saturday	Spring quarter closes, 5:20 p.m.
June	10	Sunday	Baccalaureate service
June	11	Monday	Fifty-sixth annual commencement
<i>Summer Quarter</i>			
June	15-16		Summer Session first term begins, registration and payment of fees
June	18	Monday	Classes begin, 8:00 a.m.
July	4	Wednesday	Independence Day; a holiday
July	28	Saturday	Registration and payment of fees for second term closes
July	30	Monday	Second term classes begin
September	1	Saturday	Second term Summer Session closes

¹ First hour classes begin at 8:15 at University Farm.

² New students must pay fees on dates announced for registration.

³ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, page 47 of the 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.

COURSES OF STUDY

UNIFORM CURRICULUM TO END OF SOPHOMORE YEAR

The courses leading to the degrees of engineer of mines, engineer of mines (in petroleum), engineer of mines (in geology), and metallurgical engineer are uniform for the first two years.

Freshmen will be divided into two sections as follows:

- a. Those entering with credits in advanced algebra and solid geometry.
- b. Those entering without credits in advanced algebra and solid geometry.

Subjects with the prefix a are to be taken by freshmen in section a; those with the prefix b are to be taken by freshmen in section b; and those without prefix are to be taken by students of both sections.

FRESHMAN YEAR

First Quarter

Dept.	No.	Title	Lect.	Lab.	Prereq.
Chemistry	14f*	General Inorganic	3†	6†	.....
Drawing	11f	Engr. Drawing	..	10	.....
a. Mathematics	2f	Algebra	6	..	.....
b. Mathematics	1f	Alg. and Solid Geom.	6	..	.....
Geology	1f	General Geology	3	1	.....
Military Science	1	Basic Course, R.O.T.C.	3	..	.....

Second Quarter

Chemistry	15w	General Inorganic	3	6	Chem. 14f
Drawing	12w	Engr. Drawing	..	8	Draw. 11f
Mathematics	4w	Trigonometry	6	..	Math. 1f or 2f
Metallurgy	1w	Assaying	4	..	Chem. 14f, Geol. 1f
Metallurgy	2w	Assaying Laboratory	..	8	Chem. 14f, Geol. 1f
Geology	23w	Elements of Mineralogy	2	2	Geol. 1f
Military Science	1	Basic Course, R.O.T.C.	3	..	.....

Third Quarter

Chemistry	16s	Qualitative Analysis	3	6	Chem. 15w
Drawing	13s	Engr. Drawing	..	8	Draw. 12w
Mathematics	5s	Analytical Geometry	6	..	Math. 4w
b. Mathematics	3s	Algebra	4	..	Math. 1f
Geology	24s	Elements of Mineralogy	4	4	Geol. 23w
Military Science	1	Basic Course, R.O.T.C.	3	..	.....

* The suffixes f, w, or s, after the course number indicate the quarter in which a course is offered—fall, winter, or spring quarter, respectively. Two or three suffixes indicate that a course is offered in each of the corresponding quarters.

† Figures following the descriptive name of a course indicate number of hours per week. Course names following indicate prerequisite courses.

COURSES OF STUDY

SOPHOMORE YEAR

First Quarter

Dept.	No.	Title	Lect.	Lab.	Prereq.
Geology	25f	Elements of Mineralogy	4	4	Geol. 24s
Geology	105f	Rock Study	..	4	Geol. 24s
Mathematics	6f	Calculus	4	..	Math. 5s
Metallurgy	3f	General	3	..	Met. 1w, 2w, Chem. 16s
Mining Engineering	1f	Mine Surveying	3	..	Math. 4w
Physics	3f	Elements of Mechanics	3	..	Math. 5s
Physics	4f	Mechanics Laboratory	..	2	Math. 5s
or Mechanics	51f	Elementary Tech. Mech.	4	..	Math. 5s
Mil. Sci.	2a, 2b, or 2c	Basic Course, R.O.T.C.	3	..	.....

Second Quarter

Anal. Chemistry	9w	Quantitative Analysis	1	7	Chem. 16s
Drawing	14w	Descriptive Geometry	3	..	Draw. 13s, Math. 5s
Drawing	15w	Drafting	..	4	With Draw. 14w
Geology	106w	Petrography	..	4	Geol. 105f
Mathematics	7w	Calculus	3	..	Math. 6f
Metallurgy	4w	Met. of Pig Iron	3	..	Met. 3f
Mining Engineering	2w	Mine Surveying	3	..	Min. Engr. 1f
Physics	23w	Heat	3	..	Phys. 3f
Physics	24w	Heat Laboratory	..	2	Phys. 4f
or Mechanics	52w	Elementary Tech. Mech.	4	..	Mech. 51f
Mil. Sci.	2a, 2b, or 2c	Basic Course, R.O.T.C.	3	..	.....

Third Quarter

Geology	2s	Historical	3	4	Geol. 1f
Mathematics	8s	Calculus	6	..	Math. 7w
Metallurgy	5s	Wrought Iron and Steel	3	..	Met. 4w
Mining	21s	Introductory Mining	4	..	.....
Mining Engineering	3s	Mine Surveying	3	4	Min. Engr. 2w
Physics	43s	Magnetism & Electricity	3	..	Phys. 3f
Physics	44s	Magnetism & Elec. Lab.	..	2	Phys. 4f
or Mechanics	53s	Elementary Tech. Mech.	4	..	Mech. 52w
Mining Engineering	4s	Field Work beginning about May 1	7 weeks		Soph. year
Geology	8s	Field Work beginning about June 20	2 weeks		Soph. year

JUNIOR AND SENIOR YEARS

COURSES LEADING TO THE DEGREE OF ENGINEER OF MINES
JUNIOR YEAR

First Quarter

Dept.	No.	Title	Lect.	Lab.	Prereq.
Exp. Engr., M.E.	84f	Elementary Lab.	..	4	With Mech. 112f
Geology	73f	Economic	3	..	Geol. 2s, 105f
Mechanics	109f	Mechanics	5	..	Math. 8s
Mechanics	112f	Mine Plant	6	..	Math. 8s
Metallurgy	106f	Base Metals	4	..	Met. 3f
Metallurgy	110f	Ore Dressing	3	..	Phys. 43s, Geol. 25f
Mining	131f	Exploration	5	..	Mining 21s

Second Quarter

Dept.	No.	Title	Lect.	Lab.	Prereq.
Exp. Engr., M.&M.	144w	Materials Testing Lab.	..	4	With Mech 110w
Mechanics	110w	Mechanics of Materials	5	..	Mech. 109f
Mechanics	113w	Mine Plant	6	..	Mech. 112f
Metallurgy	107w	Base Metals	4	..	Met. 106f
Metallurgy	111w	Ore Dressing	3	..	Met. 110f
Mining	132w	Development	5	..	Min. 131f
Mining Engr.	105w	Mine Mapping	..	6	Min. Engr. 4s

Third Quarter

Mechanics	111s	Mechanics of Materials	5	..	Mech. 110w
Mechanics	114s	Mine Plant	6	..	Mech. 113w
Metallurgy	108s	Precious Metals	4	..	Met. 107w
Metallurgy	115s	Ore Dressing Lab.	..	6	Met. 111w
Mining	130s	First Aid, 1 week			.....
Mining	134s	Mining Methods	5	..	Min. 132w
Mining Engr.	107s	Mine Mapping	..	6	Min. Engr. 105w
Metallurgy	116s	Field Work in Metallurgy beginning about May 1	10 days		Junior year
Mining	135s	Field Work in Mine Plant and Mining beginning about May 1	2 weeks		Junior year

SENIOR YEAR

First Quarter

Dept.	No.	Title	Lect.	Lab.	Prereq.
Electrical Engr.	41f	Electric Power	2	3	Phys. 43s, or Mech. 53s
Geology	111f	Ore Deposits	3	..	Geol. 73f, 106w
Mechanics	117f	Water Power	5	2	Mech. 111s
Mechanics	118f	Engr. Construction	..	8	Mech. 111s
Metallurgy	119f	Ore Testing	2	..	Met. 108s
Metallurgy	120f	Ore Testing Lab.	..	8	Met. 108s
Mining	141f	Mine Administration	5	..	Min. 134s
Mining	144f	Thesis	..	2	Min. 134s

Second Quarter

Exp. Engr., M.E.	181w	Advanced Lab.	..	4	Exp. Engr. 84f
Geology	112w	Petroleum	3	..	Geol. 111f
Geology	115w	Applied Geology	3	..	Geol. 73f, 111f
Mechanics	119w	Mine Plant Design	..	9	Mech. 118f
Metallurgy	121w	Special Problems	..	4	Met. 119f
Mining	142w	Mine Methods	5	..	Min. 141f
Mining	145w	Thesis	..	12	Min. 144f

Third Quarter

Geology	113s	Problems in Ore Dep's	..	4	Geol. 112w
Mechanics	120s	Mine Plant Design	..	12	Mech. 119w
Metallurgy	122s	Special Problems	..	8	Met. 121w
Mining	140s	Mine Rescue, 1 week	..	..	.....
Mining	143s	Mine Management	5	..	Min. 142w
Mining	146s	Thesis	..	12	Min. 145w

DEPARTMENT OF MINING

The department is well supplied with samples of the smaller mine equipment, models, drawings, photographs, lantern slides, and mine maps. The lectures treat of prospecting, development, support of excavations, mining methods, mine administration, mining law, and the necessary allied subjects. The courses in mining extend through the sophomore, junior, and senior years.

FIELD WORK IN MINING

JUNIOR YEAR

At the end of the junior year students are required to study mine plant and mining methods in one or more mining districts under the direction of members of the faculty. This work begins about May 15, and not over three weeks will be devoted to it. The work is carried on in the leading western metal mining districts, the exact location to be announced in April of each year. The expenses for the trip are estimated at \$225. A deposit of \$50 must be made before starting on the trip to cover board and lodging and necessary side trips. Any balance will be returned at the close of the work in the field.

All notes, data, and sketches necessary for a complete report on the field work, must be fully and neatly recorded in notebooks. These notebooks will be collected at the close of the trip and returned to the student at the reopening of field work at the school. In judging the character of the student's field work, equal importance will be attached to the completed report and to the original field notes. The department reserves the right to reject notebooks considered below the standard that should be demanded of candidates for senior work. During the months of June, July, and August, the student is urged to spend at least six weeks in actual underground mining work in the West for which he may receive wages. The department will render all possible assistance in locating students in districts of their choice.

Field work will reopen at the School of Mines and Metallurgy, Monday, September 19, 1927. No senior will be registered after that date. Registration will cover field work, electric power, and geology.

The final reports covering field work in mining and metallurgy must be prepared at the School of Mines and Metallurgy under the direct supervision of the departments concerned.

On October 10 all seniors who expect to graduate must register for the remaining subjects. Prior to this date the student must submit a typewritten report on field work fully illustrated with drawings, to scale, made from the field sketches, covering mining, metallurgical and milling operations, and details of plant and equipment. Final registration will not be allowed until after reports on field work are accepted. All final reports, therefore, must be presented on or before October 10. These reports shall become the property of the school.

The completion of sophomore and junior field work is a requisite for graduation, and satisfactory evidence thereof must be submitted to the department. Should a student, for sufficient reason, fail to complete this work in regular course, he may, with the consent of the department, be permitted to pursue his regular studies. In all such cases, however, the degree will be withheld until all field work is completed.

DEPARTMENT OF MINING ENGINEERING

MINE SURVEYING

The work in surveying is given in the sophomore year and is designed primarily for mining engineers. The work begins with the elements of plane surveying, with special reference to the computations necessary, followed by the higher theoretical work in plane surveying and its application to the problems met in underground surveying. Beginning about May 1, the class devotes seven weeks to field work at some convenient point on the Mesabi, Cuyuna, or Vermilion Range. The exact location will be announced in March of each year. The expenses for this trip are estimated at \$150.

The students will be divided into squads of two to four. Each student will be required to complete satisfactorily a practical course in plane and underground surveying including exercises in chaining and taping; adjustment and use of surveying instruments, solar and stellar observations; laying out railroad tangents and curves; making earthwork estimates; and other problems. In addition each squad will be required to make a yardage estimate of the stripping of an open-pit mine; to transfer a meridian, from the surface, underground and make a complete survey of an underground mine.

The data obtained will be used in the course in mine mapping during the winter quarter of the junior year, and credit for field work is withheld until maps of the underground survey are satisfactorily completed.

A full equipment of surveying instruments of the latest and best types is furnished each squad for this work.

COURSES LEADING TO THE DEGREE OF ENGINEER OF MINES IN GEOLOGY JUNIOR YEAR

First Quarter

Dept.	No.	Title	Lect.	Lab.	Prereq.
Geology	61f	Blowpipe Analysis	2	4	Geol. 25f
	or 65f	or Crystallography	2	4	Geol 25f
Geology	73f	Economic	3	..	Geol. 2s, 105f
Geology	131f	Advanced Petrology	3	3	Geol. 2s, 106w
Geology	151f	Advanced General	3	..	Geol. 73f
Mechanics	109f	Mechanics	5	..	Math. 8s
Mining	131f	Exploration	5	..	Min. 21s
Elective	....	.....	3	..	.....

COURSES OF STUDY

11

Second Quarter

Dept.	No.	Title	Lect.	Lab.	Prereq.
Geology	124W	Struct. & Metamorphic	3	..	Geol. 73f, 105f
Geology	132W	Advanced Petrology	3	3	Geol. 28, 106W
Geology	144W	Geologic Maps	..	6	Geol. 73f
Geology	152W	Advanced General	3	..	Geol. 73f
Mechanics	110W	Mechanics of Materials	5	..	Mech. 109f
Mining	132W	Development	5	..	Min. 131f
Mining Engr.	105W	Mine Mapping	..	6	Min. Engr. 48
Elective	....	.....	3	..	.....

Third Quarter

Geology	125S	Struct. & Metamorphic	6	..	Geol. 73f, 105f
Geology	133S	Advanced Petrology	3	3	Geol. 28, 106W
Geology	145S	Geologic Maps	..	12	Geol. 73f
Geology	153S	Advanced General	3	..	Geol. 73f
Mechanics	111S	Mechanics of Materials	5	..	Mech. 110W
Mining	134S	Mining Methods	5	..	Min. 132W
Geology	150S	Field Work beginning about May 1		6 weeks	Geol. 125S

SENIOR YEAR

First Quarter

Dept	No.	Title	Lect.	Lab.	Prereq.
Geology	91f	Paleontology	3	..	Geol. 28
Geology	111f	Ore Deposits	3	..	Geol. 73f, 106W
Metallurgy	110f	Ore Dressing	3	..	Phys. 43S, Geol. 25f
Mining	141f	Mine Administration	5	..	Min. 134S
Thesis	....	.....	..	8	.....
Electives	....	.....	6	..	.....

Second Quarter

Geology	92W	Paleontology	3	..	Geol. 28
Geology	112W	Petroleum	3	..	Geol. 111f
Geology	137W	Testing Econ. Materials	1	4	Geol. 73f
Geology	140W	Applied Petrography	1	4	Geol. 111f, 133S
Geology	166W	Mineralography	..	6	Geol. 111f
Metallurgy	111W	Ore Dressing	3	..	Met. 110f
Mining	142W	Mine Methods	5	..	Min. 141f
Thesis	....	.....	..	8	.....

Third Quarter

Geology	93S	Paleontology	3	..	Geol. 28
Geology	113S	Prob. in Ore Deposits	..	4	Geol. 112W
Geology	141S	Applied Petrography	1	4	Geol. 111f, 133S
Geology	167S	Mineralography	..	6	Geol. 111f
Metallurgy	115S	Ore Dressing Lab.	..	6	Met. 111W
Thesis	....	.....	..	8	.....

FIELD WORK IN GEOLOGY

At the end of the sophomore year mining students are required to devote about two weeks to geologic mapping. This course usually comes after a seven-week course in surveying and the fields chosen are the Vermilion and Mesabi iron ranges of Minnesota. This work is intended to

train the students in the interpretation of field relations and the preparation of geologic maps and cross sections.

The second field course in geology is required only of those students who are candidates for the engineer of mines (in geology) degree. The course begins early in May and is completed in June. The course requires altogether about six weeks' work, and the field chosen is the Black Hills region of South Dakota or some other western region. The expenses of the trip are estimated at \$225. A deposit of \$50 must be made before starting on the trip to cover lodging and necessary side trips. Any balance will be returned at the close of the work in the field. The student is trained in interpretation of field data; in detailed mapping, underground and on the surface; in the preparation of geologic cross sections through mines; and he may gather material which will serve as a basis for future study in advanced courses the following year. The work conforms to the standards of official surveys as nearly as practicable. In preparation for the trip a lecture of one hour per week will be scheduled for part of the third quarter preceding the trip. At the close of the field season the students are expected to obtain positions with mining companies either as miners or as engineers, or if openings are available, they may enter geological surveys for the season's work.

Field work in geology for students having taken either of the above trips will reopen at the School of Mines and Metallurgy, Wednesday, September 21, 1927. The final reports covering the field work must be prepared at the School of Mines and Metallurgy under the direct supervision of the Department of Geology. These reports are to be turned in to the department on September 26.

COURSES LEADING TO THE DEGREE OF ENGINEER OF MINES IN PETROLEUM

JUNIOR YEAR

First Quarter

Dept.	No.	Title	Lect.	Lab.	Prereq.
Exp. Engr.	84f	Elementary Laboratory	..	4	With Mech. 112f
Geology	73f	Economic	3	..	Geol. 2s, 105f
Geology	131f	Advanced Petrology	3	3	Geol. 2s, 106w
Geology	151f	Advanced General	3	..	Geol. 73f
Mechanics	109f	Mechanics	5	..	Math. 8s
Mechanics	112f	Mine Plant	6	..	Math. 8s
Pet. Engr.	131f	Oil Field Development	5	..	Min. 21s

Second Quarter

Geology	124w	Struct. & Metamorphic	3	..	Geol. 73f, 105f
Geology	132w	Advanced Petrology	3	3	Geol. 2s, 106w
Geology	152w	Advanced General	3	..	Geol. 73f
Mechanics	110w	Mechanics of Materials	5	..	Mech. 109f
Mechanics	113w	Mine Plant	6	..	Mech. 112f
Min. Engr.	105w	Mine Mapping	..	3	M.E. 4s
Pet. Engr.	132w	Oil Field Development	5	..	Pet. Engr. 131f

COURSES OF STUDY

Third Quarter

Dept.	No.	Title	Lect.	Lab.	Prereq.
Geology	125S	Struct. & Metamorphic	6	..	Geol. 73f, 105f
Geology	133S	Advanced Petrology	3	3	Geol. 2S, 106W
Geology	153S	Advanced General	3	..	Geol. 73f
Mechanics	111S	Mechanics of Materials	5	..	Mech. 110W
Mechanics	114S	Mine Plant	6	..	Mech. 113W
Pet. Engr.	151S	Petroleum Refining	5	..	.....
Pet. Engr.	135S	Field Work		3 weeks	Jr. year

SENIOR YEAR

First Quarter

Dept.	No.	Title	Lect.	Lab.	Prereq.
Geology	91f	Paleontology	3	..	Geol. 2S
Geology	111f	Ore Deposits	3	..	Geol. 73f, 106W
Mechanics	117f	Hydraulics	5	2	Mech. 111S
Mechanics	118f	Engineering Const.	..	8	Mech. 111S
Pet. Engr.	141f	Administration	5	..	Min. 134S
Pet. Engr.	144f	Thesis	..	6	Min. 134S
Electives	....			5	

Second Quarter

Chemistry	168W	Petroleum & Pet. Prod.	1	4	.....
Geology	92W	Paleontology	3	..	Geol. 2S
Geology	102W	Micropaleontology	..	6	Geol. 91f or 111f
Geology	112W	Petroleum	3	..	Geol. 111f
Geology	144W	Geologic Maps	..	6	Geol. 73f
Mechanics	119W	Engineering Const.	..	9	Mech. 118f
Pet. Engr.	142W	Production Technology	5	..	Pet. Engr. 141f
Pet. Engr.	145W	Thesis	..	6	Pet. Engr. 144f

Third Quarter

Geology	93S	Paleontology	3	..	Geol. 2S
Geology	103S	Micropaleontology	..	6	Geol. 102W
Geology	145S	Geologic Maps	..	12	Geol. 73f
Pet. Engr.	143S	Production Technology	5	..	Pet. Engr. 142W
Pet. Engr.	146S	Thesis	..	12	Pet. Engr. 145W

FIELD WORK IN PETROLEUM ENGINEERING

JUNIOR YEAR

At the end of the junior year students are required to study petroleum production and refining in one or more districts under the direction of members of the faculty. This work begins about May 15 and not over three weeks will be devoted to it. The expenses for this trip are estimated at \$225. A deposit of \$50 must be made before starting on the trip to cover board and lodging and necessary side trips. Any balance will be returned at the close of the work in the field.

All notes, data, and sketches, necessary for a complete report on the field work, must be fully and neatly recorded in notebooks. These notebooks will be collected at the end of the trip and returned to the student at the reopening of field work at the school. In judging the character of the student's field work, equal importance will be given to the completed report and to the original field notes. Notebooks considered below the standard that should be demanded of candidates for senior work may be

rejected by the faculty members in charge. Upon termination of the field trip, candidates for the degree of engineer of mines (in petroleum) are urged to spend at least six weeks in practical work in one of the oil districts, for which they may receive wages. The faculty members in charge will render all possible assistance in locating students in suitable positions.

Field work will reopen at the School of Mines and Metallurgy, Monday, September 19, 1927. No senior will be registered after that date. Registration will cover field work, paleontology, and ore deposits.

The final reports covering field work in petroleum production and refining must be prepared at the School of Mines and Metallurgy under the supervision of the departments concerned.

On October 10 all seniors who expect to graduate must register for the remaining subjects. Prior to this date the student must submit a type-written report on field work fully illustrated with drawings to scale, made from the field sketches, covering production methods and details of plant and equipment. Final registration will not be allowed until after reports on field work are accepted. All final reports, therefore, must be presented on or before October 10. These reports will become the property of the school.

The completion of sophomore and junior field work is a requisite for graduation, and satisfactory evidence thereof must be submitted to the department. Should a student, for sufficient reason, fail to complete this work in regular course, he may, with the consent of the department, be permitted to pursue his regular studies. In all such cases, however, the degree will be withheld until all field work is completed.

COURSES LEADING TO THE DEGREE OF METALLURGICAL ENGINEER

JUNIOR YEAR

First Quarter

Dept.	No.	Title	Lect.	Lab.	Prereq.
Geology	73f	Economic	3	..	Geol. 2s, 105f
Mechanics	109f	Mechanics	5	..	Math. 8s
Mechanics	112f	Mine Plant	6	..	Math. 8s
Metallurgy	106f	Base Metals	4	..	Met. 3f
Metallurgy	110f	Ore Dressing	3	..	Phys. 43s, Geol. 25f
Metallurgy	112f	Ore Dressing Lab.	..	4	Phys. 43s, Geol. 25f
Metallurgy	153f	Metallography	3	4	Chem. 28w, Phys. 43s

Second Quarter

Mechanics	110w	Mechanics of Materials	5	..	Mech. 109f
Mechanics	115w	Metallurgical Plant	3	..	Mech. 112f
Metallurgy	107w	Base Metals	4	..	Met. 106f
Metallurgy	111w	Ore Dressing	3	..	Met. 110f, 112f
Metallurgy	113w	Ore Dressing Lab.	..	4	Met. 110f, 112f
Metallurgy	154w	Metallography	3	4	Met. 153f
Mining	133w	Elementary Mining	5	..	Min. 21s
Mining Engr.	106w	Mine Mapping	..	3	Min. Engr. 4s

COURSES OF STUDY

15

Third Quarter

Dept.	No.	Title	Lect.	Lab.	Prereq.
Mechanics	111s	Mechanics of Materials	5	..	Mech. 110w
Mechanics	116s	Metallurgical Plant	3	..	Mech. 115w
Metallurgy	108s	Precious Metals	4	..	Met. 107w
Metallurgy	114s	Ore Dressing Lab.	..	6	Met. 111w, 113w
Metallurgy	155s	Metallography	3	4	Met. 154w
Mining	130s	First Aid, 1 week	..	..	.....
Mining Engr.	107s	Mine Mapping	..	3	Min. Engr. 4s
Metallurgy	116s	Field Work in Metallurgy beginning about May 1	10 days		Junior year
Mining	139s	Field Work in Mine Plant and Mining beginning about May 1	2 weeks		Junior year

SENIOR YEAR

First Quarter

Dept.	No.	Title	Lect.	Lab.	Prereq.
Electrical Engr.	41f	Electric Power	2	3	Phys. 43s or Mech. 53s
Geology	111f	Ore Deposits	3	..	Geol. 73f, 106w or
or Mechanics	118f	Engineering Constr.	..	8	Mech 111s
or Met.	163f	Advanced Metallography	3 or 6		Met. 151, 155, 157
Mechanics	117f	Water Power	5	2	Mech 111s
Metallurgy	119f	Ore Testing	2	..	Met. 108s
Metallurgy	120f	Ore Testing Lab.	..	8	Met. 108s
Metallurgy	123f	Electrometallurgy	3	..	Met. 108s
Metallurgy	124f	Thesis	..	8	.....

Second Quarter

Geology	112w	Petroleum	3	..	Geol. 111f or
or Mechanics	119w	Mine Plant Design	..	9	Mech. 118f
Metallurgy	117w	Advanced Metallurgy	4	6	Met. 108s
Metallurgy	121w	Special Problems	..	4	Met. 119f
Metallurgy	125w	Thesis	..	18	Met. 124f
Metallurgy	164w	Advanced Metallography	3	..	Met. 155s, or
or Geology	115w	Applied Geology	3	..	Geol. 73f, or
or Mining	142w	Mine Methods	5	..	Min. 141f

Third Quarter

Metallurgy	118s	Advanced Metallurgy	4	6	Met. 117w
Metallurgy	122s	Special Problems	..	8	Met. 121w
Metallurgy	126s	Thesis	..	18	Met. 125w
Metallurgy	165s	Advanced Metallography	3	..	Met. 155s, or
or Geology	113s	Prob. in Ore Deposits	..	4	Geol. 112w, or
or Mining	143s	Mine Management	5	..	Min. 142w
Mining	140s	Mine Rescue, 1 week	..	..	.....

DEPARTMENT OF METALLURGY

This department is well supplied with representative ores of all the most important metals, drawings of furnaces, and models and samples of all the different furnace products. The lectures treat of all the principal methods now in use. The practical work consists in visits to smelting and refining works which are accessible. The work in metallurgy extends through four years.

ASSAYING

The lectures treat of, and describe, apparatus, reagents, assay furnaces, fuels, etc., in connection with this subject. The principles of assaying and sampling are fully explained. A collection of representative ores of various metals with a collection of corresponding slags is shown, and instruction is given as to nature and quality of fluxes. Special and rapid methods of testing slags and metallurgical products as employed in western smelting works are emphasized.

The laboratory course includes preparing and testing reagents, making cupels, etc., and assaying samples of ores, furnace and mill products, and bullion; different charges are tried and practical conclusions drawn.

Great importance is attached to the work of the laboratory. A large, well-ventilated furnace room in which are located muffle and crucible furnaces, and another room of similar dimensions equipped with desks, pulp and bead balances, afford accommodations to a large number of students. Ores of various metals of known value are given the students who are required to make up the necessary charges and submit their report in detail. This work is offered to students completing the necessary courses in mineralogy and chemistry.

ORE DRESSING

The lectures and recitations in ore dressing extend through the junior year, and comprise a detail study of ore dressing and concentrating machinery, together with a study of typical combinations of dressing machines as found in the various mining districts of the United States. In connection with the theoretical work, the ore dressing laboratory and testing plant of the school are utilized for illustration, and practical use of ore dressing machinery.

ORE TESTING

The lectures treat of the problems in ore testing such as extraction and losses in roasting, concentration, and other milling operations. Both the ore dressing laboratory and the Mines Experiment Station laboratory are available for working out practical problems. The Mines Experiment Station laboratory is maintained to aid the mining interests of the state of Minnesota in solving problems connected with concentration and conservation of the iron and manganiferous ores in the state.

The School of Mines and Metallurgy laboratories therefore serve both educational and commercial needs.

Educational.—The student becomes familiar with the use of the various types of machines such as crushers, rolls, classifiers, concentration and flotation machinery.

Commercial.—The laboratories are used by the Mines Experiment Station to determine the best methods of treatment to produce a commercial product at the lowest cost. Recently additional commercial machinery has been obtained and new appliances are constantly being developed. Commercial samples varying from 500 pounds to carload lots can be treated by various methods.

FIELD WORK IN METALLURGY

At the end of the junior year students are required to study practical operations at one or more smelters and mills. This begins about May 15. The expenses for this trip are estimated at \$225. A deposit of \$50 must be made before starting on the trip to cover board and lodging and necessary side trips. Any balance will be returned at the close of the work in the field.

All notes, data, and sketches, necessary for a complete report on the field work, must be fully and neatly recorded in notebooks. These notebooks will be collected at the end of the trip and returned to the student at the reopening of field work at the school. In judging the character of the student's field work equal importance will be given to the completed report and to the original field notes. The department reserves the right to reject notebooks considered below standard.

Upon termination of the junior field work in metallurgy and two weeks in mining and mine plant, the members of the junior class who are candidates for the degree of metallurgical engineer are urged to spend at least six weeks in practical work in one or more of the smelters or mills, for which they may receive wages. The department will render all possible assistance in locating students in districts of their choice.

Field work will reopen at the School of Mines and Metallurgy, Monday, September 19, 1927. No senior will be registered after that date. Registration will cover field work, electric power, and geology.

The final reports covering field work in metallurgy and mining must be prepared at the School of Mines and Metallurgy under the direct supervision of the departments concerned.

On October 10 all seniors who expect to graduate must register for the remaining subjects. Prior to this date the student must submit a type-written report on field work fully illustrated with drawings to scale, made from the field sketches, covering metallurgical and milling operations and details of plant and equipment. Final registration will not be allowed until after reports on field work are accepted. All final reports, therefore, must be presented on or before October 10. These reports will become the property of the school.

The completion of sophomore and junior field work is a requisite for graduation, and satisfactory evidence thereof must be submitted to the department. Should a student, for sufficient reason, fail to complete this work in regular course, he may, with the consent of the department, be permitted to pursue his regular studies. In all such cases, however, the degree will be withheld until all field work is completed.

METALLOGRAPHY

Courses in metallography are offered to candidates for the degree of metallurgical engineer in the School of Mines and Metallurgy, to students in the colleges of Dentistry, Engineering and Architecture, Science, Literature, and the Arts, in the School of Chemistry, and in the Graduate School.

These courses deal with the study of metals and alloys. The lectures treat of, and describe, the apparatus used in connection with this subject, the method of preparing specimens, physical and metallographic principles involved, and the interpretation of the results of microscopic examination and thermal analysis. There is an elaborate file of references and abstracts relating to the whole field of metallography, furnishing up-to-date information on the various phases of the work. A collection of specimens, photomicrographs, and lantern slides covering wrought iron, low carbon structural, rail, and tool steels, brasses, bronzes, and other industrial alloys is available for study and comparison. The laboratory course includes the microscopic and pyrometric study of metals and alloys. The laboratories are equipped with grinding and polishing apparatus, microscopes, photomicrographic apparatus, vacuum electric furnace, carbon resistance furnaces, nichrome and platinum resistance furnaces of various designs, gas furnaces, heat treating furnace, and pyrometers of the latest and improved type. This department has a special dark room for the preparation of photomicrographs.

PROGRAM

CHEMISTRY

No.	Title	Req. of	Prereq.	Hrs.	Day	Bldg.	Instr.
9w*	Analytical Chemistry ...	All soph.	16s	VI-IX	TTh	C	Mr. Geiger
14f	General Inorganic	All fr.	....	II	TThS	C	Mr. Pervier
				VII-IX	T		
				VI-VIII	Th		
15w	General Inorganic	All fr.	14f	II	TThS	C	Mr. Pervier
				VII-IX	T		
				VI-VIII	Th		
16s	Qual. Chem. Analysis...	All fr.	15w	II	TThS	C	Mr. Pervier
				VIII-IX	W		
				VI-IX	F		
123f	Adv. Anal. Chemistry...	Elective	9w	Ar	Ar	C	Mr. Sarver
124w	Adv. Anal. Chemistry...	Elective	9w	Ar	Ar	C	Mr. Sarver
168w	Petroleum and Petroleum Products	Sr.Pet.E.		Ar	Ar	C	Mr. Harding

DRAWING AND DESCRIPTIVE GEOMETRY

No.	Title	Req. of	Prereq.	Hrs.	Day	Bldg.	Instr.
11f	Engr. Drawing	All fr.	....	III-IV	MTWFS	E	Mr. Myers
12w	Engr. Drawing	All fr.	11f	III-IV	TWFS	E	Mr. Potter
13s	Engr. Drawing	All fr.	12w	III-IV	TWFS	E	Mr. Myers
14w	Desc. Geometry	All soph.	13s, Math. 5s	I	MWF	E	Mr. Myers
15w	Drafting	All soph.	With 14w	III-IV	WF	E	Mr. Potter

ELECTRICAL ENGINEERING

No.	Title	Req. of	Prereq.	Hrs.	Day	Bldg.	Instr.
41f	Electrical Power	Sr.E.M.	Phys.43s or Mech.53s	II I-III	TTh F	EE	Ar

EXPERIMENTAL ENGINEERING

MATHEMATICS AND MECHANICS

No.	Title	Req. of	Prereq.	Hrs.	Day	Bldg.	Instr.
144w	Materials Testing Lab. ...	Jr.E.M.					
			With Mech.110w	VI-IX	Th	Ex	Mr. Boehnlein

MECHANICAL ENGINEERING

84f	Elem. General Lab.	Jr.E.M.					
			With Mech.112f	VI-IX	Th	Ex	Mr. Dawson
181w	Adv. General Lab.	Sr.E.M.	84f	VI-IX	Th	Ex	Mr. Shoop

GEOLOGY AND MINERALOGY

No.	Title	Req. of	Prereq.	Hrs.	Day	Bldg.	Instr.
1f	General Geology	All fr.	....	II	MWF	P	Mr. Thiel
2s	Historical Geology	All soph.	1f	I	MWF	P	Mr. Thiel

* The suffixes f, w, and s, after the course number indicate the quarter in which a course is offered—fall, winter, or spring quarter, respectively. Two or three suffixes indicate that a course is offered in each of the corresponding quarters.

SCHOOL OF MINES AND METALLURGY

No.	Title	Req. of	Prereq.	Hrs.	Day	Bldg.	Instr.
198	Elem. of Paleontology..	Elective	....	Ar		P	Mr. Stauffer
23w	Elem. of Mineralogy....	All fr.	1f	II	WF	P	Mr. Gruner
	Sec. 1			VII-VIII	W		
	2			VII-VIII	F		
24s	Elem. of Mineralogy....	All fr.	23w	II	MWF	P	Mr. Gruner
	Sec. 1			VII-IX	M		
	2			VI-VII	T		
	2			III-IV	M		
	2			VII-IX	F		
25f	Elem. of Mineralogy....	All soph.	24s	I	MWF	P	Mr. Gruner
	Sec. 1			VII-IX	T		
	2			VI-VII	F		
	2			VI-VIII	M		
	2			VI-VII	W		
61f	Blowpipe Analysis	Elective	25f	Ar	Ar	P	Mr. Gruner
65f	Crystallography	Elective	25f	Ar	Ar	P	Mr. Gruner
73f	Econ. Geology	All jr.	2s,105f	VI	MWF	P	Mr. Schwartz
85s	Summer Field Work....	All soph	2s	2 wks.			Mr. Gruner, Mr. Thiel
91f	Index Fossils of N. Am.	Sr.E.M.(Geol.)	2s	I	F	P	Mr. Stauffer
				VI-VII	MW		
92w	Index Fossils of N. Am.	Sr.E.M.(Geol.)	2s	I	F	P	Mr. Stauffer
				VI-VII	MW		
93s	Index Fossils of N. Am.	Sr.E.M.(Geol.)	2s	I	F	P	Mr. Stauffer
				VI-VII	MW		
101f	Sedimentation	Elective	24s	Ar	Ar	P	Mr. Allison
105f	Rock Study	All soph.	24s	VI	TTh	P	Mr. Grout
	Sec. 1			VII-VIII	Th		
	2			VII-VIII	T		
106w	Petrography	All soph	105f				
	Sec. 1			VI-VII	MF	P	Mr. Grout
	2			III-IV	M		
	2			VI-VII	W		
111f	Ore Deposits	All sr.	73f,106w	I	TThS	P	Mr. Emmons
112w	Geology of Petroleum...	All sr.	111f	I	TThS	P	Mr. Emmons
113s	Prob. in Ore Deposits..	All sr.	112w	VI-IX	Th	P	Mr. Emmons
115w	Applied Geology	Sr.E.M.	73f,111f	I	MWF	P	Mr. Thiel
124w	Struct. & Metamorph. ...	Jr.E.M.(Geol.)	73f,105f	VI	MWF	P	Mr. Schwartz
125s	Struct. & Metamorph. ...	Jr.E.M.(Geol.)	73f,105f	II	MTWThFS	P	Mr. Schwartz
127	Geol. of Lake Sup. Reg.	Elective	125s	Ar	Ar	P	Mr. Thiel
131f	Advanced Petrology	Jr.E.M.(Geol.)	2s,106w	III	TThS	P	Mr. Grout
				I	F		
				VII-VIII	F		
132w	Advanced Petrology	Jr.E.M.(Geol.)	2s,106w	I	F	P	Mr. Grout
				III	TThS		
				VI	TTh		
133s	Advanced Petrology ...	Jr.E.M.(Geol.)	2s,106w	I	F	P	Mr. Grout
				III	TThS		
				VII-VIII	F		
137w	Testing Econ. Minerals..	Sr.E.M.(Geol.)	73f	VII	T	P	Mr. Grout
				VIII-IX	MW		

PROGRAM

No.	Title	Req. of	Prereq.	Hrs.	Day	Bldg.	Instr.
140w	Applied Petrography ...	Sr.E.M.(Geol.)	111f,113s	II I-II	F MW	P	Mr. Grout
141s	Applied Petrography ...	Sr.E.M.(Geol.)	111f,113s	II I-II	F MW	P	Mr. Grout
144w	Inter. of Geol. Maps...	Jr.E.M.(Geol.)		VII-IX	TTh	P	Mr. Allison
145s	Inter. of Geol. Maps...	Jr.E.M.(Geol.)	124w	VI-VIII	MTWTh	P	Mr. Allison
150s	Field Geology	Jr.E.M.(Geol.)	125s	6 wks.			Mr. Emmons
151f	Advanced General	Jr.E.M.(Geol.)	73f	III	MWF	P	Mr. Stauffer
152w	Advanced General	Jr.E.M.(Geol.)	73f	III	MWF	P	Mr. Stauffer
153s	Advanced General	Jr.E.M.(Geol.)	73f	III	MWF	P	Mr. Stauffer
166w	Mineralography	Sr.E.M.(Geol.)	111f	II-III	TThS	P	Mr. Schwartz
167s	Mineralography	Sr.E.M.(Geol.)	111f	VIII-IX	MWF	P	Mr. Schwartz
246	Pre-Cambrian Geology ..	Elective	125s	Ar	Ar	P	

GERMAN

No.	Title	Req. of	Prereq.	Hrs.	Day	Bldg.	Instr.
24f*	Beginning	Elective	Ar	Ar	Ar	F	Mr. Davies
25w	Beginning	Elective	....	Ar	Ar	F	Mr. Davies
26s	Beginning	Elective	....	Ar	Ar	F	Mr. Davies
27f	Narrative Prose	Elective	2 yrs.	Ar	Ar	F	Mr. Lussky
28w*	Advanced Chemical	Elective	27f	Ar	Ar	F	Mr. Lussky
29s	Advanced Chemical	Elective	27f	Ar	Ar	F	Mr. Lussky

METALLURGY

No.	Title	Req. of	Prereq.	Hrs.	Day	Bldg.	Instr.
1w	Assaying	All fr.					
			Chem.14f,Geol.1f	V	TWFS	M	Mr. Kersten
2w	Assay Lab.	All fr.					
			Chem.14f,Geol.1f	I-VIII	M	M	Mr. Christian
3f	General Metallurgy	All soph.					
			1w,2w,Chem.16s	I	TThS	M	Mr. Christian
4w	Metallurgy of Pig Iron...	All soph.	3f	I	TThS	M	Mr. Christian
5s	Wrought Iron & Steel...	All soph.	4w	I	TThS	M	Mr. Christian
106f	Met. of Base Metals....	Jr.E.M.&Met.E.	3f	I	F	M	Mr. Pease
				III	TThS		
107w	Met. of Base Metals....	Jr.E.M.&Met.E.	106f	I	F	M	Mr. Pease
				III	TThS		
108s	Met. of Precious Met. ...	Jr.E.M.&Met.E.	107w	I	F	M	Mr. Pease
				III	TThS		
109f	Met. of Base Metals....	M.E.&Chem.		Ar	Ar	M	Mr. Christian
							tionson
109w	Met. of Base Metals....	E.E.&Chem.	Chem.8s	Ar	Ar	M	Mr. Christian
110f	Ore Dressing	All jr.					
			Phys.43s,Geol.25f				
			or Mech.53s	III	MWF	M	Mr. Allard
111w	Ore Dressing	All jr.	110f	III	MWF	M	Mr. Allard

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

No.	Title	Req. of	Prereq.	Hrs.	Day	Bldg.	Instr.
112f	Ore Dressing Lab.	Jr.Met.E.	Phys.43s,Geol.25f or Mech.53s	VI-IX	Th	M	Mr. Allard
113w	Ore Dressing Lab.	Jr.Met.E.	110-112f	VI-IX	Th	M	Mr. Allard
114s	Ore Dressing Lab.	Jr.Met.E.	111w, 113w	VIII-IX VI-IX	F Th	M	Mr. Allard
115s	Ore Dressing Lab.	Jr.E.M.&E.M. (Geol.)	111w	VI-VII VI-IX	F T	M	Mr. Allard
116s	Field Work in Met.	Jr.Met.E.	Jr.yr.	10 days			
117w	Advanced Metallurgy ..	Sr.Met.E.	108s	II	TWThS	M	Mr. Christian- tianson
118s	Advanced Metallurgy ..	Sr.Met.E.	117w	VI-IX II VI-VII VI-IX	Th MWFS T Th	M	Mr. Christian- tianson
119f	Ore Testing	Sr.E.M.&Met.E.	108s	II	MW	M	Mr. Christian- tianson
120f	Ore Testing Lab.	Sr.E.M.&Met.E.	108s	VI-IX	MT	M	Mr. Christian- tianson
121w	Spec. Prob. in Ore Test.	Sr.E.M.&Met.E.	119f	VI-IX	W	MEx	Mr. Pease
122s	Spec. Prob. in Ore Test.	Sr.E.M.&Met.E.	121w	VI-IX	MW	M	Mr. Pease
123f	Electrometallurgy	Sr.Met.E.	108s	I IV	MW S	M	Mr. Christian- tianson
124f	Thesis in Metallurgy....	Sr.Met.E.	Jr.yr.	IV VIII-IX VI-IX	MW Th M	M	Ar Ar Ar
125w	Thesis in Metallurgy....	Sr.Met.E.	Jr.yr.	III II 13 hrs.	TWThS M Ar	M	Ar
126s	Thesis and Specifications	Sr.Met.E.	125w	18 hrs.	Ar	M	Ar
150f	Mphy. for Elec. Engr. ..	Elective		Ar	Ar	M	Mr. Dowdell
151w	Adv. Mphy. for Elec. Engr.	Elective	150f	Ar	Ar	M	Mr. Dowdell
153f	Mphy. Long Course	Jr.Met.E.	Chem.9w Phys.43s or Mech.53s	VII VI-IX VI	MWF T MWF	M	Mr. Dowdell
154w	Mphy. Long Course	Jr.Met.E.	153f	VI VI-IX	MWF T	M	Mr. Dowdell
155s	Mphy. Long Course	Jr.Met.E.	154w	VI VI-IX	MWF T	M	Mr. Dowdell
156f	Mphy. for Mech. Eng. ..	Elective		Ar	Ar	M	Mr. Harder
157w	Adv. Mphy. for Mech. ..	Elective	Chem.21-22	Ar	Ar	M	Mr. Harder
159s	Dental Metallography ...	All jr.dent.		Ar	Ar	M	Mr. Harder
160f	Mphy. for Chemists ...	Elective	Chem.21-22 Chem.20	Ar Ar	Ar Ar	M M	Mr. Weber
161w	Adv. Mphy. for Chem...	Elective	160f	Ar	Ar	M	Mr. Weber
162s	Adv. Mphy. for Chem...	Elective	160f	Ar	Ar	M	Mr. Weber
163f	Adv. Metallography ...	Elective	151,155,157	Ar	Ar	M	Mr. Harder
164w	Adv. Metallography ...	Elective		Ar	Ar	M	Mr. Harder
165s	Adv. Metallography ...	Elective		Ar	Ar	M	Mr. Harder
201f	Adv. Mphy. for Gr. Stud.	Elective		Ar	Ar	M	Mr. Harder
202w	Adv. Mphy. for Gr. Stud.	Elective		Ar	Ar	M	Mr. Harder
203s	Adv. Mphy. for Gr. Stud.	Elective		Ar	Ar	M	Mr. Harder
204-205-							
206	Thesis for Gr. Stud.	Elective		Ar	Ar	M	Mr. Pease
207-208-							
209	Spec. Prob. Metallurgy ..	Elective		Ar	Ar	M	Mr. Pease
210-211-							
212	Spec. Prob. Adv. Met. ..	Elective		Ar	Ar	M	Mr. Pease

MILITARY SCIENCE AND TACTICS

No.	Title	Req. of	Prereq.	Hrs.	Day	Bldg.	Instr.
1	First Year Basic.....	All fr.		IX	MWF	A	Ar
2a, 2b	Second Year Basic	All soph.*	1	VIII	F	A	Ar
3a, 3b	First Year Advanced...	Elective jr.	1,2	Ar	Ar	A	Ar
4a, 4b	Second Year Advanced..	Elective sr.	3	Ar	Ar	A	Ar

MINE PLANT AND MECHANICS

No.	Title	Req. of	Prereq.	Hrs.	Day	Bldg.	Instr.
1f	Alg. & Solid Geom.	B fr.	....	I	MTWThFS	M	Mr. Sanderson
2f	Algebra	A fr.	....	I	MTWThFS	M	Mr. Sanderson
3s	Algebra	B fr.	1f	V	MTW	M	Mr. Sanderson
4w	Trigonometry	All fr.		I	TWThFS	M	Mr. Sanderson
5s	Analytical Geom.	All fr.	4w	I	MTWThFS	M	Mr. Sanderson
6f	Calculus	All soph.	5s	II	TThS	M	Mr. Sanderson
7w	Calculus	All soph.	6f	II	TThS	M	Mr. Sanderson
8s	Calculus	All soph.	7w	II	TThS	M	Mr. Sanderson
51f	Elem. Tech. Mechanics..	Elective	Math.5s	III	MWF	M	Mr. Sanderson
52w	Elem. Tech. Mechanics..	Elective	51f	II	MWF	M	Mr. Sanderson
53s	Elem. Tech. Mechanics..	Elective	52w	II	MWF	M	Mr. Sanderson
109f	Mechanics	Jr.E.M.&Met.E.	8s	IV	MTWFS	M	Mr. Comstock
110w	Mech. of Materials.....	Jr.E.M.&Met.E.	109f	IV	MTWFS	M	Mr. Comstock
111s	Mechanics	Jr.E.M.&Met.E.	109f	IV	MTWFS	M	Mr. Comstock
112f	Mine Plant	Jr.E.M.&Met.E.	8s	II	MTWThFS	M	Mr. Comstock
113w	Mine Plant	Jr.E.M.	112f	II	MTWThFS	M	Mr. Comstock
114s	Mine Plant	Jr.E.M.	113w	II	MTWThFS	M	Mr. Comstock
115w	Metallurgical Plant	Jr.Met.E.	112f	II	MTWThFS	M	Mr. Comstock
116s	Metallurgical Plant	Jr.Met.E.	115w	II	MTWThFS	M	Mr. Comstock
117f	Hyd. & Water Power...	Sr.E.M.&Met.E.	111s	III	MTWThS	M	Mr. Comstock
118f	Engr. Construction	Sr.E.M.	111s	VI-IX	WF	M	Mr. Gow
119w	Mine Plant Design	Sr.E.M.	118f	VI-IX	TF	M	Mr. Gow
120s	Mine Plant Design	Sr.E.M.		VI-IX	TF	M	Mr. Gow

MINING

No.	Title	Req. of	Prereq.	Hrs.	Day	Bldg.	Instr.
21s	Introductory Mining ...	All soph.					
			Registration for soph. trip	IV	MWF	M	Mr. Gow
130s	First Aid	Jr.E.M.&Met.E.	21s	1 wk.		M	
131f	Exploration	Jr.E.M.&E.M. (Geol.)	21s	I	MTWThS	M	Mr. Parker
132w	Development	Jr.E.M.&E.M. (Geol.)	131f	I	MTWThS	M	Mr. Parker

* Two hours' drill credit allowed on account of work required in the classroom and in the field.

SCHOOL OF MINES AND METALLURGY

No.	Title	Req. of	Prereq.	Hrs.	Day	Bldg.	Instr.
133w	Elementary Mining	Jr.Met.E.	....	I	MTWThS	M	Mr. Gow
134s	Mining Methods	Jr.E.M.&E.M. (Geol.)	132w	I	MTWThS	M	Mr. Parker
135s	Practical Mining	Jr.E.M.	Soph.yr.	2 wks.			
139s	Practical Mining	Jr.Met.E.	Soph.yr.	2 wks.			
140s	Mine Rescue	Sr.E.M.&Met.E.	....	1 wk.			
141f	Administration	Sr.E.M.&E.M. (Geol.)	134s	IV	MTWFS	M	Mr. Parker
142w	Coal Mining	Sr.E.M.&E.M. (Geol.)	141f	IV	MTWFS	M	Mr. Parker
143s	Mine Management	Sr.E.M.	142w	IV	MTWFS	M	Mr. Parker
144f	Thesis	Sr.E.M.	135s,134s	Ar	Ar	M	Mr. Parker
145w	Thesis	Sr.E.M.	144f	Ar	Ar	M	Mr. Parker
146s	Thesis	Sr.E.M.	145w	Ar	Ar		

MINING ENGINEERING

No.	Title	Req. of	Prereq.	Hrs.	Day	Bldg.	Instr.
1f	Mine Surveying	All soph.	Math.4w	III	MWF	M	Mr. Lambert
2w	Mine Surveying	All soph.	1f	III	TThS	M	Mr. Lambert
3s	Mine Surveying	All soph.	2w	III	TThS	M	Mr. Lambert
	Sec. 1			VI-IX	Th	M	Mr. Lambert
	2			VI-IX	F	M	Mr. Lambert
4s	Field Work	All soph.	3s	7 wks.		M	Mr. Lambert
105w	Mine Mapping	Jr.E.M.	4s	VII-IX	MW	M	Mr. Gow
106w	Mine Mapping	Jr.Met.E.	4s	VII-IX	MW	M	Mr. Gow
107s	Mine Mapping	Jr.E.M.&Met.E.	105w	VII-IX	MW	M	Mr. Gow

PETROLEUM ENGINEERING

No.	Title	Req. of	Prereq.	Hrs.	Day	Bldg.	Instr.
151s	Petroleum Refining	Jr.Pet.E.	....	Ar	Ar	M	Mr. Christianson

PHYSICS

No.	Title	Req. of	Prereq.	Hrs.	Day	Bldg.	Instr.
3f	Mechanics and Sound...	Elective	Math.5s	II	MWF	Ph	Mr. Erikson
4f	Mechanics Laboratory...	Elective	With 3f	VIII-IX	M	Ph	Mr. Erikson
23w	Heat	Elective	3f	II	MWF	Ph	Mr. Miller
24w	Heat Laboratory	Elective	4f	VIII-IX	M	Ph	Mr. Miller
43s	Magnetism & Elec.	Elective	3f	II	MWF	Ph	Mr. Zeleny

ROMANCE LANGUAGES

No.	Title	Req. of	Prereq.	Hrs.	Day	Bldg.	Instr.
1-2*	Beginning French	Elective	....	Ar	Ar	F	Mr. Searles
3-4	Intermediate French ...	Elective	1-2	Ar	Ar	F	Mr. Searles
21-22-23*	Survey French Lit.	Elective	3-4	Ar	Ar	F	Mr. Searles
1-2*	Beginning Spanish	Elective		Ar	Ar	F	Mr. Gillett
3-4	Intermediate Spanish...	Elective	1-2	Ar	Ar	F	Mr. Gillett
65-66-67*	Spanish Literature	Elective	3-4	Ar	Ar	F	Mr. Gillett

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

The Bulletin of the University of Minnesota

*The College of Pharmacy
Announcement for the Years
1927-1929*



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1927							1928													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2	1	2	3	4	5	6	7	1	2	3	4	5	6	7
3	4	5	6	7	8	9	8	9	10	11	12	13	14	8	9	10	11	12	13	14
10	11	12	13	14	15	16	15	16	17	18	19	20	21	15	16	17	18	19	20	21
17	18	19	20	21	22	23	22	23	24	25	26	27	28	22	23	24	25	26	27	28
24	25	26	27	28	29	30	29	30	31	..	..	..	..	29	30	31	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
AUGUST							FEBRUARY							AUGUST						
..	1	2	3	4	5	6	..	..	..	1	2	3	4	..	..	..	1	2	3	4
7	8	9	10	11	12	13	5	6	7	8	9	10	11	5	6	7	8	9	10	11
14	15	16	17	18	19	20	12	13	14	15	16	17	18	12	13	14	15	16	17	18
21	22	23	24	25	26	27	19	20	21	22	23	24	25	19	20	21	22	23	24	25
28	29	30	31	..	..	..	26	27	28	29	..	..	..	26	27	28	29	30	31	..
..
SEPTEMBER							MARCH							SEPTEMBER						
..	..	..	..	1	2	3	..	..	..	..	1	2	3	..	..	..	..	..	..	1
4	5	6	7	8	9	10	4	5	6	7	8	9	10	2	3	4	5	6	7	8
11	12	13	14	15	16	17	11	12	13	14	15	16	17	9	10	11	12	13	14	15
18	19	20	21	22	23	24	18	19	20	21	22	23	24	16	17	18	19	20	21	22
25	26	27	28	29	30	..	25	26	27	28	29	30	31	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	..	..	..	..	..	..
OCTOBER							APRIL							OCTOBER						
..	..	..	..	..	..	1	1	2	3	4	5	6	7	..	1	2	3	4	5	6
2	3	4	5	6	7	8	8	9	10	11	12	13	14	7	8	9	10	11	12	13
9	10	11	12	13	14	15	15	16	17	18	19	20	21	14	15	16	17	18	19	20
16	17	18	19	20	21	22	22	23	24	25	26	27	28	21	22	23	24	25	26	27
23	24	25	26	27	28	29	29	30	..	..	..	..	..	28	29	30	31	..	..	..
30	31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER						
..	..	1	2	3	4	5	..	..	1	2	3	4	5	..	..	1	2	3	4	5
6	7	8	9	10	11	12	6	7	8	9	10	11	12	4	5	6	7	8	9	10
13	14	15	16	17	18	19	13	14	15	16	17	18	19	11	12	13	14	15	16	17
20	21	22	23	24	25	26	20	21	22	23	24	25	26	18	19	20	21	22	23	24
27	28	29	30	..	..	..	27	28	29	30	31	..	..	25	26	27	28	29	30	..
..
DECEMBER							JUNE							DECEMBER						
..	..	..	..	1	2	3	..	..	..	..	1	2	..	..	..	..	..	..	1	
4	5	6	7	8	9	10	3	4	5	6	7	8	9	2	3	4	5	6	7	8
11	12	13	14	15	16	17	10	11	12	13	14	15	16	9	10	11	12	13	14	15
18	19	20	21	22	23	24	17	18	19	20	21	22	23	16	17	18	19	20	21	22
25	26	27	28	29	30	31	24	25	26	27	28	29	30	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	31	..	..	..	..	..

UNIVERSITY CALENDAR

1927-28

Fall Quarter

1927			
September	15	Thursday	Payment of fees closes, except for new students
September	15-17		Entrance examinations (for removal of entrance deficiencies)
September	16-19		Registration of all new students entering the freshman class
September	19-23		Examinations for removal of conditions Physical examinations Registration period, ¹ colleges of Science, Literature, and the Arts, and Education
September	20-24		Freshman week
September	22-23		Registration days ¹ for all colleges not included above
September	23	Friday	Payment of fees for new students closes
September	26	Monday	Fall quarter classes begin, 8:30 ² a.m. Fall semester extension classes ³ begin
October	20	Thursday	Senate meeting, 4:30 p.m.
October	22	Saturday	Homecoming Day
November	11	Friday	Armistice Day; a holiday
November	24	Thursday	Thanksgiving Day; a holiday
December	1	Thursday	State Day Convocation
December	14-17		Final examination period
December	15	Thursday	Commencement Convocation Senate meeting, 4:30 p.m.
December	17	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	21	Wednesday	Payment of fees closes for all students in residence fall quarter ⁴

Winter Quarter

December	27-29		Entrance examinations
1928			
January	3	Tuesday	Registration day for new students in all colleges
January	4	Wednesday	Christmas vacation ends, winter quarter classes begin, 8:30 ² a.m.
January	28	Saturday	First semester extension classes close
January	30	Monday	Second semester extension classes begin
February	13	Monday	A holiday (February 12, Sunday, Lincoln's Birthday)
February	16	Thursday	Charter Day Convocation Senate meeting, 4:30 p.m.
February	22	Wednesday	Washington's Birthday; a holiday
March	14-17		Final examination period

THE COLLEGE OF PHARMACY

March	15	Thursday	Commencement Convocation Payment of fees closes for all students in residence winter quarter ¹
March	17	Saturday	Winter quarter ends, spring vacation be- gins, 5:30 p.m.

Spring Quarter

March	19-21		Entrance examinations
March	23-24		Registration days for new students in all colleges
March	26	Monday	Spring vacation ends, spring quarter classes begin, 8:30 ² a.m.
April	6	Friday	Good Friday; a holiday
May	10	Thursday	Cap and Gown Day Convocation
May	17	Thursday	Senate meeting, 4:30 p.m.
May	26	Saturday	Second semester extension classes close
May	30	Wednesday	Memorial Day; a holiday
June	6-9		Final examination period
June	9	Saturday	Spring quarter closes, 5:20 p.m.
June	10	Sunday	Baccalaureate service
June	11	Monday	Fifty-sixth annual commencement

Summer Quarter

June	15-16		Summer Session first term begins, reg- istration and payment of fees
June	18	Monday	Classes begin, 8:00 a.m.
July	4	Wednesday	Independence Day; a holiday
July	28	Saturday	Registration and payment of fees for second term closes
July	30	Monday	Second term classes begin
September	1	Saturday	Second term Summer Session closes

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty fees for late registration, page 6.

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 8:00 in the Medical School and at 8:15 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.

ADMINISTRATIVE OFFICERS

Lotus Delta Coffman, Ph.D., LL.D., President

William Watts Folwell, LL.D., President Emeritus

Frederick J. Wulling, Phm.G., Phm.D., LL.M., Ph.M. *causa honoris*, Dean
of the College of Pharmacy, Professor of Pharmacology, and Director
of the University Medicinal Plant Gardens

GENERAL INFORMATION

The thirty-sixth course of the College of Pharmacy begins and ends as announced in the calendar on the preceding pages.

ADMISSION BY CERTIFICATE

Diplomas or other evidences of the completion of an accredited four-year high school course, or of its educational equivalent, are required for admission. The high school course must have included:

- | | |
|--|---------|
| 1. English | 4 units |
| or English | 3 units |
| and a foreign language..... | 2 units |
| 2. Mathematics | |
| Elementary algebra | 1 unit |
| Plane geometry | 1 unit |
| 3. Latin | 1 unit |
| 4. Physics | 1 unit |
| 5. Enough additional work to make in all 15 units, of which not more than 4 may be in Group F. | |

Group F consists of high school, vocational, and miscellaneous subjects. The subjects are no longer designated by the University. The applicant is free to present in this division such subjects as are not listed in other groups, but which are certified by the superintendent or principal as being of acceptable nature and counted toward graduation.

Prospective students in pharmacy are advised to include in their high school courses, higher algebra and solid geometry, but not botany, chemistry, or physiology because these latter three subjects are included in the regular pharmacy course.

Owing to the limited capacity of the Pharmacy Building, not more than sixty new students can be admitted annually. Applications for admission should be in the registrar's office not later than July 1, by June 1, if possible.

ADMISSION BY EXAMINATION

Students may take examinations in subjects for which they have no certificates. A high school training covers a minimum of 15 units, a unit being a school year of standard work in a given subject. State High School Board certificates and College Entrance Examination Board certificates are accepted in lieu of examinations in respective high school subjects.

NEW STUDENTS

All applicants for admission and to advanced standing should request the high schools or colleges they attend to send complete transcripts of their records to the registrar of the University as early as possible and not later than July 1. Upon receipt of the credentials, the registrar will notify the applicant concerning his admission and will forward directions for registration. (See calendar for registration dates.)

New students are admitted only at the beginning of the fall quarter.

OLD STUDENTS

About September 1, the registrar will send a fee statement to the student's home address as it appears on the records of his office. Those who fail to receive the statement within a week should write to the registrar and ask for it. (See calendar for dates of registration and payment of fees.)

FEES AND OTHER EXPENSES

The quarterly tuition fee of \$35 for resident students and \$45 for non-resident students includes all laboratory fees, except chemistry, and it is payable before the beginning of each quarter. Certificates entitling the student to admission to classes will not be issued until fees have been paid.

Tuition fee (per quarter)	
Resident of Minnesota	\$35.00
Non-residents	45.00
Incidental fee (per quarter).....	5.00
Deposit (first quarter only).....	10.00
Military deposit (required of all students taking military drill).....	10.00
Special fees:	
Examination for removal of condition.....	1.00
Examination for credits (after the first six weeks in residence).....	5.00
Special examination	5.00
Chemistry deposit	5.00

REGISTRATION PENALTIES

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

Those desiring to take special work may pay fees on a clock hour basis, the rate being \$1.50 an hour for resident students and \$2 an hour for non-resident students.

GRADUATION REQUIREMENTS

Regular attendance at lectures, recitations, and laboratory exercises is required. Students will not be permitted to present themselves for final examination unless they have been in attendance upon at least seven eighths of the total work of the course for which they have matriculated.

Every person upon whom any degree is conferred must be of good moral character; must have completed the required lecture and laboratory courses, the last year spent in this college; and must have passed examinations in the subjects required for graduation.

Drugstore experience is not a requirement for graduation.

ADVANCED STANDING

Applicants for advanced standing must pass the entrance examinations or present the usual equivalents. They must furnish satisfactory evidence of time spent and subjects covered in previous professional studies at accredited institutions, and must pass the examinations of all departments in which they desire credit, if such examinations are deemed necessary by the professors in charge. Students will not be permitted to substitute private work in any branch for the regular course work.

UNCLASSED STUDENTS

Persons meeting the entrance requirements desiring to do less than the work of the regular course may be admitted as unclassified or special students provided there is laboratory room for them. Work completed satisfactorily will be credited should the students subsequently enter the regular course, or apply to the State Board of Pharmacy for examination, for a license to practice. Registered pharmacists who desire to take certain branches of study may avail themselves of any of the college facilities.

EXAMINATIONS AND STANDING

Examinations are held during the last week of each quarter, and are supplementary to the written and practical tests and quizzes that are held at frequent intervals during the year, and, with them, form largely the basis of final determination of fitness for promotion or graduation.

The standing of students is indicated by the letters A, B, C, D, (A highest, D lowest passing mark), E (condition), I (incomplete), and F (failure). Conditions may be removed as indicated below. 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.

In order to become eligible for final examinations students are required to attend at least seven eighths of the lectures in each course. This does not apply to laboratory courses, which must be taken in full.

Students having conditions in more than two major or in more than three minor subjects of the first year cannot enter upon the second year's work. Candidates for graduation must have removed all conditions before entering upon the third quarter of the graduating year.

Examinations for the removal of conditions will be offered the week preceding the opening of the fall quarter. Similar examinations will also be given during the first thirty days of the winter and spring quarters. Announcement of these examinations will appear in the general information bulletin and the *Official Daily Bulletin*. Conditioned students are required to inform themselves as to these dates as soon as they learn that they are conditioned, as no other notice is given. A fee of one dollar is charged for a condition examination. Failure at the condition examination necessitates a repetition of the subject. Students who carry a condition into a succeeding year may find a conflict of lecture or laboratory hours. In such cases they are to give preference to the lower course.

Absences will not be excused unless satisfactory reasons are given. Habitual absence without a satisfactory excuse, continued indifference to study, or persistently poor scholarship may subject the student to probation or temporary or permanent suspension. Any of the facilities afforded by the University are open to the students of this college, subject to the approval of the dean. Opportunity is offered to do advanced work in all branches. Textbooks may be obtained after coming to the University.

Students find their time fully occupied with the regular curriculum.

MEDICINAL PLANT LABORATORY AND GARDEN

Students receive instruction in medicinal plant culture and in the harvesting, drying, preparing, and milling of drugs in the very representative medicinal plant garden and in the plant laboratory and conservatory. The garden and plant laboratory have been added to increase the educational facilities of the college. The college has no experience nor information concerning the commercial cultivation of medicinal plants.

DISPENSARY PRESCRIPTION PRACTICE

The seniors, under competent direction and supervision, dispense the prescriptions written by the physicians in the Out-Patient Department of the University Hospitals. During the past year upwards of twenty-five thousand prescriptions were filled, most of them formulated ones, only a negligible percentage calling for proprietaries.

ELECTIVES IN OTHER UNIVERSITY COLLEGES

Students may elect certain subjects in other university colleges, if such election does not interfere with their regular work. Subjects elected must be approved by the dean.

COLLEGE TRAINING FOR PHARMACISTS

The recognition of the need of substantial college training for pharmacists finds expression in many ways. In many states, including Minnesota, such training is now obligatory by law. In a number of other states credit is given for college work. Graduates of the four-year course need only one additional year of drugstore experience before they become eligible for examination by the State Board of Pharmacy for full registration.

SUMMER SCHOOL

The College of Pharmacy offers no courses in purely pharmaceutical subjects but the summer school offers the following courses which are part of the pharmacy course: general chemistry, qualitative chemistry, organic chemistry, general botany, physiology, bacteriology, rhetoric, physics, modern languages, and animal biology.

Requests for summer school bulletins should be made directly to the university registrar.

MINNESOTA STATE PHARMACEUTICAL ASSOCIATION SCHOLARSHIP

The Minnesota State Pharmaceutical Association awards annually \$105 in cash and a token to that student who is a citizen of the United States, who has resided in Minnesota for the last five years, and who has earned the highest general or average rating at the completion of the first two years of technical pharmaceutical work up to ten days before Cap and Gown Day and who is a candidate for the first degree in pharmacy from this college. If such student should discontinue attendance at the college, the said sum is to be awarded to the student next highest in standing who meets the other requirements.

THE FAIRCHILD SCHOLARSHIP

Mr. Samuel W. Fairchild offers a scholarship in the sum of \$300 to be awarded to the student in any of the colleges holding membership in the American Association of Colleges of Pharmacy who has had two years of drugstore experience, is a high school graduate, who has completed one year in a recognized college of pharmacy, 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. Fuller particulars may be had from the dean of the college.

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 from the four-year course leading to the degree of bachelor of science in pharmacy.

THE JACOBSON PRIZE

David L. Jacobson, '99, offers annually a gold medal to that student who graduates with the highest general average rating from the first graduate course in pharmacy leading to the degree master of science in pharmacy.

POSITIONS FOR GRADUATES

The demand for graduates of this college has always been greater than the supply and is continually growing. Practically all members of the senior class are engaged before graduation. This college is recognized in all states, including those in which state standards of efficiency have been established.

STATE BOARD OF PHARMACY

The State Board of Pharmacy meets at the college four times each year to examine candidates for registration. For information concerning the board or state examinations, address the secretary of the board, 2943 Twenty-seventh Ave. So., Minneapolis.

THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

This college is a member of the American Association of Colleges of Pharmacy, whose object is the promotion of higher pharmaceutical education. Through the influence of the association, higher standards of education are being adopted from time to time by its members and others, evidenced by the fact that several states by law or by board of pharmacy ruling recognize the standards set by the association. Member colleges must maintain certain minimum entrance and graduation requirements. This college exceeds these requirements.

THE NORTHWESTERN BRANCH OF THE AMERICAN PHARMACEUTICAL
ASSOCIATION

The Northwestern Branch of the American Pharmaceutical Association has its headquarters at the College of Pharmacy. About four meetings are held annually. Students of pharmacy are eligible to membership in the branch, but are privileged to attend the meetings without becoming members.

COMMUNICATIONS

Communications not relating to registration should be addressed to the dean, Professor Frederick J. Wulling, University of Minnesota, Minneapolis, Minnesota. Communications relating to registration or advanced standing should be addressed to the University Examiner, Registrar's Office, University of Minnesota.

For further information see general information bulletin.

COURSE OF STUDY

The College of Pharmacy has discontinued the three-year course leading to the degree pharmaceutical chemist and now offers only one undergraduate course of four years' duration, leading to the degree bachelor of science in pharmacy and including one year of work in certain subjects in the College of Science, Literature, and the Arts, or other colleges of equal standing. This was formerly the optional four-year course. It has become the obligatory minimum degree course by action of the university regents at their April, 1926, meeting. Graduate work in pharmacy, leading to the Master's and Doctor's degrees, respectively, is now under the direction of the Graduate School. The graduate work is open to graduates of the four-year course of this or other colleges of pharmacy of similar standing and who have the degree bachelor of science in pharmacy and who have shown exceptional scholarship and capacity in the undergraduate course and possess unquestioned ability to carry on independent or research work.

THE PRESENT REGULAR COURSE

This course extends over a period of four full university years. The curriculum is described in the following pages, but its division among the four years may be changed as necessity may warrant. All courses begin only with the fall or first quarter.

OUTLINE OF THE REGULAR FOUR-YEAR COURSE

(Subject to change)

FIRST YEAR

This year includes a minimum total of 45 quarter credits among which must be a minimum of 10 of rhetoric, 9 of modern language, 10 of college physics or animal biology. The 16 additional credits are electives. Students may complete this first year at the College of Science, Literature, and the Arts at the University, or at any junior college, or at any academic college of equal standing, in which case they will be admitted to the second year of the four-year course; or they may complete the 45 academic credits at the University by carrying them concurrently during the first two years with some of the technical pharmaceutical subjects. The first choice is recommended. If the student chooses to carry academic and professional work concurrently, the outline of the first two years would be as follows:

FIRST YEAR—COMBINED

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
General Chemistry	General Chemistry	Qualitative Chemistry
General Botany	General Botany	General Botany
Rhetoric* (5 credits)	Rhetoric* (5 cred.)	Rhetoric* (5 cred.)
Modern Language|| (3 or 5 cred.)	Modern Language|| (3 or 5 cred.)	Modern Language|| (3 or 5 cred.)
Military Drill	Military Drill	Military Drill
Personal Hygiene		

* Total of only 10 credits required.

|| Total of only 9 credits required.

THE COLLEGE OF PHARMACY

SECOND YEAR—COMBINED

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
Physics or Animal Biology* (5 cred.)	Physics or Animal Biology* (5 cred.)	Physics or Animal Biology* (5 cred.)
Academic Electives||	Academic Electives||	Academic Electives||
Didactic Pharmaceutical Chemistry	Didactic Pharmaceutical Chemistry	Didactic Pharmaceutical Chemistry
Pharmacy	Pharmacy	Pharmacy
Pharmacognosy	Pharmacognosy	Pharmacognosy
Military Drill	Military Drill	Military Drill

SECOND YEAR

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
Botany	Botany	Botany
General Chemistry	General Chemistry	Qualitative Chemistry
Military training	Military training	Military training
Pharmacy	Pharmacy	Pharmacy
Pharmac. Chemistry, Didactic	Pharmac. Chemistry, Didactic	Pharmac. Chemistry, Didactic
Pharmacognosy	Pharmacognosy	Pharmacognosy

THIRD YEAR

The third and fourth year curricula are the same for all students, as follows:

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
Materia Medica	Materia Medica	Materia Medica
Pharmacognosy	Pharmacognosy	Pharmacognosy
Pharmac. Chemistry, Practical	Pharmac. Chemistry, Practical	Therapeutics
Military training	U. S. P. Testing	Operative Pharmacy
Organic Chemistry	Military training	Military training
	Organic Chemistry	

FOURTH YEAR

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
Dispensing	Dispensing	Dispensing
U. S. P. Assay	U. S. P. Assay	U. S. P. Assay
Bacteriology	Drug and Food Analysis	Mineralogy and Crystallog.
Drug and Food Analysis	Physiology	Drug and Food Analysis
Dispensary Practice	Dispensary Practice	Law and Ethics
Organic Pharmacy		Dispensary Practice

CREDIT VALUE

The credit values of courses were changed September, 1918. Now a credit value covers one period of lecture or recitation or two, and in some laboratory subjects three, periods of laboratory work per week per quarter. The numbers expressing the credit value of courses are now fifty per cent greater than formerly, when the college was on the semester basis.

* Total of only 10 credits of either required.

|| Sufficient to make a total of 45 academic credits.

DESCRIPTION OF COURSES

STATEMENT OF COURSES

Following each course is a statement, in parentheses, of credits, classes of students eligible, prerequisites, days of the week, class hour, and location of class. Thus (3 cred.; jr., sr., grad.; 3-4; MTW II) means that the course carries three credits, is open to juniors, seniors, and graduates, demands Course 3-4 as a prerequisite, and meets on Monday, Tuesday, and Wednesday, at the second hour.

BACTERIOLOGY AND IMMUNOLOGY

Professors Winford P. Larson, M.D., Arthur T. Henrici, M.D.; Associate Professor Robert G. Green, M.A., M.D.; Instructors Beryl S. Green, M.A., H. Orin Halvorson, B.S., Ch.E., Charles E. Skinner, Ph.D.

51f,w,s,su. General Bacteriology. Lecture and laboratory course. The principles and technique of general bacteriology. Studies in the morphologic and biologic characters of the common bacteria. Preparation of cultural media. Disinfectants and disinfection. Bacteriology of water and food products. (5 cred.; sr.; prereq., 1 yr. biol., 1 yr. chem.) Dr. Henrici, Dr. Green.

BOOK RESEARCH AND SEMINAR WORK

Throughout the year students are required to do book research and seminar work in the pharmaceutical library during certain hours released for the purpose from the pharmaceutical laboratory and other periods. Beginning with the coming year it is proposed to provide regularly in the college schedule one two-hour period a week for library and seminar work during the second quarter of the graduating year. A room has been reserved for this purpose in the Pharmacy Building.

BOTANY

Professors J. Arthur Harris, Ph.D., Head; Carl O. Rosendahl, Ph.D., Josephine E. Tilden, M.S.; Associate Professors Frederic K. Butters, Ph.D., William S. Cooper, Ph.D., Rodney B. Harvey, Ph.D.; Assistant Professor Ned L. Huff, M.A.; Instructors Ethel M. Mygrant, M.S., Vernon Young, M.A.; Teaching Assistants, Paul Harvey, M.S., Esther Goering Herrick, B.S., Ethel Sue Horton, M.A., Patience E. Kidd, M.S., Edna K. Lockwood, George Steinbauer, B.S., Abraham Stoesz, B.A., and Nellie Thompson, B.A.

CHEMISTRY: INORGANIC

Professor M. Cannon Sneed, Ph.D.; Assistant Professor Henry N. Stephens, Ph.D.; Instructor J. Lewis Maynard, B.A.

- 4f-5w. Inorganic Chemistry. A study of the general laws of chemistry and of the non-metals, the metals, and their compounds. (8 cred.; fr.; prereq., high school chem.) Mr. Stephens.
- 14f-15w. Inorganic Chemistry. A study of the general laws of chemistry and of the non-metals and their compounds. (10 cred.; fr.; no prereq.) Mr. Maynard.
- 16s. Qualitative Chemical Analysis. Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. (5 cred.; fr.; prereq., 5 or 15.) Mr. Maynard.

CHEMISTRY: ORGANIC

Professor William H. Hunter, Ph.D., Assistant Professor Walter M. Lauer, Ph.D.

- 1f-2w. Elementary Organic Chemistry. A discussion of the important classes of organic compounds, both aliphatic and aromatic. The laboratory work includes the preparation of typical substances. Primarily for dentistry and pharmacy students. (8 cred.; soph.; prereq., Inorg. Chem., 5 or 15.) Mr. Lauer.

CLINICAL MICROSCOPY

Professor.....; Instructor.....

- 1s. Clinical Chemistry and Microscopy. Includes (a) the microscopic study of urine, its color, sediments, and finer chemical tests and (b) the microscopic study of urine sediments, blood, pus, epithelial cells, casts, etc. Optional. (1 cred.; sr.; no prereq.)

DISPENSARY PRESCRIPTION PRACTICE

Instructor Hallie Bruce, Phm.G.; Assistant Vivian Vogel, Phm.C.

- 1f,w,s. Dispensary Prescription Practice. The prescription dispensing for the Out-Patient Department of the University Hospital is in charge of the College of Pharmacy. The senior students do the prescription work under competent direction. (3 cred.; sr.; prereq., Pharm. 5.) Miss Bruce, Miss Vogel.

FIRST AID TO THE INJURED

Lecturer Charles N. McCloud, Phm.D., M.D., and assistant.

- 1s. Emergency Cases. A series of lectures and demonstrations designed to qualify the pharmacists to administer upon emergency cases before the arrival of the physician. (1 cred.; sr.; no prereq.) Dr. McCloud.

MATERIA MEDICA

Professor Frederick J. Wulling, Phm.G., Phm.D., LL.M.; Assistant Professor Earl B. Fischer, B.S.; Instructor Charles E. Smythe, and assistants.

- 1f,w,s. Inorganic Materia Medica. This course runs concurrently and in close relationship with Pharmacy 8 and 11, and includes chiefly the medical properties and doses of inorganic official bodies. (1 cred.; fr.; no prereq.) Mr. Wulling and assistants.
- 2f,w,s. Organic Materia Medica. The identity, sources, botanical origins, families, constituents, preparations and doses of the U. S. P., and of some unofficial vegetable drugs are studied in this course. (6 cred.; fr.; no prereq.) Mr. Fischer, Mr. Smythe, and assistants.

MILITARY SCIENCE AND TACTICS

Professor Bernard Lentz, Major, Infantry; Assistant Professors, Kent Nelson, Lieutenant Colonel, Medical Corps; Ray C. Hill, Major, Infantry; Frederic H. Bockoven, Major, Dental Corps; Porter P. Wiggins, Captain, Infantry; Wilton B. Persons, Captain, Signal Corps; Don F. Pratt, Captain, Infantry; Nyal L. Adams, Captain, Coast Artillery Corps; Arthur R. Walk, Captain, Infantry; William F. Rehm, Captain, Infantry; Julian H. Gist, Captain, Infantry; Frederick S. Matthews, Captain, Infantry; John F. Cassidy, First Lieutenant, Coast Artillery Corps; Instructors, Harry E. Strider, Master Sergeant, Signal Corps; Alfred Brandt, Master Sergeant, Infantry; Aubrey R. Dunkum, Staff Sergeant, Coast Artillery Corps; John Coop, Sergeant, Infantry; Ernest R. Mylk, Sergeant, Infantry.

- 1f-2w. First Year Basic Course R.O.T.C. Infantry. Practical and theoretical instruction in school of soldier squad and company; elementary subjects of military training; infantry weapons and equipment. (No cred.; fr.; no prereq.; MWF IV; A.)
- 3s. First Year Basic Course. Same as 1f-2w. (No cred.; fr.; prereq., 1-2; W VI, VIII, IX; A.)
- 4f-5w. Second Year Basic Course R.O.T.C. Infantry. Practical instruction in school of platoon and company; military sketching and map reading; infantry weapons including machine gun and automatic rifle; minor tactics. (No cred.; fr., jr.; prereq., 1-2-3; MWF IV; A.)
- 6s. Second Year Basic Course R.O.T.C. Infantry. Same as 4f-5w. (No cred.; fr., jr.; prereq., 4-5; W VII, VIII, IX; A.)
- 51f-52w. First Year Advanced Course R.O.T.C. Infantry. Field engineering; infantry weapons, including trench mortars, 37 mm. gun, grenades, pistol; minor tactics and musketry. (No cred.; jr.; prereq., 1-2-3, 4-5-6; MWF II, III, IV, VI, VIII; TThS I, II, III, IV; TTh, VI, VII, VIII, IX; A.)
- 53s. First Year Advanced Course R.O.T.C. Same as 51f-52w. (No cred.; jr.; prereq., 51-52; W VII, VIII, IX; A.)

- 54f-55w. Second Year Advanced Course R.O.T.C. Infantry. Minor tactics; administration; military law; military history and policy of the United States; rules of land warfare. (No cred.; sr.; prereq., 51-52, 53; MWF II, III, IV, VI, VIII; TThS I, II, III, IV; TTh, VI, VII, VIII, IX; A.)
- 56s. Second Year Advanced Course R.O.T.C. Same as 54f-55w. (No cred.; sr.; prereq., 54-55; W VII, VIII, IX; TThS IV; A.)

PHARMACY

Professors Frederick J. Wulling, Phm.G., Phm.D., LL.M., Ph.M. *causa honoris*, Gustav Bachman, Phm.D., Phm.M.; Associate Professor Charles H. Rogers, D.Sc. in Phm.; Instructors Ragnar Almin, Phm.C., Hallie Bruce, Phm.G., Charles V. Netz, Phm.C., M.S., Del D. Turner, Phm.C.; Assistant Vivian Vogel, Phm.C.

- 1f. History of Pharmacy. This course embraces the study of the history of pharmacy, including the U. S. Pharmacopoeia through all of its revisions and the literature of pharmacy. ($\frac{3}{4}$ cred.; fr., jr.; no prereq.) Mr. Wulling, Mr. Rogers.
- 2f. This course includes the study and preparation of the active constituents of many vegetable drugs, scale salts of iron, plasters, soaps, oleoresins, collodions, effervescing salts, etc. ($6\frac{1}{2}$ cred.; jr.; prereq., 4f, 6w, 8s.) Mr. Bachman, Mr. Turner.
- 3f. Metrology. A critical study of weights and measures and balances; specific gravity, specific volume; allegation, etc. ($4\frac{1}{2}$ cred.; fr., jr.; no prereq.) Mr. Rogers, Mr. Netz.
- 5w. The Physics of Pharmacy. This course covers a review and more extended elucidation of such divisions of physics as apply to pharmaceutical processes. ($4\frac{1}{2}$ cred.; fr., jr.; prereq., 3.) Mr. Rogers, Mr. Netz.
- 7w,s. Pharmaceutical Processes. A study of the various laboratory processes employed in pharmaceutical manufacture. (5 cred.; fr., jr.; prereq., 5.) Mr. Rogers, Mr. Netz.
- 2w,s. Pharmacopoeial Preparations. This course includes the study and preparation of official bodies for which the Pharmacopoeia gives formulae and processes. ($7\frac{1}{2}$ cred.; fr., jr.; prereq., 7.) Mr. Rogers, Mr. Netz, and assistant.
- 4f,w,s. Pharmacy Quiz. A thoro review of the work covered in Courses 3f, 5w, 7s, and 2s. ($4\frac{1}{2}$ cred.; fr., jr.; prereq., 3, 5, 7, 2.) Mr. Rogers, Mr. Netz.
- 6w,s. Identification of Inorganic U. S. P. Preparations. The study of the appearance and physical properties of inorganic official preparations. (2 cred.; fr., jr.; prereq., 2.) Mr. Rogers, Mr. Netz.
- 9f. Pharmaceutical Chemical Philosophy. This course treats of the principles underlying chemistry and elucidates chemical facts and phenomena in their pharmaceutical aspects. (3 cred.; fr., jr.; no prereq.) Mr. Wulling.

- 11w. The Pharmaceutical Chemistry of the Non-Metals. A study of the description, properties, pharmacy, and manufacture of the non-metals used in pharmacy, including their U. S. P. preparations. (3 cred.; fr., jr.; prereq., 9.) Mr. Wulling.
- 8s. U. S. P. Inorganic Salts. Especial reference to sources, description, properties, and manufacture. (3 cred.; fr., jr.; prereq., 9.) Mr. Wulling, Mr. Almin.
- 13s. Classification of Pharmaceutical Organic Compounds. A preparation for Pharmacy 15. (1½ cred.; jr., sr.; prereq., Chemistry 31f and 32w.) Mr. Wulling, Mr. Rogers.
- 15f,w,s. Pharmaceutical Organic Compounds and Their Preparations. Includes the critical study of cellulin and its derivatives, destructive distillation products, starches, sugars, fermentation products, organic acids, fixed oils and fats, volatile oils, waxes and animal fats, alkaloids, glucosides, animal drugs and products, etc. (9 cred.; jr., sr.; prereq., 13, Chemistry 31f and 32w.) Mr. Rogers.
- 17w. Pharmacopoeial Qualitative Analysis. A critical study of the identity, purity, limit, and percentages tests of the Pharmacopoeia and their application either wholly or in part to practically every official organic and inorganic salt and compound. (5½ cred.; jr.; prereq., 11w and Chem. 16s.) Mr. Bachman, Mr. Almin, Mr. Turner.
- 18w,s. Pharmacopoeial Quantitative Analysis. This course includes the gravimetric, volumetric, and gasometric determinations of the U. S. Pharmacopoeia, but not Pharmaceutical Assay (12w). (15 cred.; sr.; prereq., 17.) Mr. Bachman, Mr. Almin, Mr. Turner.
- 19f,w,s. Prescription Incompatibility. Therapeutic, pharmaceutical, and chemical incompatibility is taken up in lecture and recitation work preliminary to Course 21. (2 cred.; sr.; prereq., 17w.) Mr. Bachman, Mr. Turner.
- 21f,w,s. Prescription Dispensing. This course runs concurrently and in cooperation with Dispensary Prescription Practice 1f,w,s, and includes the critical study of the prescription and practical work in dispensing a wide range of prescriptions taken from actual medical practice. (13 cred.; sr.; prereq., 17w.) Mr. Bachman, Miss Bruce, Mr. Turner, Miss Vogel.
- 8a,w,s. Manufacture of Pharmaceutical Inorganic Salts. The preparation of upwards of forty pharmaceutical salts included in this course. (6 cred.; jr., sr.; prereq., 8s, Chemistry 16s.) Mr. Rogers, Mr. Netz, and assistants.
- 10f. National Formulary. This lecture and laboratory course includes a partial study of the National Formulary and the making of a number of its more important preparations. (1½ cred.; jr., sr.; prereq., 15, 8a.) Mr. Bachman, Mr. Almin, Mr. Turner.
- 12s. Pharmaceutical Assay. The quantitative determination of alkaloidal and other active constituents of a number of the potent U. S. P. organic drugs and preparations. (2 cred.; sr.; prereq., 17w.) Mr. Bachman, Mr. Almin, Mr. Turner.

- 14s. Synthetic Remedies. The study of the pharmaceutical chemistry of synthetic chemicals in medical use. (1 cred.; jr., sr.; prereq., 15f,w,s.) Mr. Rogers.
- 16w. Homeopathic Pharmacy. Exposition of principles underlying the preparation of homeopathic remedies, including some laboratory work. (1 cred.; jr.; no prereq.) Mr. Wulling, Mr. Bachman. Optional.
- 25w,s. Identification of U. S. P. Salts. The study of the physical identity of the more important official inorganic and organic salts. (2 cred.; jr., sr.; prereq., 8, 15.) Mr. Bachman, Mr. Turner.
- 20s. Microchemistry. Work in the microchemistry of pharmacy is included in the work of a number of other courses, but will soon be offered as a separate course. (No cred.; no prereq.)
- 27f. Mathematics of Pharmacy. While students are required to have a preparation in arithmetic, algebra, and geometry, before entering, they receive frequent drills throughout the year. Examinations in the subject are required. (1 cred.; fr., jr.; prereq., 3.) Mr. Wulling, Mr. Bachman, Mr. Rogers, Miss Bruce.
- 29f,w,s. Drug and Food Analysis. A course designed to prepare students for commercial pharmaceutical analytical work. (24 cred.; sr.; prereq., Chemistry 31f and 32w.) Mr. Rogers, Mr. Netz, and assistant.
- 51f,w. Metrology, Elementary, For nurses. (1 cred.; fr., jr.; no prereq.) Mr. Wulling.

PHARMACEUTICAL AND BUSINESS LAW

Professor Frederick J. Wulling, Phm.G., Phm.D., LL.M.

- 1s. Law for Pharmacists. The lectures introduce the subjects of contracts, agency, commercial paper, insurance, etc., in their application to the practice of pharmacy, and discuss the liability of retail pharmacists. (2 cred.; sr.; no prereq.) Mr. Wulling.
- 2s. Minnesota Pharmacy Laws. Statute laws of Minnesota affecting practice of pharmacy. Lectures by special lecturers experienced in the application and operation of pharmacy laws. (1/3 cred.; sr.; no prereq.)

PHARMACEUTICAL MINERALOGY AND CRYSTALLOGRAPHY

Professor

- 1s. Mineralogy. A study of the occurrence and properties of minerals of pharmaceutical importance; ores of metals used in pharmacy; non-metallic minerals and mineral waters in their mineralogic and geologic relation. (1 cred.; sr., grad.; no prereq.)
- 2s. Crystallography. A survey of form and more evident physical characters as a basis for practice in sight recognition of economic minerals and their distinction from common rocks. (1 cred.; sr., grad.; prereq., 1.)

PHARMACOGNOSY

Assistant Professor Earl B. Fischer, B.S.; Instructor Charles E. Smythe; Assistant Herbert Kroning.

- 1f. Medicinal Plant Study and Drug Preparations. The principles underlying the preparation of plant drugs, including the study of plants cul-

- tivated in the medicinal plant garden, and herbarium work. (1 cred.; fr.; no prereq.; ar.; ar.) Mr. Fischer, Mr. Smyithe, and assistants.
- 2w,s. The Pharmacognosy of the Thallophytes and Archegoniates. In this course some of the drugs and economic products obtained from the thallophytes and archegoniates are studied. (5 cred.; fr.; prereq., 1f.) Mr. Fischer, Mr. Smyithe, and assistants.
- 3f. Drug Collection and Preparation. Scientific methods of drug collection and preparation of about fifty drugs from plants grown in the medicinal plant garden. (3 cred.; jr.; prereq., 1f.) Mr. Fischer, Mr. Smyithe, and assistants.
- 4s,w. Pharmaco-Histology and Pharmacognosy of the Angiosperms. Includes micrometry and the detailed study of the inner structure of parts of the higher plants as illustrated by the study of the whole and powdered, vegetable and animal drugs, and their adulterants. (10 cred.; jr.; prereq., 2w,s,3f. Botany 17f, 18w.) Mr. Fischer, Mr. Smyithe, and assistants.
- 5s. Field Work. The classes are taken on field searches for native medicinal plants. The study of the distinguishing characteristics of certain orders, families, and genera of medicinal plants is included in this work. (2 cred.; jr.; prereq., 4w.) Mr. Fischer.
- 6w. Physiological Drug Assay. Optional. The pharmacopoeial and the more important unofficial methods of biologic assay of drugs and their preparations are studied. (3 cred.; sr.; prereq., 4s,w.) Mr. Fischer.
- 7w,s. Advanced Pharmacognosy. Designed to give students a working knowledge of the use of the more important microscopical accessories in advanced pharmacognostic work. (3 cred.; sr.; prereq., 4s,w.) Mr. Fischer.

PHYSICAL EDUCATION FOR MEN

Professor Fred W. Luehring, Ph.M., Director; Associate Professors Louis J. Cooke, M.D., Assistant Director, Louis F. Keller, M.A.; Instructors Emil Iverson, Blaine McKusick, LL.B., Walter R. Smith, B.A., Director of Intramural Athletics, Niels Thorpe; Assistant Lloyd S. Boyce.

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.

4f. Personal Hygiene. One hour per week; first quarter. Examination at close of course. (No cred.; all; no prereq.) Dr. Cooke.

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

PHYSICAL EDUCATION FOR WOMEN

Professor J. Anna Norris, M.D., Director; Assistant Professors May S. Kissock, B.A., Gertrude M. Baker, B.A., Alice H. Tolg, M.D., Helen W. Hazelton, B.A.; Instructors Else H. Bockstruck, B.S., Mary Starr Conger, Grace E. Denny, B.A., Pauline L. Lane, B.A., Florence Warnock.

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; conducts yearly consultations with, and examines when necessary, all upperclass students; gives courses in hygiene; organizes neuromuscular activity leading toward organic strength, nervous stability, conscious motor control, correct bodily 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 Woman's Athletic Association in encouraging and organizing athletic sports; holds regular office hours for the purpose of consultation with all students who desire its advice.

Work in this department is required of all newly entering students (see Course 4). Physical examinations or consultations required annually of all students.

For elective classes in gymnastics, dancing, swimming, field hockey, basket-ball, baseball, and other activities, see bulletin of the College of Science, Literature, and the Arts.

For requirements for a teacher's certificate, see bulletin of the College of Education.

4f. Preliminary Hygiene. One lecture a week. The most essential aspects of the care of the body. (No cred.; all new students; no prereq.) Dr. Norris.

PHYSIOLOGY

Professors Elias P. Lyon, Ph.D., M.D., LL.D., Frederick H. Scott, Ph.D., M.B., D.Sc., Jesse F. McClendon, Ph.D.; Associate Professor Chauncey J. V. Pettibone, Ph.D.; Assistant Professor Esther M. Greisheimer, Ph.D., M.D.

4w,s,su. Human Physiology. Lectures and laboratory. (5 qtr. cred.; S.L.A., H.E., and others; prereq., elem. biol. and chem.) Dr. Lyon, Dr. Griesheimer, and others.

5w,s,su. Same as Course 4 without laboratory. (4 qtr. cred.; pharm. stud.)

57f,su. Physiologic Chemistry. (4 qtr. cred.; dent. stud. and others; prereq., org. chem.) Mr. Pettibone.

For other courses see Medical School bulletin.

THERAPEUTICS AND TOXICOLOGY

Associate Professor Edgar D. Brown, Ph.D., M.D.

1s. Therapeutics and Toxicology. Drugs are studied in groups as governed by their medicinal and toxic properties. Remedial measures other than those depending upon drugs are fully considered. Poisonous action and doses of drugs also receive consideration. (3 cred.; jr.; prereq., Pharmacognosy 5, Mat. Med. 1.) Dr. Brown.

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

School of Chemistry
Part I

Announcement of Courses for the Years
1926-1928



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THE SCHOOL OF CHEMISTRY

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I. William Geiger, Ph.D., Associate Professor of Analytical Chemistry
Landon A. Sarver, Ph.D., Assistant Professor of Analytical Chemistry

¹ On sabbatic furlough, 1926-27.

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 H. Armin Pagel, M.A., Assistant in Analytical Chemistry

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 _____, Instructor in Chemical Engineering

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F. Anton Gray, B.S., Instructor in Geology and Mineralogy

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John V. Martenis, M.E., Associate Professor of Machine Design

Charles F. Shoop, B.S., B.S. (M.E.), Professor of Steam Engineering

Thomas P. Hughes, Instructor in Forging

John H. Moffett, Met.E., Instructor in Foundry Practice

Dayton A. Rogers, Instructor in Machine Shop Practice

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Ralph L. Dowdell, Ph.D., Assistant Professor of Metallography

Ludwig J. Weber, Ph.D., Instructor in Metallography

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Peter Christianson, B.S., E.M., Professor of Metallurgy

Levi B. Pease, M.S., Professor of Metallurgy

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Ray C. Hill, Major, Infantry, Assistant Professor of Military Science and Tactics

Frederic H. Bockoven, Major, Dental Corps, Assistant Professor of Military Science and Tactics

Don F. Pratt, Captain, Infantry, Assistant Professor of Military Science and Tactics

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- Arthur R. Walk, Captain, Infantry, Assistant Professor of Military Science and Tactics
- Nyal L. Adams, Captain, Coast Artillery Corps, Assistant Professor of Military Science and Tactics
- William F. Rehm, Captain, Infantry, Assistant Professor of Military Science and Tactics
- Julian H. Gist, Captain, Infantry, Assistant Professor of Military Science and Tactics
- Myron J. Conway, Lieutenant, Infantry, Assistant Professor of Military Science and Tactics
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- Harry E. Strider, Master Sergeant, Instructor in Military Science and Tactics
- Aubrey R. Dunkum, Staff Sergeant, Instructor in Military Science and Tactics
- John Coop, Sergeant, Instructor in Military Science and Tactics
- Ernest R. Mylk, Sergeant, Instructor in Military Science and Tactics

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- Fred W. Luehring, Ph.M., Professor of Physical Education and Director of Physical Education and Athletics for Men
- Louis J. Cooke, M.D., Associate Professor of Physical Education and Assistant Director of Physical Education and Athletics for Men
- Louis F. Keller, M.A., Associate Professor of Physical Education and Athletics for Men
- Blaine McKusick, B.A., LL.D., Instructor in Physical Education for Men
- Harold T. Taylor, M.A., Instructor in Physical Education for Men
- Niels Thorpe, Instructor in Physical Education for Men

PHYSICAL EDUCATION FOR WOMEN

- J. Anna Norris, M.D., Professor of Physical Education and Director of Physical Education for Women
- Gertrude M. Baker, B.A., Assistant Professor of Physical Education for Women
- Helen W. Hazelton, B.A., Assistant Professor of Physical Education for Women
- May S. Kissock, B.A., Assistant Professor of Physical Education for Women
- Alice J. H. Tolg, M.D., Assistant Professor of Physical Education for Women
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- Grace Denny, B.S., Instructor in Physical Education for Women
- Irene M. Evans, B.S., Instructor in Physical Education for Women
- Pauline Lane, B.A., Instructor in Physical Education for Women

¹ On sabbatic furlough, 1926-27.

PHYSICS

Henry A. Erikson, B.E.E., Ph.D., Professor of Physics and Chairman of the Department

Louallen F. Miller, Ph.D., Associate Professor of Physics

John T. Tate, Ph.D., Professor of Physics

Joseph Valasek, Ph.D., Assistant Professor of Physics

John H. Van Vleck, Ph.D., Associate Professor of Physics

Anthony Zeleny, Ph.D., Professor of Physics

J. William Buchta, Ph.D., Instructor in Physics

PHYSIOLOGIC CHEMISTRY

Jesse F. McClendon, Ph.D., Professor of Physiologic Chemistry

Chauncey J. V. Pettibone, Ph.D., Associate Professor of Physiologic Chemistry

PREVENTIVE MEDICINE AND PUBLIC HEALTH

Harold S. Diehl, M.A., M.D., Associate Professor of Preventive Medicine and Public Health and Head of the Department

R. Wilson Archibald, D.V.M., Assistant Professor of Preventive Medicine and Public Health

James A. Child, C.E., Assistant Professor of Preventive Medicine and Public Health

Harold A. Whittaker, B.A., Assistant Professor of Preventive Medicine and Public Health

Lawrence H. Cady, B.S., M.D., Instructor in Preventive Medicine and Public Health

Harry De Witt Lees, M.D., Instructor in Preventive Medicine and Public Health

William A. O'Brien, M.D., Instructor in Preventive Medicine and Public Health

GENERAL INFORMATION

The School of Chemistry occupies a large modern building, recently completed, which is located on the new campus of the University. It is 180 by 200 feet and has six floors. Its laboratories are designed to afford facilities for instruction in the various branches of chemistry. The departmental 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 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 four-year course leads to the degree of bachelor of science in chemistry. This course offers students a thoro training in the fundamentals of chemistry and related subjects. It serves as a basis for specialization in chemistry and forms a suitable foundation for graduate work. Graduates of this course secure positions in colleges, in governmental bureaus, and in the chemical industries, as teachers, analysts, or research assistants.

The course in Chemical Engineering leads to the degree of bachelor of science in chemical engineering at the end of four years, and to the degree of master of science in chemical engineering at the end of the fifth year which is taken in the Graduate School. It aims to give the student a broad foundation in chemistry, engineering, and allied sciences. The professional degree of chemical engineer will be conferred upon those who have received the degree of bachelor of science in chemical engineering, or its equivalent, when they have completed an additional year's work in the Graduate School, have had four years of practical experience in positions of responsibility in chemical engineering, and have presented a satisfactory thesis based upon their professional work. The Master's degree for work in chemical engineering will be accepted in lieu of the additional year of college work required for the professional degree. While the graduates of this course are fitted to hold positions in the general fields of chemistry, they are especially prepared to undertake work in the manufacturing, operating, or research departments of industrial plants. The expansion of chemical industries and other branches of chemical activities in this country as a result of war conditions has created many new opportunities for chemical engineering graduates.

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. While the regular matriculation takes place in the fall, it is possible for students to enter the School of Chemistry in January, at the opening of the winter quarter, if they meet the full requirements.

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

2. Mathematics: elementary algebra, one unit; plane geometry, one unit; higher algebra,* one-half unit; solid geometry,* one-half unit.

3. Chemistry: one unit.†

4. Enough additional work to make in all fifteen units, of which not more than four may be in Group F. Two units of German, and one of physics are strongly recommended.

List of entrance subjects.—Only those subjects included in the following groups may be counted toward admission.

The term *unit* means not less than five recitations of forty minutes each per week for a period of thirty-six weeks. In laboratory, drawing, and other manual courses, twice this amount of time is required for one unit.

Group A English: 3 or 4 units.

Group B Languages: Latin, Greek, German, French, Spanish, Scandinavian, 1 to 4 units each.

Group C History and social sciences: European history, 2 units; English and senior American history, $\frac{1}{2}$ unit each; economics, sociology, economic history of England, and economic history of the United States, $\frac{1}{2}$ unit each; American government, commercial geography, and history of commerce, $\frac{1}{2}$ unit or 1 unit each.

Group D Mathematics: Elementary algebra and plane geometry, 1 unit each; unified mathematics, 2 units; higher algebra, solid geometry, and trigonometry, $\frac{1}{2}$ unit each.

Group E Natural sciences: General science, physics, and chemistry, 1 unit each; botany and zoology, $\frac{1}{2}$ or 1 unit each; physiology, astronomy, geology, and physiography, $\frac{1}{2}$ unit each.

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

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 School of Chemistry.

Registration.—The hours for registration in the School of Chemistry are from 9:00 to 12:00 a.m. and from 2:00 to 4:30 p.m., on Thursday and Friday, September 23 and 24, 1926. Fees must be paid before registration

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

† Students will be admitted without chemistry if they satisfy the remaining requirements and present the full 15 units. If chemistry is not presented for entrance, the student will find it necessary to take a quarter of freshman chemistry, five credits, in addition to the regular course. This will usually require attendance at the following Summer Session. It is also very desirable that physics be included in the high school course.

can be effected. Each student will obtain a statement of his fees at the office of the registrar, Library Building.

All students entering the college for the first time must present their credentials to the registrar at the University, who will notify the applicant with regard to his admission. Before registering all new matriculants are required to take a physical examination.

Students should consult the University calendar in regard to registration dates and the *Handbook for Students in the School of Chemistry* for the procedure of registration.

Students will not be allowed to register for less than 14 or more than 19 credit hours without the approval of the Students' Work Committee.

No change in registration will be permitted later than 10 days after the beginning of the quarter.

Fees.—The following fees are charged:

Tuition fee (per quarter):	
Residents of Minnesota.....	\$30.00
Non-residents	40.00
Incidental fee (per quarter).....	4.00
Military deposit (required of all who register for military drill).....	10.00
Deposit* (first quarter only).....	5.00
Special fees:	
Examination for removal of conditions.....	1.00
Examinations for credit (after first six weeks in residence).....	5.00
Special examinations	5.00
Chemistry deposit	5.00
Graduation fee	10.00

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

Students exempt from fees.—Fellows, scholars, assistants, and instructors, and other members of the teaching staff and scientific bureaus or experiment stations, when regularly enrolled as students in the Graduate School are not required to pay tuition fees.

Expenses.—Detailed statements regarding living expenses may be found in the bulletin of general information.

Junior Review Examinations.—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 courses Technological Chemistry 105 and 106, and Chemical Engineering 101.

* This deposit is made to cover such charges as may be incurred for lockers, library penalties, laboratory breakage, etc.

2. They will be held regularly at the beginning of the fall, winter, and spring 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, at the beginning of 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 before entering courses having numbers greater than 53, with the exception of Technological Chemistry 105 and 106, and Chemical Engineering 101.

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.

Theses.—Each senior in the course in Chemistry is required to prepare and submit a thesis based upon his original investigations. This work amounts to five credits per quarter throughout the senior year and each student is therefore expected to devote at least fifteen hours per week to it.

The subject of the thesis should be filed in the dean's office not later than November 1. The preliminary draft of the thesis should be submitted to the chief of the division concerned before June 1, and the final copy on or before June 10. A bound copy, 8½ by 11 inches, in the prescribed form, will be furnished by the student to be placed in the chemistry library.

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, field work, 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 report writing 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.

Requirements for graduation in Chemistry.—To obtain the degree of bachelor of science in chemistry the student must satisfactorily complete all of the required courses and in addition a sufficient number of approved electives to make a total of at least 210 credits. If high school chemistry was not presented for entrance, the five extra hours required in freshman chemistry increase the total requirement to 215 credits. Fifteen elective credits must be taken in chemistry.

Requirements for graduation in Chemical Engineering.—The degree of bachelor of science in chemical engineering requires the satisfactory completion of all the required courses together with a sufficient number of approved electives to make a total of 218 credits. In the absence of high school chemistry for entrance, this total requirement becomes 223 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 $17\frac{1}{2}$ credits per quarter for 12 quarters.

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 application 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 duPont Fellowship in Chemistry.—This fellowship was founded by E. I. duPont 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.

Prizes.—Various prizes in the University are open to students in the School of Chemistry. A list of them is given in the general information bulletin. In addition there are two prizes which are open to chemistry and chemical engineering students only. These have been established by the Phi Lambda Upsilon National Honorary Chemical Fraternity and the Twin City Alumni Association of the Alpha Chi Sigma Chemical Fraternity. These prizes are awarded to men students near the close of their sophomore year.

Research fellowships.—In the Engineering Experiment Station there are two research fellowships which are open to engineering graduates, including chemical engineers. Each of these bears an annual stipend of \$750. The holder is required to give twenty hours per week to such research service as may be assigned him. In addition he is expected to carry work in the Graduate School toward an advanced degree.

Assistants.—The School of Chemistry employs twenty-six assistants at \$650 or \$750 per annum. They are required to devote twelve hours per week to instruction and other assigned work. They thereby obtain valuable ex-

perience in laboratory teaching under competent direction. In addition to these duties, each assistant is expected to pursue graduate work toward a higher degree.

Reserve Officers Training Corps.—The War Department has established at this University units of infantry, coast (heavy) artillery, signal corps, medical corps, and dental corps in which both basic and advanced courses are given. The basic course is required for the first two years; the advanced course is elective for the third and fourth years.

Students of the School of Chemistry may enroll in the advanced course of the infantry 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 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 entitled *Handbook for Students in the School of Chemistry*. Each student is expected to observe these instructions.

Changes in bulletin.—The faculty of the School of Chemistry reserves the right to change its 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.

American Chemical Society.—The Minnesota section of the American Chemical Society has its headquarters at the University. All students who are interested are cordially invited to attend its meetings.

Changes in course numbers.—Beginning with this bulletin, that is, in the year 1926, the numbers of many courses in the School of Chemistry are changed, in order to avoid confusion. No numbers have been changed in the Division of Inorganic Chemistry. Hereafter, it will be necessary to prefix the name of the division to the number of the course rather than merely Chemistry. Thus, Chemistry 35-36-37 becomes Organic Chemistry 51-52-53. In this bulletin the old course numbers are included in parentheses.

CURRICULA

CHEMISTRY AND CHEMICAL ENGINEERING

FRESHMAN AND SOPHOMORE YEARS

The freshman and sophomore years are the same in Chemistry as in Chemical Engineering, so that the student may postpone his choice between these two curricula until the beginning of his junior year.

Mathematics.—Freshmen entering without high school higher algebra will take Course 9 (Higher Algebra); and those who have had higher algebra will register for Course 12 (Trigonometry). All freshmen are given a review in algebra during the first two weeks; those who have shown sufficient ability will proceed in Course 12 for the remainder of the fall quarter. The rest of the class will take Course 9, and will follow it with Courses 12, 11, and 13 during the winter and spring quarters and the following *Summer Session*, respectively.

Those entering without solid geometry must take Mathematics 10 (Solid Geometry) in their first quarter instead of drawing. They should take Drawing 7w-8s in the winter and spring quarters, three credits each.

Chemistry.—Students entering without high school chemistry will take Inorganic Chemistry 6-7-8 (General Inorganic Chemistry) during their freshman year and Inorganic Chemistry 12 (Qualitative Analysis) during the following *Summer Session*.

German.—If two years of high school German are presented for entrance, the student may complete the requirement in this subject by taking German 27, 28, 29 in the junior year. Without high school German, he will take German 24, 25, 26 in the sophomore year and German 27, 28, 29 in the junior year.

REGULAR FRESHMAN YEAR

For students satisfying the requirements of algebra, solid geometry, and chemistry.

First Quarter

Course No.	Title	Credits	Lect.	Rec.	Lab.
M. and M. 12	Trigonometry	5	..	5	..
Inorg. Chem. 9	General Inorganic Chemistry.....	5	3	1	5
English 4	Rhetoric and Composition.....	3	..	3	..
Drawing 4	Drawing and Descriptive Geometry.....	2	..	..	6
M.E. 12, 13, or 17	Shop	2	..	..	6
Mil. Sci. 1	First Year Basic Course.....	..	..	..	3

Second Quarter

M. and M. 11	College Algebra	5	..	5	..
Inorg. Chem. 10	General Inorganic Chemistry.....	5	3	1	5
English 5	Rhetoric and Composition.....	3	..	3	..
Drawing 5	Drawing and Descriptive Geometry.....	2	..	..	6
M.E. 12, 13, or 17	Shop	2	..	..	6
Mil. Sci. 2	First Year Basic Course.....	..	..	..	3

SCHOOL OF CHEMISTRY

Third Quarter

M. and M. 13	Analytic Geometry	5	..	5	..
Inorg. Chem. 12	Qualitative Analysis	5	1	2	6
English 6	Rhetoric and Composition.....	3	..	3	..
Drawing 6	Drawing and Descriptive Geometry.....	2	..	..	6
M.E. 12, 13, or 17	Shop	2	..	..	6
P.H. 2	Hygiene and First Aid.....	..	1	..	..
Mil. Sci. 3	First Year Basic Course.....	..	..	..	3

REGULAR SOPHOMORE YEAR

First Quarter

Course No.	Title	Credits	Lect.	Rec.	Lab.
M. and M. 24	Differential Calculus	5	..	5	..
Inorg. Chem. 13	Qualitative Analysis	5	..	2	9
Physics 3	Elements of Mechanics and Sound.....	3	3	1	..
Physics 4	Elements of Mechanics and Sound Lab. . .	1	..	..	2
German 24 ¹	Beginning German	4	..	4	..
Mil. Sci. 4	Second Year Basic Course.....	..	..	..	3

Second Quarter

M. and M. 25	Integral Calculus	5	..	5	..
Anal. Chem. 1	Quantitative Analysis	5	1	1	10
Physics 23	Heat	3	3	1	..
Physics 24	Heat Laboratory	1	..	..	2
German 25 ¹	Beginning German	4	..	4	..
Mil. Sci. 5	Second Year Basic Course.....	..	..	..	3

Third Quarter

M. and M. 84	Technical Mechanics	5	5	..	..
Anal. Chem. 2	Quantitative Analysis	5	1	1	10
Physics 43	Magnetism and Electricity.....	3	1	3	..
Physics 44	Electrical Laboratory	1	..	..	2
German 26 ¹	Beginning German	4	4	..	..
Mil. Sci. 6	Second Year Basic Course.....	..	..	..	3

THE COURSE IN CHEMISTRY

(For freshman and sophomore years see pages 15 and 16.)

JUNIOR YEAR

First Quarter

Course No.	Title	Credits	Lect.	Rec.	Lab.
Org. Chem. 51	Organic Chemistry	5	3	1	6
Anal. Chem. 123	Advanced Analytical Chemistry.....	3	1	..	7
Phys. Chem. 101	Physical Chemistry	5	3	1	6
German 27	Narrative Prose	3	..	3	..
	Electives to complete program ²				

¹ Students who have credit for two years of German in high school will take electives in the sophomore year instead of German 24-25-26.

² For list of suggested electives see page 19. A total of 15 elective credits must be taken in Chemistry for graduation.

CURRICULA

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Second Quarter

Org. Chem. 52	Organic Chemistry	5	3	1	6
Anal. Chem. 124	Advanced Analytical Chemistry.....	3	1	..	7
Phys. Chem. 102	Physical Chemistry	5	3	1	6
German 28	Advanced Chemical German.....	3	..	3	..
	Electives to complete program ¹				

Third Quarter²

Org. Chem. 53	Organic Chemistry	5	3	1	6
Phys. Chem. 103	Physical Chemistry	5	3	1	6
German 29	Advanced Chemical German.....	3	..	3	..
Physics 35	Optics.....	2	2	1	..
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	..
	Electives to complete program ¹				

SENIOR YEAR

First Quarter

Course No.	Title	Credits	Lect.	Rec.	Lab.
Chemistry 96	Thesis (in any division).....	5	..	..	15
Tech. Chem. 100	Food Analysis	3	1	..	6
	Electives to complete program ¹				

Second Quarter

Chemistry 97	Thesis	5	..	..	15
Tech. Chem. 101	Food Analysis	3	1	..	6
	Electives to complete program ¹				

Third Quarter

Chemistry 98	Thesis	5	..	..	15
Tech. Chem. 102	Food Analysis	3	1	..	6
	Electives to complete program ¹				

THE COURSE IN CHEMICAL ENGINEERING

(For freshman and sophomore years see pages 15 and 16.)

JUNIOR YEAR

First Quarter

Course No.	Title	Credits	Lect.	Rec.	Lab.
Org. Chem. 51	Organic Chemistry	5	3	1	6
Tech. Chem. 105	Methods of Technical Analysis.....	3	1	..	6
M. and M. 85	Strength of Materials (with lab.).....	4	..	3	3
M.E. 38	Machine Design	3	1	..	6
German 27	Narrative Prose	3	..	3	..

Second Quarter

Org. Chem. 52	Organic Chemistry	5	3	1	6
Tech. Chem. 106	Methods of Technical Analysis.....	3	1	..	6
M. and M. 86	Hydraulics (with lab.).....	3	..	2	3
M.E. 147	Heat Engines	4	3	..	6
German 28	Advanced Chemical German.....	3	..	3	..

¹ For list of suggested electives see page 19. A total of 15 elective credits must be taken in Chemistry for graduation.

² Students who plan to take Industrial Chemistry in the senior year must register for Chem. Eng. 101 in this quarter.

SCHOOL OF CHEMISTRY

Third Quarter

Org. Chem. 53	Organic Chemistry	5	3	1	6
Chem. Engr. 101	Unit Processes	4	4	1	3
M.E. 148	Heat Engines	3	2	..	4
Physics 35	Optics	2	2	1	..
German 29	Advanced Chemical German.....	3	..	3	..
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	..

SUMMER SESSION

Summer practice consisting of Chem. Eng. 151f,su-152w,su, Chemical Manufacture, will be taken by students in Chemical Engineering in the regular Summer Session between their junior and senior years. It is required for the degree of bachelor of science in chemical engineering.

SENIOR YEAR

First Quarter

Course No.	Title	Credits	Lect.	Rec.	Lab.
Phys. Chem. 101	Physical Chemistry	5	3	1	6
Chem. Engr. 102	Unit Process Problems.....	2	..	2	..
Chem. Engr. 131	Industrial Inorganic Chemistry.....	4	4	1	..
E.E. 43	Electric Power	3	2	..	3
	Electives to complete program ¹				

Second Quarter

Phys. Chem. 102	Physical Chemistry	5	3	1	6
Chem. Engr. 103	Unit Process Problems.....	2	..	2	..
Chem. Engr. 132	Industrial Organic Chemistry.....	4	4	1	..
E.E. 44	Electric Power	3	2	..	3
	Electives to complete program ¹				

Third Quarter

Chem. Engr. 187	Inspection Trip, spring vacation.....	2	..	..	..
Phys. Chem. 103	Physical Chemistry	5	3	1	6
Chem. Engr. 104	Unit Process Problems.....	2	..	2	..
E.E. 45	Electric Power	3	2	..	3
	Electives to complete program ¹				

ENGINEERING ADMINISTRATION

The following group of elective courses has been prepared for those advanced students in this college who desire a broad training for service in executive and administrative positions. There is an increasing demand for engineers who have such training, and students whose scholastic records are of high grade are encouraged to include this entire series of electives in their junior and senior years. The more advanced courses may be taken in a postgraduate year, also.

SOPHOMORE YEAR

First Quarter

Course No.	Title	Credits
Econ. 8.	Principles of Economics.....	3

Second Quarter

Econ. 9	Principles of Economics.....	3
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Third Quarter

Econ. 10	Principles of Economics.....	3
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¹ In one of the quarters 3 credits must be elected in metallurgy or mineralogy. See page 19 for list.

CURRICULA

JUNIOR YEAR

First Quarter

Course No.	Title	Credits
Econ. 29	Principles of Accounting.....	3

Second Quarter

Econ. 89	Production Management.....	3
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Third Quarter

Econ. 155	Corporation Finance	3
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SENIOR YEAR

First Quarter

Course No.	Title	Credits
Econ. 161	Labor Problems	3
Econ. 85	Economics of Marketing.....	3

Second Quarter

Econ. 73	Railway Traffic and Rates.....	3
Econ. 168	Personnel Management	3

Third Quarter

Econ. 28	Business Law	3
Econ. 130	Cost Accounting	3
Econ. 154	Public Utilities	3

SUGGESTED ELECTIVES

Drawing 9f,w,s; 41f,w; 42f,w; 43f,w
 Economics 8f, 9w, 10s
 Metallurgy 3f, 4w, 5s, 109f, 109w, 106f, 107w, 108s
 Mineralogy 67f
 Metallography 160f-161w-162s
 Political Science 1f,w,s; 7f,w,s; 111f,w
 Inorganic Chemistry 101s, 102w, 103f, 104w, 105s
 Analytical Chemistry 125s, 127f, 128w, 129s
 Organic Chemistry 111f, 113s, 115s, 116w, 122w, 123s 137f, 139f,w,s
 Physical Chemistry 105w, 110f,w; 130s, 143s
 Technological Chemistry 100f, 101w, 102s, 103w, 104s
 Chemical Engineering 102f, 103w, 104s, 133f, 134s, 136w, 153f, 154w, 155s

DESCRIPTIONS OF COURSES

INORGANIC CHEMISTRY

- 1f-2w-3s. General Inorganic Chemistry. A study of general laws of chemistry and of the non-metals and their compounds. 2. A continuation of Course 1. 3. Metals and their compounds. Continuation of Course 2. 4 cred. per qtr.; no prereq. Mr. Reyerson.
- 4f-5w. General Inorganic Chemistry. A study of the general laws of chemistry and of the non-metals and their compounds. More intensive than Courses 1f-2w-3s. 4 cred. per qtr.; prereq., high school chemistry. Mr. Kirk.
- 6f-7w-8s. General Inorganic Chemistry. Includes a study of general laws of chemistry and of non-metals and their compounds. 7. Continuation of Course 6. 8. A study of metals and their compounds. 5 cred. per qtr.; no prereq. Miss Cohen.
- 9f,w-10w,s. 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. Mr. Sneed.
- 11s,f. 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. Mr. Stephens.
- 12f,s-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. Mr. Sneed.
- 14f-15w. General Inorganic Chemistry. (Engineers, miners, and pharmacists.) 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. Mr. Pervier.
- 16s. Qualitative Chemical Analysis. (Engineers, miners, and pharmacists.) 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. Mr. Kirk.
- 17s. Glassblowing. Exercises in the more important operations in building chemical apparatus. 1 cred.; no prereq. Mr. Stephens.
- 19s. Teachers' Course. A consideration of the fundamental principles of chemistry with particular reference to the teaching of chemistry in the high school. Discussion of such topics as training of the teacher, laboratory equipment, etc. 3 cred.; prereq., general chemistry and qualitative analysis. Mr. Geiger.

- 22f-23w-24s. Chemistry and Practice of Photography. Lectures and laboratory practice dealing with the preparation and use of developing, printing, toning, intensifying, and reducing solutions, and the technique of the photographic processes. 2 cred. per qtr.; prereq., Anal. Chem. 1 and 2. (Not offered 1926-27.)
- 51f,w,s. 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. 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. Open to seniors. 5 cred. per qtr.
- 101s. History of Chemistry. The historical development of the theories of chemistry from the period of the ancients to the present time is covered by this course, particular emphasis being given to modern theories and laws. 2 cred.; prereq., Org. Chem. 52. Miss Cohen.
- 102w. 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. Mr. Sneed.
- 103f-104w-105s. Advanced Inorganic Chemistry. A 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. Mr. Sneed.
- 301f-302w-303s Research in Inorganic Chemistry. Credits to be arranged. Mr. Sneed, Mr. Reyerson.

ANALYTICAL CHEMISTRY

- 1w-2s (20-21). Quantitative Analysis. Introductory courses covering the general principles and methods of quantitative analysis. Typical problems are assigned and attention is given to proper laboratory practice. Course 1, Gravimetric Analysis. Course 2, Volumetric Analysis. 5 cred. per qtr.; prereq., Inorg. Chem. 13. Mr. Geiger.
- 7f,w,s (27). Quantitative Analysis. (Pre-med.) An introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems are assigned and attention is given to proper laboratory practice. 4 cred.; prereq., Inorg. Chem. 11 or 13. Mr. Sarver.
- 9w (28). Quantitative Analysis. (Dentists, engineers, miners.) A 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. Geiger.
- 53f,w,s. Junior Review Examination in Quantitative Analysis. Required of juniors in the School of Chemistry. Prereq., 1, 2. Mr. Geiger.
- 96f-97w-98s. Senior Thesis. Open to seniors. 5 cred. per qtr.

- 101w-102s (120-121). 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. Mr. Geiger.
- 123f-124w-125s. Advanced Analytical Chemistry. A systematic survey by general lectures with typical procedures selected for laboratory practice. Drill in application of modern chemical theory to analytical problems. Sanitary analysis of water is included in spring quarter. 1 lect., 7 lab. hrs. per week; 3 cred.; prereq., 1, 2, or 7. Mr. Sarver.
- 127f-128w-129s. Chemistry of the Rare Elements. Chemical relations and general reactions of those rarer elements not considered in more general courses. Analyses of commercially important ores and compounds of these elements are made. 1 lect. and 6 hrs. lab. per week; 3 cred. per qtr.; prereq., 1, 2. Mr. Brinton.
- 227f-228w-229s. Selected Topics in Analytical and Inorganic Chemistry. Problems of an advanced nature presenting special difficulties will be selected for study and investigation in the laboratory, in the library, and by conference. Open only to graduate students who have had 18 credits of quantitative analysis, and who have a reading knowledge of French and German. 2, 3, or 4 cred. per qtr. Mr. Brinton.
- 301f-302w-303s (321-322-323). Research in Quantitative Analysis. Cred. ar. Mr. Brinton, Mr. Geiger.

ORGANIC CHEMISTRY

- 1f-2w (31-32). Elementary Organic Chemistry. (Dentists, pharmacists.) A discussion of the important classes of organic compounds, both aliphatic and aromatic. The laboratory work includes the preparation of typical substances. 4 cred. per qtr.; prereq., Inorg. Chem. 11. Mr. Lauer.
- 6w-7s (31-32). Elementary Organic Chemistry. (Pre-med.) A discussion of the important classes of organic compounds, both aliphatic and aromatic. The laboratory work includes the preparation of typical substances. 4 cred. per qtr.; prereq., Inorg. Chem. 11. Mr. Smith.
- 51f-52w-53s (35-36-37). Organic Chemistry. An introduction to the chemistry of carbon compounds. The laboratory work will include the preparation of characteristic substances. 5 cred. per qtr.; prereq., 15 cred. in chemistry. Mr. Hunter.
- 96f-97w-98s. Senior Thesis. Open to seniors. 5 cred. per qtr.
- 101f-102w-103s. (191-192-193). 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 Chemistry 137-139. 3 cred. per qtr.; prereq., 53. Mr. Hunter.
- 111f (133). Reagents in Organic Chemistry. A discussion of typical reagents used in organic reactions: their limits of applicability, methods of use, and types of substances with which they react. May be accompanied

- by appropriate laboratory work in Chemistry 137. 3 cred.; prereq., 53. Mr. Smith.
- 113s. The Aliphatic Compounds. An 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. (Not offered in 1926-27.) Mr. Lauer.
- 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 Organic Chemistry 139. 3 cred.; prereq., 53. Mr. Smith.
- 116w (134). The Terpenes. The terpenes and their oxygen derivatives. The constituents of essential oils. The constitution of the rubber hydrocarbon with the important theories of oxidation and of vulcanization. 3 cred.; prereq., 53. Mr. Stephens.
- 122w. The Aromatic Compounds. The chemistry of the aromatic compounds with special reference to dye intermediates and synthetic drugs. 3 cred.; prereq., 53. Mr. Lauer.
- 123s. Dyes. A study of the important classes of dyes from the viewpoint of the organic chemist. 3 cred.; prereq., 53. Mr. Lauer.
- 137f (138). Advanced Organic Chemistry Laboratory Work. Difficult preparations and problems. It is intended primarily to supplement the student's knowledge of the methods of organic chemistry. 2 to 5 cred.; prereq., 53. Mr. Lauer.
- 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 (231-232-233). Organic Chemistry Seminar. 1 hr. per week, 1 cred. Open only to students taking research in organic chemistry. Mr. Hunter.
- 301f-302w-303s (331-332-333). Research in Organic Chemistry. Cred. ar. Mr. Hunter, Mr. Smith.

PHYSICAL CHEMISTRY

- 96f-97w-98s. Senior Thesis. Open to seniors. 5 cred. per qtr.
- 101f-102w-103s (140-141-142). Physical Chemistry. A general survey of the subject. 3 lect. and 1 rec.; lab. work 3 or 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. Mr. MacDougall.
- 105w (155). Application of Higher Mathematics to Chemical Problems. 3 lect.; 3 cred.; prereq., integral calculus. Mr. MacDougall.
- 110f,w (143). Physical Chemistry. (Designed chiefly for medical and biological students.) 4 cred. per qtr.; prereq., Org. Chem. 7. Mr. Taylor.

- 116f-117w-118s (146-147-148). 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., 103s and calculus. Mr. Taylor.
- 129s (149). Principles of Colloidal Chemistry. 2 cred.; prereq., 101. Mr. Reyerson.
- 130s (150). Application of Colloidal Chemistry. 2 cred.; prereq., 101. (Not offered in 1926-27.) Mr. Reyerson.
- 131f-132w-133s (157-158-159). Colloidal Chemistry Laboratory. Cred. and hrs. ar. Must be preceded or accompanied by Physical Chemistry 129 or 130. Mr. Reyerson.
- 144s. Magnetochemistry. A course in atomic structure dealing specially with the magnetic properties of substances. Lectures, discussions, and reports. 3 cred.; prereq., 103. Mr. Taylor.
- 201f-202w-203s (243-244-245). 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. (Not offered in 1926-27.) Mr. MacDougall.
- 204f-205w-206s (246-247-248). 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. Mr. MacDougall.
- 211f-212w-213s (253-254-255). 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 (250-251-252). Physical Chemistry Seminar. 1 hr. a week. For students taking advanced courses in physical chemistry. 1 cred. per qtr. Mr. MacDougall.
- 301f-302w-303s (341-342-343). Research in Physical Chemistry, Including Work in Electrochemistry, Photo- and Radio-Chemistry, and Colloids. Cred. ar. Mr. Lind, Mr. MacDougall, Mr. Reyerson, Mr. Taylor.

PHOTO- AND RADIO-CHEMISTRY

- 161f-162w-163s. 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., Phys. Chem. 103. Mr. Lind.
- 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 Radioactivity, 161. Mr. Lind.
- 175s. Photochemistry. History, development, and present status of photochemistry. 3 cred.; prereq., optics and Phys. Chem. 103. Mr. Lind.
- 271f-272w-273s. Chemical Activation. (Seminar 1 hour per week for graduate students). The 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.

TECHNOLOGICAL CHEMISTRY

- 1f,w,s (60). Power Plant Chemistry. (Engineers.) Proximate analysis of coal, determination of calorific power; technical analysis of flue gases and furnace gases. 3 cred.; prereq., Inorg. Chem. 16. Mr. Brewer.
- 2w,s (69). Boiler Water and Petroleum Products. (Engineers.) 2 or 3 cred.; prereq., 1. Mr. Harding.
- 96f-97w-98s. Senior Thesis. Open to seniors. 5 cred. per qtr.
- 100f-101w-102s (161-162-163). Food Analysis. A course including the chemical analysis of the various food materials and food products and the detection of food adulterations. A course in methods of analysis. 3 cred. per qtr.; prereq., Anal. Chem. 1, 2. Mr. Stoppel.
- 103w (164). Exact Gas Analysis. 1 or 2 cred.; prereq., Anal. Chem. 1, 2. Mr. Harding.
- 104s (166). Microchemistry. The 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 (167). Gas and Fuel Analysis. The chemical analysis of solid and gaseous fuels with a determination of their calorific value and methods of testing municipal gas. 3 cred.; prereq., Anal. Chem. 1, 2. Mr. Harding.
- 106w (168). 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.
- 107f,w,s (169). General Technical Analysis. Includes a large range of topics, textiles and paper, paint and varnishes, asphalt and tars, boiler waters, soaps, edible oils and fats, and various other food materials and food products. 1, 2, or 3 cred.; prereq., Anal. Chem. 1, 2. Mr. Harding.
- 301f-302w-303s (351-362-363). Research Work in Technological Chemistry. Cred. ar. Mr. Harding.

CHEMICAL ENGINEERING

- 31f (78). Chemistry of Engineering Materials. Consideration of the chemistry and properties of materials used in engineering practice. Wood, iron and steel, alloys, fuels, water, cements, paints, bitumens, etc. Lectures and recitations. 3 cred.; prereq., Inorg. Chem. 16. Mr. Montonna.
- 41s (186). Gas Manufacture and Distribution. Fundamental principles of manufacture of coal gas, carburetted water gas, and other industrial fuel gases, and the apparatus for manufacture and distribution. Open to sophomores in the College of Engineering 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. Montillon.
- 96f-97w-98s. Senior Thesis. Open to seniors. 5 cred. per qtr.

- 101s (171). Unit Processes. Principles and materials of construction, operation, and uses of machinery for the unit processes. Lectures and recitations. Laboratory work in operating and testing. Visits to chemical plants. 4 cred.; prereq., Anal. Chem. 1, 2, Org. Chem. 52. Mr. Mann.
- 102f (178). 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. 2 cred.; prereq., 101. Mr. Montillon.
- 103w (178). 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. 2 cred.; prereq., 101. Mr. Montillon.
- 104s (178). Unit Process Problems. Problems in leaching and dissolving, counter-current extraction, gas absorption, and distillation. Drying by air, steam, and direct heat dryers. 2 cred.; prereq., 101. Mr. Montillon.
- 111f-112w-113s (180-181-182). Design of Chemical 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., 131, 132. Mr. Montillon.
- 131f (172). 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., 101. Mr. Mann.
- 132w (173). 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. Mr. Mann.
- 133f (183). Chemistry of Explosives. The history and development of modern explosives, their manufacture and uses. Lectures, required reading, and reports. 4 cred.; prereq., 132. (Not offered in 1926-27.) Mr. Montonna.
- 134s (184). 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.) Mr. Montonna.
- 136w (188). 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. Mr. Montonna.
- 141s (186). 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.

- 151f,su (174). 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 (175). Chemical Manufacture. (Organic) Similar to 151 but covering the organic field. Laboratory. 3 or more cred.; prereq., 101. Mr. Montonna.
- 153f-154w-155s-156su (185). 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. Mr. Montonna.
- 160s. Intermediates and Dyestuffs Laboratory. The 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., 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. Mann.
- 179s. Advanced Applied Electrochemistry. The more recent development in the manufacture of inorganic and organic products. Lectures and recitations. Laboratory optional. 3 cred.; prereq., 176, 177. 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 (271-272-273). Seminar. Presentation and discussion of papers concerning the newer developments in chemical industries. 1 cred. per qtr. Mr. Mann.
- 301f-302w-303s (371-372-373). Research in Chemical Engineering. Unit processes, applied electrochemistry and electric furnace work, and chemical manufacture. Ched. ar. Mr. Mann, Mr. Montillon, Mr. Montonna.

DRAWING AND DESCRIPTIVE GEOMETRY

- 4f-5w-6s. Engineering Drawing and Descriptive Geometry. The elements of drafting, including the study of polyhedra and other problems of solid and constructive geometry. An elementary course in descriptive geometry including graphical methods of representation, correlated in part with analytical geometry. Required of freshmen who satisfy the entrance requirements in mathematics. 2 cred. per qtr.; prereq., solid geometry. Mr. Williams.
- 7w-8s. Engineering Drawing and Descriptive Geometry. This course covers the same subject-matter as Course 4-5-6. It is required of freshmen

- who take Mathematics 9-10 during the first quarter. 3 cred. per qtr.; Prereq., solid geometry. Mr. Schuck.
- 9f,w,s. Drafting. Developments and intersections. Assembly drawings, outline drawings, diagrammatic layout, and detail drawings of experimental and industrial installations. 3 cred. per qtr.; prereq., Drawing 6 or 8. Mr. French.
- M.&M.rof. Solid Geometry. Lines and planes in space, dihedral and polyhedral angles; polyhedrons, cylinders, cones, similarity, prismoid formula, sphere area, volumes, numerical exercises in area, volumes, weights. 4 hours per week but without credit. Mr. Archibald.
- 34f,w,s. Lettering. A practical course in plain lettering. 1 cred. per qtr.; prereq., Drawing 4 or 7. Mr. Levens.
- 41f,w,s-42f,w,s-43f,w,s. Technical Drawing. Theoretical and practical graphics, the reading and making of working plans. Projections, sketching, lettering, conventions, renderings, and translations. 2 cred. per qtr.; no prereq. Mr. Kirchner.
- 45f,w,s-46f,w,s. Alphabets. Construction and analysis of various types of letterings. Exercises. Open to jr. and sr.; 2 cred. per qtr.; no prereq. Mr. Kirchner.
- 57f-58w-59s. Graphical Methods. The theory of graphic charts and diagrams. This course can be entered at any quarter, also can be continued from one quarter through the following quarter. 2 cred. per qtr.; prereq., Drawing 9, Mathematics and Mechanics 84. Mr. Levens.

ECONOMICS

- 8f-9w-10s. General Economics. (Engineers.) Principles of economics with special emphasis upon their application to current problems, such as money, banking, conservation, insurance, international commerce, monopolies, transportation, labor, socialism, public ownership, and finance. 3 cred.; no prereq. Mr. O'Hara.
- 25w-26s. Principles of Accounting. 4 cred. per qtr.; prereq., 8, 9. Mr. Heilman.
- 28f,s. Business Law. A course in business law arranged for engineers, including the law of contracts, suretyship, agency, partnership, corporations, negotiable instruments, conveyance patents, and riparian rights. Offered to jr., sr., and soph. with 6 cred. in economics; 3 cred. Mr. Palmer.
- 29f,s. Principles of Accounting. (Engineers.) The purpose and principles of account classification; capital and revenue; accruals; valuation; depreciation; preparation and interpretation of balance sheets, income accounts, and other statements. 3 hrs. of lect. and 1 lab. period a week; 3 cred.; no prereq. Mr. Heilman.
- 51f-52w-53s. Business Law. Principles governing ordinary business transactions. Contracts—formation, operation, interpretation, breach, and discharge. Agency and service. Negotiable instruments. Business associations—partnerships and private corporations. Property—personal and real. 3 cred. per qtr.; prereq., 9 cred. in economics or political science. Mr. Young.

- 73w. Railway Traffic and Rates. Railway transportation from standpoint of the business man and shipper. Freight-shipping documents. Classification and tariffs, time and preference freight, private car lines, industrial track-age and terminal service, express rates and service, special passenger rates. 3 cred.; prereq., 8 and 9. Mr. Cummings.
- 85f,s. Economics of Marketing. A general course dealing with the mechanics and operation of markets; classification, organization, market agencies as factors in production. The price making process; control of supply, assumption of risk, incidence of marketing costs. Wastes of competition. 3 cred.; prereq., 8, 9. Mr. Vaile.
- 89w. Production Management. Types of operating organization; specialization; co-ordination of men and departments, planning; delegation of authority; means of control; establishment and maintenance of standards for materials, operation, machinery; scientific management; personnel problems. 3 cred.; prereq., sr. without prereq. or jr. with 8 and 9 or equivalent. Mr. O'Hara.
- 130s. Cost Accounting. (General Survey.) The mechanism of cost control and the managerial uses of cost information. Mr. Ostlund.
- 131f-132w-133s.¹ Cost Accounting. General principles of cost accounting; elements of costs; methods of arriving at costs, and of distribution overhead; application of cost accounting principles to selling, banking, mining, farming, etc. 3 cred. per qtr.; prereq., 29. Mr. Ostlund.
- 161f,w. Labor problems and trade unionism. Mr. Hansen.
- 167w. Personnel Administration. Managerial policy for various types of organization on labor. Special attention to job analysis, employment, incentives, and regularization of employment. Mr. Stead.
- 168s. Advanced Personnel Administration. Special attention to employee training, joint relations, health and safety, and methods of personnel research, e.g., by analysis of labor turnover. Mr. Stead.
- 172f,w,s. Economics of Transportation. 3 cred.; prereq., 8, 9. Mr. Cummings.

ELECTRICAL ENGINEERING

- 43f-44w-45s. Electric Power. An elementary study of the problems involved in the generation, distribution, measurement, and utilization of electric power. Lectures, recitations, and laboratory work supplemented by numerous problems. 3 cred. per qtr.; prereq., physics. Mr. Johnson.

ENGLISH

- 4f-5w-6s. Rhetoric and Composition. Practical training in the art of writing; the principles of structure; reading of types of literature. 3 cred. per qtr.; no prereq. Mr. Creamer.

GEOLOGY AND MINERALOGY²

- 67f. Mineralogy of Chemical Materials. Lectures on special laboratory methods of mineralogy, nature and identification of the chief commercial

¹ All quarters must be completed before credit is given for any quarter.

² For other courses in the Department of Geology and Mineralogy, see bulletin of the College of Science, Literature, and the Arts.

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. Gray.

GERMAN

Sequences.—For students entering without German, Courses 24-25-26, 27, 28-29. For students entering with two years of preparatory German, Courses 27, 28-29.

24f-25w-26s. Beginning German. Pronunciation, conversation, grammar, and composition; readings and easy prose. 4 cred. per qtr.; no prereq. Mr. Lussky.

27f. Narrative Prose. Reading, grammar review. 3 cred.; prereq. 25 or two years preparatory German. Mr. Davies.

28w-29s. Advanced Chemical German. Selections from more difficult works on chemistry. 3 cred. per qtr.; prereq., 27. Mr. Davies.

MATHEMATICS AND MECHANICS

MATHEMATICS

9f,w. Higher Algebra. (High school.) Fundamental rules, fractions, linear simultaneous equations, graphs, theory of exponents, surds, complex quantities, quadratic equations, numerical exercises. Without credit. Mr. Brooke.

10f(su). Solid Geometry. See Course 10f under Department of Drawing and Descriptive Geometry.

11w,s. College Algebra. Theory of quadratic equations, interpretation of complex results, graphical representation, indeterminate equations, ratio, proportion, variation, progressions, series, undetermined coefficients, binomial theorem, logarithms, theory of equations, derivatives, Horner's method. 5 cred.; prereq., trigonometry. Mr. Holman.

12f,w,s. Trigonometry. Rectangular co-ordinates, angles, trigonometric functions, solution of plane right triangles, reduction formulas, fundamental relations, addition formulas, double angles, half angles, identities and equations, inverse functions, oblique triangles, De Moivre's theorem, spherical right triangles. 5 cred.; prereq., higher algebra. Mr. McClintock.

13f,w,s(su). Analytic Geometry. Co-ordinates, systems, equations, locus, straight line, second degree equations, polar co-ordinates, parametric equations, derivatives, tangents, normals, conic sections, rotation of axes, empirical equations, space co-ordinates, plane, line quadric surfaces, cylinders, space curves, tangent lines, planes. 5 cred.; prereq., 11. Mr. Warne.

24f,w,s. Differential Calculus. Rules for differentiating, simple applications of derivative, maxima and minima, differentials, rates, change of variables, radius of curvature, mean value, indeterminate forms, partial differentiation, series, Taylor's theorem, asymptotes, singular points, applications to geometry of space. 5 cred.; prereq., 13. Mr. Dalaker.

25w,s. Integral Calculus. Standard elementary forms, definite integral, rational fractions, integration by substitution, integration by parts, reduction formulas, integration a process of summation, successive and partial integration, elementary ordinary differential equations. 5 cred.; prereq., 24. Mr. Siler.

MECHANICS

26f,w,s,su. Technical Mechanics. (Statistics.) 5 cred.; prereq., 25. Mr. Herrick.

84s. Technical Mechanics. (For chemical engineers.) 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. Mr. Hartig.

MATERIALS

85f. Strength of Materials with Laboratory. (Chemical engineers.) Mechanical and elastic properties of materials of construction, beams, shafts, columns, combined stresses, dynamic stresses. 4 cred.; prereq., 84. Mr. Hartig.

HYDRAULICS

86w. Hydraulics with Laboratory. (Chemical engineers.) Hydrostatics, Bernoulli's theorem, flow through orifices, pipes, and over weirs, dynamic action of jets and streams, flow of gases through pipes. 3 cred.; prereq., 84. Mr. Hartig.

MECHANICAL ENGINEERING

12f,w,s. Elementary Shop Practice in Foundry. Floor and machine molding, iron, brass, and aluminum casting. Inspection trips and reports. 1 hr. lect. and 5 hrs. lab.; 2 cred.; no prereq. Mr. Moffett.

13f,w,s. Elementary Shop Practice in Forging. Forging and welding wrought iron and steel; hardening, tempering, and annealing high carbon steel. 1 hr. lect. and 5 hrs. lab. per week; 2 cred.; no prereq. Mr. Hughes.

17f,w. Elementary Shop Practice in Machine Shop. An elementary course in machine shop work arranged especially for students in Chemical Engineering. 1 hr. lect. and 5 hrs. lab. per week; 2 cred.; no prereq. Mr. Rogers.

38f. Machine Design. Calculation and design of machine parts: riveted joints, screwed fastenings, bearings, rotating pieces, flexible connections, gears, engine details, rope driving. Arranged for students in Chemical Engineering. Lectures and drafting. 3 cred.; prereq., M. & M. 26. Mr. Flodin.

147w. Heat Engines. Elementary thermodynamics. Properties of steam; calorimeters, pyrometry; types and details of steam engines; valve gears; governors; compound engines; condensers, pumps. Combustion and fuels; evaporation; steam boilers, smoke prevention. Includes 4 hrs. lab. work per week; 4 cred.; prereq., M. & M. 84. Mr. Shoop.

148s. Heat Engines. Elementary study of steam turbines and gas engines; gas producers. Refrigeration. Air compressors. Includes 4 hrs. work in lab. each week. 3 cred.; prereq., 147. Mr. Shoop.

METALLOGRAPHY

- 160f. Metallography. (Chemists.) 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. Harder.
- 161w. Advanced Metallography. (Chemists.) 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. Harder.
- 162s. Advanced Metallography. (Chemists.) 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. Harder.
- 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. Harder.
- 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. Harder.
- 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. Harder.
- 201f-202w-203s. Advanced Metallography for Graduate Students. Intended primarily for research work. Mr. Harder.

METALLURGY

- 3f. General Metallurgy. Combustion, fuels, refractory materials, furnaces, and fluxes. Lectures and recitations. 3 cred.; prereq., Inorg. Chem. 8 or equivalent. Mr. Christianson.
- 4w. Metallurgy of Pig Iron. General principles of iron blast furnace practice. Construction of furnace, handling of stock and products, principles of regulations. Lect. and rec.; 3 cred.; prereq., Metallurgy 3. 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., Metallurgy 4. Mr. Christianson.
- 106f. Metallurgy of the Base Metals. Lead, copper, zinc, and mercury. Consideration of smelting methods and principles involved in refining. Lectures and recitations; 4 cred.; prereq., Metallurgy 3. Mr. Pease.
- 107w. Metallurgy of Base Metals. Continuation of Course 106. 4 cred.; prereq., Metallurgy 106. Mr. Pease.
- 108s. Metallurgy of the Precious Metals. Principles involved and methods used in the extraction of gold, silver, and other precious metals. Lectures and recitations; 4 cred.; prereq., Metallurgy 107. Mr. Pease.

- 109f. Metallurgy of Base Metals. (Chemists, mechanical engineers.) Special consideration is given to mechanical appliances. Lect. and rec.; 3 cred.; prereq., Inorg. Chem. 8 or equivalent. Mr. Christianson.
- 109w. Metallurgy of Base Metals. (Chemists, electrical engineers.) Special consideration is given to electrical appliances. Lect. and rec.; 3 cred.; prereq., Inorg. Chem. 8 or equivalent. Mr. Christianson.

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. No credits 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.¹ 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., work, which may be applied towards graduation.

1f-2w-3s. First Year Basic Course, R.O.T.C. No prereq.

Infantry. Practical instruction in schools of soldier, squad, platoon, company, battalion; ceremonies, rifle marksmanship, military courtesy, military hygiene and first aid, and physical drill.

Coast Artillery. Duties of heavy artillery soldier; military customs and methods; elementary topography; practical study of one gun and one carriage.

4f-5w-6s. Second Year Basic Course, R.O.T.C. Prereq., 1-2-3.

Infantry. Practical and theoretical instruction in schools of company and battalion; scouting and patrolling, musketry, interior guard duty, automatic rifle.

¹ Students in Chemical Engineering who wish to take the Advanced Course, R.O.T.C., in their junior year may postpone some of the required work until their senior year, but this should be done only after consultation with Professor C. A. Mann.

- Coast Artillery. Duties of non-commissioned officer of heavy artillery: guns, carriages, ammunition, and accessories; elementary topography (preparation of precise maps); construction and operation of motor vehicles.
- 51f-52w-53s. First Year Advanced Course, R.O.T.C. 3 cred. per qtr.; prereq., 4-5-6.
- Infantry. Military sketching, military field engineering, machine guns, military law, rules of land warfare, command and leadership.
- Coast Artillery. Duties of a heavy artillery officer; guns, carriages, and determination of geodetic data; motor transport (advanced).
- 54f-55w-56s. Second Year Advanced Course, R.O.T.C. 3 cred. per qtr.; prereq., 51-52-53.
- Infantry. Command and leadership, infantry weapons (37 mm. gun, 3-inch trench mortar), administration, military history, and national defense act, combat principles.
- Coast Artillery. Duties of heavy artillery officer; administrative methods; military law; military policy of the United States; tactics of infantry; field engineering; problems in employment of heavy artillery and in the use of heavy artillery against armored ships.

PHYSICAL EDUCATION FOR MEN

General statement.—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 courses 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 Professor L. F. Keller before registering.

- 1f-2w-3s. Freshman Physical Education. Mass activities, corrective exercise, apparatus work, swimming, games, and efficiency test. Credit.¹ No prereq.
- 4f,w,s. Freshman Hygiene. Credit.¹ No prereq. Dr. Cooke.
- 7f-8w-9s. Advanced Leaders. 1 hour of instruction; 2 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.
- 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: golf, soccer, handball, boxing. Winter: winter sports, wrestling, tumbling. Spring: swimming, indoor baseball, volley-ball, tennis. Lecture, one hour; practice, three hours. 2 cred. per qtr.; prereq., 1-2-3 or instructor's permission. Mr. Keller.
- 16f-17w-18s. Drill Substitution. By petition in substitution for military science. Examiner, Dr. L. J. Cooke. No cred.; no prereq. Mr. Iverson.

¹ Course 1-2-3, 4 carries a total of three credits. The entire course must be completed before credit is received for any quarter. Preventive Medicine 12 may be offered as a substitute for Course 4.

- 30s. Athletic Training and First Aid. Principles governing conditioning of men for various sports; diet, sleep, exercise, bathing, massage. Over-training, its cause, diagnosis, prevention, and cure. Prevention and first aid treatment of common athletic injuries. 2 cred.; no prereq. Dr. Cooke.

PHYSICAL EDUCATION FOR WOMEN

This department aims to promote the health of the women students. It gives physical examination and advice to all on entrance; plans systematically to keep in close touch with them during their first 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 bodily 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 Woman's Athletic Association in encouraging and organizing athletic sports; holds regular office hours for the purpose of consultation with all students who desire its advice.

Work in this department is required of all newly entering students (see Courses 1-2-3 and 4) 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 their sophomore year). Physical examinations or consultations required annually of all students.

For a special four-year professional course designed to prepare graduates for the responsible direction of physical education activities see bulletin of the College of Education.

Six credits toward the degree can be gained by taking courses in exercise. (Courses 43-44-45, 66-67-68, 69-70-71.)

For further information see bulletin of the College of Science, Literature, and the Arts and of the College of Education.

- 1f-2w-3s. Elementary Physical Training. Lighter forms of gymnastics, apparatus work, orthopedic exercise, folk dancing, indoor and outdoor games. Individual health consultations. No cred.; no prereq. Required of all new students. Dr. Norris.
- 4f,w,s. Preliminary Hygiene. 1 lecture a week. The most essential aspects of the care of personal health. No cred.; no prereq. Required of all new students. Dr. Norris.

PHYSICS

- 3f,w,s. Elements of Mechanics and Sound. Mechanics of solids, fluids, wave motion, and sound; simpler fundamental principles. First part of a general course, 3, 23, 31, 43. Course 4 should be taken with this course. 3 lect., 1 quiz hour a week; 3 cred.; prereq., trigonometry, equivalent to Mathematics 12. Mr. Erikson.
- 4f,w,s. Elements of Mechanics and Sound Laboratory. Measurements in the mechanics of solids, fluids, wave motion, and sound; the laboratory

- part supplementing Course 3. One two-hour session in the laboratory a week. 1 cred.; prereq., 3 or registration in 3. Mr. Erikson.
- 23f,w. Heat. A study of the principles underlying heat phenomena. Course 24 should be taken in conjunction with this course. 3 lect., 1 quiz hour a week; 3 cred.; prereq., 3. Mr. Miller.
- 24f,w. Heat Laboratory. The laboratory part supplementing Course 23. One two-hour session in the laboratory a week. 1 cred.; prereq., 4, 23, or registration in 23. Mr. Miller.
- 33f,s. Optics. A study of the principles underlying light phenomena. Course 34 should be taken in conjunction with this course. 3 lect., 1 quiz hour a week; 3 cred.; prereq., 3. Mr. Valasek.
- 34f,s. Optics Laboratory. The laboratory part supplementing Course 33. One two-hour session in the laboratory a week. 1 cred.; prereq., 4, 33, or registration in 33. Mr. Valasek.
- 35w,s. Optics. Experimental demonstration of optical phenomena and a brief study of the fundamental optical principles. 2 lect. a week. Designed for those who cannot take the fuller course. 2 cred.; prereq., 3. Mr. Valasek.
- 43w,s. Electricity. A study of the principles underlying magnetic and electric phenomena. Course 44 should be taken in conjunction with this course. 3 lect., 1 quiz hour a week; 3 cred.; prereq., 3. Mr. Zeleny.
- 44w,s. Electrical Laboratory. The laboratory part supplementing Course 43. One two-hour session in the laboratory a week. 1 cred.; prereq., 4, 43, or registration in 43. Mr. Zeleny.

For other electives in the Department of Physics see bulletin of the College of Science, Literature, and the Arts.

PHYSIOLOGIC CHEMISTRY

- 100xw-101xs. Physiologic Chemistry. Metabolism of proteins, fats, carbohydrates, and inorganic substances in health and disease. Third year medical students and others. 3 cred. per qtr.; prereq., physics and Organic Chemistry 53. Mr. McClendon.
- 100yw-101ys. Physiologic Chemistry Laboratory. 3 cred. per qtr. Mr. McClendon.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

- 2s. Hygiene and First Aid to the Sick and Injured. Lectures, demonstrations, and recitations. Promotion of health. Sources, routes, and prevention of communicable diseases. 1 hour per week during spring quarter. No cred. Mr. Cady.
- 3f,w,s. Personal Hygiene and Elementary Sanitation. Elementary principles of normal body function; predisposing and actual causes of disease; ways in which disease may be avoided. 2 cred.; 36 hrs.; no prereq. (Students electing this course will be excused from taking Course 2.) Dr. Lees.
- 50f,w,su. Public and Personal Health. 3 cred.; prereq., An. Biol. 1 and 2, and Psy. 1 and 2. Dr. O'Brien.

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

School of Chemistry

Part II

Announcement of Program for the Year
1927-1928



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FRESHMAN WEEK

Every student entering any department of the University for the first time as a freshman in the fall of 1927 is required to be here throughout the week before the opening of classes. Every new freshman must present himself at the registrar's office either Friday, September 16, Saturday, September 17, or Monday, September 19, to begin the process of registration. Those coming later than 5:00 p.m. Monday, September 19, will be subject to the usual penalty for late registration. See Penalty Fees, page 47 of the bulletin of general information.

During the week September 20 to 24, in addition to carrying out their registration, freshmen will meet for lectures on such subjects as how to study, the use of the library, important university and college regulations, and will visit the library, the scientific laboratories, and other points of interest to them in connection with their choice of studies and of their future occupations.

During this week there will be the usual physical examinations and psychological tests and such other examinations as will enable the faculty to place the students in classes for which they are best fitted.

The general purpose of the Freshman Week is to help the student to make a good start on his work and to adjust himself to the new and perplexing conditions of university life.

NOTICE THAT ATTENDANCE THROUGHOUT FRESHMAN WEEK IS A REQUIREMENT

It is recommended that as many as possible present themselves for registration on Friday, September 16, in order to avoid the inconvenience and delay incident to the congestion on the last day.

1927							1928													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
..	3	4	5	6	7	1 2	1	2	3	4	5	6	7	1	2	3	4	5	6	7
..	..	..	..	..	..	..	8	9	10	11	12	13	14	8	9	10	11	12	13	14
10	11	12	13	14	15	16	15	16	17	18	19	20	21	15	16	17	18	19	20	21
17	18	19	20	21	22	23	22	23	24	25	26	27	28	22	23	24	25	26	27	28
24	25	26	27	28	29	30	29	30	31	..	..	..	..	29	30	31	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
AUGUST							FEBRUARY							AUGUST						
..	1	2	3	4	5	6	..	..	..	1	2	3	4	..	..	..	1	2	3	4
7	8	9	10	11	12	13	5	6	7	8	9	10	11	5	6	7	8	9	10	11
14	15	16	17	18	19	20	12	13	14	15	16	17	18	12	13	14	15	16	17	18
21	22	23	24	25	26	27	19	20	21	22	23	24	25	19	20	21	22	23	24	25
28	29	30	31	..	..	..	26	27	28	29	..	..	..	26	27	28	29	30	31	..
..
SEPTEMBER							MARCH							SEPTEMBER						
..	..	..	..	1	2	3	..	..	..	..	1	2	3	..	..	..	..	..	..	1
4	5	6	7	8	9	10	4	5	6	7	8	9	10	2	3	4	5	6	7	8
11	12	13	14	15	16	17	11	12	13	14	15	16	17	9	10	11	12	13	14	15
18	19	20	21	22	23	24	18	19	20	21	22	23	24	16	17	18	19	20	21	22
25	26	27	28	29	30	..	25	26	27	28	29	30	31	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	..	..	..	..	..	..
OCTOBER							APRIL							OCTOBER						
..	..	..	..	..	1	2	1	2	3	4	5	6	7	..	1	2	3	4	5	6
2	3	4	5	6	7	8	8	9	10	11	12	13	14	7	8	9	10	11	12	13
9	10	11	12	13	14	15	15	16	17	18	19	20	21	14	15	16	17	18	19	20
16	17	18	19	20	21	22	22	23	24	25	26	27	28	21	22	23	24	25	26	27
23	24	25	26	27	28	29	29	30	..	..	..	..	..	28	29	30	31	..	..	..
30	31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
NOVEMBER							MAY							NOVEMBER						
..	..	1	2	3	4	5	..	..	1	2	3	4	5	..	..	..	..	1	2	3
6	7	8	9	10	11	12	6	7	8	9	10	11	12	4	5	6	7	8	9	10
13	14	15	16	17	18	19	13	14	15	16	17	18	19	11	12	13	14	15	16	17
20	21	22	23	24	25	26	20	21	22	23	24	25	26	18	19	20	21	22	23	24
27	28	29	30	..	..	..	27	28	29	30	31	..	..	25	26	27	28	29	30	..
..
DECEMBER							JUNE							DECEMBER						
..	..	..	..	1	2	3	..	..	..	..	1	2	..	..	..	..	..	..	1	
4	5	6	7	8	9	10	3	4	5	6	7	8	9	2	3	4	5	6	7	8
11	12	13	14	15	16	17	10	11	12	13	14	15	16	9	10	11	12	13	14	15
18	19	20	21	22	23	24	17	18	19	20	21	22	23	16	17	18	19	20	21	22
25	26	27	28	29	30	31	24	25	26	27	28	29	30	23	24	25	26	27	28	29
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	31	..	..	..	..	..

UNIVERSITY CALENDAR

1927-28

Fall Quarter

1927			
September	15	Thursday	Payment of fees closes, except for new students
September	15-17		Entrance examinations (for removal of entrance deficiencies)
September	16-19		Registration of all new students entering the freshman class
September	19-23		Examinations for removal of conditions Physical examinations Registration period, ¹ colleges of Science, Literature, and the Arts, and Education
September	20-24		Freshman week
September	22-23		Registration days ¹ for all colleges not included above
September	23	Friday	Payment of fees for new students closes
September	26	Monday	Fall quarter classes begin, 8:30 ² a.m. Fall semester extension classes ³ begin
October	20	Thursday	Senate meeting, 4:30 p.m.
October	22	Saturday	Homecoming Day
November	11	Friday	Armistice Day; a holiday
November	24	Thursday	Thanksgiving Day; a holiday
December	1	Thursday	State Day Convocation
December	14-17		Final examination period
December	15	Thursday	Commencement Convocation Senate meeting, 4:30 p.m.
December	17	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	21	Wednesday	Payment of fees closes for all students in residence fall quarter ⁴

Winter Quarter

December	27-29		Entrance examinations
1928			
January	2-3		Registration days for new students in the College of Science, Literature, and the Arts

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty for late registration, page 47 of the 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 the appropriate committee of the college concerned permitting registration at a later date.

² First hour classes begin at 8:15 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.

January	3	Tuesday	Registration day for new students in all other colleges
January	4	Wednesday	Christmas vacation ends, winter quarter classes begin, 8:30 ² a.m.
January	28	Saturday	First semester extension classes close
January	30	Monday	Second semester extension classes begin
February	13	Monday	A holiday (February 12, Sunday, Lincoln's Birthday)
February	16	Thursday	Charter Day Convocation Senate meeting, 4:30 p.m.
February	22	Wednesday	Washington's Birthday; a holiday
March	14-17		Final examination period
March	15	Thursday	Commencement Convocation Payment of fees closes for all students in residence winter quarter ¹
March	17	Saturday	Winter quarter ends, spring vacation begins, 5:30 p.m.

Spring Quarter

March	19-21		Entrance examinations
March	23-24		Registration days for new students in all colleges
March	26	Monday	Spring vacation ends, spring quarter classes begin, 8:30 ² a.m.
April	6	Friday	Good Friday; a holiday
May	10	Thursday	Cap and Gown Day Convocation
May	17	Thursday	Senate meeting, 4:30 p.m.
May	26	Saturday	Second semester extension classes close
May	30	Wednesday	Memorial Day; a holiday
June	6-9		Final examination period
June	9	Saturday	Spring quarter closes, 5:20 p.m.
June	10	Sunday	Baccalaureate service
June	11	Monday	Fifty-sixth annual commencement

Summer Quarter

June	15-16		Summer Session first term begins, registration and payment of fees
June	18	Monday	Classes begin, 8:00 a.m.
July	4	Wednesday	Independence Day; a holiday
July	28	Saturday	Registration and payment of fees for second term closes
July	30	Monday	Second term classes begin
September	1	Saturday	Second term Summer Session closes

¹ Registration subsequent to the date specified will necessitate the approval of the college concerned. See also penalty for late registration, page 47 of the 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 the appropriate committee of the college concerned permitting registration at a later date.

² First hour classes begin at 8:15 at University Farm.

SCHOOL OF CHEMISTRY

ADMINISTRATION

O. M. Leland, Dean.....	127C
S. C. Lind, Director.....	127C
I. W. Geiger, Chairman, Students' Work Committee....	127C
H. H. Barber, Superintendent, Supply and Equipment....	226C

OFFICES OF OUTSIDE DEPARTMENTS

Drawing and Descriptive Geometry	208E	Metallography	.....306M
Economics	.....113B	Metallurgy	.....103M
Electrical Engineering	.....135EE	Military Science and Tactics....	A
English	.....108E	Physical Education for Men....	106A
Geology and Mineralogy.....	108P	Physical Education for Women	101WGM
German	.....211F	Physics	.....20Ph
Mathematics and Mechanics.....	114E	Physiologic Chemistry	.....307MH
Mechanical Engineering	.....105ME	Preventive Medicine and Public Health	.....MH

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, a one-quarter course given in the fall.

1w, the same course given in the winter.

1f-2w-3s, a three-quarter course given in the fall, winter, and spring.

1f,w,s, a one-quarter course given each quarter.

1f,w,s-2f,w,s-3f,w,s, a three-quarter course in which each quarter's work is given each quarter.

ABBREVIATIONS

Buildings.—Main Engineering, E.; Experimental Engineering, Ex.; Electrical Engineering, E.E.; Mechanical Engineering, M.E.; Power Plant Laboratory, P.Pl.; Armory, A.; Business Administration, B.; Chemistry, C.; Folwell Hall, F.; Old Library, O.L.; Physics, Ph.; Pillsbury Hall, P.; Psychology, Psy.; Women's Gymnasium, W.Gm.; Administration, University Farm, Ad(F); Engineering, University Farm, En(F); Chemistry, University Farm, Ch(F); Horticulture, University Farm, Hr(F); Stock Pavilion, University Farm, St(F).

Other abbreviations and symbols.—I, II, III, etc., First hour (8:30-9:20), second hour (9:30-10:20), third hour (10:30-11:20), fourth hour (11:30-12:20), fifth hour (12:30-1:20), sixth hour (1:30-2:20), seventh hour (2:30-3:20), eighth hour (3:30-4:20), ninth hour (4:30-5:20).

Ar.	To be arranged or assigned
Lab.	Laboratory
Lect.	Lecture
MTWThFS	Monday, Tuesday, etc.
Rec.	Recitation
Sec.	Section

OUTLINES OF CURRICULA

The required courses in each curriculum in this college are listed below with the quarters in which they regularly occur. In addition, the necessary number of approved elective courses must be taken to complete the requirements for the separate degrees.

CHEMISTRY AND CHEMICAL ENGINEERING REGULAR FRESHMAN YEAR

For students satisfying the requirements of algebra, solid geometry, and chemistry.

FALL	Credits	WINTER	Credits	SPRING	Credits
M. & M. 11.....	5	M. & M. 12.....	5	M. & M. 13.....	5
Inorg. Chem. 9.....	5	Inorg. Chem. 10.....	5	Inorg. Chem. 12.....	5
English 4.....	3	English 5.....	3	English 6.....	3
Drawing 4.....	2	Drawing 5.....	2	Drawing 6.....	2
M.E. 12, 13, or 17.....	2	M.E. 12, 13, or 17.....	2	M.E. 12, 13, or 17.....	2
Mil. Sci. 1.....	0	Mil. Sci. 2.....	0	P.H. 2.....	0
				Mil. Sci. 3.....	0

REGULAR SOPHOMORE YEAR

FALL	Credits	WINTER	Credits	SPRING	Credits
M. & M. 24.....	5	M. & M. 25.....	5	M. & M. 84.....	5
Inorg. Chem. 13.....	5	Anal. Chem. 1.....	5	Anal. Chem. 2.....	5
Physics 3.....	3	Physics 23.....	3	Physics 43.....	3
Physics 4.....	1	Physics 24.....	1	Physics 44.....	1
German 24.....	4	German 25.....	4	German 26.....	4
Mil. Sci. 4.....	0	Mil. Sci. 5.....	0	Mil. Sci. 6.....	0

CHEMISTRY JUNIOR YEAR

FALL	Credits	WINTER	Credits	SPRING	Credits
Org. Chem. 51.....	5	Org. Chem. 52.....	5	Org. Chem. 53.....	5
Anal. Chem. 123.....	3	Anal. Chem. 124.....	3	Phys. Chem. 103.....	5
Phys. Chem. 101.....	5	Phys. Chem. 102.....	5	German 29.....	3
German 27.....	3	German 28.....	3	Physics 35.....	2
				Inorg. Chem. 51.....	0
				Inorg. Chem. 52.....	0
				Anal. Chem. 53.....	0

SENIOR YEAR

FALL	Credits	WINTER	Credits	SPRING	Credits
Chemistry 96.....	5	Chemistry 97.....	5	Chemistry 98.....	5
Tech. Chem. 100.....	3	Tech. Chem. 101.....	3	Tech. Chem. 102.....	3

Together with 34 elective credits, 15 of which must be in Chemistry.

CHEMICAL ENGINEERING

JUNIOR YEAR

FALL	Credits	WINTER	Credits	SPRING	Credits
Org. Chem. 51.....	5	Org. Chem. 52.....	5	Org. Chem. 53.....	5
Tech. Chem. 105.....	3	Tech. Chem. 106.....	3	Chem. Eng. 101.....	4
M. & M. 85.....	4	M. & M. 86.....	3	M.E. 139.....	3
M.E. 28.....	3	M.E. 138.....	4	Physics 35.....	2
German 27.....	3	German 28.....	3	German 29.....	3
				Inorg. Chem. 51.....	0
				Inorg. Chem. 52.....	0
				Anal. Chem. 53.....	0

SUMMER Credits

Chem. Eng. 151.....	3
Chem. Eng. 152.....	3

SENIOR YEAR

FALL	Credits	WINTER	Credits	SPRING	Credits
Phys. Chem. 101.....	5	Phys. Chem. 102.....	5	Phys. Chem. 103.....	5
Chem. Eng. 102.....	2	Chem. Eng. 103.....	2	Chem. Eng. 104.....	2
Chem. Eng. 131.....	4	Chem. Eng. 132.....	4	E.E. 45.....	3
E.E. 43.....	3	E.E. 44.....	3	Spring Vacation	
				Chem. Eng. 187.....	2

Together with 16 elective credits, 3 of which must be in metallurgy or mineralogy.

CHANGES IN CURRICULA MECHANICAL ENGINEERING

The number M.E. 38 is changed to M.E. 28.
The number M.E. 147 is changed to M.E. 138.
The number M.E. 148 is changed to M.E. 139.

CHANGES IN DESCRIPTIONS OF COURSES INORGANIC CHEMISTRY

106f-107w-108s. Chemistry of the Rare Elements. History, occurrence, preparation, and properties of the less usual elements. Classification, valence, and atomic structure of these elements as related to the natural system of the chemical elements. Preparation and properties of their compounds. Use of the microscope and the spectroscope in following the course of the purification. Prereq., Anal. Chem. 1 or 2, or by permission. Three cred. per quarter. Mr. Kirk.

ANALYTICAL CHEMISTRY

127f-128w-129s. Analytical Chemistry of the Rare Elements. A survey of the quantitative methods for the estimation of the rare elements other than the rare earths. Analyses of commercially important alloys, ores, and compounds are made. One lecture and seven laboratory hours per week. Prereq., Anal. Chem. 101, 102. Three cred. per quarter. Mr. Geiger.
Course 227f-228w-229s is discontinued.

TECHNOLOGICAL CHEMISTRY

Course 2w,s changed to Boiler Water.
Course 3w,s, Petroleum Products, is added. Two cred. per qtr.; prereq. 1. Mr. Harding.

ECONOMICS

Course 85f,w,s, Economics of Marketing, changed to Bus. Adm. 67f,w,s, Market Administration.

MECHANICAL ENGINEERING

Course 17f,w changed to 17f,w,s.
Course 38 changed to 28.
Course 147 changed to 138.
Course 148 changed to 139.

PROGRAM

1927-28

INORGANIC CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s	General Inorganic Chemistry..... (4 cred. per qtr.; no prereq.)				
	Sec. 1 (Pre-med., pre-dent., jr. architects)				
	Lect.	VI	MWF	225C	
	Lab.	VI-VII	TTh	110C	
		or VIII-IX	TTh	110C	
	Sec. 2 (Agr.) fall, winter				
	Lect.	VII	MWF	100C	Mr. Pervier
	Lab.	VIII-IX	MW	110C	Mr. Pervier
	Sec. 2 (Agr.) spring				
	Lect.	VII	MF	225C	Mr. Pervier
		IV	S	225C	Mr. Pervier
	Lab.	VIII-IX	MF	110C	Mr. Pervier
4f	General Inorganic Chemistry.... (4 cred. per qtr.; prereq., high school chem.)				
	Sec. 1 (Engrs)				
	Lect.	I	TThS	100C	Mr. Heisig
	Lab.	VI-VIII	F	110C	Mr. Heisig
	Quiz	VIII	M	100C	
	Sec. 2 (Engrs.)				
	Lect.	IV	TS	100C	Mr. Barber
		VI	Th	100C	Mr. Barber
	Lab.	II-IV	M	110C	Mr. Barber
	Quiz	VIII	M	100C	
	Sec. 3 (Engrs.)				
	Lect.	I	TThS	100C	Mr. Heisig
	Lab.	III-V	T	110C	Mr. Heisig
	Quiz	VIII	M	100C	
	Sec. 4 (Pharm., phys. ed.)				
	Lect.	I	MWF	325C	Mr. Stephens
	Lab.	VII-VIII	TTh	290C	Mr. Stephens
	Sec. 5 (Pre-dent., pre-med.)				
	Lect.	VI	MWF	100C	Mr. Stephens
	Lab.	VI-VII	TTh	210C	Mr. Stephens
		or VIII-IX	TTh	210C	Mr. Stephens
5w	General Inorganic Chemistry.... (4 cred. per qtr.; prereq., 4)				
	Sec. 1 (Engrs.)				
	Lect.	IV	TS	100C	Mr. Barber
		VI	Th	100C	Mr. Barber
	Lab.	VI-VIII	F	110C	Mr. Barber
	Quiz	VII	M	490C	Mr. Barber
	Sec. 2 (Engrs.)				
	Lect.	I	TThS	100C	Mr. Heisig
	Lab.	II-IV	S	110C	Mr. Heisig
	Quiz	VIII	F	100C	Mr. Heisig
	Sec. 3 (Pharm., phys. ed.)				
	Lect.	I	MWF	325C	Mr. Stephens
	Lab.	VII-VIII	TTh	290C	Mr. Stephens
	Sec. 4 (Pre-dent., pre-med.)				
	Lect.	VI	MWF	100C	Mr. Stephens
	Lab.	VI-VII	TTh	210C	Mr. Stephens
		or VIII-IX	TTh	210C	Mr. Stephens

SCHOOL OF CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
6f-7w-8s	General Inorganic Chemistry.... (5 cred. per qtr.; no prereq.)				
	Lect.	II	MWF	225C	Miss Cohen
	Lab.	I-III	ThS	210C	Miss Cohen
9f-10w	General Inorganic Chemistry.... (5 cred. per qtr.; prereq., high school chem.)				
	Sec. 1 (Agr.)				
	Lect.	VII	MWF	225C	
	Lab.	VIII-IX	MWF	110C	
	Sec. 2 (Chem., S.L.A.)				
	Lect.	II	MWF	100C	Mr. Sneed
	Lab.	I-III	ThS	290C	Mr. Sneed
9w-10s	General Inorganic Chemistry.... (5 cred. per qtr.; prereq., high school chem.)				
	Lect. (Both secs.)	III	MWF	100C	
	Lab. Sec. 1 (Engrs.)	V-VI	MWF	290C	
	2 (Others)	VIII-IX	MWF	290C	
11f	Qualitative Chemical Analysis... (4 cred.; prereq., 3 or 5)				
	Lect.	IV	MWF	225C	Miss Cohen
	Lab.	VI-VII	MW	290C	Miss Cohen
11s	Qualitative Chemical Analysis... (4 cred.; prereq., 3 or 5)				
	Lect.	VI	MWF	100C	Mr. Stephens
	Lab.	VI-VII	TTh	210C	Mr. Stephens
		or			
	Lab.	VIII-IX	TTh	210C	Mr. Stephens
12f	Qualitative Chemical Analysis... (5 cred.; prereq., 8 or 10)				
	Lect.	I	TThS	325C	Mr. Maynard
	Lab.	VI-VIII	MW	290C	Mr. Maynard
12s	Qualitative Chemical Analysis... (5 cred.; prereq., 8 or 10)				
	Lect.	II	MWF	100C	Mr. Sneed
	Lab.	I-III	ThS	290C	Mr. Sneed
13f	Qualitative Chemical Analysis... (5 cred.; prereq., 12)				
	Lect.	VI	MW	111C	
	Lab.	VII-IX	MW	290C	
	Lab.	VI-VIII	F	290C	
13w	Qualitative Chemical Analysis... (5 cred.; prereq., 12)				
	Lect.	I	TTh	325C	Mr. Maynard
	Lab.	VI-VIII	MWF	290C	Mr. Maynard
14f-15w	General Inorganic Chemistry.... (5 cred. per qtr.; no prereq.)				
	Sec. 1 (Engrs)				
	Lect.	II	TThS	100C	Mr. Heisig
	Lab. (Fall)	VI-IX	T	110C	Mr. Heisig
		II-III	F	110C	Mr. Heisig
	Quiz (Fall)	VIII	M	490C	Mr. Heisig
	Lab. (Winter)	VI-IX	T	110C	Mr. Pervier
		VI-VII	Th	110C	Mr. Pervier
	Quiz (Winter)	VIII	F	490C	Mr. Pervier

INORGANIC CHEMISTRY

11

No.	Title	Hour	Day	Bldg.	Instructor
	Sec. 2 (Miners)				
	Lect.	II	TThS	100C	Mr. Pervier
	Lab.	VII-IX	T	110C	Mr. Pervier
		VI-VIII	Th	110C	Mr. Pervier
	Sec. 3 (Pharm., phys. ed.)				
	Lect.	I	MWF	225C	Mr. Maynard
	Lab.	VI-VIII	TTh	290C	Mr. Maynard
16s	Qualitative Chemical Analysis... (5 cred.; prereq., 5 or 15)				
	Sec. 1 (Engrs)				
	Lect.	VII	MWF	100C	Mr. Barber
	Lab.	IV-V	T	110C	Mr. Barber
		VI-IX	Th	110C	Mr. Barber
	Sec. 2 (Engrs.)				
	Lect.	I	TThS	100C	Mr. Heisig
	Lab.	VI-IX	M	110C	Mr. Heisig
		VI-VII	W	110C	Mr. Heisig
	Sec. 3 (Engrs. and miners)				
	Lect.	II	TThS	100C	Mr. Pervier
	Lab.	VIII-IX	W	110C	Mr. Pervier
		VI-IX	F	110C	Mr. Pervier
	Sec. 4 (Pharm.)				
	Lect.	I	MWF	325C	Mr. Maynard
	Lab.	VI-VIII	TTh	290C	Mr. Maynard
17s	Glassblowing (1 cred.; jr., sr., grad.)	Ar	Ar	Ar	Mr. Stephens
19s	Teachers' Course (3 cred.; prereq., general chem. and qual. anal.)	IV	MWF	315C	Mr. Geiger
51f,w,s	Junior Review Examination (In- organic) (No cred.; prereq., Anal. Chem. 1 and 2; required of juniors in School of Chem.)	Ar	Ar	ArC	Mr. Sneed
52f,w,s	Junior Review Examination (Qua- litative Analysis) (No cred.; prereq., Anal. Chem. 1 and 2; required of juniors in School of Chem.)	Ar	Ar	ArC	Mr. Sneed
101s	History of Chemistry..... (2 cred.; prereq., Org. Chem. 52)	Ar	Ar	ArC	Miss Cohen
102w	Advanced Qualitative Analysis... (2 or 3 cred.; prereq., Anal. Chem. 1, 2)	Ar	Ar	290C	Mr. Sneed
103f-104w-105s	Advanced Inorganic Chemistry.. (3 cred. per qtr.; prereq., Anal. Chem. 1, 2; Org. Chem. 52)	IV	MWF	111C	Mr. Sneed
106f-107w-108s	Chemistry of the Rare Elements.. (3 cred. per qtr.; prereq., Anal. Chem. 1 or 2 or by permission)	Ar	Ar	ArC	Mr. Kirk
301f-302w-303s	Research in Inorganic Chemistry (Cred. ar.)	Ar	Ar	ArC	Mr. Sneed

SCHOOL OF CHEMISTRY

ANALYTICAL CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
1w-2s	Quantitative Analysis (5 cred. per qtr.; prereq., Inorg. Chem. 13)				
	Lect.	VI	M	325C	Mr. Geiger
	Quiz	VI	W	410C	
	Sec. 1 Rec.	VII	W	315C	
	Lab.	VII-IX	M	310C	
		VIII-IX	W	310C	
		VI-IX	F	310C	
	Sec. 2 Rec.	VI	F	315C	
	Lab.	VII-IX	MWF	310C	
7f	Quantitative Analysis (4 cred.; prereq., Inorg. Chem. 11 or 13)				
	Lect. (Secs. 1, 2)	VI	M	325C	Mr. Geiger
	Sec. 1 Rec. (limit 30)	VI	W	315C	
	Lab.	VII-IX	MW	310C	
		VI-VII	F	310C	
	Sec. 2 Rec. (limit 30)	VI	F	315C	
	Lab.	VII-IX	MF	310C	
		VI-VII	W	310C	
	Sec. 3 Lect.	VII	T	315C	Mr. Sarver
	Rec.	VI	Th	315C	
	Lab.	VIII-IX	T	310C	
		VII-IX	Th	310C	
		I-III or II-IV	S	310C	
			S		
7w,s	Quantitative Analysis (Same as 7f, Sec. 3)				
9w	Quantitative Analysis (3 cred.; prereq., Inorg. Chem. 11 or 16)				
	Lect.	VI	T	325C	Mr. Geiger
	Lab.	VII-IX	T	310C	
		VI-IX	Th	310C	
53f,w,s	Junior Review Examination (Quantitative Analysis) (No cred.; prereq., Anal. Chem. 1 and 2; required of juniors in School of Chem.)	Ar	Ar	ArC	Mr. Geiger
101w-102s	Quantitative Analysis (5 cred. per qtr.; prereq., Inorg. Chem. 13)	VI-IX	MWF	ArC	Mr. Geiger
123f-124w-125s	Advanced Analytical Chemistry . . (3 cred. per qtr.; prereq., 1, 2, or 7)				
	Lect.	VI	T	315C	Mr. Sarver
	Lab.	VII-IX	T	310C	
		VI-IX	Th	310C	
127f-128w-129s	Analytical Chemistry of the Rare Elements (3 cred. per qtr.; prereq., 1, 2)	Ar	Ar	ArC	Mr. Geiger
301f-302w-303s	Research in Quantitative Analysis (Cred. ar.)	Ar	Ar	ArC	Mr. Geiger

ORGANIC CHEMISTRY

13

ORGANIC CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w	Elementary Organic Chemistry (Pre-dent., pharm.)*				
	(4 cred. per qtr.; 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	I-IV	S	390C	
	3	VI-IX	M	390C	
	4	VI-IX	T	390C	
	5	VI-IX	W	390C	
6w-7s	Elementary Organic Chemistry (Pre-medic.)†				
	(4 cred. per qtr.; prereq., Inorg. Chem. 11)				
	Lect. (all secs.)	IV	MWF	100C	Mr. Smith
	Lab. Conference(all secs.)	III	T	100C	Mr. Smith
	Quiz (all secs.)	IV	T	Ar	Ar
	Lab. Sec. 1	VI-IX	M	390C	
	2	VI-IX	T	390C	
	3	VI-IX	W	390C	
	4	VI-IX	Th	390C	
	5	VI-IX	F	390C	
51f-52w-53s	Organic Chemistry				
	(5 cred. per qtr.; prereq., 15 cred. in chem.)				
	Lect. (All secs.)	III	MWF	325C	Mr. Hunter
	Sec. 1 (Chem.) Rec.	IV	T	111C	Mr. Hunter
	Lab. f,w	I-III	TTh	390C	
	Lab. s	VII-IX	TTh	390C	
	Sec. 2 (Others) Rec.	III	Th	111C	Mr. Lauer
	Lab.	VI-VIII	TTh	390C	Mr. Lauer
	Advanced Organic Chemistry	III	TThS	315C	Mr. Hunter
	(3 cred. per qtr.; prereq., 53)				
111f	Reagents in Organic Chemistry	II	MWF	325C	Mr. Smith
	(3 cred.; prereq., 53)				
113s	The Aliphatic Compounds	II	MWF	315C	Mr. Smith
	(3 cred.; prereq., 53)				
115s	The Heterocyclic Compounds	II	MWF	315C	Mr. Smith
	(3 cred.; prereq., 53)				
116w	The Terpenes	Ar	Ar	ArC	Mr. Stephens
	(3 cred.; prereq., 53)				
122w	The Aromatic Compounds	Ar	Ar	ArC	Mr. Lauer
	(3 cred.; prereq., 53)				
123s	Dyes	II	TThS	215C	Mr. Lauer
	(3 cred.; prereq., 53)				

* For pre-dent. and pharm. only. Others must have permission of the instructor to enter this course.

† For pre-medic. only. Pre-dent. and others must have permission of the instructor to enter this course.

SCHOOL OF CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
137f	Advanced Organic Chemistry Laboratory Work	Ar	Ar	ArC	Mr. Lauer
	(2 to 5 cred.; prereq., 53)				
139f,w,s	Advanced Organic Chemistry Laboratory Work	Ar	Ar	ArC	Mr. Hunter
	(2 to 5 cred.; prereq., 53)				
201f-202w-203s	Organic Chemistry Seminar.....	Ar	Ar	ArC	Mr. Hunter
	(1 cred. per qtr.; open only to students taking research in organic chem.)				
301f-302w-303s	Research in Organic Chemistry..	Ar	Ar	ArC	Mr. Hunter, Mr. Smith
	(Cred. ar.)				

PHYSICAL CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
101f-102w-103s	Physical Chemistry				
	(3 to 5 cred. per qtr.; prereq., 2 yrs. col. chem., 1 yr. col. physics)				
	Lect. (Both secs.)	IV	MWF	325C	Mr. MacDougall
	Sec. 1 (Chem.) Rec. f,w	IV	S	111C	
	Rec. s	III	S	111C	
	Lab.	VI-VIII	MW	15C	Mr. MacDougall
				117C	
	Sec. 2 (Others) Rec.	IV	S	115C	Mr. MacDougall
	Lab.	VI-VIII	F	15C	Mr. MacDougall
105w	Application of Higher Mathematics to Chemical Problems.....	Ar	Ar	ArC	Mr. MacDougall
	(3 cred.; prereq., integral calculus)				
110f,w	Physical Chemistry				
	(4 cred.; prereq., Org. Chem. 7)				
	Lect. (Both secs.)	VI	TTh	225C	Mr. Taylor
		VI	F	325C	Mr. Taylor
	Lab. Sec. 1	I-III	MW	15C	Mr. Taylor
	2	VII-IX	TTh	117C	Mr. Taylor
116f-117w-118s	Advanced Physical Chemistry....	Ar	Ar	ArC	Mr. Taylor
	(3 cred. per qtr. or 4 with lab.; prereq., 103 and calculus)				
129s	Principles of Colloidal Chemistry	(Not offered in 1927-28)			
	(2 cred.; prereq., 102)				
130s	Applications of Colloidal Chemistry	(Not offered in 1927-28)			
	(2 cred.; prereq., 102)				
131f-132w-133s	Colloid Chemistry Laboratory....	(Not offered in 1927-28)			
	(Cred. ar.; prereq., cred. or registration in 129 or 130)				
144s	Magnetochemistry	Ar	Ar	ArC	Mr. Taylor
	(3 cred.; jr., sr.; prereq., 103)				
161f-162w-163s	Radioactivity	Ar	Ar	ArC	Mr. Lind
	(2 cred. per qtr.; prereq., Phys. Chem. 103)				
164f,w,s	Radioactivity Laboratory	Ar	Ar	ArC	Mr. Lind
	(Must be preceded or accompanied by Radioactivity 161)				

TECHNOLOGICAL CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
175s	Photochemistry (3 cred.; prereq., Optics and Phys. Chem. 103)	Ar	Ar	ArC	Mr. Lind
201f-202w-203s	Thermodynamics and Chemistry.. (4 cred. per qtr.; prereq., 103 and calculus)	II	TThS	315C	Mr. MacDougall
204f-205w-206s	Kinetic Theory and Atomistics... (4 cred. per qtr.; prereq., 103 and calculus)	(Not offered in 1927-28)			
211f-212w-213s	Advanced Physical Chemistry Laboratory (Cred. ar.; prereq., 103)	Ar	Ar	ArC	Mr. MacDougall
251f-252w-253s	Physical Chemistry Seminar..... (1 cred. per qtr.; for students taking advanced courses in physical chemistry)	IV	T	315C	Mr. MacDougall, Mr. Taylor
271f-272w-273s	Chemical Activation (1 cred. per qtr.; prereq., physics and physical chemistry)	Ar	Ar	ArC	Mr. Lind
301f-302w-303s	Research in Physical Chemistry.. (Cred. ar.)	Ar	Ar	ArC	Mr. Lind, Mr. Mac- Dougall, Mr. Taylor

TECHNOLOGICAL CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
1f,w,s	Power Plant Chemistry (Engrs.).. (3 cred.; prereq., Inorg. Chem. 16)				
	Sec. 1	I-IV	MS	10C	Mr. Brewer
	2	VI-IX	MW	10C	
2w	Boiler Water (Engrs.)..... (3 cred.; prereq., 1)				
	Lect.	I	T	215C	Mr. Harding
	Lab.	VI-IX	TTh	10C	
2s	Boiler Water (Engrs.)..... (3 cred.; prereq., 1)				
	Lect.	IV	M	215C	Mr. Harding
	Lab.	Ar	Ar	ArC	
3w,s	Petroleum Products (Engrs.).... (2 cred.; prereq., 1)				
	Lect.	Ar	Ar	ArC	Mr. Harding
100f-101w-102s	Food Analysis (3 cred. per qtr.; prereq., Anal. Chem. 1, 2)				
	Lect.	III	F	215C	Mr. Stoppel
	Lab.	VI-VIII	TF	217C	Mr. Stoppel
103w	Exact Gas Analysis..... (1 or 2 cred.; prereq., Anal. Chem. 1, 2)	Ar	Ar	ArC	Mr. Harding
104s	Microchemistry (1 or 2 cred.; prereq., Anal. Chem. 1, 2)	Ar	Ar	ArC	Mr. Harding

SCHOOL OF CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
105f	Gas and Fuel Analysis..... (3 cred.; prereq., Anal. Chem. 1, 2)				
	Lect. (Both secs.)	I	S	215C	Mr. Harding
	Sec. 1 Rec.	II	S	215C	Mr. Harding
	Lab.	I-III	TTh	10C	Mr. Stoppel
	Sec. 2 Rec.	IV	M	215C	Mr. Harding
	Lab.	VI-VIII	TTh	10C	Mr. Harding
106w	Petroleum and Petroleum Products (3 cred.; prereq., Anal. Chem. 1, 2)				
	Lect. (Both secs.)	I	S	215C	Mr. Harding
	Sec. 1 Rec.	II	S	215C	Mr. Harding
	Lab.	I-III	TTh	10C	Mr. Stoppel
	Sec. 2 Rec.	I	W	215C	Mr. Harding
	Lab.	VI-VIII	TTh	10C	Mr. Harding
107f,w,s	General Technical Analysis..... (1 to 3 cred.; prereq., Anal. Chem. 1, 2)	Ar	Ar	ArC	Mr. Harding
301f-302w-303s	Research in Technological Chem- istry (Cred. ar.)	Ar	Ar	ArC	Mr. Harding

CHEMICAL ENGINEERING

No.	Title	Hour	Day	Bldg.	Instructor
31f	Chemistry of Engineering Mate- rials (3 cred.; prereq., Inorg. Chem. 16)	IV	MWF	315C	Mr. Montonna
41s	Gas Manufacture and Distribution (3 cred.; open to soph. in College of Engr. who have completed 1 year of chemistry)	Ar	Ar	ArC	Mr. Montillon
76f-77w	Applied Electrochemistry (3 cred. per qtr.; open to jr. and sr. engrs.)				
	Lect.	IV	WF	115C	Mr. Montillon
	Lab. Sec. 1	VI-VIII	M	25C	Mr. Ruth
	2	Ar	Ar	ArC	
101s	Unit Process (4 cred.; prereq., Anal. Chem. 1, 2, Org. Chem. 52)	I	MTWThF	111C	Mr. Mann
	Lab. Sec. 1	VI-VIII	M	90C	Mr. Montonna,
	2	VI-VIII	W		Mr. Ruth
	3	I-III	S		
102f-103w-104s	Unit Process Problems..... (2 cred. per qtr.; prereq., 101)	II	WF	111C	Mr. Mann, Mr. Montillon
111f-112w-113s	Design of Chemical Equipment and Plants (2 cred. per qtr.; prereq., 131, 132)	II-IV VI-VIII	M M	410C 410C	Mr. Montillon
131f	Industrial Inorganic Chemistry.. (4 cred.; prereq., 101)	I	MTWThF	111C	Mr. Mann, Mr. Montonna
132w	Industrial Organic Chemistry.... (4 cred.; prereq., 101)	I	MTWThF	111C	Mr. Mann, Mr. Montonna

DRAWING AND DESCRIPTIVE GEOMETRY

No.	Title	Hour	Day	Bldg.	Instructor
133f	Chemistry of Explosives..... (4 cred.; prereq., 132)	Ar	Ar	ArC	Mr. Montonna
134s	Intermediates and Dye Stuffs... (3 cred.; lab. optional (See 160); prereq., 132 or equivalent)	Ar	Ar	ArC	Mr. Montonna
136w	Chemistry and Technology of Cel- lulose (3 cred.; prereq., Org. Chem. 52 or equivalent)	Ar	Ar	ArC	Mr. Montonna
141s	Gas Manufacture and Distribution (3 cred.; open to chemists and chemical engineers)	Ar	Ar	ArC	Mr. Montillon
151f,su	Chemical Manufacture (Inorganic) (3 or more cred.; prereq., 101)	Ar	Ar	90C	Mr. Montonna
152w,su	Chemical Manufacture (Organic) (3 or more cred.; prereq., 101)	Ar	Ar	90C	Mr. Montonna
153f-154w-155s- 156su	Special Laboratory Problems... (3 or more cred.; prereq., 151, 152)	Ar	Ar	90C	Mr. Mann, Mr. Montillon, Mr. Montonna
160s	Intermediates and Dyestuffs Labo- ratory (3 or more cred.; prereq. ar.)	Ar	Ar	90C	Mr. Montonna
176f-177w	Applied Electrochemistry (4 cred. per qtr.; prereq., Phys. Chem. 103)				
	Lect.	I	MWF	215C	
	Lab.	VI-VIII	W or Th	25C	
179s	Advanced Applied Electrochem- istry (3 cred.; lab. optional; prereq., 176, 177)	Ar	Ar	ArC	Mr. Mann
187s	Inspection Trip (2 cred.; prereq., 132)	I-VIII	(Spring vacation)		Mr. Mann, Mr. Montillon
201f-202w-203s	Seminar (1 cred. per qtr.; open to stu- dents taking advanced courses in Chemical Engineering)	Ar	Ar	ArC	Mr. Mann, Mr. Montonna
301f-302w-303s	Research in Chemical Engineering (Cred. ar.)	Ar	Ar	ArC	Mr. Mann, Mr. Montillon, Mr. Montonna

DRAWING AND DESCRIPTIVE GEOMETRY

No.	Title	Hour	Day	Bldg.	Instructor
4f	Engineering Drawing (2 cred.; prereq., solid geometry)				
	Sec. 1	VIII-IX	MW	445C	Mr. Schuck,
		III-IV	T	445C	Mr. Williams
	Sec. 2	VIII-IX	MW	443C	
		III-IV	T	443C	
5w	Engineering Drawing (2 cred.; prereq., 4)	VIII-IX	MT	iE	Mr. Williams
		III-IV	T	iE	
6s	Engineering Drawing and Descrip- tive Geometry (2 cred.; prereq., 5)	VIII-IX	M	445C	Mr. Williams
		VII-VIII	F	445C	
		I-II	T	445C	

SCHOOL OF CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
7w	Engineering Drawing (3 cred.; prereq., M.&M. 10)	VII-IX VIII-IX	MT W	445C 445C	Mr. Schuck
8s	Engineering Drawing and Descriptive Geometry (3 cred.; prereq., 7)	VIII-IX I-II VII-VIII	MTh T F	1E 1E 1E	Mr. Schuck
9f,w,s	Drafting (2 to 6 cred.; prereq., 6 or 8)	Ar	Ar	Ar	Mr. French
M.&M.10f	Solid Geometry (No cred.; no prereq.)	VII VIII	MWTh W	203E 203E	Mr. Archibald
M.&M.10w	Solid Geometry (No cred.; no prereq.)	I-II I VII	T W M	21E 21E 22E	
34f,w,s	Lettering (1 cred.; prereq., 4 or 7)				
	Sec. 1	IV	T	107E	Mr. Archibald,
	2	II	Th	203E	Mr. Doseff
45f,w,s-46f,w,s	Alphabets (2 cred. per qtr.; no prereq.)	II	TTh	206E	Mr. Kirchner, Mr. Schuck
57f-58w-59s	Graphical Methods (2 cred. per qtr.; prereq., 23, 27, or 29 and M.&M. 84)	I	WF	206E	Mr. Levens

ECONOMICS

ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
8f-9w-10s	General Economics (3 cred. per qtr.; no prereq.)				
	Sec. 1	I	MWF	107E 22E (spring)	Mr. O'Hara
	2	I	MWF	21E	
	3	III	MWF	135E	
	4	IV	MWF	203E	
	5	IV	MWF	335EE	
25w-26s	Principles of Accounting..... (4 cred. per qtr.; prereq., 8-9)				
	Lect. Sec. 1	I	TThS	302B	Mr. Heilman
	2	II	MWF	303B	
	3	IV	MWF	302B	
	4	VI	MWF	302B	
	(Laboratory sections to be arranged)				
28f,s	Business Law (3 cred.; prereq., 8-9)	I	MWF	135E	Mr. Palmer
29f	Principles of Accounting..... (3 cred.; no prereq.)				
	Sec. 1	I	MWF	22E	Mr. Heilman
	2	IV	MWF	136EE	
29s	Principles of Economics..... (See 29f)	I	MWF	206E	Mr. Heilman

BUSINESS ADMINISTRATION

No.	Title	Hour	Day	Bldg.	Instructor
67f,w,s	Market Administration (3 cred.; prereq., 8, 9)	I	TThS	209B	Mr. Vaile

GEOLOGY AND MINERALOGY

No.	Title	Hour	Day	Bldg.	Instructor
89w	Production Management (3 cred.; prereq., 8, 9)	I	TThS	6B	Mr. O'Hara
130s	Cost Accounting (General Survey) (3 cred.; prereq., 29)	I	TThS	303B	Mr. Ostlund
131f-132w-133s*	Cost Accounting (3 cred. per qtr.; prereq., 29)	II	TThS	303B	Mr. Ostlund
161f	Labor Problems and Trade Unionism (3 cred.; jr., sr.; prereq., 8, 9)	IV	MWF	202B	Mr. Hansén
161w	Labor Problems and Trade Unionism (3 cred.; jr., sr.; prereq., 8, 9)	III	TThS	109B 16B	Mr. Hansen
167w	Personnel Administration (3 cred.; prereq., 8, 9)	I	TThS	202B	Mr. Stead
	Sec. 1	I	TThS	202B	Mr. Stead
	2	II	TThS	213B	
168s	Advanced Personnel Administration (3 cred.; prereq., 167)	I	TThS	209B	Mr. Stead

ELECTRICAL ENGINEERING

No.	Title	Hour	Day	Bldg.	Instructor
43f-44w-45s	Electric Power (3 cred. per qtr.; prereq., Physics 43 and 44)				
	Lect.	II	TTh	138EE	Mr. Johnson
		III	S	138EE	
	Lab.	I-II	S	107EE	

ENGLISH

No.	Title	Hour	Day	Bldg.	Instructor
4f-5w-6s	Rhetoric and Composition (3 cred. per qtr.; no prereq.)				
	Sec. 1	III	MWF	238EE	Mr. Ambler,
	2	III	MWF	335EE	Mr. Creamer
4w	Rhetoric and Composition (3 cred. per qtr.; no prereq.)				
	Sec. 1	V	MWF	107E	
	2	VIII	MW	107E	
		IX	Th		
5s	Rhetoric and Composition (3 cred.; prereq., 4)				
	Sec. 1	I	MWF	3E	
	2	V	MWF	107E	

GEOLOGY AND MINERALOGY

No.	Title	Hour	Day	Bldg.	Instructor
67f	Mineralogy of Chemical Materials (3 cred.; prereq., 6 qtr. cred. in chem. at Univ.)				
	Lect.	III	MWThF	104P	Mr. Gruner
	Lab.	III-IV	T	100P	Mr. Gruner

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

SCHOOL OF CHEMISTRY

GERMAN

No.	Title	Hour	Day	Bldg.	Instructor
24f-25w-26s	Beginning German	IV	MTWTF	209½F	
	(4 cred. per qtr.; no prereq.)				
27f	Narrative Prose	I	MWF	107F	
	(3 cred.; prereq., 26 or 2 yrs. prep. German)				
28w-29s	Advanced Chemical German.....	II	MWF	209½F	Mr. Davies
	(3 cred. per qtr.; prereq., 27)				

MATHEMATICS AND MECHANICS

See Engineering program for other sections and courses.

MATHEMATICS

No.	Title	Hour	Day	Bldg.	Instructor
9f	Higher Algebra	VI	MTWThF	22E	Mr. Brooke
	(No cred.; no prereq.)				
9w	Higher Algebra				
	(See 9f)				
	Sec. 4	V	MTWThFS	136E	
10f,w	(See Course 10f under Drawing and Descriptive Geometry)				
11f	College Algebra				
	(5 cred.; prereq., higher algebra)				
	Sec. 15	VI	MTWThF	106E	Mr. Holman
	16	VI	MTWThF	104E	
11w	College Algebra				
	(See 11f)				
	Sec. 12	VI	MTWThF	205E	
11s	College Algebra				
	(See 11f)				
	Sec. 1	III	MTWThF	3E	
	2	VII	MWThF	3E	
		III	S	3E	
	4	IV	MTWFS	3E	
12w	Trigonometry				
	(5 cred.; prereq., M.&M. 11)				
	Sec. 10	VI	MTWThF	106E	Mr. McClintock
12s	Trigonometry	VI	MTWThF	22E	
	(See 12w)				
13f	Analytic Geometry				
	(5 cred.; prereq., 12)				
	Sec. 1	V	MTWFS	203E	Mr. Siler
	2	VI	MTWThF	215E	
	3	III	MTWThF	215E	
	4	VII	MTWThF	215E	
13w	Analytic Geometry				
	(See 13f)				
	Sec. 1	II	MTWThF	215E	
	2	III	MWThFS	36EE	
				7E	
13s	Analytic Geometry				
	(See 13f)				
	Sec. 9	VI	MTWThF	205E	

MECHANICAL ENGINEERING

No.	Title	Hour	Day	Bldg.	Instructor
24f	Differential Calculus (5 cred.; prereq., 13)				
	Sec. 7	III	MWThFS	203E	Mr. Hartig
24w	Differential Calculus (See 24f)				
	Sec. 4	III	MTWThF	5E	
24s	Differential Calculus (See 24f)				
	Sec. 1	I	MWThFS	205E	
	2	V	MTWFS	215E	
25w	Integral Calculus (5 cred.; prereq., 24)				
	Sec. 5	III	MTWThF	136E	Mr. Dalaker
25s	Integral Calculus (See 25w)				
	Sec. 3	III	MWThFS	106E	

MECHANICS

No.	Title	Hour	Day	Bldg.	Instructor
26f	Technical Mechanics (Statics)... (5 cred.; prereq., 25)				
	Sec. 1	V	MTWFS	136E	Mr. Herrick
	2	II	MTWThF	215E	
26w,s,su	Technical Mechanics (Statics)... (See Engineering bulletin. Chem- ists allowed to take Course 26 only by special permission of the Students' Work Committee.)				
84s	Technical Mechanics (5 cred.; prereq., 25)	III	MWThFS	7E	Mr. Hartig

MATERIALS

No.	Title	Hour	Day	Bldg.	Instructor
85f	Strength of Materials with Labo- ratory (4 cred.; prereq., 84)				
	Lect.	II	MWF	138EE	Mr. Hartig
	Lab.	VI-VII	M	Ex	

HYDRAULICS

No.	Title	Hour	Day	Bldg.	Instructor
86w	Hydraulics with Laboratory..... (3 cred.; prereq., 84)				
	Lect.	I	MF	22E	Mr. Hartig
	Lab.	VI-VII	W	Ex	

MECHANICAL ENGINEERING

No.	Title	Hour	Day	Bldg.	Instructor
12f	Foundry (2 cred.; no prereq.)				
	Lect.	I	T	204ME	Mr. Moffett
	Shop	VIII-IX	Th	ME	
		VII-IX	F	ME	
12w	Foundry (2 cred.; no prereq.)				
	Lect.	I	T	204ME	
	Shop	VIII-IX	Th	ME	
		VII-IX	F	ME	

SCHOOL OF CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
12s	Foundry (2 cred.; no prereq.)				
	Lect.	IV	S	204ME	
	Shop	III-IV VII-IX	T W	ME ME	
13f	Forge (2 cred.; no prereq.)				
	Lect.	I	T	202PPI	Mr. Hughes
	Shop	VIII-IX VII-IX	Th F	ME ME	
13w	Forge (2 cred.; no prereq.)				
	Lect.	I	T	202ME	
	Shop	VIII-IX VII-IX	Th F	ME ME	
13s	Forge (2 cred.; no prereq.)				
	Lect.	I	T	202PPI	
	Shop	III-IV VII-IX	T W	ME ME	
17f,w	Machine Shop (2 cred.; no prereq.)				
	Lect.	I	T	102ME	Mr. Shipley
	Shop	VIII-IX VII-IX	Th F	ME ME	Mr. Rogers
17s	Machine Shop (2 cred.; no prereq.)				
	Lect.	IV	S	102ME	Mr. Shipley
	Lab.	III-IV VII-IX	T W	ME	
28f	Machine Design (3 cred.; prereq., M.&M. 26 or 84)				
	Lect.	III	W	202PPI	Mr. Martenis
	Lab.	VI-IX	WF	100PPI	Mr. Thornburg
138w	Heat Engines (4 cred.; prereq., M.&M. 84)				
	Lect.	IV	MWF	215Ex	
	Lab.	VI-IX	F	Ex	Mr. Dawson
139s	Heat Engines (3 cred.; prereq., 147)				
	Lect.	IV	MWF	215Ex	
	Lab.	VI-IX	F	Ex	Mr. Dawson
METALLOGRAPHY					
No.	Title	Hour	Day	Bldg.	Instructor
160f-161w-162s	Metallography (3 cred. per qtr.; prereq., Anal. Chem. 1, 2)				
	Lect.	III	MF	306M	Mr. Harder
	Lab. Sec. 1	VI-VIII	Th	306M	Mr. Dowdell
	2	Ar	Ar	306M	Mr. Dowdell, Mr. Weber
163f-164w-165s	Advanced Metallography (3 cred. per qtr.; prereq., 6 cred. in metallography)	Ar	Ar	M	Mr. Harder
201f-202w-203s	Advanced Metallography for Graduate Students (Cred. ar.)	Ar	Ar	M	Mr. Harder

METALLURGY

No.	Title	Hour	Day	Bldg.	Instructor
3f	General Metallurgy (3 cred.; prereq., Inorg. Chem. 8 or equivalent)	I	TThS	108M	Mr. Christianson
4w	Metallurgy of Pig Iron..... (3 cred.; prereq., 3)	I	TThS	108M	Mr. Christianson
5s	Metallurgy of Wrought Iron and Steel (3 cred.; prereq., 4)	I	TThS	108M	Mr. Christianson
106f-107w	Metallurgy of Base Meta's..... (4 cred. per qtr.; prereq., 3)	I III	F TThS	108M 108M	Mr. Pease Mr. Pease
108s	Metallurgy of Precious Metals... (4 cred.; prereq., 107)	I III	F TThS	108M 108M	Mr. Pease Mr. Pease
109f,w	Metallurgy of Base Metals..... (3 cred.; prereq., Inorg. Chem. 8 or equiv.)	IV	MWF	108M	Mr. Christianson, Mr. Pease

MILITARY SCIENCE AND TACTICS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w	First Year Basic Course, R.O.T.C. (Artillery and Signal Corps) (No cred.; no prereq.)				
	Sec. 1	I	MWF	A	Ar
	2	IX	MWF	A	Ar
3s	First Year Basic Course, R.O.T.C. (Artillery and Signal Corps) (No cred.; prereq., 1 and 2)	VII-IX	T	A	Ar
4f-5w	Second Year Basic Course, R.O.T.C. (Artillery and Signal Corps) (No cred.; prereq., 1, 2, and 3)				
	Sec. 1	I	MWF	A	Ar
	2	IX	MWF	A	Ar
6s	Second Year Basic Course, R.O.T.C. (Artillery and Signal Corps) (No cred.; prereq., 4 and 5)	VII-IX	T	A	Ar
51f-52w	First Year Advanced Course, R.O.T.C. (Artillery) (3 cred.; prereq., 4, 5, and 6)				
	Rec.	IV	MWF	A	Capt. Adams
	Lab.	VIII-IX	M	A	
53s	First Year Advanced Course, R.O.T.C. (Artillery) (3 cred.; prereq., 52)				
	Rec.	II	MWF	A	Capt. Adams
	Lab.	III IX	T T	A A	
54f-55w	Second Year Advanced Course, R.O.T.C. (Artillery) (3 cred.; prereq., 53)				
	Rec.	III	MWF	A	Capt. Adams
	Lab.	VIII-IX	W	A	
56s	Second Year Advanced Course, R.O.T.C. (Artillery) (3 cred.; prereq., 55)				
	Rec.	III	MWF	A	Capt. Adams
	Lab.	VIII-IX	T	A	

SCHOOL OF CHEMISTRY

PHYSICAL EDUCATION FOR MEN

No.	Title	Hour	Day	Bldg.	Instructor	
1f-2w	Freshman Physical Education...					
	(Cred.;* no prereq.)					
	Sec. 1	II	TTh	A		
	2	III	TTh	A		
	3	VI	TTh	A		
3s	Freshman Physical Education...					
	(Cred.;* no prereq.)					
	Sec. 1	II	TTh	A		
	2	III	TTh	A		
	3	VI	MTh	A		
4f	Freshman Physical Education...					
	(Cred.;* no prereq.)					
	Sec. 1	II	TTh	A		
	2	III	TTh	A		
	3	VI	MTh	A		
4f	Freshman Hygiene					
	(Cred.;* no prereq.)					
	Sec. 1	II	T	301F	Dr. Cooke	
	2	IV	T			
	3	II	F			
4w	Freshman Hygiene					
	(Cred.;* no prereq.)					
	Sec. 1	IV	T	301F	Dr. Cooke	
2	II	F				
3	IV	S				
4s	Freshman Hygiene					
	(Cred.;* no prereq.)					
	Sec. 1	III	M	301F	Dr. Cooke	
	2	IV	T	301F		
	3	II	F	301F		
7f-8w-9s	Advanced Leaders					
	(1 cred. per qtr.; prereq., 1, 2, and 3 or permission)					
	Sec. 1	IV	T	A		
		II	TTh			
	2	IV	T	A		
		III	TTh			
	3	IV	T	A		
		VI	TTh			
4	IV	T	A			
	VII	TTh				
5	IV	T	A			
	VIII	TTh				
6	II	MWF	A			
7	III	MWF	A			
8	IV	MWF	A			
10f-11w-12s	Minor Sports					
	(2 cred. per qtr.; prereq., 1, 2, and 3 or permission)					
	Lect.	IV	S	A		
Lab.	IV	MWF				

* Course 1-2-3 and 4 carries a total of three credits. The entire course must be completed before credit is received for any quarter. Preventive Medicine 2 may be offered as a substitute for 4.

Course 1f-2w-3s carries no credit when taken in place of military science and tactics by foreign students and others in the School of Chemistry.

PHYSICS

No.	Title	Hour	Day	Bldg.	Instructor
16f-17w-18s	Drill Substitution (No cred.; no prereq.)				
	Sec. 1	II	MWF	A	Mr. Iverson
	2	III	MWF	A	
	3	IV	MWF	A	
30s	Athletic Training and First Aid.. (2 cred.; no prereq.)	I	MWF	A	Dr. Cooke

PHYSICAL EDUCATION FOR WOMEN

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s*	Elementary Physical Training.... (No cred.; no prereq.)	III IV VI VIII	MWF MWF MWF MWF	3,151,153WGm 3,151,153WGm 3,151,153WGm 3,151,153WGm	Ar Ar Ar Ar
4f	Preliminary Hygiene (No cred.; no prereq.)	III I II III IV VI	TThS M T W M T	3,151,153WGm 201WGm	Ar
4w	Preliminary Hygiene (No cred.; no prereq.)	III	W	201WGm	
4s	Preliminary Hygiene (No cred.; no prereq.)	II	T	201WGm	

PHYSICS

No.	Title	Hour	Day	Bldg.	Instructor
3f	Elements of Mechanics and Sound (3 cred.; prereq., trig. equiv. of M.&M. 12)				
	Lect.	II	MWF	30Ph	Mr. Erikson
	Quiz	II	Th	305E	
	or	IX	Th	100C	
3w	Elements of Mechanics and Sound (3 cred.; prereq., trig. equiv. of M.&M. 12)				
	Lect.	VIII	MWF	30Ph	Mr. Erikson
	Quiz	IX	F	305E	
3s	Elements of Mechanics and Sound (3 cred.; prereq., trig. equiv. of M.&M. 12)				
	Lect.	III	TThS	30Ph	Mr. Erikson
	Quiz	IX	F	305E	
4f	Elements of Mechanics Laboratory (1 cred.; prereq., 3 or registra- tion in 3)	VI-VII or I-II	Th	16Ph	Mr. Erikson

* The third quarter is open to students who have not taken the preceding quarters. The winter quarter is not open to students who have not had the fall quarter.

SCHOOL OF CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
4w,s	Elements of Mechanics Laboratory (1 cred.; prereq., 3 or registration in 3)				
	Sec. 1	VI-VII	T	16Ph	Mr. Erikson and assistants
	2	VIII-IX	T	16Ph	
	3	I-II	Th	16Ph	
	4	VIII-IX	Th	16Ph	
23f	Heat (3 cred.; prereq., 3)				
	Lect.	III	TThS	30Ph	Mr. Miller
	Quiz	IX	Th		
23w	Heat (3 cred.; prereq., 3)				
	Lect. Sec. 1	I	MWF	30Ph	Mr. Miller
	2	II	MWF	30Ph	
	3	VI	MWF	30Ph	Mr. Miller
	Quiz	II	Th	305E	
		or IX	Th	100C	
24f	Heat Laboratory (1 cred.; prereq., 4, 23, or registration in 23)				
	Sec. 1	VI-VII	M	23Ph	Mr. Miller and assistants
	2	VIII-IX	M	23Ph	
	3	VI-VII	T	23Ph	
	4	VIII-IX	T	23Ph	
24w	Heat Laboratory (1 cred.; prereq., 4, 23, or registration in 23)	VI-VII	Th	23Ph	Mr. Miller
33f,s	Optics (3 cred.; prereq., 3)				
	Lect.	I	TThS	30Ph	Mr. Valasek
	Quiz	IX	Th	30Ph	
34f,s	Optics Laboratory (1 cred.; prereq., 4, 33, or registration in 33)				
	Sec. 1	VI-VII	Th	23Ph	Mr. Valasek
	2	VI-VII	F	23Ph	
35w	Optics (2 cred.; prereq., 3)				
	Lect.	VI	TTh	30Ph	Mr. Valasek
	Quiz	IX	F	30Ph	
35s	Optics (2 cred.; prereq., 3)				
	Lect.	VI	TTh	30Ph	Mr. Valasek
	Quiz	IV	S		
43w	Electricity (3 cred.; prereq., 3)				
	Lect.	III	TThS	30Ph	Mr. Zeleny
	Quiz	IX	Th	100C	
43s	Electricity (3 cred.; prereq., 3)				
	Lect.	II	MWF	30Ph	Mr. Zeleny
	Quiz	II	Th	305E	
	or IX	IX	Th	30Ph	

No.	Title	Hour	Day	Bldg.	Instructor
44w	Electricity Laboratory (1 cred.; prereq., 4, 43, or registration in 43)				
	Sec. 1	VI-VII	T	31Ph	Mr. Zeleny
	2	VIII-IX	T	31Ph	and assistants
	3	VI-VII	W	31Ph	
44s	Electricity Laboratory (1 cred.; prereq., 4, 43, or registration in 43)	VI-VII	Th	31Ph	Mr. Zeleny

PHYSIOLOGIC CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
100xw-101xs	Physiologic Chemistry (3 cred. per qtr.; prereq., physics and Org. Chem. 53)	IV	MWF	214MH	Mr. McClendon
100yw-101ys	Physiologic Chemistry Laboratory (2 cred. per qtr.)				
	Sec. a	I-III	TTh	310MH	Mr. McClendon
	Sec. b	I-III	FS	310MH	Mr. Pettibone and assistants

PREVENTIVE MEDICINE AND PUBLIC HEALTH

No.	Title	Hour	Day	Bldg.	Instructor
2s	Hygiene and First Aid to Sick and Injured (No cred.; no prereq.)				
	Sec. 1	VI	T	305E	Dr. Cady
	2	IX	F	305E	
3f,w,s	Personal Hygiene and Elementary Sanitation (2 cred.; no prereq.)	IV	TS	101B MH	Dr. Lees
50f,w,su	Public and Personal Health (3 cred.; prereq., Zool. 1, 2 and Psy. 1, 2)	V	MWF	101B MH	Dr. O'Brien

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

The College of Education

Part I

Announcement of Courses for the Years
1926-1928



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Alvin H. Hansen, Ph.D., Professor of Economics
Everhart P. Harding, Ph.D., Associate Professor of Chemistry
Samuel B. Harding, Ph.D., Professor of History
J. Arthur Harris, Ph.D., Professor of Botany and Head of the Department of Botany
William L. Hart, Ph.D., Professor of Mathematics
Rodney B. Harvey, Ph.D., Associate Professor of Plant Pathology and Botany
Ernest A. Heilman, Ph.D., Associate Professor of Accounting
Arthur T. Henrici, M.D., Professor of Bacteriology and Immunology
Lewis B. Hessler, Ph.D., Assistant Professor of English
Ray C. Hill, Major, Infantry, Assistant Professor of Military Science and Tactics
James T. Hillhouse, Ph.D., Assistant Professor of English
Edgar J. Huenekens, B.A., M.D., Assistant Professor of Pediatrics
Ned L. Huff, M.A., Assistant Professor of Botany
Gertrude R. Hull, Assistant Professor of Music
William H. Hunter, Ph.D., Professor of Chemistry
John C. Hutchinson, B.A., Professor of Greek, Emeritus
Clarence M. Jackson, M.S., M.D., LL.D., Professor of Anatomy and Director of the Department of Anatomy
Dunham Jackson, Ph.D., Professor of Mathematics
Elizabeth Jackson, Ph.D., Assistant Professor of English
Albert Ernest Jenks, Ph.D., Sc.D., Professor of Anthropology, Chairman of the Department of Anthropology, and Director of the Americanization Training Course
Maynard S. Johnson, Ph.D., Assistant Professor of Entomology and Economic Zoology
John B. Johnston, Ph.D., Professor of Neurology and Dean of the College of Science, Literature, and the Arts

- Robert T. Jones, B.S. in Arch., Associate Professor of Architectural Design
 Roy C. Jones, M.S. in Arch., Associate Professor of Architectural Construction
- Cornelia Kennedy, Ph.D., Assistant Professor of Agricultural Biochemistry
 Earle G. Killeen, Professor of Music
- William H. Kirchner, B.S., Professor of Drawing and Descriptive Geometry
 and Head of the Department of Drawing and Descriptive Geometry
- Raymond E. Kirk, M.S., Assistant Professor of Inorganic Chemistry
 May S. Kissock, B.A., Assistant Professor of Physical Education for Women
- Frederick Klaeber, Ph.D., Professor of Comparative and English Philology
 and Head of the Department of Comparative Philology
- Alexander Krappe, Ph.D., Assistant Professor of Romance Languages
 August C. Krey, Ph.D., Professor of History
- Samuel Kroesch, Ph.D., Associate Professor of German
- Harold F. Kumm, B.A., LL.B., S.J.D., Assistant Professor of Political Science
- Dorothy Kurtzman, R.N., Assistant Professor of Nursing, and Superintendent of Nurses
- Morris B. Lambie, M.A., Associate Professor of Political Science
 Walter M. Lauer, Ph.D., Assistant Professor of Chemistry
- Alvin H. Larson, B.S., Assistant Professor of Plant Pathology and Botany
 Winford P. Larson, M.D., Professor of Bacteriology and Immunology and
 Head of the Department of Bacteriology and Immunology
- Irville C. LeCompte, Ph.D., Professor of Romance Languages
 Thomas G. Lee, M.D., Professor of Comparative Anatomy
- Bernard Lentz, Major, Infantry, U.S.A., Professor of Military Science
 and Tactics
- William Lindsay, Associate Professor of Music
- Fred W. Luehring, Ph.M., Professor of Physical Education and Director
 of the Department of Physical Education and Athletics
- Elmer J. Lund, Ph.D., Associate Professor of Animal Biology
 Gustav A. Lundquist, Ph.D., Assistant Professor of Rural Sociology
 George F. Lussy, Ph.D., Assistant Professor of German
- Elias P. Lyon, Ph.D., M.D., LL.D., Professor of Physiology and Director
 of the Department of Physiology
- Jesse F. McClendon, Ph.D., Professor of Physiologic Chemistry
 Orianna McDaniel, M.D., Assistant Professor of Preventive Medicine and
 Public Health and Director, Division of Preventable Diseases, State
 Board of Health
- Frank H. MacDougall, Ph.D., Professor of Chemistry
- Wylle B. McNeal, M.A., Professor of Home Economics and Chief of the
 Division of Home Economics
- Frederick M. Mann, M.S. in Arch., Professor of Architecture and Head
 of the Department of Architecture
- Ernest S. Mariette, M.D., Assistant Professor of Medicine
 Jay A. Myers, Ph.D., M.D., Assistant Professor of Preventive Medicine
 and Public Health

- Louallen F. Miller, Ph.D., Associate Professor of Physics
Dwight E. Minnich, Ph.D., Associate Professor of Animal Biology
Cecil A. Moore, Ph.D., Professor of English
Paul Morand, Licencié ès Lettres, Assistant Professor of Romance Languages
Clarence A. Morrow, Ph.D., Assistant Professor of Agricultural Biochemistry
Amy P. Morse, B.A., Assistant Professor of Drawing and Design
Bruce D. Mudgett, Ph.D., Professor of Economics
Mildred D. Mudgett, Ph.D., Assistant Professor of Sociology and Supervisor of Field Practice Work
Walter R. Myers, Ph.D., Assistant Professor of Economics
Kent Nelson, Lieutenant Colonel, Medical Corps, Assistant Professor of Military Science and Tactics
Charles W. Nichols, Ph.D., Assistant Professor of English
J. Anna Norris, M.D., Professor of Physical Education for Women and Director of Health and Physical Education for Women
Oscar W. Oestlund, Ph.D., Associate Professor of Animal Biology
Everett W. Olmsted, Ph.D., Litt.D., Professor of Romance Languages and Head of the Department of Romance Languages
Orlena Ordahl, R.N., Assistant Professor of Nursing
Harry J. Ostlund, B.A., Assistant Professor of Economics
Leroy S. Palmer, Ph.D., Professor of Agricultural Biochemistry
Donald G. Paterson, M.A., Professor of Psychology
Wilton B. Persons, Captain, Signal Corps, Assistant Professor of Military Science and Tactics
Chauncey J. Pettibone, Ph.D., Associate Professor of Physiologic Chemistry
Anna H. Phelan, Ph.D., Assistant Professor of English
Ethel L. Phelps, Ph.D., Assistant Professor of Textiles and Clothing
Ruth S. Phelps, Ph.D., Associate Professor of Romance Languages
Joseph B. Pike, M.A., Professor of Latin and Head of the Department of Latin
Don F. Pratt, Captain, Infantry, Assistant Professor of Military Science and Tactics
H. Bruce Price, Ph.D., Associate Professor of Agricultural Economics
Harold S. Quigley, Ph.D., Associate Professor of Political Science
Frank M. Rarig, M.A., Professor of Public Speaking
Andrew T. Rasmussen, Ph.D., Professor of Neurology
Gertrude Reeves, Assistant Professor of Music
William F. Rehn, Captain, Infantry, Assistant Professor of Military Science and Tactics
John J. Reighard, M.A., C.P.A., Assistant Professor of Accounting
Lloyd H. Reyerson, Ph.D., Assistant Professor of Chemistry
William A. Riley, Ph.D., Professor of Entomology and Economic Zoology and Head of the Department of Animal Biology
Adolph Ringoen, Ph.D., Assistant Professor of Animal Biology
Thomas S. Roberts, M.D., Professor of Ornithology and Director of the Zoological Museum

- Rhodes Robertson, M.S. in Arch., Assistant Professor of Architectural Design
- C. Otto Rosendahl, Ph.D., Professor of Botany
- Henry Rottschaefer, B.A., S.J.D., Professor of Law
- Clare Leo Rotzel, B.C.S., C.P.A., Associate Professor of Accounting
- Arthur G. Ruggles, M.A., Professor of Economic Entomology
- Martin B. Ruud, Ph.D., Associate Professor of English
- Landon A. Sarver, Ph.D., Assistant Professor of Chemistry
- Charles A. Savage, Ph.D., Professor of Greek and Chairman of the Department of Greek
- Richard E. Scammon, Ph.D., Professor of Anatomy
- Carl Schlenker, B.A., Professor of German and Chairman of the Department of German
- George M. Schwartz, Ph.D., Assistant Professor of Geology and Mineralogy
- Carlyle M. Scott, Professor of Music and Chairman of the Department of Music
- Frederick H. Scott, M.B., Ph.D., Sc.D., Professor of Physiology
- Colbert Searles, Ph.D., Professor of Romance Languages
- S. Carl Shipley, B.S., M.E., Professor of Mechanical Engineering
- Lester B. Shippee, Ph.D., Professor of History
- Royal R. Shumway, B.A., Associate Professor of Mathematics
- Charles P. Sigerfoos, Ph.D., Professor of Zoology
- Edward H. Sirich, Ph.D., Associate Professor of Romance Languages
- Lee I. Smith, Ph.D., Assistant Professor of Chemistry
- M. Cannon Sneed, Ph.D., Professor of Chemistry
- Pitirim A. Sorokin, Dr. of Soc., Professor of Sociology
- Clarence Spears, M.D., Professor of Physical Education
- Elvin C. Stakman, Ph.D., Professor of Plant Pathology and Botany
- Clinton R. Stauffer, Ph.D., Professor of Geology and Mineralogy
- Lawrence D. Steefel, Ph.D., Assistant Professor of History
- J. Warren Stehman, Ph.D., Associate Professor of Economics
- George M. Stephenson, Ph.D., Assistant Professor of History
- Elmer E. Stoll, Ph.D., Professor of English
- Andrew A. Stomberg, M.S., Professor of Scandinavian Languages and Literatures
- Lucy A. Studley, M.A., Assistant Professor of Home Economics
- Emerson G. Sutcliffe, Ph.D., Assistant Professor of English
- David F. Swenson, B.S., Professor of Philosophy
- John T. Tate, Ph.D., Professor of Physics
- Nelson W. Taylor, Ph.D., Assistant Professor of Chemistry
- George A. Thiel, Ph.D., Assistant Professor of Geology and Mineralogy
- Joseph M. Thomas, Ph.D., Professor of English and Chairman of the Department of English
- Josephine E. Tilden, M.S., Professor of Botany
- Alice J. H. Tolg, M.D., Assistant Professor of Physical Education for Women
- Anthony L. Underhill, Ph.D., Associate Professor of Mathematics

FACULTY

II

- Roland S. Vaile, M.A., Associate Professor of Economics
Joseph Valasek, Ph.D., Assistant Professor of Physics
Marion L. Vannier, R.N., Associate Professor of Nursing and Director of
School of Nursing
John H. Van Vleck, Ph.D., Assistant Professor of Physics
Cortlandt van Winkle, Ph.D., Assistant Professor of English
Maurice B. Visscher, Ph.D., Assistant Professor of Physiology
E. Marion Wade, M.A., Assistant Professor of Preventive Medicine and
Public Health
Warren C. Waite, Ph.D., Assistant Professor of Economics
Arthur R. Walk, Captain, Infantry, Assistant Professor of Military Science
and Tactics
Wilson D. Wallis, Ph.D., Associate Professor of Anthropology
Frank K. Walter, M.A., M.L.S., Professor of Library Methods, University
Librarian
Marion Weller, B.A., Associate Professor of Textiles
Albert B. White, Ph.D., Professor of History
Harold A. Whittaker, B.A., Assistant Professor of Preventive Medicine and
Public Health
Norman Wilde, Ph.D., Professor of Philosophy and Head of the Depart-
ment of Philosophy
John J. Willaman, Ph.D., Associate Professor of Plant Chemistry
Herbert Woodrow, Ph.D., Associate Professor of Psychology
Jeremiah S. Young, Ph.D., Professor of Political Science and Chairman of
the Department of Political Science
Anthony Zeleny, Ph.D., Professor of Physics
Otto F. Bradley, B.A., Lecturer in Sociology
Joanna C. Colcord, M.S., Lecturer in Sociology
Monica K. Doyle, B.A., Lecturer in Sociology
J. Franklin Ebersole, M.A., Professorial Lecturer in Economics
Dorothea D. Kittridge, Lecturer in Economics
Belle Mead, M.A., Lecturer in Sociology
E. F. Waite, B.A., LL.B., Lecturer in Sociology
Mary P. Wheeler, Lecturer in Sociology
Helen A. Young, B.S., Lecturer in Sociology
Ira S. Allison, Ph.D., Instructor in Geology and Mineralogy
R. Wilson Archibald, D.V.M., Instructor in Preventive Medicine and Public
Health
Amy E. Armstrong, M.A., Instructor in English
Emily A. Babcock, M.A., Instructor in Latin
Emma Bach, M.A., Instructor in German
Reuel R. Barlow, B.A., Instructor in Journalism
William O. Beal, M.A., M.S., Instructor in Astronomy and Assistant
Astronomer
David R. Blanpied, B.A., Instructor in Romance Languages
Harold C. Blote, B.A., Instructor in Philosophy
Else H. Bockstruck, B.S., Instructor in Physical Education for Women

- Ruth E. Boynton, B.S., M.D., Instructor in Preventive Medicine and Public Health
- Alfred Brandt, Master Sergeant, Instructor in Military Science and Tactics
- Carlotta M. Brown, Instructor in Millinery
- J. William Buchta, M.A., Instructor in Physics
- Eula B. Butzerin, R.N., B.S., Instructor in Preventive Medicine and Public Health
- Laurence H. Cady, B.S., M.D., Instructor in Preventive Medicine and Public Health
- S. Elizabeth Carlson, Ph.D., Instructor in Mathematics
- Muriel B. Carr, Ph.D., Instructor in English
- John A. Cederstrom, Ph.B., Instructor in Animal Biology
- James A. Childs, C.E., Instructor in Preventive Medicine and Public Health
- Irene Clayton, B.S., Instructor in Physical Education for Women
- John Coop, Sergeant, Instructor in Military Science and Tactics
- Mary Starr Conger, Instructor in Physical Education for Women
- E. P. Crossen, M.S., Instructor in Agricultural Economics
- William Dehorn, Ph.D., Instructor in German
- Frances del Plaine, M.A., Instructor in English
- Grace E. Denny, B.S., Instructor in Physical Education for Women
- Ernest M. Dopp, M.A., Instructor in Botany
- Aubrey R. Dunkum, Staff Sergeant, Instructor in Military Science and Tactics
- Alexandre Duvoir, Instructor in Oboe
- Adella Eppel, M.S., Instructor in Home Economics
- Christian Erck, Instructor in Cello
- Helen Irene Erickson, R.N., Instructor in Nursing
- Irene Evans, Instructor in Physical Education for Women
- Robert D. Evans, M.S., M.D., Instructor in Bacteriology and Immunology
- George H. Fairclough, F.A.G.O., M.Mus., Assistant Professor of Music
- Ralph H. Farmer, B.A., Instructor in Economics
- Sherman W. Finger, Ph.B., Associate Professor of Physical Education and Athletics
- Hally J. Fisher, R.N., Instructor in Preventive Medicine and Public Health
- Margaret Gable, M.A., Instructor in English
- Dorothy Gary, M.A., Instructor in Sociology
- Thaddeus Giddings, Instructor in Public School Music
- Bueford M. Gile, M.A., Instructor in Agricultural Economics
- Vetta Goldstein, Instructor in Drawing and Design
- Ethel R. Gorham, M.S., Instructor in Home Economics
- Richard A. Graves, M.A., Instructor in Economics
- Margaret C. Gray, B.A., Instructor in Secretarial Studies
- George Grisez, Instructor in Clarinet
- Madeleine Guillemin, M.A., Instructor in Bacteriology and Immunology
- Marguerite Guinotte, Brevet Supérieur, Certificat d'Aptitude Pédagogique, M.A., Instructor in Romance Languages
- J. Roy Haag, M.S., Instructor in Agricultural Biochemistry

- Ford P. Hall, B.A., B.C.L., Instructor in Political Science
Halvor O. Halvorson, M.S., Instructor in Bacteriology
Richard Hartshorne, Ph.D., Instructor in Geography
Wheeler Hawley, M.A., Instructor in Romance Languages
Helen Hazelton, B.A., Instructor in Physical Education for Women
Donald C. Heath, B.S. (Arch.), Instructor in Architecture
Edna F. Heidbreder, M.A., Instructor in Psychology
F. Lincoln D. Holmes, M.A., Instructor in Public Speaking
Budd A. Holt, M.A., Instructor in Agricultural Economics
Charles B. Howe, M.A., Instructor in Agricultural Economics
Thomas P. Hughes, Instructor in Mechanical Engineering
Carlyle Jacobson, B.A., Instructor in Psychology
Michael Jalma, Band Master
Frances Johnson, Ph.D., Instructor in Mathematics
Arnold V. Johnston, M.A., Instructor in Political Science
Blanche Kendall, Instructor in Music
Helen M. Kepler, M.A., M.D., Instructor in Anatomy
Joseph T. King, M.S., M.D., Instructor in Physiology
Agnes Kolshorn, M.A., Instructor in Home Economics
Richard L. Kozelka, M.A., Instructor in Economics
Otto F. Kuhlman, M.A., Instructor in Accounting
Cary Landis, Ph.D., Instructor in Psychology
Pauline Lane, B.A., Instructor in Physical Education for Women
Theos A. Langlie, B.A., Instructor in Psychology
Harry De Witt Lees, M.D., Instructor in Preventive Medicine and Public Health and Assistant Director of Students' Health Service
Faith Leonard, B.S., Instructor in Secretarial Studies
Alex S. Levens, B.S. in C.E., Instructor in Drawing and Descriptive Geometry
Richard Lindenhahn, Instructor in French Horn
Winslow H. Loveland, M.A., Instructor in English
Thomas S. Lovering, M.E. in Geol., Ph.D., Instructor in Geology and Mineralogy
Reuel I. Lund, C.P.A., M.A., Instructor in Accounting
Duane McCracken, M.A., Instructor in Economics
Margaret E. Macgregor, M.A., Instructor in English
Ernest S. Mariette, B.S., M.D., Instructor in Medicine
Lillian M. Mayer, B.S., M.D., Instructor in Preventive Medicine and Public Health
J. Lewis Maynard, B.A., Instructor in Chemistry
Robert E. Maxwell, M.A., Instructor in Economics
Shirley P. Miller, M.A., Instructor in Anatomy
John H. Moffett, M.E., Instructor in Mechanical Engineering
Wayne L. Morse, M.A., Instructor in English
Ethel M. Mygrant, M.S., Instructor in Botany
Ernest Mylk, Private 1st Class, Spec. 4th Class, Instructor in Military Science and Tactics
Elizabeth Nissen, M.A., Instructor in Romance Languages
William A. O'Brien, M.D., Instructor in Pathology, Preventive Medicine and Public Health
Ada Olsen, Instructor in Nursing
Fern Osbeck, B.S., Instructor in Home Economics

- Henry Owens, M.A., Instructor in Romance Languages
 Helen Chelsey Peck, Instructor in Public Health Nursing
 Abe Pepinsky, Instructor in Music
 George M. Peterson, M.A., Instructor in Economics
 Carl J. Ratzlaff, B.S., M.A., Instructor in Economics
 William H. Richards, Instructor in Mechanical Engineering
 G. A. Richardson, M.S., Instructor in Agricultural Biochemistry
 Adolph Ringoen, Ph.D., Instructor in Animal Biology
 Dayton A. Rogers, Instructor in Machine Shop Practice
 James Runser, M.S., Instructor in Accounting
 Harold Russell, B.A., B.L.S., Instructor in Library Methods
 W. Martin Sandstrom, B.A., M.S., Instructor in Agricultural Biochemistry
 Karl Scheurer, Instructor in Music
 Irene I. Sell, Ph.B., Instructor in Home Economics
 Miles Sery, Instructor in Tuba and Cornet
 Katharine Sias, B.A., Instructor in Physical Education for Women
 Alethea E. Smith, B.A., Instructor in Public Speaking
 Mary Cynthia Smith, B.A., Instructor in Medical Social Service
 Walter R. Smith, B.A., Instructor in Physical Education for Men and
 Director of Intramural Athletics
 Robert L. Starkey, Ph.D., Instructor in Bacteriology
 William H. Stead, M.A., Instructor in Economics
 Clyde W. Stephens, Instructor in Piano
 Henry N. Stephens, Ph.D., Instructor in Chemistry
 Marion M. Steward, Instructor in Dietetics
 Thomas E. Steward, B.A., Instructor in Journalism
 Louise Stoddard, Instructor in Home Economics
 August L. Strand, Instructor in Entomology
 Harry E. Strider, Master Sergeant, Instructor in Military Science and
 Tactics
 William W. Swanson, B.A., M.S., Instructor in Physiology
 Harold T. Taylor, M.A., Instructor in Physical Education for Men
 W. Bayard Taylor, M.A., Instructor in Economics
 Mary A. Tebbets, B.A., Instructor in Medical Social Service and Director
 of the Division of Medical Social Service
 Gertrude I. Thomas, Instructor in Dietetics
 Faith Thompson, Ph.D., Instructor in History
 Ella A. M. Thorp, B.A., Instructor in Mathematics
 Niels Thorpe, Instructor in Physical Education for Men
 Arturo Torres-Rioseco, M.A., Certificado de Pedagogia, Instructor in
 Romance Languages
 George B. Watts, M.A., Instructor in Romance Languages
 Benjamin W. Wheeler, M.A., Instructor in History
 Isabel White, R.N., B.S., Instructor in Nursing
 Henry J. Williams, Instructor in Harp
 David H. Willson, Ph.D., Instructor in History
 Elmer E. Young, Instructor in Fine Arts
 Vernon Young, Instructor in Botany
 Nina L. Youngs, B.A., Instructor in Economics
 Carle C. Zimmermann, Ph.D., Instructor in Sociology

GENERAL INFORMATION

Admission as regular students.—To be admitted to regular standing in the College of Education students must be able to satisfy one of the following requirements:

a. Completion of the requirements for admission to the Senior College of the College of Science, Literature, and the Arts, or of the College of Agriculture, Forestry, and Home Economics, during which time at least 90 credits and 90 honor points shall have been earned. An introductory course in general psychology must be included.

b. The College of Education grants 90 credits to graduates of the advanced graduate course of Minnesota state teachers colleges.

c. In the following four-year specialized curricula students may register in the College of Education in the freshman year, provided they have completed the requirements for admission to the University:

Art Education	Physical Education for Women
Nursing Education	Public School Music
Occupational Therapy	Trade and Industrial Education
Physical Education for Men	

In all other cases of four- or five-year curricula as outlined in this bulletin, the prescribed work of the first two years is to be taken prior to the student's entrance to the College of Education. Students with two years of college training who are short certain entrance requirements will make up all deficiencies after enrolling in the College of Education.

All courses of a special curriculum should be completed, altho it may not always be possible to complete them in the order listed.

Admission as unclassified students.—The College of Education grants to graduates of the advanced Latin and the advanced English courses of the Minnesota state teachers colleges, 63 credits.

Teachers of experience who are unable to meet the regular requirements for admission are admitted to the College of Education as unclassified students.

Admission with advanced standing.—Graduates of the three-year course in the state teachers colleges of Minnesota may receive not more than 112½ credits in the College of Education.

Residence requirements.—The minimum term of residence in the College of Education is two years beginning as soon as the entrance requirements have been fulfilled.

Students may shorten the two years of residence only by meeting such additional requirements in quality and quantity of professional work as will make the training of such students equal to that of students regularly registered for two full years.

Students registered as freshmen and sophomores in the College of Education will be guided by the faculty regulations of the College of Science, Literature, and the Arts, but will be amenable to the Student Personnel Committee of this college.

Appointments Bureau.—Graduates of the College of Education qualifying for the university teacher's certificate will be recommended for positions for which they are qualified. Students on the Minneapolis campus should register with the Bureau of Recommendations, 202 Old Library Building.

Bureau of Educational Research.—The College of Education conducts a Bureau of Educational Research for the purpose of promoting investigations by faculty and students in problems of education. The bureau is under the direction of the dean of the college and the members of the faculty co-operate as their several interests dictate. Through the bureau opportunity is given for co-operation with public schools in studies bearing upon problems of school administration, classroom instruction, and related matters. The bureau is responsible for the publication of a series of studies under the general title of Educational Monographs.

Graduate work in education.—Graduate work in education leading to the degree of master of arts or doctor of philosophy may be pursued in the Graduate School. Students who desire to undertake graduate work with education as a major must have had at least 6 credits in psychology, and, in addition to this, a total of not less than 12 credits in education. Students who desire to undertake graduate work with education as a minor must have at least 6 credits in psychology, and, in addition to this, a total of not less than 6 credits in education.

All courses bearing numbers of 100 and above are open for credit to graduate students. Before attempting to make out their programs, graduate students in education should consult the dean of the College of Education and the dean of the Graduate School.

Graduate students who are candidates for advanced degrees are advised to take Ed. Psy. 116-117 or Ed. Psy. 116a and Ed. 208 unless they have previously had the equivalent of these courses. Courses bearing numbers 200 and above are open to graduate students only.

Students working for a Master's degree with a major in school administration will be required to take the following courses unless the equivalent has been taken as undergraduate work.

- Ed. Psy. 55—Educational Psychology, no credit
- Ed. 208—Methods of Educational Research, 2 credits
- Ed. Psy. 111—Educational Diagnosis, 3 credits
- Ed. Psy. 116-117 or 116a—Statistical Methods, 3 or 4 credits

Graduate work may be pursued during summer sessions. The Master's degree may ordinarily be completed in four summer sessions. For full statement of regulations, consult the Graduate School bulletin.

Graduate conference.—All graduate students majoring in education are required to meet with the department staff every alternate Monday evening from 7:15 to 9:00 for conference regarding subjects of original investigations. This work carries no credit.

Credits and honor points.—The Senate regulations governing the system of marks is as follows:

1. That there shall be four grades, A, B, C, and D, representing varying degrees of achievement, which shall be acceptable for the completion of a single course; but

this definition shall not be construed as preventing any college or school from setting special standards of performance as a condition of registration in particular courses of study, of admission to the college or school, of promotion, of counting work toward a degree, or of continued residence in the college or school. Work merely acceptable for the completion of all his single courses of study does not constitute a satisfactory record for a student when his college specifies higher requirements for any purpose.

2. There shall be two grades indicating work of distinctly unsatisfactory quality. These grades shall be known as E (condition), which may be removed by examination or other means stipulated by the faculty of the college or school concerned, and F (fail) which may be removed only by a repetition of the work in the course, or, in exceptional cases, by examination by permission of the faculty concerned.

3. There shall be a Grade I (incomplete), which shall indicate that a student, for reasons satisfactory to the instructor in charge, shall have been unable to complete the work of the course. This grade shall be given only when the work already done has been of quality acceptable for the completion of the course. Any student receiving this grade shall be given an opportunity to complete the said course within the first thirty days of his next quarter in residence.

4. There shall be a symbol, T (transferred), indicating the transfer of credit from another institution or from one college to another of the University of Minnesota. This symbol shall be provisional and subject to final evaluation by the faculty of the college or school to which the student is transferred.

The amount of work pursued by a student is estimated in credit hours; the quality or grade of his work, in honor points.

A *credit hour* is one hour per week of recitation or lecture work extending throughout one quarter, or three hours per week of laboratory work through one quarter. It is assumed that each credit hour will demand on the average three hours a week of the student's time for recitation or lecture, one hour in class and two hours of preparation; for laboratory courses, three hours in the laboratory.

Honor points are computed as follows: each credit hour with the grade of A entitles the recipient to 3 honor points; each credit hour with the grade of B entitles the recipient to 2 honor points; each credit hour with the grade of C to 1 honor point; each credit hour with the grade of D to no honor points. Illustration: A student completing a one-quarter 3-credit course and receiving the grade of A would be entitled to 9 honor points; if receiving the grade of B, to 6 honor points; if receiving the grade of C, to 3 honor points; if receiving the grade of D, to no honor points.

The degree of bachelor of science.—Students graduating from the College of Education will receive the degree of bachelor of science.

Candidates for this degree may major in any department listed on page 19.

Graduation with distinction.—The degree of bachelor of science *with distinction* is granted to graduates of this college who have attained special excellence in scholarship as evidenced by an average grade of "B." Candidates must be recommended to the faculty for the degree with distinction by their major department on the basis of scholarship and the degree of advancement of the courses pursued. The faculty has the final authority in making the award.

COURSES OF STUDY

GENERAL REQUIREMENTS

AMOUNT AND GRADE OF WORK

a. During his entire course the student must earn (1) 180 credits in addition to the required courses in drill, gymnasium, and physical education or a smaller number of credits determined as follows: For every 5 honor points in excess of one honor point per credit the number 180 is diminished by one, but no student will be recommended for graduation who has not completed all of the courses required in his particular curriculum and who has not satisfied all the requirements for a teacher's certificate; (2) $1\frac{1}{2}$ honor points per credit in his major subject; and (3) an average of 1 honor point per credit in all other courses pursued during the junior and senior years.

b. Fifteen credits are regarded as the usual load. Students who wish to register for more than 17 hours must show a record of $1\frac{1}{2}$ honor points per credit for the previous quarter. Students may not carry less than 13 hours without petition.

c. A maximum of 27 credits is elective from courses in agriculture and home economics except in the special curricula in those fields.

d. No student whose absences in any course exceeds one sixth of the scheduled meetings of the class shall be admitted to the final examination without permission of the dean of the college or of the Student Personnel Committee.

e. All students registered in the College of Education shall maintain satisfactory standards of oral and written English. A Committee on Standards of English in Education will recommend ways of remedying deficiencies and will determine when satisfactory standards have been attained.

Honor points are computed on the basis of one and one-half times the number of credits required in the major subject, e.g., in case a major recommendation requires 36 credits, the number of honor points will be 54. From among the courses carried in a department the student may select those which he will present as meeting this requirement except that he must include all courses which are specified in the departmental announcement as required for the recommendation for the certificate.

Professional lectures.—From time to time during the year lectures of general interest to students of education will be given by members of the faculty and invited speakers. All students in the College of Education are expected to attend these lectures. Special announcements will appear in the *Official Daily Bulletin*.

The University Teacher's Certificate

The university teacher's certificate is legally valid for two years as a first grade professional certificate. After two years of successful teaching experience in Minnesota, the certificate may become a life certificate, upon

endorsement by the State Department of Education and the president of the University.

The university teacher's certificate is granted only to graduates of the College of Education and to students completing work for a graduate degree who have satisfied the requirements of a special curriculum as outlined in this bulletin. Students expecting to receive this certificate upon graduation shall be registrants in the College of Education from the beginning of the junior year. Students desiring the teacher's certificate in home economics or agriculture shall also be registrants in the College of Agriculture, Forestry, and Home Economics.

The university teacher's certificate is offered in the following subjects:

Agriculture	Natural Science
Animal Biology	Norwegian
Art Education	Nursery School Education
Botany	Nursing Education
Chemistry	Occupational Therapy
Commercial Education	Physical Education for Men
Elementary Education	Physical Education for Women
Elementary School Supervision	Physics
English	Political Science
French	Public School Administration
Geography	Public School Music
German	School Psychologist
High School Normal Training	Social Studies
History	Spanish
Home Economics	Swedish
Latin	Teaching Subnormal Children
Mathematics	Trade and Industrial Education

All students without teaching experience, desiring a university teacher's certificate, will be required to comply with the prescribed requirements for the university teacher's certificate in a secondary school subject, or the specific requirements of a special curriculum. Such students will also be required to complete a two years' course leading to the degree of bachelor of science. No certificate can be granted except with a degree from the University of Minnesota.

By a proper selection of courses students qualifying for the degree of bachelor of science may qualify for a certificate in more than one field. This is desirable since most beginning teachers in public schools are required to teach more than one subject.

Prescribed Course of Study for the University Teacher's Certificate in a Secondary School Subject

Students not completing a specialized curriculum as described in this bulletin will be required to pursue the following prescribed professional courses in order to receive the Bachelor's degree and the university teacher's certificate in a secondary school subject.

H.Ed. 1	Brief Course in History of Education.....	5 credits
H.Ed. 3	Educational Sociology	3 credits
Ed.Psy. 55	Educational Psychology	3 credits
Ed.T. 15	Technique of High School Instruction.....	3 credits
Ed.Ad. 65	The High School.....	3 credits
	Special Methods and Practice Teaching.....	8 or 9 credits

The following courses *must be taken in the order named*, each being regarded as a prerequisite to all the courses which follow it:

Educational Psychology 55
 Technique of High School Instruction 15
 Special Methods and Practice Teaching

Educational Psychology is a prerequisite for The High School. (Ed. Ad. 65.)

Students who have pursued history of education in normal schools or elsewhere will be allowed to substitute for the Brief Course in the History of Education, Hist. Ed. 101, 102, or 103. Graduates of normal schools cannot take for credit Psychology 1 or 2.

In addition to the special methods and practice teaching course in the subject in which the student wishes to do practice teaching, he must satisfy the departmental requirement in the teaching subject as listed in the bulletin of the College of Education, Part II.

The courses prerequisite to the special methods and practice teaching courses should be completed by the end of the junior year. Arrangements for practice teaching in academic subjects should be made through Mr. Boardman, the principal of the University High School, and in the special subjects through the following major advisers:

Agricultural Education.....	A. V. Storm
Art Education.....	Ruth Raymond
Home Economics.....	Clara Brown
Industrial Education.....	Homer J. Smith
Physical Education for Men.....	G. F. Keller
Physical Education for Women.....	J. Anna Norris
Public School Music.....	T. P. Giddings
Subnormal Education.....	John G. Rockwell

Arrangements for practice teaching should be made before the close of the quarter immediately preceding the quarter in which the practice teaching is to begin.

The teacher's courses in methods of teaching and in practice teaching are combined into a one-year course in the following subjects:

English	German
Mathematics	Latin
Secondary school science	Romance languages (French and Spanish)
History and social science	Commercial subjects

Prescribed Courses for the University Certificate for Elementary School Teachers

Students who have been graduated from a two-year normal training course or its equivalent and who wish to work for the Bachelor's degree in education and the university teacher's certificate for elementary school teachers may enroll in the College of Education. The courses listed below as required presuppose a full two-year normal training course.

REQUIRED COURSES

No.	Title	Credits
Ed.Psy. 55	Educational Psychology	3
Ed.Psy. 111	Educational Diagnosis	3
Ed.Soc. 3	Educational Sociology	3
Ed.Ad. 119-120	Elementary School Curriculum	4
Hist.Ed. 103	History of Modern Elementary Education.....	3
Ed.Ad. 160	Elementary School Supervision.....	3
Ed.Ad. 124	Educational Administration	3
Ed.Psy. 116	Educational Statistics	2
Ed.T. 44	Children's Literature	3

Seven hours to be elected from courses listed below

Ed.Ad. 168	The Junior High School.....	3
Ed.T. 148	Teachers' and Supervisors' Course in Arith. (lower grades)....	2
Ed.T. 149	Teachers' and Supervisors' Course in Arith. (upper grades)....	2
Ed.T. 43	The Teaching of English in the Elementary School.....	2
Ed.T. 45	Teaching of History and Geography.....	2
Ed.T. 23	The Teaching of Geography.....	3
Ed.T. 181	Technique of Elementary Instruction.....	3
	Special methods courses in elementary and junior high school teaching.	

Total required credits.....	36
18 credits in each of two of the following fields or such others as may be approved: English, history, languages, political science, science, mathematics, geography.....	36
General electives	18
Total credits required for certificate.....	90

SPECIALIZED CURRICULA IN ADMINISTRATION OR SUPERVISION

The following specialized curricula are prescribed for prospective superintendents of schools, elementary school principals or supervisors, and high school principals. These curricula require five years for completion, two years in the Junior College, two years in one of the three special curricula in the College of Education, and one year in the Graduate School. The satisfactory completion of four years of work entitles the student to the degree of bachelor of science and to the university teacher's certificate. The satisfactory completion of the fifth year's work entitles the student to the Master's degree and the certificate in administration or supervision.

1. *Students from other institutions.*—Students entering from other institutions may qualify for the certificate in administration or in supervision, either by meeting the requirements set forth below or by making such substitutions or modifications as his previous education and training shall warrant. All substitutions or modifications of these requirements must meet with the approval of the student's major adviser and the faculty.

2. *Extra-curricular activities.*—The student who is anticipating the field of public school administration as his life work should avail himself of the opportunities which the University offers for the development of leadership and those personal qualities essential to success in the administrative

field. Under guidance, he should select for active participation those extra-curricular activities which offer the best training and experience suitable to his individual needs.

3. *Teaching minors.*—Students anticipating the certificate in administration or supervision must complete two teaching minors during the four years of undergraduate work, which shall include a course in special methods and practice teaching in one of these minors. A third teaching minor is desirable. Students should have these requirements in mind when planning their junior college work. The teaching minors* may be selected from any two of the following fields: English, foreign language, history, and social science, mathematics, science. Other teaching minors may be selected on the approval of the major adviser and the faculty.

CURRICULA IN ADMINISTRATION OR SUPERVISION

A. GENERAL JUNIOR COLLEGE CURRICULUM

FOR ALL STUDENTS ANTICIPATING A UNIVERSITY CERTIFICATE IN ADMINISTRATION OR SUPERVISION

<i>Freshman Year</i>					
FALL	CREDITS	WINTER	CREDITS	SPRING	CREDITS
English A	5	English B	5	English C	5
History 1	5	History 2	5	Political Sci. 1	5
Natural Science	5	Natural Science	5	French or German ¹	5
Military Science		Military Science		Military Science	
Physical Education		Physical Education		Physical Education	
	—		—		—
	15		15		15
<i>Sophomore Year</i>					
CREDITS	CREDITS	CREDITS	CREDITS	CREDITS	CREDITS
Psychology 1	3	Psychology 2	3	Sociology 1	5
Economics 8	3	Economics 9	3	Electives ²	10
Electives ²	9	Electives ²	9	Military Science	
Military Science		Military Science		Physical Education	
Physical Education		Physical Education			
	—		—		—
	15		15		15

* See departmental course outlined for minor requirements.

¹ Twenty credits must be secured in either French or German in the University if no work in these languages was presented for entrance. (See schedule in the bulletin of the College of Science, Literature, and the Arts, Part I, page 6.)

² The electives should be selected in view of the teaching minor requirements.

B. CURRICULA IN COLLEGE OF EDUCATION—SPECIALIZED CURRICULA IN ADMINISTRATION OR SUPERVISION

I. THREE-YEAR CURRICULUM FOR SUPERINTENDENTS OF SCHOOLS AND ELEMENTARY SCHOOL PRINCIPALS

Major Adviser: Fred Engelhardt

Junior Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Ed.Psy. 55, Ed.Psy.	3	H.Ed. 3, Ed. Soc.	3	H.Ed. 103, Hist. of Ed. 3	
Ed.Psy. 116, Statist.		Ed.T. 15, Tech. of H. S.		Ed.Ad. 65, The H. S. . .	3
Meth.	2	Instruc.	3	Electives ¹	9
Electives ¹	10	Electives ¹	9		
	—		—		—
	15		15		15

Senior Year

Credits		Credits		Credits	
Spec. Meth. and Pract.		Spec. Meth. and Pract.		Spec. Meth. and Pract.	
Teach.	3	Teach.	3	Teach.	3
Ed.Ad. 124, Ed. Admin. 3		Ed.Ad. 125, Ed. Admin. 3		Ed.Ad. 115, Prac. Sup. 3	
Ed.Psy. 134, Men. Tests 2		Ed.Ad. 160, Supervision 2		Ed.Ad. 123, H. S. Sup. 3	
Ed.T. 181, Tech. of		Electives ¹	7	Electives ¹	6
Elem. Instr.	3				
Electives ¹	4				
	—		—		—
	15		15		15

II. THREE-YEAR CURRICULUM FOR HIGH SCHOOL PRINCIPALS

Major Adviser: L. V. Koos

Junior Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Ed.Psy. 55, Ed. Psy. ...	3	H.Ed. 3, Ed. Soc.	3	Ed.T. 15, Tech. of Teach. 3	
Ed.Psy. 116, El. Statist.		Ed. 102, Hist. of Mod.		Ed.Ad. 65, The High	
Meth.	2	Sec. and Higher Ed. . .	3	School	3
Electives ¹	10	Electives ¹	9	Electives ¹	9
	—		—		—
	15		15		15

Senior Year

Credits		Credits		Credits	
Spec. Meth. and Pract.		Spec. Meth. and Pract.		Spec. Meth. and Pract.	
Teach.	3	Teach.	3	Teach.	3
Ed.Ad. 124, Ed. Admin. 3		Ind.Ed. 61, Soc. Signif. of		Ed.Psy. 111, Ed. Diag. 3	
Ed.Psy. 134, Men. Tests		Voc. Ed.	2	Ed.Ad. 123, Supvr. of	
and Men. Diag.	2	Ed.Ad. 113, High Sch.		H. S. Instr.	3
Ed.Ad. 160, Prin. of Sup. 2		Cur.	3	Ed.Ad. 133, Guidance in	
Electives ¹	5	Electives ¹	7	Sec. Schools	3
	—		—	Electives ¹	3
	15		15		15

¹ Selection under guidance from the following additional courses is recommended: Ind. Ed. 171, Administration of Industrial Education 3; Public Health 53, Elements of Preventive Medicine 3; Public Speaking and Journalism 6; Physical Education 97, Organization and Administration of Physical Education 3; Agricultural Administration 151, 3.

COLLEGE OF EDUCATION

III. THREE-YEAR CURRICULUM FOR ELEMENTARY SCHOOL SUPERVISORS

Major Adviser: Leo J. Brueckner

Junior Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Ed. Psy. 55, Ed. Psy.	3	H.Ed. 3, Ed. Soc.	3	Ed. Psy. 111, Ed. Diag. . . .	3
Ed. Psy. 116, El. Statis. . . .		Ed. T. 44, Child. Lit. . . .	3	H. Ed. 103, Hist. Mod. . . .	
Meth.	2	Elective ¹	9 or 10	El. Ed.	3
Elective ¹	10			Ed. Ad. 119, El. Curric. . .	3
	—		—	Elective ¹	6 or 7
	15		15 or 16		15 or 16

Senior Year

		Credits	Credits	Credits
Ed. Ad. 160, Prin. of		Ed. Ad. 161, Supervision 2	Ed. Ad. 162, Supervision 2	
Super.	2	Ed. Ad. 125, City School	Ed. Ad. 115, Pract. Supr. 3	
Ed. Ad. 124, Ed. Admin. 3		Admin.	Elective ¹	10
Ed. Psy. 134, Men. Tests 2		Elective ¹		
Elective ¹	8			
	—		—	—
	15		15	15

Seven hours to be elected from courses listed below

Ed. Ad. 168	The Junior High School.	3
Ed. T. 148	Teachers' and Supervisors' Course in Arithmetic (lower grades) . . .	2
Ed. T. 149	Teachers' and Supervisors' Course in Arithmetic (upper grades) . . .	2
Ed. T. 43	Teaching of English in Elementary School.	2
Ed. T. 45	Teaching of History and Geography.	2
Ed. T. 181	Technique of Elementary Instruction.	3
	Special methods courses in elementary and junior high school teaching.	
Ed. T. 23	Teaching of Geography	3
Ed. Ad. 161B	Adjustment of Schools to Individual Differences.	2
	Total required credits.	44
	18 credits in each of two of the following fields or such others as may be approved: English literature, history, languages, political science, science, mathematics, geography.	36
	General electives	10
	Total credits required for certificate.	90

C. GRADUATE SCHOOL CURRICULUM

Fifth Year

FOR STUDENTS ANTICIPATING A CERTIFICATE IN ADMINISTRATION OR SUPERVISION

The candidate for the certificate of administration or supervision in any one of the following fields (superintendent of schools, elementary principal, elementary supervisor, and secondary school principal) must satisfactorily complete the requirements for the Master's degree (see Graduate School bulletin). The language requirement may be waived in all cases where a language is not essential in the thesis or the work to be pursued.

The work of the student shall constitute a major in educational administration and supervision and a minor in educational psychology.

¹ Students without normal school training or experience in the elementary field are advised not to take this course, except with the permission of the major adviser and the faculty.

AGRICULTURAL EDUCATION

Major Adviser: A. V. Storm

GENERAL STATEMENT

Students who desire to teach agriculture in the high schools or other secondary schools may, upon graduation, obtain the university teacher's certificate in addition to the regular college degrees, by registering in both the College of Education and the College of Agriculture, Forestry, and Home Economics, in the junior and senior years. It is desirable to consult the head of the Department of Agricultural Education earlier to avoid difficulties that may arise in the program of specialization. The university teacher's certificate entitles the holder to teach agriculture in any Minnesota high school for two years. Upon satisfactory completion of the teaching of these two years, the holder may have the certificate renewed as a life certificate by approval of the president of the University and the State Commissioner of Education.

FRESHMAN AND SOPHOMORE COURSES

The courses during the freshman and sophomore years are the same as are required of all agriculture students in the College of Agriculture. Every student should, if possible, complete these subject courses before the end of the sophomore year. Any subjects that cannot be taken in the freshman or sophomore years must take precedence the following year. Care should be taken in registration to give precedence to courses offered only one quarter. See bulletin, College of Agriculture, Forestry, and Home Economics.

JUNIOR AND SENIOR COURSES

(Required for university teacher's certificate in agriculture)

For the junior and senior years the following curriculum has been approved by the College of Agriculture, Forestry, and Home Economics, and the College of Education and is required of all students who are candidates for the university teacher's certificate in agriculture.

JUNIOR YEAR

SENIOR YEAR

Fall Quarter

Agr. Ed. 11f,w,s, Principles of Vocational Education, 3	Agr. Ed. 154f,w, Rural Education and Community Life, 3 (Agr. Ed. 11) or Sociol. 14f,w,s, Rural Sociology, 3 (Sociol. 1 or sr. class)
Agr. Ed. 21f, Vocational Education, 3	Agron. 102f,w, Farm Management: Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
Agron. 121f, Cereal Crops, 3 (Agron. 1)	Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 10)
Agron. 131f,w, Principles of Genetics, 3 (Bot. or An. Biol. 9 cred.)	Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
An. Husb. 2f, Types and Breeds of Live-stock, 3 (An. Husb. 1)	Pl. Path. 1f,w, Plant Pathology, 5 (Bot. 9 cred.)
Hort. 6f, Fruit Growing, 3 (May be omitted if completed as a part of the general requirements)	Electives
Electives, 0 or 2	

Winter Quarter

Agr. Ed. 41f,w,s, Apprentice Teaching, 2 (See tabular statement)	Agr. Econ. 141w, Marketing Organization: Semi-Perishables, 3 (Agr. Econ. 140)
Agron. 122w, Corn and Potato Crops, 3 (Agron. 1)	Agr. Ed. 42f,w,s, Teaching, 3 (See tabular statement)
An. Husb. 3w, Types and Breeds of Live- stock, 3 (An. Husb. 2)	Agr. Ed. 75f,s, Visual Presentation, 3 (Agr. Ed. 11)
Ent. 3f,w, Economic Entomology, 3 (An. Biol. 16)	Agron. 103w,s, Farm Management: Op- eration, 3 (Agron. 102)
Electives	Vet. 9w, Veterinary Studies, 3 Electives

Spring Quarter

Agr. Econ. 140f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)	Agr. Ed. 151w,s, Organization and Man- agement, 5 (Agr. Ed. 11, 21)
Agr. Ed. 131w,s, Methods in Teaching High School Agriculture, 5 (See tabu- lar statement)	Agr. Engr. 40f,s, Mechanical Training I, 3 Vet. 10s, Veterinary Studies 3, (Vet. 9) Electives
Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1)	
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)	

ART EDUCATION

FOUR-YEAR CURRICULUM IN THE COLLEGE OF EDUCATION

Major Adviser: Ruth Raymond

The following special curriculum in art education qualifies the student to teach art in grades or high schools, and to supervise art instruction. Art courses are open at the beginning of the freshman year to those registering in the College of Education.

- Major subject—art, including the following minimal requirements:
 - 18 credits in design
 - 18 credits in drawing
 - 12 credits in handicrafts¹
 - 5 credits in art history and appreciation²
 - 3 credits in teacher's course in art
 - 6 credits in practice teaching
 - Minor subject—education, with the following requirements:
 - 3 credits in educational psychology
 - 5 credits in history of education
 - 3 credits in educational sociology
 - 3 credits in technique of teaching
 - 3 credits in secondary education
- See Teacher's Course and Practice Teaching above.
- Minor subjects—18 (minimal number) credits chosen from any department whose courses are accredited in the College of Education.
 - Required supporting courses:
 - 15 credits in composition
(The 9-credit course in rhetoric for technical students may be substituted)
 - 6 credits in general psychology
 - 3 credits in textiles
 - 10 credits in history (if high school history of ancient, medieval, and modern periods is not offered for entrance)
 - 10 credits in science (if minor subject is home economics or trade education)
 - Electives, which are recommended to be in a modern language, a science, or a social science, if the minor subject has not involved these departments.

¹ Courses 10f and 11w in Trade and Industrial Education (see page 72) may be chosen to fulfill a portion of this requirement.

² These credits may be chosen from the following courses: Art Ed. 70, Art Ed. 53, 54, Art Appreciation 1, Home Economics 51, Greek 42, 43, 44, 45.

COMMERCIAL EDUCATION

Major Adviser: G. W. Dowrie

The curriculum in commercial education is designed to prepare teachers of commercial subjects in secondary schools. It is purposely made much broader in its scope than the present program of the typical high school commercial department, with the idea of paving the way for meeting more effectively than at present the needs of high school students who enter business.

The first two years' work, taken in the Junior College, Science, Literature, and the Arts, consists of the regular academic requirements of that college, with the foreign language requirement omitted and foundation courses in psychology, economics, statistics, and accounting added.

The junior and senior years in the College of Education consist of certain prescribed courses in education and commerce, considerable leeway being left for electives in the two fields and in other departments.

Students who enter the College of Education from other institutions must substitute for some of their electives such of the junior college requirements as they have not fulfilled.

For students preparing to become teachers of shorthand and typewriting, Secretarial Training (Economics 94-99 inclusive) or the equivalent, to be approved by the instructor, is a prerequisite for the teachers' course (Ed.T. 80, 81, and 82). The two-year secretarial sequence should be started at the beginning of the sophomore year.

JUNIOR COLLEGE

1. 15 credits in English (English A-B-C).
2. 10 credits in one natural science.
3. 10 credits in one social science, other than economics.
4. 5 credits in Mechanism of Exchange (Economics 3).
5. 10 credits in General Economics (Economics 6-7).
6. 6 credits in General Psychology (Psychology 1-2).
7. 8 credits in Principles of Accounting (Economics 25-26).
8. 5 credits in Elements of Statistics (Economics 14).
9. 21 credits of electives, for which the following are especially recommended: continuation of a language begun in high school, public speaking, philosophy, additional social science.

COLLEGE OF EDUCATION

Junior Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
H.Ed. 1, History of Education	5	Ed.Psy. 55, Educational Psychology	3	Ed.T. 15, Technique of Teaching	3
H.Ed. 3, Educational Sociology	3	Econ. 52, Business Law ..	3	Ed.Ad. 65, The High School	3
Econ. 51, Business Law ..	3	Electives	8 to 11	Econ. 53, Business Law ..	3
Electives	4 to 7			Econ. 139, Advanced General Accounting	3
				Electives	3 to 5

Senior Year

FALL	Credits	WINTER	Credits	SPRING	Credits
Ed. T. 80, Teacher's Course in Commercial Education	3	Ed. T. 81, Teachers' Course in Commercial Education	3	Ed. T. 82, Teachers' Course in Commercial Education	3
Geog. 61, Geography of Commercial Production	5	Econ. 141, Monetary and Banking Policy	3	Geog. 62, Trade Routes and Trade Centers....	3
Econ. 161, Labor Problems	3	Electives .....	.8 to 11	Econ. 86, Office Management	3
Electives .....	.3 to 6			Econ. 85, Economics of Marketing	3
				Electives .....	.3 to 5

Recommended Electives

	Credits
Secretarial Training (Economics 94 to 99, inclusive).....	15 to 30
Advertising (Psychology 56 and Economics 88).....	6
Merchandising (Economics 180-181-182C).....	3 to 9
Industrial History (History 80-81).....	6
Personnel Management (Economics 167).....	3
Additional English Composition	6
Corporation Finance (Economics 155).....	3
Survey of Cost Accounting (Economics 130).....	3
Economics of Transportation (Economics 172).....	3

HIGH SCHOOL NORMAL TRAINING

Major Adviser: W. E. Peik

The special curriculum for persons preparing to teach normal training in Minnesota high schools is organized from the beginning of the freshman year, the first two years of which are taken in the Junior College. Students may begin on this curriculum upon entrance to the University but successful teaching experience in the elementary, preferably the rural, field is essential to qualify for these positions. Advanced normal graduates will complete the work in two years by making the necessary selection of courses to satisfy the four-year curriculum leading to the degree and the university certificate.

FOUR-YEAR CURRICULUM

Freshman Year

FALL	Credits	WINTER	Credits	SPRING	Credits
An. Biol. 14, Animal Biology	3	An. Biol. 15, Animal Biology	3	An. Biol. 16, Animal Biology	3
Eng. A, Fr. English....	5	Eng. B, Fr. English....	5	Eng. C, Fr. English....	5
Hist. 1 or 2, Modern World	5	Hist. 2 or 3, Modern World	5	Pol. Sci. 1, Am. Govt. . .	5
Art. Ed. 1Tf, Fundamental Princ. of Design	2	Art. Ed. 2Tw, Fundamental Princ. of Design	2	Art. Ed. 3Ts, Fundamental Princ. of Design	2
Phys. Ed. 1f, Elem. Phys. Train.	0	Phys. Ed. 2w, Elem. Phys. Train.	0	Phys. Ed. 3s, Elem. Phys. Train.	0
—	15	—	15	—	15

Sophomore Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Bot. 4, General Botany..	3	Bot. 5, General Botany..	3	Bot. 6, General Botany..	3
Soc. 1, Sociology.....	5	Psy. 1, General Psychology	3	Psy. 2, General Psychology	3
Rhet. 11, Description, or		Rhet 12, Narration, or		Rhet. 20, Exposition, or	
Pub. Sp. 41, Public Speaking	5	Pub. Sp. 42, Public Speaking	3	Pub. Sp. 43, Public Speaking	3
Art Ed. 37T, Weaving		Art Ed. 7, Sketch, or		Art Ed. 8, Sketch, or	
Basketry	1	Art Ed. 4, Still Life... 1		Art Ed. 5, Still Life... 1	
Art Ed. 38T, Allied		Phys. Ed. 17, Games and		Phys. Ed. 18, Games and	
Crafts	1	Folk Dancing	0	Folk Dancing	0
Phys. Ed.	0	Geog. 51w, Human Geog. 5		Geog. 52s, Int. to Regional Geog.	5
Elective	2				
	—		—		—
	15		15		15

Junior Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Eng. 44, Am. Literature	3	Eng. 45, Am. Literature	3	Eng. 8, Shakespeare... 4	
Hist. 7, Am. Hist.	5	Hist. 8, Am. Hist.	5	H. Ed. 103, Hist. of	
Ed. Psy. 55, Ed. Psy. ...	3	P.H. 50, Pub. and Personal Health	3	El. Ed.	3
Art. Ed. 41, Pottery... 2		Art Ed. 32, Cardboard and		Art Ed. 44T, Application	
Phys. Ed. 43, Play and		Paper Con., or.....		of Design to Fabric. 1	
Playground	½	Art Ed. 37T, Bookbinding	1	Ed. Psy. 111, Ed. Diagnosis	3
Elective	2	Phys. Ed. 44, Play and		Phys. Ed. 45, Play and	
	—	Playground	3	Playground	½
	15½		—	Elective	
			15		—
					15½

Senior Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Ed.Ad. 119, El. Curriculum	3	Ed.Ad. 161, Sup. of Elem. Inst.	2	Ed.Ad. 112, Sup. of El. Inst.	2
Ed.Ad. 160, Prin. of Supervision	2	Ed.T. 46, Practice Teaching with Special Methods	5	Soc. 14, Rural Sociol. . .	3
F. 148, Teacher's Course in Arith. (lower grades)	2	Art. Apprec. 1, Art Appreciation	2	Ed.T. 189, Teachers' Course in Arith. (upper grades)	2
Ed.T.43, Teaching of Eng. in Elem. School	2	H.E. 40, Child Training	3	Ed.T. 23, Teachers' Course in Geog.	3
Ed.T181, Tech. of Elem. Instruct.	3	Elective	3	Ed.Ad. 115, Practice Supervision	3
Phys.Ed. 60, Minor Sports with Tech.	1			Phys.Ed. 61, Minor Sports with Tech.	1
Elective	2			Elective	1
	—		—		—
	15		15		15

HOME ECONOMICS EDUCATION

Major Adviser: Wylle B. McNeal

For the junior and senior years the following courses 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 the university 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 who expects to teach home economics and who expects to obtain the university endorsement for a certificate must meet the following requirements: (A) a minimum of 22 credits in professional work, (B) the special scholarship requirement, (C) home practice in foods and cookery, and (D) completion of all of the subjects listed under any one of the 5 lines of specialization described below.

REQUIREMENTS FOR THE UNIVERSITY TEACHER'S CERTIFICATE
IN HOME ECONOMICS

Students in the Home Economics Course desiring to qualify as teachers must comply with the following requirements:

A. Completion of 22 credits of *professional work*, including

JUNIOR YEAR

Ed. Psy. 55f,w,s, Ed. Psy. 3 (Psy. 1-2)
or Agr. Ed. 11f,w,s, Principles of Vocational Education, 3

H.E. Ed. 40f, Child Training, 3 (Psy. 1-2)
Hist. and Phil. of Ed. 5s, Public Ed. in U. S. 3 (Psy. 1-2)

H.E. Ed. 42f,w,s, Special Methods of Teaching Home Economics, 5 (H.E. 13, 22, Psy. 1-2, Ed. Psy. 55 or Agr. Ed. 11)

SENIOR YEAR

H.E. Ed. 46, 47, 48, or 49f,w,s, Observation and Teaching, 8 (H.E. Ed. 42)

B. Satisfaction of special *scholarship requirement*

Prior to registration for Observation and Teaching the student must have a grade of C in each of the following Home Economics courses: Garment Making, Dressmaking, Textiles, Foods and Cookery, Food Economics, Drawing and Design, and Advanced Design.

C. Home practice in foods and cookery following courses H.E. 21 and 22 is required as a prerequisite to Observation and Teaching. A conference with a Home Economics instructor should precede this work and an examination must be passed.

D. Completion of one of the following subject-matter courses:

GENERAL TEACHERS' CURRICULUM

Junior Year

- Agr. Econ. 1w,s, Principles of Economics, 5.
 H.E. 37f,s, Health Care of the Family (Bact. 51) Physiol. 4.
 H.E. 52f,w,s, Art History and Appreciation, 3 (H.E. 51).
 H.E. 53f,w,s, Advanced Design, 3 (H.E. 51).
 Rhetoric 22f,w,s, Public Speaking, 5 (Rhet. 3).
 H.E. 23f,w, Nutrition I, 5 (H.E. 2, Bact. 51, Agr. Biochem. 3).
 H.E. 108f,w,s, Nutrition II, 5 (H.E. 23).
Electives.—Enough electives should be selected to make up, with those courses listed above and the professional courses, from 15 to 17 credit hours each quarter. Full work for the year consists of 48 credit hours.

Senior Year

- H.E. 17f,w,s,su, Advanced Clothing Construction, 3 (H.E. 13, 52, 53).
 H.E. 36f,w,s, Home Management: Operation and Maintenance, Lect., 3 (H.E. 22).
 H.E. 35f,w,s, Home Management: Operation and Maintenance, Laboratory, 6 (H.E. 22, Home Practice in Foods and Cookery, Prev. Med. 52, and H.E. 40 prereq. or parallel, 34 parallel).
 H.E. 103f,w,s, Nutrition of the Family, 3 (H.E. 23, 108 or parallel).
 H.E. 104, Field Work in Nutrition, 3. (H.E. Ed. 40, 103 or parallel).
 or
 H.E. 156, Hospital Social Service, 3 (108, 103 or parallel).
 H.E. 123w,s, Clothing Economics, 2 (H.E. 12, Econ. 5).
 H.E. 131f,w,s, Home Management: House Planning and Equipment, 5 (H.E. 52, 53).
 Agr. Economics 126, Economics of Consumption, 3 (Econ. 5).

TEACHERS' CURRICULUM IN FOODS AND HOME MANAGEMENT

Students specializing in this course may omit the following subjects from the Teachers' Curriculum in Home Economics:

Senior Year

- H.E. Econ. 49f,w, Observation and Teaching, 8 (H.E. 42, Ed. 55 or Agr. Ed. 11).

They shall add the following subjects to the Teachers' Curriculum in Home Economics:

- H.E. 25w, Experimental Cookery, 3 (H.E. 22).
 H.E. 109s, Advanced Nutrition, 5 (H.E. 108).
 H.E. Ed. 47f,w, Observation and Teaching, 8 (H.E. 34, 35, 42).

CURRICULUM IN TEXTILES AND CLOTHING

Students specializing in this curriculum may omit the following subjects from the General Teachers' Curriculum in Home Economics:

Junior Year

- H.E. 23f,w, Nutrition I, 5 (H.E. 21, Bact. 51, Agr. Biochem. 3).
 H.E. 108f,w,s, Nutrition II, 5 (H.E. 23).

Senior Year

- H.E. Ed. 49f,w,s, Observation and Teaching, 8 (H.E. Ed. 42, Ed. Psy. 55 or Agr. Ed. 11).
 H.E. 103, Nutrition of the Family, 3.
 H.E. 104, Field Work in Nutrition, 3 or H.E. 156, Hospital Service, 3.

They shall add the following subjects to the Teachers' Curriculum in Home Economics:

Junior Year

H.E. 55f, Decorative Needlework and Other Crafts, 3 (H.E. 51, 53, or parallel).

Senior Year

H.E. 18s, Commercial Clothing Manufacture, 4 (H.E. 17).

H.E. Ed. 48f,w,s, Observation and Teaching (H.E. Ed. 42, Ed. Psy. 55 or Agr. Ed. 11).

H.E. 122w,s, Advanced Textiles, 3 (H.E. 3, Agr. Econ. 1).

CURRICULUM IN RELATED ART

Students specializing in this course may omit the following subjects from the Teachers' Curriculum in Textiles and Clothing:

Senior Year

H.E. Ed. 48f,w,s, Observation and Teaching of Textiles and Clothing, 8.

H.E. 18s, Commercial Clothing Manufacture, 4.

H.E. 122w,s, Advanced Textiles, 3.

Agr. Econ. 126, Economics of Consumption, 3 (Econ. 1).

They shall add the following courses:

Junior Year

Art Ed. 4-5-6; Art Ed. 7-8-9.

H.E. 58, Costume Design, 3 (H.E. 13, 53, recommended 55).

Senior Year

Art Ed. 29-30-31.

H.E. 57s, Batik and Other Crafts, 3 (H.E. 3, 53 or 11).

H.E. 54, Interior Design 3 (H.E. 52, 53).

H.E. Ed. 46f,w, Observation and Teaching of Related Art, 8 (H.E. Ed. 42, H.E. 43 or parallel and 11.)

H.E. Ed. 43w, Organization and Methods for Related Art Teaching, 3 (H.E. Ed. 42 or parallel, H.E. 53, 131 or parallel).

CURRICULUM IN HOME ECONOMICS EXTENSION

Students having had two or more years of experience in teaching and who wish to go into Home Economics Extension work, should take the Teachers' Curriculum in Home Economics and add the following courses as electives:

Junior Year

Soc. 14f,w,s, Rural Sociology, 3 (1 or sr. class).

Agr. Ed. 75w,s, Visual Presentation, 3 (Agr. Ed. 11).

Senior Year

H.E. 44w, Home Economics Extension Work, 3 (H.E. Ed. 42, 49 or parallel).

NATURAL SCIENCE

Advisers: H. A. Erikson, I. W. Geiger, J. A. Smith

Students preparing to teach science in Minnesota high schools should qualify to give instruction in two or more sciences, since almost all positions open to graduates require teaching in at least two fields. As a matter of fact most Minnesota schools now require instruction in general science for which the teacher should be trained in both biological and physical sciences. While it is possible to meet the major or minor sequences in one or more of any of the sciences as in other academic subjects, the following special curriculum in natural science is recommended for those persons de-

siring to secure the best preparation for the teaching of high school science. It requires:

1. Completion of 30 hours of work in one of the four natural sciences: chemistry, botany, animal biology, physics. (On account of the mathematics requirements, students majoring in physics may satisfy the requirement by offering but 25 hours.) In the program above the word *major* means any one of these four subjects.
2. Completion of 15 hours, from one to five natural sciences: chemistry, physics, botany, animal biology, geology. This course is designated a *minor*.
3. Completion of introductory courses in two of three of the courses named under (2) not major or minor.
4. Completion of ten hours in chemistry.

The above curriculum should be elected at the beginning of the freshman year. In general it permits a student to meet the requirements for admission to the College of Education except in the case of students majoring in physics. Such students should take Mathematics 6, 7, and 30 during the first four quarters of their course, 10 hours of natural science (instead of 15), begin foreign language during the third quarter, and postpone work in social science until after entering the College of Education at the beginning of the junior year. Students are advised to continue work in their major science through the senior year. Students finding it necessary to modify their programs to meet this schedule will be relieved from meeting other admission requirements of the College of Education by the beginning of the junior year. The following sample curricula are offered to show the distribution of courses:

FOUR-YEAR CURRICULUM
FOR THOSE MAJORING IN NATURAL SCIENCE ASIDE FROM PHYSICS

JUNIOR COLLEGE

Freshman Year

Credits		Credits		Credits	
FALL		WINTER		SPRING	
English A	5	English B	5	English C	5
Natural science	5	Natural science	5	Natural science	5
Foreign language	5	Foreign language	5	Foreign language	5

Sophomore Year

Credits		Credits		Credits	
FALL		WINTER		SPRING	
Foreign language	5	Social science	5	Social science	5
Major	5	Major	5	Major	5
Psychology 1	3	Psychology 2	3	Natural science	5
Electives	3	Electives	3		

COLLEGE OF EDUCATION

Junior Year

Credits		Credits		Credits	
FALL		WINTER		SPRING	
Major	5	Major	5	History of Education I.	5
Natural science	5	Electives	5	Technique of H. S. Inst.	3
Ed. Psychology 55	3	Ed. Sociology 3	3	Electives	7
Electives	3	Electives	3		

COLLEGE OF EDUCATION

Senior Year

FALL	Credits	WINTER	Credits	SPRING	Credits
Natural science	5	Natural science	5	Teachers' Course 64	3
The High School (Ed.Ad. 65)	3	Teachers' Course 63	3	Electives	12
Teachers' Course 62	3	Electives	7 or 8		
Electives	4 or 5				

NATURAL SCIENCE COURSE WITH A MAJOR IN PHYSICS

JUNIOR COLLEGE

Freshman Year

FALL	Credits	WINTER	Credits	SPRING	Credits
English A	5	English B	5	English C	5
Natural science	5	Natural science	5	Foreign language	5
Mathematics 6	5	Mathematics 7	5	Mathematics 30	5

Sophomore Year

FALL	Credits	WINTER	Credits	SPRING	Credits
Physics 3 and 4	4	Physics 23 and 24	4	Physics 43 and 44	4
Foreign language	5	Foreign language	5	Foreign language	5
Mathematics 50	5	Mathematics 51	5	Mathematics 52	5
Psychology 1	3	Psychology 2	3	Electives	2 to 3

COLLEGE OF EDUCATION

Junior Year

FALL	Credits	WINTER	Credits	SPRING	Credits
Physics 33 and 34	4	Physics 134	3	Physics 124	3
Natural science	5	Natural science	5	Natural science	5
Ed. Psychology 55	3	Ed. Sociology 3	3	History of Education 1	5
Electives	5	Electives	5	Technique of H. S. Inst. 3	

Senior Year

FALL	Credits	WINTER	Credits	SPRING	Credits
Physics 144	3	Natural science	5	Natural science	3
The High School (Ed.Ad. 65)	3	Special Methods and Practice Teaching, T63	3	Special Methods and Practice Teaching, T64	3
Special Methods and Practice Teaching, T62	3	Electives	8	Electives	9
Electives	5				

FIVE-YEAR COURSES

Many students will find it difficult to secure all of the training they desire within the limits of a four-year period. For those who find it possible to continue their training for an additional year, it is recommended that they pursue work in either of two majors—(1) they may continue their natural science major in the Graduate School and minor in education or (2) they may major in education and carry natural science as a minor.

COURSES OF STUDY

35

FIFTH-YEAR SEQUENCES
EDUCATION

No.	Title	Credits
Major:		
Ed.Psy. 106f-107w-108s	Advanced Educational Psychology.....	9
Ed.Psy. 111f-112w	Educational Diagnosis	4
Hist.Ed. 102w	History of Modern Secondary Education.....	3
Ed. 208f	Methods of Educational Research.....	2
		—
		18
	Thesis	
Minor:		
106f-107w-108s		

BOTANY

No.	Title	Credits
Major:		
Bot. 113-114	Advanced Taxonomy	6
Bot. 118	Cytology	3
Bot. 131	Field Ecology	5
Bot. 141	Physical Phases of Plant Physiology.....	5
		—
		19
	Thesis	
Minor:		
Bot. 131 and 141		

CHEMISTRY

Prerequisite requirements for graduate work:

Organic Chemistry 51-52-53 (15 credits), in addition to introductory courses in General, Qualitative, and Quantitative Chemistry.

No.	Title	Credits
Major:		
Phys.Chem. 101-102-103	Physical Chemistry	9 to 15
Org.Chem. 103-104-105	Advanced Inorganic	9
		—
		18
Minor:		
103-104-105		

PHYSICS

No.	Title	Credits
Major:		
Phys. 101-103-105	Theoretical Physics	15
Phys. 144f	Electrical Measurements	3
Phys. 134w	Applied Optics	3
Phys. 124	Pyrometry	3
		—
		21
Minor:		
122,132,142		

ANIMAL BIOLOGY

No.	Title	Credits
Major:		
An.Biol. 109-110	General Physiology	10
An.Biol. 181-182	Embryology	6
An.Biol. 183	Genetics and Eugenics.....	3
		—
		19
	Thesis	
Minor:		
An.Biol. 181-182 or 181-182-183		

NURSING EDUCATION

Major Adviser: Marion L. Vannier

The following curriculum leads to a combined degree of bachelor of science in the College of Education and graduate in nursing. It is planned to prepare students for administrative and executive positions in hospitals, for teaching positions in schools of nursing, and for positions in public health nursing. Under the latter heading come such positions as the visiting nurse, the school nurse, the infant welfare nurse, and the rural public health nurse.

FIVE-YEAR CURRICULUM

First Year—in College of Education

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Rhetoric A	5	Rhetoric B	5	Rhetoric C	5
Botany 1	5	Botany 2	5	Anatomy 2	4
Chemistry 6	5	Chemistry 7	5	Chemistry 8 ¹	5
	15		15		14

Second Year—in College of Education

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Animal Biology 1	5	Animal Biology 2	5	History of Education 1 ..	5
Psychology 1	3	Psychology 2	3	Bacteriology 51	5
History 1 or 2	5	History 2 or 4	5	History of Nursing	1
English Composition 18 ..	3	English Composition 19 ..	3	Theory of Dietetics	1
				Educational Psychol-	
				ogy 55	3
	16		16		15

Third Year—Registration in Both College of Education and School of Nursing

FALL		WINTER	
	Credits		Credits
Technique of Teaching, Ed.T. 15	3	Hospital Economics	2
Educational Sociology, H.Ed. 3	3	Pharmacy 1	3
Physics 4	5	Pharmacy 14	1
Ethics of Nursing	1	Drawing 69	1
Electives	5	Dietetic Practice	4
	17	Hospital Service	4
			15
SPRING		SUMMER	
	Credits		Credits
Bandaging	1	Hospital Service	6 ²
Surgical Technique	1	(Note.—Residence in hospital begins	
Nursing Practice	7	with winter quarter.)	
Hospital Service	6		
	15		

¹ Chemistry 9 and 10 (10 credits) and a five-credit elective may be substituted if chemistry was taken in high school

² Eight hours daily practice in the various services.

Fourth Year—Registration in Both College of Education and School of Nursing

FALL		WINTER	
	Credits		Credits
Elementary Pathology	1	Junior Pediatrics	1
Surgical Nursing	2	Special Therapy	1
Gynecology	1	Prof. Prob.	1
Junior Obstetrics	1	Hospital Service	6 ²
Hospital Service	6 ²		—
	—		9
	11		
SPRING		SUMMER	
	Credits		Credits
Medical Nursing	3	Massage	1
Common Diseases	1	Nervous and Mental.....	1
Tuberculosis	1	Skin Diseases	1
Hospital Service	6	Hospital Service	6 ²
	—		—
	11		9

Fifth Year—Registration in Both College of Education and School of Nursing

FALL		WINTER	
	Credits		Credits
Senior Pediatrics	2	Senior Obstetrics	1
Dieting in Diseases.....	1	Special Senses	1
Hygiene and Public Health.....	1	Special Methods	3 ³
Hospital Service	6	High School (Ed.Ad. 65).....	3 ³
	—	Electives	2 ³
	10	Hospital Practice Teaching.....	2 ³
			—
			15
SPRING		SUMMER	
	Credits		
Practice Teaching	5	Hospital Service.....	
Electives	5		
Hospital Administration	4		
	—		
	14		

Last two quarters to be devoted to public health courses if the student desires.

The nine quarters spent in hospital work is to carry blanket credit of 45 credits in the College of Education. The other 135 credits leading to the B.S. degree are to be taken in the College of Education. (First year, 44 credits; second year, 47 credits; third year, 17 credits; fifth year, 27 credits.)

NURSERY SCHOOL EDUCATION

Major Adviser: John E. Anderson

This special curriculum is arranged for persons who are preparing to teach or direct nursery schools or other types of schools for children of pre-school age, a field of work which is becoming increasingly important.

It also offers opportunity for individuals who wish to enter the field of parent education or the direction of child study classes to secure basic train-

² Eight hours daily practice in the various services.

³ To carry College of Education credit.

ing which, combined with one year of graduate work, will fit the individual for effective work in this rapidly growing field.

The curriculum is offered in co-operation with the Institute of Child Welfare, an organization recently established with the aid of a grant from the Laura Spelman Rockefeller Memorial for the scientific study of the development of the normal child from birth to six years. Co-operating with the institute are a number of university departments: Anatomy, Education, Home Economics, Pediatrics, Psychology, Psychiatry, Public Health Nursing, and Sociology. The institute maintains a nursery school for the observation and study of young children, which will be used for observation and practice for students undertaking this curriculum.

JUNIOR COLLEGE REQUIREMENTS

The student must satisfy the regular admission requirements of the College of Education. For the purpose of this curriculum, he should present at least the following:

- a. 15 credits in English.
- b. 10 credits in psychology.
- c. 10 credits in natural sciences, exclusive of psychology.
- d. 15 credits in social sciences, including Sociology 1.
- e. Additional courses to total 90 credits.

Candidates satisfying the entrance requirements will be admitted only upon approval of the major adviser for special fitness for this work.

COLLEGE OF EDUCATION

In addition to the required courses listed above, the candidate must present a sufficient number of electives to make up a total of 90 credits. Electives should be discussed with the major adviser.

Junior Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Prev. Med. 53, Elementary Prev. Med.	3	Soc. 51, Occurrence of Socially Inadequate . .	3	Psy. 144, Abnormal Psychology	3
H.E. 70, Food Preparation	3	Psy. 144, Abnormal Psychology	3	C.W.I. 50, Nursery School Methods	3
C.W.I. 60, Nursery School and Parental Education Movement	3	C.W.I. 50, Nursery School Methods	3	Electives	9
Ed.Psy. 57, Ontogenetic Psychology	3	Prev. Med. 58, Maternity and Child Hygiene . . .	3		—
Electives	4	Electives	3		15
	—		—		
	15		15		

For Prev. Med. 53, Prev. Med. 50 or 52 may be substituted. For H.E. 70, H.E. 20 may be substituted.

Senior Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Anat. 135, Physically De-		C.W.I. 53, Nursery School		C.W.I. 54, Nursery School	
veloped Child	2	Technique	2	Technique	2
C.W.I. 170, Parental		H.E.Ed. 40, Child Train-		H.Ed. 103, History of	
Education	3	ing	3	Modern Elementary Ed-	
C.W.I. 52, Nursery School		Soc. 90, Elementary Field		ucation	3
Technique	2	Work	2	C.W.I. 30, Development	
Soc. 90, Elementary Field		Electives	8	of Young Child	3
Work	2			Electives	7
Electives	6				
	—		—		—
	15		15		15

Suggested Electives

- Art Ed. 32. Cardboard and Paper Construction
- Art Ed. 35. Clay Modeling
- Art Ed. 37. Elementary Weaving, Basketry, etc.
- Art Ed. 38. Allied Crafts
- Ed.T. 44. Children's Literature
- Ed.Psy. 143-144-145. Individual Mental Examination
- Ed.Psy. 149-150-151. Psycho-Educational Clinic
- Home Econ. 52. Art History and Appreciation
- Home Econ. 56. Appreciation of Color and Design
- Home Econ. 71. Elementary Dietetics
- Home Econ. 72. Special Problems in Home Management
- English 41-42-43. Public Speaking
- Preventive Medicine 61. Mental Hygiene
- Sociology 52. Elementary Case Work
- Sociology 60. Child Welfare.

OCCUPATIONAL THERAPY

Major Adviser: Marion A. Tebbets

Occupational therapy is practiced by teachers of training and experience in many hospitals throughout the country. The therapeutic value of this work in the treatment of disease and in successful convalescence makes it of definite value to physicians and hospital administrators. The part it plays in the restoration to economic efficiency of the more or less permanently disabled and its educational value in the reconstruction of the injured and in the promotion of new vocational capacity is attracting the attention of social workers, economists, and educators.

With the co-operation of the Medical School and of certain departments in the College of Science, Literature, and the Arts, the College of Education offers a course of instruction covering a period of four years in occupational therapy which leads to the degree of bachelor of science.

FOUR-YEAR CURRICULUM IN THE COLLEGE OF EDUCATION

First Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
English A	5	English B	5	English C	5
Animal Biology 1.....	5	Animal Biology 2.....	5	Relationships of Medical Social Workers 62...	1
French 1 or 3.....	5	French 2 or 9.....	5-3	French 3 or 10.....	5-3
or		or		or	
German 1 or 15.....	5-4	German 2 or 31.....	5-3	German 3 or 32.....	5-3
Preliminary Hygiene 4..	0	Ethics of Nursing 11...	1	Hospital and Hospital Economics 64	1
				Electives	2
	<hr/>		<hr/>		<hr/>
	15-14		16-14		14-12

Second Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Sociology 1	5	Prin. and Pract. of Med- ical Social Service 60..	3	Psychology 3	3
Psychology 1	3	Psychology 2	3	Fundamental Principles of Design, Art Ed. 3....	3
Fundamental Principles of Design, Art Ed. 1....	3	Fundamental Principles of Design, Art Ed. 2....	3	Sketch Drawing, etc., Art Ed. 9.....	1
Sketch Drawing, etc., Art Ed. 7	1	Sketch Drawing, etc., Art Ed. 8	1	Occupational Therapy 63	1
Clay Modeling, Art Ed. 35	1	Cardboard and Paper Construction, Art Ed. 32	1	Electives	6-7
Elements of Preventive Medicine 53	3	Occupational Hygiene and and Disease 73.....	2		
	<hr/>		<hr/>		<hr/>
	16		13		14-15

Third Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Sociology 51	3	Sociology 52	3	Educational Sociology 3	3
History 1 or 7.....	5	Educational Psychology 55	3	Technique of Teaching, Ed.T. 15	3
Principles of Harmony in Form and Color, Art Ed. 20	3	History 2 or 8.....	5	The High School, Ed.Ad. 65	3
Still Life, Art Ed. 4....	1	Principles of Harmony in Form and Color, Art Ed. 21	3	Principles of Harmony in Form and Color, Art Ed. 22	3
Composition, Art Ed. 10	1	Still Life, Art Ed. 5....	1	Still Life, Art Ed. 6....	1
Elementary Weaving, Basketry, etc., Art Ed. 37	2	Composition, Art Ed. 11	1	Composition, Art Ed. 12	1
	<hr/>		<hr/>		<hr/>
	15		16		14

FALL		Fourth Year ¹		WINTER		SPRING	
	Credits		Credits		Credits		Credits
Public and Personal Health 50	3	Sociology 60	3	Educational Diagnosis 111	4	Application of Design to Fabrics, Art Ed. 44	2
Practice Teaching 16	5	Physiology 4	5	Metal Work 46	2	Types of Art Instruction, Art Ed. 84	1
Art History and Appreciation, Art Ed. 70	2	Mental Hygiene 61	1	Field Work	5-7		
Allied Crafts 38	1	Bookbinding, Art Ed. 33	2				
Elementary Pottery 41	2	Application of Design in Needle Work, Art Ed. 45	2				
Methods of Elementary Woodwork Ind. 10	2						
	15		13				14-16

SUMMER QUARTER

Course	Credits
Advanced Basketry 39	3
Advanced Weaving 40	3
Field Work ¹	3-6

PHYSICAL EDUCATION FOR MEN

FOUR-YEAR CURRICULUM IN THE COLLEGE OF EDUCATION

A physical examination is required of all new matriculants, and of all others using the department privileges, at the beginning of the year, and as often during their college course as their physical condition may indicate. Students taking the required work in physical education are examined at the close of the year.

Courses 1-2-3 and 4 are prescribed for all freshmen and must be taken in the first year of residence. 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.

The following curriculum has been outlined for a special four-year professional course in physical education and athletic coaching.

CURRICULUM FOR MEN MAJORING IN PHYSICAL EDUCATION

Major Adviser: L. F. Keller

Freshman Year

No.	Title	Credits			Prerequisite courses
		F	W	S	
Comp. A,B,C	Freshman English	5	5	5	None
Chem. 14,15	General Inorganic Chemistry	5	5	..	None
Sociol. 1	Introduction to Sociology	..	..	5	None
Prev. Med. 3	Personal Hygiene and Elementary Sanitation	..	..	2	None
Mil. Sci. 1,2,3	First Year Basic Course	..	..	..	None
Phys. Ed. 1,2,3	Freshman Physical Education	..	..	..	None
	Approved electives	5	5	3	
		15	15	15	

¹ During the third year (summer quarter) and in the fourth year opportunities will be given for practice work in hospitals. This field work will be credited on the usual university basis.

COLLEGE OF EDUCATION

Sophomore Year

No.	Title	Credits			Prerequisite courses
		F	W	S	
An. Biol. 1-2	General Zoology	5	5	..	None
Psy. 1-2	General Psychology	3	3	..	None
Anat. 3	Human Anatomy .....	..	..	4	An. Biol. 1-2
Phys. Ed. 10-11-12	Minor Sports	2	2	2	Phys. Ed. 1,2,3
Phys. Ed. 7-8-9	Advanced Leaders	1	1	1	Phys. Ed. 1,2,3
Bact. 51	General Bacteriology .....	..	..	5	An. Biol. 1-2, Chem. 1-2-3 or equiv.
Mil. Sci. 4-5-6	Second Year Basic Course....	..	..	..	Mil. Sci. 1,2,3
	General electives	4	4	3	
		15	15	15	

Junior Year

No.	Title	Credits			Prerequisite courses
		F	W	S	
Physiol. 58,59	Human Physiology .....	..	4	4	Biol. 1 qtr., chem. 1 qtr.
Anat. 135	Physical Development of Childhood	2	..	..	None
Phys. Ed. 19-20-21	Gymnastics	1	1	1	Phys. Ed. 1,2,3
Phys. Ed. 22-23	Kinesiology	2	2	..	Anat. 4
Phys. Ed. 24	Technique of Gymnastic Teaching .....	..	..	2	Phys. Ed. 22-23
Phys. Ed. 30	Athletic Training and First Aid .....	..	..	2	None
Prev. Med. 53	Elements of Preventive Medicine	3	..	..	Psy. 1-2, Bact. 51
H. Ed. 1	History of Education.....	5	..	..	Psy. 1-2
Ed. Psy. 55	Educational Psychology .....	..	3	..	Psy. 1-2
Ed. Ad. 65	The High School.....	..	..	3	Ed. 55
	General electives	2	5	3	
		15	15	15	

Senior Year

No.	Title	Credits			Prerequisite courses
		F	W	S	
Prev. Med. 80	Educational Hygiene .....	..	3	..	Prev. Med. 50-52-53
Phys. Ed. 28	Physical Examination and Normal Diagnosis	2	..	..	Physiol. 58,59
Phys. Ed. 29	Orthopedic and Remedial Gymnastics .....	..	2	..	Phys. Ed. 22-23-24
Phys. Ed. 31	History of Physical Education	2	..	..	Ed. 1
Phys. Ed. 32	Principles of Physical Education .....	..	3	..	Phys. Ed. 10-11-12, 23-24
Phys. Ed. 33	Organization and Administration of Physical Education .....	..	..	3	Phys. Ed. 32
Phys. Ed. 37	Football .....	..	..	3	None
Phys. Ed. 38	Basket-Ball .....	..	2	..	None
Phys. Ed. 39	Track .....	..	..	2	None
Phys. Ed. 42	Baseball	2	..	..	None
Phys. Ed. 43-44-45	Practice Teaching.....	2	2	2	Phys. Ed. 10 11 12, 24, F.d. 55
Ed. 3	Educational Sociology	3	..	..	Psy. 1-2
	General electives	4	3	5	
		15	15	15	

COURSES FOR MEN MINORING IN ATHLETIC COACHING

No.	Title	Credits			Prerequisite courses
		F	W	S	
Phys. Ed. 1-2-3	Freshman Phys. Ed. ....	..	..	..
Phys. Ed. 4	Freshman Hygiene .....	..	..	..
Phys. Ed. 10-11-12	Minor Sports	2	2	2	
Phys. Ed. 30	Athletic Training .....	..	..	2	
Phys. Ed. 33	Organization and Administration of Physical Education.....	..	..	3	
Phys. Ed. 37	Football	3	..	..
Phys. Ed. 38	Basket-Ball .....	..	2	..	
Phys. Ed. 39	Track Athletics .....	..	..	2	
Phys. Ed. 42	Baseball .....	..	..	2	
Anat. 3	Human Anatomy .....	..	..	4	

NOTE.—All candidates for the teacher's certificate with minor recommendation in athletic coaching, must take Physical Education 30 and 35 and Anatomy 3. The balance of nineteen credit hours may be secured from any of the courses listed above.

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 bodily 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 is required of all newly entering students (see Courses 1-2-3 and 4), 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 year). Physical examinations or consultations are required annually of all students.

Six credits toward the degree can be gained by taking courses in exercises (Courses 43-44-45, 66-67-68, 69-70-71).

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.

Statement of fees.—Elementary physical training, \$2.50 a quarter. All designed to prepare graduates for the responsible direction of physical education activities. Students desiring to enter the course should consult with the head of this department. They should be without organic diseases or serious functional disorder, should have a keen sense of rhythm, should possess qualities of personality which will win the co-operation of others,

and should have a voice adapted to speaking in public. They should have training in the sciences and should, if possible, have had a unit of physics in high school.

FOUR-YEAR CURRICULUM IN THE COLLEGE OF EDUCATION FOR WOMEN
STUDENTS MAJORING IN PHYSICAL EDUCATION

Major Adviser: J. Anna Norris

Freshman Year

No.	Title	Credits			Prerequisite courses
		F	W	S	
English A-B-C	Freshman English ¹	5	5	5	None
Chem. 14-15	Gen. Inorg. Chemistry ²	5	5	..	None
Farm Engr. 23	General Physics ³ .....	..	..	5	None
History 1-2	Modern World ¹	5	5	..	None
Sociology 1	Introduction to Sociology ¹..	..	..	5	None
Phys. Ed. 40	Preliminary Hygiene	1	..	..	None
Phys. Ed. 22s, 25s or 28s	Elem. Int. or Adv. Swimming	..	..	0	None
Phys. Ed. 37-38 ⁴	Freshman Hockey, Basket- Ball	0	0	..	None
Phys. Ed. 48f-49w- 50s	Tennis, Gymnastics, Base- ball	0	0	0	None
		16	15	15	

Sophomore Year

No.	Title	Credits			Prerequisite courses
		F	W	S	
An. Biol. 1-2 ⁵	General Zoology ¹	5	5	..	None
Anat. 3 ^s	Human Anatomy ⁶ .....	..	..	5	An. Biol. 1-2
Psy. 1-2 ⁶	General Psychology	3	3	..	None
Prev. Med. 2f,w	First Aid ⁶	1	or 1	..	An. Biol. 9 cr.
Bact. 51f,w,s	General Bacteriology ¹ .....	..	..	5	Chem. 10 cr., Biol. 10 cr.
Pub. Sp. 41f-42w	Public Speaking ¹	3	3	..	Rhet. A-B-C or 4-5-6
Phys. Ed. 25f or 28f	Int. or Advanced Swimming	0	..	..	Phys. Ed. 22 or equivalent
Phys. Ed. 51-52	Soph. Major Gymnastics....	$\frac{1}{2}$	$\frac{1}{2}$	..	Phys. Ed. 49-50
Phys. Ed. 56w-57s	Swim. with Technique.....	..	$\frac{1}{2}$	$\frac{1}{2}$	Phys. Ed. 28 or equivalent
Phys. Ed. 63-64-65	Hockey, Basket-Ball, Base- ball with Technique.....	1	1	1	Phys. Ed. 37-38
Ed. Psy. 55	Educational Psychology .....	..	..	3	Psy. 1-2
	Elective	3	..	..
		15 $\frac{1}{2}$ -16 $\frac{1}{2}$	13-14	14 $\frac{1}{2}$	

¹ For description of course see bulletin of College of Science, Literature, and the Arts.

² For description of course see bulletin of School of Chemistry.

³ For description of course see bulletin of College of Agriculture.

⁴ The second quarter is open to students who have not taken the preceding quarter.

⁵ The entire course must be completed before credit is received for any quarter.

⁶ For description of course see bulletin of Medical School.

NOTE.—If one year of chemistry is presented at entrance the student may take instead of Course 14-15 the more intensive Course 4-5.

If one year of physics is presented at entrance no physics will be required.

COURSES OF STUDY

Junior Year

No.	Title	Credits			Prerequisite courses
		F	W	S	
Physiol. 58-59	Human Physiology .....	..	4	4	An. Biol. 1-2, 10 cr. Chemistry
H.Ed. 1	History of Education.....	5	..	..	Psy. 1-2
H.Ed. 3	Educational Sociology	3	..	..	Psy. 1-2
Phys. Ed. 43-44-45	Play and Playground.....	$\frac{1}{2}$	3	$\frac{1}{2}$	Phys. Ed. 6 qtrs.
Phys. Ed. 54-55	Gym. for Junior Majors....	$\frac{1}{2}$	$\frac{1}{2}$	..	Phys. Ed. 51-52
Phys. Ed. 58-59	Adv. Folk Dancing with Technique .....	..	1	1	Phys. Ed. 6 qtrs.
Phys. Ed. 60-61	Minor Sports with Technique	1	..	1	Phys. Ed. 6 qtrs.
Phys. Ed. 66-67-68	Elem. Interp. Dancing.....	1	1	1	Phys. Ed. 6 qtrs.
Phys. Ed. 75	History of Phys. Ed. ....	..	2	..	
Phys. Ed. 80-81	Kinesiology	3	4	..	Anat. 3, Farm Eng. 23
Phys. Ed. 82	Physical Examination .....	..	..	2	Phys. Ed. 80-81
Phys. Ed. 83	Tech. of Gym. Teach. ....	..	..	3	Phys. Ed. 54-55, 80-81
	Elective .....	..	..	3	
		14	15 $\frac{1}{2}$	15 $\frac{1}{2}$	

Senior Year

No.	Title	Credits			Prerequisite courses
		F	W	S	
Ed.Ad. 65	The High School.....	3	..	..
Phys. Ed. 69-70-71	Advanced Int. Dancing with Technique	1	1	1	Phys. Ed. 66-67-68
Phys. Ed. 72f-73w	Senior Gymnastics	$\frac{1}{2}$	$\frac{1}{2}$	..	Phys. Ed. 54-55
Phys. Ed. 76w	Diagnosis and Prophylaxis..	..	2	..	Bact. 51, Physiol. 58-59
Phys. Ed. 84	Principles of Gym.	2	..	..	Phys. Ed. 55, 83
Phys. Ed. 85-86	Principles of Phys. Ed. ....	..	2	1	Phys. Ed. 44, 84, 91
Phys. Ed. 87	Personal and School Hygiene .....	..	..	3	Physiol. 58-59
Phys. Ed. 88-89-90	Orthopedic and Remedial Gymnastics	1	1	1	Phys. Ed. 82
Phys. Ed. 91f	Principles of Dancing.....	2	..	..	Phys. Ed. 59, 67-68
Phys. Ed. 92f-93w-94s	Practice Teaching	2	2	2	Phys. Ed. 43-44-45, 56-57, 60-61, 63-64-65, 69-70, 84, 91
Phys. Ed. 97w	Organization and Administration .....	..	3	..	Phys. Ed. 75
	Electives	4	5	5	
		15 $\frac{1}{2}$	16 $\frac{1}{2}$	13	

Some electives which are permitted by program hours.

- Anthropology, 51 (Introduction)
- Art Education, 1 (Appreciation)
- Astronomy, 11 (Descriptive)
- English, 8 (Shakespeare)
- Greek, 43 (Sculpture), 44 (Literature and Life), 45 (Mythology)
- Human Anatomy, 135 (Physical Development of Childhood)
- Philosophy, 1 (Problems), 2 (Logic), 3 (Ethics)
- Political Science, 1 (American Government)
- Preventive Medicine and Public Health, 59 (Social Hygiene), 61 (Mental Hygiene)
- Sociology, 6 (Modern Social Reform), 14 (Rural Sociology).

COURSE FOR WOMEN STUDENTS MINORING IN PHYSICAL EDUCATION

No.	Cred.	Title	Offered to	Prereq. courses
Phys. Ed. 1-2-3	0	Elem. Physical Training.....	Required of all new students	None
Phys. Ed. 4	0	Preliminary Hygiene	Required of all new students	None
Phys. Ed. 22-23	0	Elementary Swimming	Soph.	None
Phys. Ed. 34-35	0	Basket-Ball and Baseball....	All	Permission of director
Phys. Ed. 43-44-45	4	Play and Playground.....	Jr., sr.	Phys. Ed., 6 qtrs.
Phys. Ed. 51-52	1	Soph. Major Gymnastics.....	Jr. minors	Phys. Ed. 1-2-3
Phys. Ed. 54-55	1	Junior Major Gymnastics...	Sr. minors	Phys. Ed. 51-52
Phys. Ed. 64-65	2	Basket-Ball, Baseball with Technique	Jr., sr.	Phys. Ed. 34-35
An. Biology. 1-2	10	General Zoology	All	No prereq.
Anatomy 3	5	Human Anatomy	Soph., jr.	An. Biol. 1-2
Phys. Ed. 80	3	Kinesiology	Jr., sr.	An. Biol. 1-2, Anat. 3
Phys. Ed. 83	3	Technique of Gymnastic Teaching	Sr.	Phys. Ed. 80, 54-55
Prev. Med. 50	3	Public and Personal Health..	Jr., sr.	An. Biol. 1-2, Psy. 1-2
Hist. Ed. 1	5	History of Education.....	Jr., sr.	6 cred. in psy.
Ed. Soc. 3	3	Educational Sociology.....	Jr., sr.	6 cred. in psy.
Ed. Psy. 55	3	Educational Psychology ...	Jr., sr.	6 cred. in psy.
Ed. T. 15	3	Technique of High School Instruction	Jr., sr.	Ed. 55
Ed. Ad. 65	3	The High School.....	Jr., sr.	Ed. Psy. 55
	3	Special Methods in Major Subject		
Ed. 16	5	Practice Teaching in Major Subject	Sr.	Ed. 15 and Special Methods Course

PUBLIC SCHOOL MUSIC

FOUR-YEAR CURRICULUM IN THE COLLEGE OF EDUCATION

Major Adviser: T. P. Giddings

	First Year			Second Year		
	Credits			Credits		
	F	W	S	F	W	S
Rhetoric A, B, C.....	5	5	5	3	3	..
Harmony 1-2-3	3	3	3			
Sight Singing and Vocal Ear Training (Solfeggio)	1	1	1	3	3	3
Piano	2	2	2			
Voice	2	2	2	1	1	1
Class Inst. Teaching (1 period strings; 1 period winds)..	2	2	2	3	3	3
				2	2	2
				2	2	2
				3	5	3

¹ Electives should be chosen to meet the teaching minor requirement in one secondary school subject such as English, public speaking, art, etc.

	Credits				Credits		
	F	W	S		F	W	S
Instrumentation and Orchestration	2	2	2	Orchestra Conducting (Mu. Ed. 64-65-66)	2	2	2
High School Methods and Practice Teaching (Mu. Ed. 32-33-34)	3	3	3	Piano, Voice or other instrument	2	2	2
Ed. Soc. 3, Ed. Psy. 55, Hist. of Ed. 1.....	3	3	3	Ensemble, Mu. Ed. 112-113-114	2	2	2
Piano, Voice or other instrument	2	2	2	Normal Piano (elective), Mu. Ed. 86-87-88	2	2	2
Orchestra or Chorus as elective	1	1	1	Observation and Teaching..	2	2	2
Electives ¹	3	3	3	Orchestra or Chorus as elective	1	1	1
				Principles of Supervision, Ed. Adm. 160.....	2	..	..
				Other electives ¹	2	4	4

SCHOOL PSYCHOLOGIST

Major Adviser: M. E. Haggerty

Students who wish to qualify for a certificate for school psychologist will be required to complete the work for a Master's degree with educational psychology as a major.

The regular requirements for admission to the College of Education must be fulfilled.

The following courses are recommended since some of them are prerequisites to required courses in the Senior College.

	Credits
Animal Biology 1 and 2.....	10
Chemistry	10
Sociology 1	5
Psychology 1 and 2.....	6
Psychology 4 and 5 (laboratory).....	4
Human Physiology 4.....	5

SENIOR COLLEGE

In addition to the required courses for the juniors and seniors listed below the candidate must earn a total of 24 credits selected from the following electives:

Psychology 124f (Psychology of Learning) 3 credits; Psychology 121f-122w (Neuro-Psychology) 6 credits; Psychology 114w-115s (Human Behavior) 6 credits; Psychology 125f-126w (Psychology of Individual Differences) 6 credits; Sociology 55 (The Occurrence of the Socially Inadequate) 3 credits; Sociology 52 (Elementary Case Work) 3 credits; Anatomy 160 (Physical Development of Childhood) 2 credits; Ed.Ad. 167f (Junior High School) 3 credits; Educational Sociology 3 credits.

¹ Electives should be chosen to meet the teaching minor requirement in one secondary school subject such as English, public speaking, art, etc.

COLLEGE OF EDUCATION

Junior Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Ed.Psy. 55, Ed. Psy. ...	3	Psy. 144w, Abnormal Psychology	3	Psy. 145s, Psychology...	3
Electives	12	P.H. 50w, Prev. Medicine	3	Ed.Psy. 111, Ed. Diag. ...	3
		Electives	9	Ed.Adm. 113s, H. S. Curriculum	3
				Ed.Adm. 119s, Elementary School Curriculum	3
				Electives	3

Senior Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Ed.Psy. 134f, Mental Tests and Diagnosis..	2	Ed.Psy. 135w, Mental Tests and Diagnosis..	2	Ed.Psy. 136s, Mental Tests and Diagnosis..	2
Ed.Psy. 116f, Statistical Methods	2	Ed.Psy. 117w, Statistical Methods	2	Ed.Psy. 118s, Statistical Methods	2
Ed.Psy. 106f, Adv. Ed. Psychology	3	Ed.Psy. 107w, Adv. Ed. Psychology	3	Ed.Psy. 108s, Adv. Ed. Psy.	3
Ed.Ad. 124f, Ed. Administration	3	Electives	8	Ed.Psy. 64s, Psy. in Personnel Work	2
Electives	5			An. Biol. 183s, An. Biology	3
				Electives	3

Graduate Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Ed.Psy. 149f, Psycho-Ed. Clinic	2	Ed.Psy. 150w, Psycho-Ed. Clinic	2	Ed.Psy. 151s, Psycho-Ed. Clinic	2
Ed.Psy. 184f, Mental Deficiency	2	Ed.Psy. 185w, Mental Deficiency	2	Ed.Psy. 186s, Mental Deficiency	2
Ed.Psy. 201f, Education (Seminar)	2	Ed.Psy. 202w, Education (Seminar)	2	Ed.Psy. 203s, Education (Seminar)	2
Electives	3	Electives	3	Electives	3
Thesis	0	Thesis	0	Thesis	0

SOCIAL STUDIES

Major Adviser: A. C. Krey

Students who desire to specialize in the group of Social Studies are advised to follow either of the following options—preferably the second.

1. Major in history, minor in social science. Students majoring in history who expect to prepare themselves to handle high school courses in social science should, in addition to meeting other requirements for graduation from the College of Education, secure credits as follows: History at least 45 credit hours (see statement under History). Political Science 1, 2, and 11 or 15. Economics 6-7. Sociology 1, 6, and 14. Geography 51-52 strongly urged.

2. Major in social science, minor in history. Students desiring to secure a major in social science with a minor in history should take the following courses: Economics 6-7, 143-144 and if possible 161 and 191-192. Political Science 1, 2, 11 or 15 and one course in foreign governments or relations. Sociology (see department's statement). History 7-8 and enough more to constitute a minor. Enough additional credits should be earned in one of these departments to satisfy major requirements in that department. Geography 51, 52, 61, or 71 strongly urged.

FIVE-YEAR COURSE LEADING TO THE DEGREE OF MASTER OF ARTS

Since in many cases students will find it difficult to secure adequate general training and at the same time pursue all of the special courses in history and social science which are desirable to follow, a five-year course leading to the degree of bachelor of arts and master of arts is recommended.

JUNIOR COLLEGE
Freshman Year

	Credits
English	15
Language (see requirements).....	10
Science	10
History 1-2	10
	—
	45

Sophomore Year

	Credits
History 7-8	10
Psychology	6
Group	15
Political Science 1 and 2.....	10
	—
	41

COLLEGE OF EDUCATION
Junior Year

	Credits
Economics 6-7	10
History 105 or 133 and 119 or 120.....	10
Sociology 1, 6 and 14.....	11
Education 1, 3, 55, and 15.....	14
	—
	45

Senior Year

	Credits
Economics 143-144	8
Political Science 11 and 15.....	10
Sociology (see departmental statement).....	9
History, intensive course (see departmental statement).....	5
Education 113-114 and 5 credits to be chosen from Courses 101, 102, 116-117, 124, 134-135-136, and 167-168.....	9
	—
	41

Graduate School

	Credits
Economics 161 and 191-192.....	9
Political Science course numbered over 100.....	5
Sociology (see departmental statement).....	6
Education 66f, 67w, 68s.....	9
	—
	29

SOCIOLOGY

Major Adviser: R. L. Finney

MAJOR IN SOCIAL THEORY (36-37 hrs.)

Course No.	Name of Course	Course No.	Name of Course
Soc. 1	Introduction to Sociology	Soc. 100	Social Psychology
Soc. 14	Rural Sociology	Soc. 101	Social Organization
Soc. 6	Modern Social Reform Movements	Soc. 102	Social Control
and Soc. 53	Elements of Criminology	Soc. 110	Community Organization and Social Work in Small Towns and Country
or Soc. 45	Social Statistics	Soc. 114	Rural Social Institutions
Soc. 51	Occurrence of the Socially Inadequate	or Soc. 140	History of Social Theory
Soc. 119	The Family	Soc. 121	Advanced Statistical Methods
or Soc. 120	Social Progress	or Soc. 141	Contemporary Social Theory

MAJOR IN APPLIED SOCIOLOGY (36-37 hrs.)

Course No.	Name of Course	Course No.	Name of Course
Soc. 1	Introduction to Sociology	Soc. 112	The Rural Social Survey
Soc. 14	Rural Sociology	or Soc. 122	Methods of Social Investigation
Soc. 45	Social Statistics	Soc. 119	The Family
Soc. 51	Occurrence of the Socially Inadequate	or Soc. 134	Legal Protection of the Child
Soc. 52	Elementary Case Work	Soc. 110	Community Organization and Social Work in Small Towns and Country
Soc. 60	Child Welfare	or Soc. 114	Rural Social Institutions
Soc. 90	Elementary Field Work	or Soc. 128	Principles of Administration Applied to Social Work
Soc. 91	Elementary Field Work	or Soc. 130	Advanced Case Work
Soc. 100	Social Psychology		

MINOR SOCIOLOGY

Course No.	Name of Course
Soc. 1	Introduction to Sociology
Soc. 6	Modern Social Reform Movements
or Soc. 14, and 4 other courses (19-20 hrs.)	

TEACHERS OF SUBNORMAL CHILDREN

Major Adviser: J. G. Rockwell

Students will complete the first two years of this course in the Junior College.

Students who complete the freshman and sophomore years of this course, who have had two years of teaching experience in elementary schools, and who complete a minimum of six credits in starred courses of the junior and senior years, will qualify for a special teaching certificate good for one year required of teachers of subnormal children in special classes for which state aid is received. All students who have not had the equivalent previously must take the course in practice teaching and handwork to qualify them for this special certificate.

Unclassed students with proper prerequisites may pursue courses for which they are qualified in the junior and senior years, on the basis of previous training and experience.

FOUR-YEAR CURRICULUM

JUNIOR COLLEGE
Freshman Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Eng. A, Fresh. English..	5	Eng. B, Fresh. English..	5	Eng. C, Fresh. English..	5
An.Biol. 1, An. Biology	5	An.Biol. 2, An. Biology	5	Ed. 1, Intro. to Sociology	5
Art Ed. 1f, Art Educa-		Art Ed. 2w, Art Educa-		Art. Ed. 3s, Art Educa-	
tion	3	tion	3	tion	3
Elective	2	Elective	2	Elective	2

Sophomore Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Psy. 1, Psychology	3	Psy. 2, Psychology	3	H.Ed. 3, Ed. Sociology...	3
Psy. 4, Psychology Lab.	2	Psy. 5, Psychology Lab.	2	H.E. 57, Weaving on	
Hist. 1, History	5	Hist. 2, History	5	Table Looms	3
Art Ed. 37, Art Educa-		Art. Ed. 32, Art Educa-		Ind. Ed. 10, Meth. Elem.	
tion	2	tion	1	Grade Wood Work...	3
Elective	3	Ind. Ed. 11, Meth. Prim.		Ed. Psy. 55, Ed. Psy...	3
		Grade Wood Work...	2	Elective	3
		Elective	3		

COLLEGE OF EDUCATION

Junior Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Phys.Ed. 43, Play and		Phys.Ed. 44, Play and		Phys.Ed. 45, Play and	
Playground	1	Playground	1	Playground	1
Ed.Psy. 134, Mental Tests	2	Ed.Psy. 135, Mental Tests	2	Ed.Psy. 184, Mental De-	
Phys.Ed. 37, Physical Ed.	0	Phys.Ed. 32, Physical Ed.	0	ficiency	2
Ed.T. 181, Tech. of El.		Ed.T. 148, Teachers'		Ed.Psy. 136, Mental Tests	2
Inst.	3	Course in Arithmetic		Phys.Ed. 33, Physical Ed-	
Ed.T. 43, Teach. of Eng.		(Lower grades)	2	ucation	0
in Elem. Grades.....	2	Electives	10	Electives	8
Electives	6				

Senior Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Ed.Psy. 111, Ed. Diag-		Elem. Case Work.....	3	Child Welfare	3
nosis	3	Ed.T. 17, Practice Teach-		Ed.T. 17, Practice Teach-	
Soc. 51, Sociology.....	3	ing	2	ing	2
Ed.T. 17, Practice Teach-		Electives	10	Electives	10
ing	2				
Electives	7				

TRADE AND INDUSTRIAL EDUCATION¹

FOUR-YEAR CURRICULUM IN THE COLLEGE OF EDUCATION

Major Adviser: Homer J. Smith

Freshman Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Eng. Af	5	Eng. Bw	5	Eng. Cs	5
Ind. 40f, Analysis.....	2	Ind. 42w, Selection of		Ind. 25s, Lit. of Ind. Ed.	2
Ind. 20f, Ind. Hist.	2	Rel. Mat. (prereq., 40f)	2	Shopwork	2
Shopwork	4	Shopwork	3	Drawing	3
Drawing	2	Drawing	3	Electives	3
		Electives	2		

¹ Part II of the College of Education bulletin lists courses of this department which are not a part of the curriculum leading to the bachelor of science degree. Some courses carry graduate credit.

COLLEGE OF EDUCATION

Sophomore Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Econ. 6f, Prin. of Econ.	5	Econ. 1w, Prin. of Econ.	5	Soc. 1s, Introd. to Soc.	5
Psy. 1f, Gen. Psy.	3	Psy. 2w, Gen. Psy.	3	Ed. Psy. 55, Ed. Psy.	
Ind. 60f, Soc. Agencies in Ed.	2	Ind. 61w, Soc. Sig. of Voc. Ed. (prereq., Ind. 60)	2	(Prereq., 6 cred. in Gen. Psy.)	3
Shopwork	3	Shopwork	3	Drawing	2
Electives	2	Electives	2	Electives	5

Junior Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Ind. 80f, Gen. Ind. Tr.	2	H.Ed. 3w, Ed. Soc. (prereq., Soc. 1)	3	Ind. 14s, Methods in Drawing (10 cred. in Draw. or by permis- sion)	2
Ed.Ad. 124f, Ed. Admin. (prereq., 10 hrs. in Ed.)	3	Ind. 70w, Methods in Shop Subjects (prereq., 40)	2	Ind. 66s, Methods in Rel. Subj. (prereq., 40 and 42)	2
Ed.T. 15f, Technique of Teaching	3	Ind. 30w, Graphic Presen- tation	2	H.Ed. 103s, Hist. of Elem. Ed.	3
Electives	7	Ed.Ad. 167w, Junior High School	2	Ed.Ad. 168s, Junior High School	2
		Electives	6	Electives	6

Senior Year

FALL		WINTER		SPRING	
	Credits		Credits		Credits
Ind. 50f, Prac. Teach.	2	Ind. 50w, Prac. Teach.	2	Ind. 50s, Prac. Teach. (prereq., 50 and 51)	2
Ind. 170f, Admin. (con- sult adviser) (Day School)	2	Ind. 171w, Admin. (pre- req., 50f) (Evening School) (prereq., 170)	2	Ind. 172s, Admin. (Part Time School) (prereq., 171)	2
Ed.Psy. 134f, Mental Tests	2	Ind. 110w, Guidance in the Schools (prereq., 134)	2	Ed.Psy. 130s, Psy. in Personnel Work	2
Electives	9	Electives	9	Electives	9

Required, as specified, 120 quarter credits. Advised electives, 60 quarter credits.
Total 180 credits.

Mathematics, Science, Art, and Athletic Coaching are appropriate elective fields. The above requirement of 15 credits in Shopwork and 10 in Drawing (25 total) may be extended by election to not to exceed 45 credits total.

Shop and Drawing courses, in *wide variety*, are offered in the College of Engineering, in the University High School, and at the William Hood Dunwoody Industrial Institute. These courses should be taken under special advice and may be either extensive or intensive in resultant training.

VISITING TEACHERS

FOUR-YEAR CURRICULUM

Major Adviser: L. J. Brueckner

JUNIOR COLLEGE

Freshman Year

	Credits
English A-B-C	15
History 1, 2, or 3 or Language.....	10
Animal Biology 1-2.....	10
Sociology 1	5
Political Science 1.....	5
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	45

Sophomore Year

	Credits
History 7-8	10
Economics 6-7	10
Psychology 1-2	6
Political Science 2.....	5
Sociology 6, 45.....	8
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COLLEGE OF EDUCATION

Junior Year

	Credits
Education T. 15.....	3
Hist. Ed. 1, Ed. Soc. 3, Ed. Psy. 55.....	11
Sociology 51, 52, 53, 70, 90, 91.....	16
Home Economics 70-71-72.....	9
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	39

Senior Year

	Credits
Educational Psychology 184-185-186.....	6
Five credits from H. Ed. 101, H. Ed. 102, Ed. Ad. 124, Ed. Psy. 116-117, Ed. Psy. 134-135-136, Ed. Ad. 167....	5
Economics 161-162 or Psy. 144-145.....	6
Sociology 60, 92, 128, 130, 134, 138-139.....	18
Sociology 153-154-155	9
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DESCRIPTION OF COURSES

GENERAL COURSES

- Ed.208. Methods in Educational Research. A study of the methods employed in treatment and presentation of educational problems. Designed to aid students in the preparation of theses. Suggested for all candidates for degrees.
- Ed.228-229-230. Problems of College Education:
Ed.228f. Problems of Student Personnel.
Ed.229w. Problems of the College and University Curriculum Instruction.
Ed.230s. Problems of Organization and Administration.

ADMINISTRATION AND SUPERVISION

- Ed.Ad.65T. The High School. For high school teachers in training. Recent growth in secondary education; pupils; place of secondary education in the system; types of reorganization; types of programs of study; types of high schools; staff; plant; costs; standardization.
- Ed.Ad.65a. The High School. For students majoring in administration. (See Ed.Ad65T.)
- Ed.Ad.113-114. High School Curriculum. A study of methods of curriculum making, types of programs of study, curricula, subjects of study, constants, variables, electives, distribution of subject-matter by years and units.
- Ed.Ad.115. Practice in Supervision. Problems and practice in the supervision of instruction in the elementary schools of Minneapolis and St. Paul.
- Ed.Ad.119. Elementary School Curriculum. Study of the principles underlying the organization of subject-matter for courses in the elementary school; examination of curricula, syllabi, and texts in the light of their function. Survey of scientific research in curricular content by subjects.
- Ed.Ad.119T-120T. Elementary School Curriculum. (Same as above for teachers.)
- Ed.Ad.121. Educational Advising of Women and Girls. A course designed to acquaint students with the problems of educational advising of girls and young women, particularly those of high school age. Students admitted to the course through conference with instructor.
- Ed.Ad.123. Supervision of High School Instruction. The present status of high school supervision; its proper scope and function. A course combining consideration of principles and their application to improving high school instruction in the academic and special subjects.
- Ed.Ad.124. Educational Administration. The present status and tendencies in the organization and administration of state and city school systems with interpretations.

- Ed.Ad.125-126. City School Administration. For superintendents and principals. Detailed study of the principles and practice of city school administration.
- Ed.Ad.128. Special Problems in Educational Administration. This course is designed primarily for superintendents and principals qualified to make intensive studies of specific problems related to the administration of a school system.
- Ed.Ad.133. Guidance in Secondary Schools. Emphasizes practices in educational and vocational guidance in junior and senior high schools, considering such phases as giving information about vocations, utilizing test results and school marks, and organizing the staff for guidance.
- Ed.Ad.160. Principles of Supervision. An analysis of the functions and duties of a supervisor as related to the improvement of instruction; specific supervisory technique; objective analysis of classroom activity; concrete applications to present day problems; case studies.
- Ed.Ad.161a. Supervision: Uses of Educational Tests in Improving Instruction. Objective evaluation of the results of teaching; diagnosis of pupil difficulty; remedial work; tests as aids to teaching; following up a testing program.
- Ed.Ad.161b. Elementary School Supervision. The adjustment of the curriculum to the abilities of pupils in the elementary school; methods of classifying pupils; general principles and methods.
- Ed.Ad.162a. Supervision of English in the Elementary Schools. Improvement of instruction in oral and silent reading; the results of scientific investigation in reading; use of standardized and informal tests; remedial work; some consideration of spelling and writing.
- Ed.Ad.162b. Supervision of Social Sciences in the Elementary Schools. The scientific work being done on the course of study, in geography, history, science, and related fields; improvement of instruction in social sciences in the elementary schools.
- Ed.Ad.162c. Supervision of Arithmetic in the Elementary Schools. The improvement of instruction in arithmetic; the evaluation of the course of study; standardized drill exercises; diagnosis of specific pupil difficulty and remedial work; tests as aids of teaching.
- Ed.Ad.164. High School Administration. A study of the high school principalship, elimination from school, secondary vocational education, the marking system, record forms, classification of students, schedule of recitations, high school library, social organization and extra-curricular activities, community relationships, teaching schedule, building, costs.
- Ed.Ad.167-168. Junior High School. A study of the special purposes of this institution and the appropriate reorganizations to achieve them; the history of the movement.
- Ed.Ad.169. Extra-Curricular Activities. Types of activities in junior and senior high schools; aims and values; practices in organizing, administering, and supervising; methods of evaluation.
- Ed.Ad.170. Special Problems in Secondary Education. Planned primarily for those at work in high schools who are qualified to make intensive

studies relating to administration and supervision of secondary education. Consult instructor before registering.

- Ed.Ad.175. City School Finance. Study of the problems of school support peculiarly related to the city district; municipal school funds, sources and expenditures; analysis of unit costs, comparative cost accounting systems, budgets, financial records and reports.
- Ed.Ad.178-179. School Surveys. A study of the literature and methods of school surveys, as a basis for the investigation of practical problems in school administration and supervision.
- Ed.Ad.205-206-207. Seminar in Educational Administration.
- Ed.Ad.218-219-220. Seminar in Secondary School Problems.
- Ed.Ad.225-226-227. Seminar in Elementary School Problems.

AGRICULTURAL EDUCATION

COLLEGE OF EDUCATION

- Agr.Ed.11. Principles of Vocational Education. The fundamental principles upon which education is based. Emphasis is placed on those phases which are most closely related to vocational education.
- Agr.Ed.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.
- Agr.Ed.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.
- Agr.Ed.42. Teaching. Preparation of lesson plans and actual teaching of classes under careful supervision in recitation and laboratory; criticism and discussion of plans, methods, and results of student teaching. Review and discussion of assigned professional readings.
- Agr.Ed.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.
- Agr.Ed.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.
- ✓Agr.Ed.82. Agricultural Extension Field Work. Actual field practice in extension work on part salary in addition to credits. Number admitted to course limited by positions available. Usually will cover summer quarter, may extend into fall quarter.
- Agr.Ed.121. Teachers' Course, Home and School Gardening. A lecture and laboratory course designed to give teachers the preparation necessary for the proper planning, management, and supervision of home and school gardens. (Not offered in 1926-27.)

- Agr.Ed.131. *Methods in Teaching High School Agriculture.* Fundamentals of method in teaching as related to teaching agriculture in high school. Organizing subject-matter of daily work; selection and manipulation of devices. Classroom and laboratory method. Specific plans for teaching secondary agriculture.
- Agr.Ed.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.
- Agr.Ed.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.
- Agr.Ed.151. *Organization and Management.* Organization and management of work in secondary schools, particularly in Minnesota, with special reference to agricultural work, courses of study, programs, equipment, laboratory and class management, extension work, plots, and co-ordination of work.
- Agr.Ed.153. *Consolidated Rural Schools.* To prepare principals to meet the problems of organization and management peculiar to consolidated rural schools, such as building arrangements, curriculum adjustments, transportation of pupils, and home project work.
- Agr.Ed.154. *Rural Education and Community Life.* The rural school as a community center, and ways and means of organizing educational and recreational activities, such as clubs, festivals, fairs, and other desirable features of rural community life.
- Agr.Ed.155. *Consolidated Rural School Problems.* Opportunities for intensive study and research in special problems of administration and supervision of village and consolidated rural schools.
- Agr.Ed.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.
- Agr.Ed.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.
- Agr.Ed.164. *Fundamentals of Agriculture.* Basic principles of agricultural science and elements of practical agriculture. Emphasis on concrete problems in soils, crops, and animal husbandry, as related to classroom instruction and to school and home projects. (Not offered in 1926-27.)
- Agr.Ed.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.
- Agr.Ed.176. *Problems in Visual Education.* Special attention to use of visual aids in teaching agriculture. The development of proper visual methods by means of research.

Agr.Ed.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.

ART EDUCATION

FUNDAMENTAL PRINCIPLES OF DESIGN

- ArtEd.1-2-3. Fundamental Principles of Design. Elementary problems involving space breaking with parallel lines; emphasis on value relations; applications to problems developed in the handicrafts. The decorative use of nature material. Inspiration from nature, not imitation of nature forms.
- ArtEd.20-21-22. Principles of Harmony in Form and Color. Color theories of Munsell, Wilson, and Sargent, discussed and exemplified, with analysis of color harmonies and original work therein. Application of color harmonies in original designs throughout the year, with reference to execution in handicraft and by commercial processes.
- ArtEd.50-51. Commercial and Industrial Design. Advertising design and lettering; design for industry. Subject-matter appropriate for high school art teaching, with emphasis on governing principles.
- ArtEd.53-54. Design for the Consumer. 53. Problems of house planning, decoration, and furnishings; 54. Problems of costume selecting and designing, settings and costume in stage design. Subject-matter appropriate for art teaching in high schools. Emphasis on governing principles. Art history an important part of courses.
- ArtEd.55-56-57. Fundamental Art Principles (for public school teachers of subjects other than art).

DRAWING

- ArtEd.4,5,6. Still Life. Drawings from objects in charcoal and pencil. Emphasis on value relations, form, and perspective.
- ArtEd.7,8,9. Sketch Drawing from the Posed Figure in Charcoal and Pencil. Action and memory drawings. Emphasis on action, form, and value relation.
- ArtEd.10-11-12. Composition. Drawing from imagination. Stimulation by poetry and music. The medium: charcoal.
- ArtEd.23,24,25. Water Color. Drawings from objects. Emphasis on form, color, and technical handling.
- ArtEd.26,27,28. Charcoal, Pencil, Pen Technique. Drawings from objects in these mediums.
- ArtEd.29,30,31. Sketch from Pose.
- ArtEd.60,61,62. Advanced Water Color.
- ArtEd.63,64,65. Advanced Technique.
- ArtEd.66,67,68. Advanced Sketch.

HANDICRAFTS

- ArtEd.32. Cardboard and Paper Construction. Subject-matter for public school work.

- ArtEd.33. Bookbinding. Sequence of problems from simplest construction to the book sewed on cords or tapes. Problems with reference to grades, high schools, and for use in occupational therapy.
- ArtEd.35. Clay Modeling. Representation of familiar objects, and illustrative modeling.
- ArtEd.37,38. Elementary Weaving, Basketry, and Allied Crafts, with reference to use in the grades and in occupational therapy.
- ArtEd.39. Advanced Basketry.
- ArtEd.40. Advanced Weaving.
- ArtEd.41. Elementary Pottery. Hand building.
- ArtEd.42-43. Advanced Pottery. Work on wheels, castings, firing, and glazing.
- ArtEd.44. Application of Design to Fabrics by means of block printing, stenciling, batik, and other dyeing processes.
- ArtEd.45. Application of Design in Needlecraft. Problems appropriate for public school work. Peasant stitches.
- ArtEd.46. Metal Work. Fundamental processes of shaping, sawing, saw piercing, riveting, and soldering.

ART HISTORY AND APPRECIATION

- ArtEd.70. Art of the Italian Renaissance.

TEACHER TRAINING

- ArtEd.80,81,82. Types of Art Instruction. Specific problems of art teaching in relation to practice teaching in Minneapolis public schools. Includes attendance upon art supervisor's meetings.
- ArtEd.83. Teacher's Course in Art. Survey of art teaching practices. Study of governing principles. History and philosophy of art teaching. Making of outlines for public school application.
- ArtEd.86,87,88. Practice Teaching in Art.

EDUCATIONAL PSYCHOLOGY

- Ed.Psy.55. Educational Psychology. A survey of fundamental facts of human behavior, involved in educational activities. Open to juniors and seniors.
- Ed.Psy.57. Ontogenetic Psychology. With emphasis on the activities of the pre-school child.
- Ed.Psy.106-107-108. Advanced Educational Psychology. Advanced work in genetic psychology, origin and nature of human organism, development and control of instincts. Methods of measuring rate of learning; study of typical learning experiments. Study of group and individual differences, and their relations to educational practice.
- Ed.Psy.111. Educational Diagnosis. The typical educational problems involving educational scales and standard tests. Nature of tests, methods of use, analysis of results obtained, and programs of remedial educational procedure based on the results of the tests.

- Ed.Psy.111T-112T. Educational Diagnosis. Same as above for teachers.
- Ed.Psy.116a. Elementary Statistical Methods. Designed to supply the immediate statistical technique necessary for the pursuit of studies in education.
- Ed.Psy.116. Statistical Methods in Education. A study of statistical methods as applied to educational investigation. This course or 116a is ordinarily required of all candidates for advanced degrees.
- Ed.Psy.117-118. Advanced Statistical Methods in Education. A survey of statistical studies in education with special reference to the methods employed and the reliability of the results obtained.
- Ed.Psy.130. Vocational Psychology. Methods of judging vocational interests and aptitudes, psychological analysis of learning or the acquisition of skill, transfer of training, motives and incentives. Intended for students especially interested in vocational and industrial education and training.
- Ed.Psy.134-135-136. Mental Tests and Mental Diagnosis. Study of mental variation in children, its nature, degree, causes, and effects. A laboratory course in the study of individual differences by means of individual and group mental tests. A critical study of group tests. Technique of classification of students by means of mental tests.
- Ed.Psy.138-139. Experimental Educational Psychology. A laboratory course designed to train students in the use of experimental methods in the study of educational problems, particularly in the field of the psychology of learning. It is suggested that this course supplement either 191 or 106-107-108.
- Ed.Psy.143-144-145. Individual Mental Examination. For teachers of sub-normal children. Demonstration and practice in mental diagnosis. Careful study will be made of different groups and systems of mental tests, and other clinical methods with discussion of general theory involved.
- Ed.Psy.149-150-151. Psycho-Educational Clinic. Conducted in co-operation with the Department of Sociology and the Medical School clinics in pediatrics and nervous and mental diseases. Students will receive systematic instruction in giving psychological examinations and in scientific interpretation of data.
- Ed.Psy.153-154-155. Research Problems. Intended for properly prepared students who desire to pursue special investigation in the field of educational psychology.
- Ed.Psy.184. Mental Deficiency. Survey of mental deficiency in children and adults. Physical traits, including study of brain defects, causes and heredity; psychology of mental deficiency; social problems of feeble-mindedness. Subjects treated with reference to the training of defectives.
- Ed.Psy.191. Systematic Educational Psychology. Advanced course covering the field of psychology as related to education. Open to seniors and graduate students. Not open to students who receive credit for Educational Psychology 106-107-108.
- Ed.Psy.192. The Psychology of Behavior Problems in Children.
- Ed.Psy.193. Speech Disorders of Public School Children.

- Ed.Psy.197-198-199. Seminar: Problems of Subnormality. Phases of subnormality studied intensively. Review of important literature and original investigation. Students required to make reports on assigned topics and submit a paper on some problem at the close of the quarter.
- Ed.Psy.201-202-203. Seminar in Educational Psychology. A research course for graduate students. Required of all students writing theses in educational psychology. Does not carry credit as course work.

HISTORY AND PHILOSOPHY OF EDUCATION

- H.Ed.1. Brief Course in History of Education. Current school problems and educational theories in the light of their history. Emphasis upon modern times and those aspects of education of most immediate concern to high school teachers.
- H.Ed.3. Educational Sociology. A study of the social aspects of the teacher's work and of education as a means of solving social problems and directing the evolution of institutions.
- H.Ed.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.
- H.Ed.101. Foundations of Modern Education. Historical analysis and interpretation of the more important elements in modern education derived from the Hebrews, Greeks, Romans, Middle Ages, and Renaissance.
- H.Ed.102. History of Modern Secondary and Higher Education. A survey of existing types of American and European secondary and higher schools, followed by a historical study of their origin, aims, growth.
- H.Ed.103. History of Modern Elementary Education. The institutions, theories, and problems of modern elementary education in the light of their history. Emphasis upon the rise of state systems and upon the history of modern educational reform.
- H.Ed.114. Philosophy of Education. A discussion of philosophically formulated ideals of education with an attempt to reach a positive philosophy of educational values.
- H.Ed.129-130. Educational Classics. An intensive study of selected writings of educational leaders; first quarter, Plato, Aristotle, Quintilian, Comenius, Locke; second quarter, Rousseau, Pestalozzi, Herbart, Froebel, and Dewey. Students may register for either quarter.
- Ed.131-132. Comparative School Systems. A survey of the existing school systems of France, England, Germany, Denmark. Emphasis upon present problems. Special reference to educational conditions in the United States. Students may register for either quarter.
- H.Ed.140-141. Topics in the History of Education.
- H.Ed.187. Seminar in Educational Sociology. The sociological foundations of educational theory will be discussed with the investigation of specific problems. Lectures, readings, and problems.
- H.Ed.211-212-213. Seminar in History of Education. Historical investigation of educational problems. Designed to train students in methods of historical investigations; problems to be selected somewhat upon the basis of student's interest.

HOME ECONOMICS EDUCATION

- H.E.Ed.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.
- H.E.Ed.42. Special Methods of Teaching Home Economics. Curricula, equipment, methods of teaching for home economics. Required of all students preparing to teach.
- H.E.Ed.43. Organization and Methods for Related Art Teaching. Organization of a related art course and methods of teaching art principles as applied to familiar objects and processes.
- H.E.Ed.46. Observation and Teaching: Related Art. A course similar to 47, but dealing with the teaching of related art.
- H.E.Ed.47. Observation and Teaching: Foods and Home Management. Observation of teaching in regular classes; criticism and discussion of class practice, lesson plans, methods, results, and examinations; preparation of lesson plans, and directed teaching of foods and cookery, and home management.
- H.E.Ed.48. Observation and Teaching: Textiles and Clothing. A course similar to 47, but dealing with the teaching of textiles and clothing.
- H.E.Ed.49. Observation and Teaching: General Home Economics. A combination of 47 and 48 giving the student experience in teaching both fields of work. Required of students in the general teaching course.
- H.E.Ed.141. Problems in 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.
- H.E.Ed.142. Educational Measurement in Home Economics. Survey of accomplishment in this field; evaluation and construction of objective tests.
- H.E.Ed.242. Home Economics Education Seminar. Current problems in home economics education will be studied.

INSTITUTE OF CHILD WELFARE

- C.W.I.60. The Nursery School and Parental Education Movement. The purpose of this course is to orient the student with reference to the development of the Nursery School and the movement for parental education. Consideration will be given to other movements such as the kindergarten and the Montessori school and to the physical and mental hygiene movement in relation to the pre-school period.
- C.W.I.50-51. Nursery School Methods. A consideration of the materials and methods utilized in the training of small children as individuals and in groups. Special attention will be paid to the home. The Nursery School will be used for illustration and observation. Lectures, discussions, and reports.

- C.W.I.52-53-54. Nursery School Technique. The technique and practice of Nursery School instruction and management. The student will be expected to spend considerable time in the Nursery School.
- C.W.I.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 angles. Lectures, readings in the experimental literature and reports.
- C.W.I.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.
- C.W.I.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.
- C.W.I.190-191. The Mental Examination of Pre-School Children. A study of the methods used in testing young children together with practice in such testing.
- C.W.I.230-231-232. Seminar in the Development of the Small Child. Reviews of current literature, discussion of fundamental problems and reports on research. Meetings in alternate weeks.
- C.W.I.233-234-235. Research in the Development of the Small Child.

LIBRARY METHODS

- Lib.Ed.7. School Library Organization. Covers routine of organization, classification, and installation of all necessary records except the card catalog; care of periodicals; mending, binding and bindery records; care of unbound material; miscellaneous problems of administration. Includes 30 hours of practice work.
- Lib.Ed.8. Cataloging for the School Library. Instruction in making a card catalog, with Library of Congress cards. If possible, students planning to take this course should be able to use the typewriter. Includes 30 hours of practice work.
- Lib.Ed.9. Reference Work in the School Library. Selection and use of reference books and miscellaneous reference material. Includes 30 hours of practice work.
- Lib.Ed.10. Book Selection for the High School Library. Books examined in the fall are those chiefly of interest to the English Department.
- Lib.Ed.11. Book Selection for the High School Library. Books chiefly of interest to the Social Science Department.
- Lib.Ed.12. Book Selection for the High School Library. Books on science, home economics, and miscellaneous subjects.

PHYSICAL EDUCATION FOR MEN

- Phys.Ed.1-2-3. Freshman Physical Education. Mass activities, corrective exercise, apparatus work, swimming, athletics, games, and efficiency test.
- Phys.Ed.4. Freshman Hygiene. Fall quarter A-H; winter quarter I-R; spring quarter S-Z.

- Phys.Ed.7-8-9. Advanced Leaders. One hour of instruction; two hours leading squads in Physical Education 1-2-3 or 16-17-18 under supervision.
- Phys.Ed.10-11-12. Minor Sports. Study of nature and function of play; use of leisure time; rules, theory, technique, and values of different sports. Fall: golf, soccer, handball, boxing; winter: winter sports, wrestling, tumbling; spring: swimming, indoor baseball, volley ball, tennis.
- Phys.Ed.13-14-15. Corrective work. By petition in place of Physical Education 1-2-3.
- Phys.Ed.16-17-18. Drill Substitution. By petition in substitution for Military Science.
- Phys.Ed.19-20-21. Gymnastics. Gymnastic marching, calisthenics, light and heavy apparatus work, and tumbling.
- Phys.Ed.22-23. Kinesiology. A discussion of the principles and mechanics of bodily movements; the relation of posture to health and efficiency; the effects of various exercises upon the tissues and organs of the body.
- Phys.Ed.24. Technique of Gymnastic Teaching. Lectures and quizzes on terminology, and technique of teaching.
- Phys.Ed.28. Physical Examination and Normal Diagnosis. Methods of inspection to determine deviations from the normal, including posture, musculature, skin, genitals, and feet; tests of hearing and vision; inspection of nose, throat, and teeth; examination of heart and lungs; methods of taking principal measurements, such as height, weight, girth, strength tests, etc.
- Phys.Ed.29. Orthopedic and Remedial Gymnastics.
- Phys.Ed.30. Athletic Training. Principles governing conditioning of men for various sports; diet, sleep, exercise, bathing, massage. Overtraining; its cause, diagnosis, prevention, and cure. Prevention and treatment of common athletic injuries.
- Phys.Ed.31. History of Physical Education. A historical survey of physical education from ancient times to the present. Special consideration of different systems of physical education and contemporary developments.
- Phys.Ed.32. Principles of Physical Education. Study of the aims and scope, and the biological aspects of physical education, with special reference to its place in education; comparative value of various activities; activities suitable to different sexes, ages, and varying conditions.
- Phys.Ed.33. Organization and Administration of Physical Education. Problems of organization, administration, and supervision. Correlation of various phases of work; health supervision, health instruction, required and elective courses, intramural and interinstitutional athletics. Construction, equipment, and care of gymnasias and fields. Athletic management.
- Phys.Ed.35. Athletic Organization and Administration. Discussion of place of athletics in physical education program; organization for athletic control; schedule making; construction and maintenance of athletic fields; purchase and care of equipment; eligibility problems; management of contests; financial accounting; insignias and awards.

- Phys.Ed.37. Football. Lectures on history, rules, theory, strategy, generalship, styles of attack and defense, methods of organizing practice and handling men, development of team spirit, officiating. Demonstrations and practice in the technique of fundamentals and position play.
- Phys.Ed.38. Basket-Ball. Lectures on rules, styles of offense and defense, the conditioning and handling of a team. Practice in fundamental technique of footwork, passing, guarding, dribbling, goal throwing, etc.
- Phys.Ed.39. Track Athletics. Instruction and practice in the standard track and field events. Lectures on the conduct of meets, rules of competition, officiating, track strategy, regulation of practice, and preparing contestants for competition.
- Phys.Ed.42. Baseball. Theoretical consideration of, and actual practice in, batting, base running, and methods of playing each position. Special attention to "inside baseball" and the development of team play.
- Phys.Ed.43-44-45. Practice Teaching. Six hours of practice per week in teaching gymnastics and corrective exercise; coaching, supervising, and officiating in all branches of athletics.

PHYSICAL EDUCATION FOR WOMEN

- Phys.Ed.1-2-3. Elementary Physical Training. An exploratory course in outdoor sports, gymnastics, folk dancing, apparatus, and individual gymnastics, with the aim of increasing skill in the activities and establishing standards of good body mechanics and habits of exercise. Shower bath fee \$2.50 per quarter.
- Phys.Ed.4. Preliminary Hygiene. One lecture a week. The most essential aspects of the care of personal health.
- Phys.Ed.7-8-9. Sophomore Physical Training. A course in gymnastics, apparatus, and games meeting twice a week throughout the year in which the hygienic, educational, and recreational values of exercise are stressed.
- Phys.Ed.10-11-12. Sophomore Orthopedic Gymnastics. For those not able to take regular class work. Exercises are individualized to meet the needs of each student.
- Phys.Ed.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.
- Phys.Ed.16-17-18. Sophomore Games and Folk Dancing. Suitable in strength for C-D girls. Conducted outdoors when weather permits.
- Phys.Ed.19-20-21. Sophomore Major Sports. Hockey in autumn, basketball in winter, baseball in spring. Suitable in strength for A-B girls.
- Phys.Ed.22-23. Sophomore Elementary Swimming.
- Phys.Ed.25-26. Sophomore Intermediate Swimming.
- Phys.Ed.28-29. Sophomore Advanced Swimming.
- Phys.Ed.30. Sophomore Skating. Practice and technique of skating, including simple figure skating and form in speed skating.
- Phys.Ed.31. Elective Life Saving. No registration necessary.

- Phys.Ed.32. General Swimming. For both beginning and advanced swimmers and divers. Shower bath tickets may be bought of the matron. No registration necessary.
- Phys.Ed.33-34-35. Elective Hockey, Basket-Ball, Baseball. No registration necessary.
- Phys.Ed.37-38. Freshman Major Hockey and Basket-Ball. Practice and study of rules.
- Phys.Ed.40. Freshman Major Hygiene. Lecture and quiz. Essential aspects of positive personal health and avoidance of disease.
- Phys.Ed.43-44-45. Play and Playground. Graded games, folk dances, and track for school and playground, two hours. A consideration of the nature and function of play and practical conduct of playground, one hour. (Not offered in 1926-27.)
- Phys.Ed.48-49-50. Tennis, Gymnastics, Baseball for Freshmen. Tennis in first term of fall quarter, posture training in second term of fall quarter, gymnastics, marching, and apparatus work in winter quarter, baseball in spring quarter.
- Phys.Ed.51-52. Gymnastics for Sophomores. Gymnastics, marching, and apparatus work.
- Phys.Ed.54-55. Gymnastics for Juniors. Gymnastics, marching, and apparatus work.
- Phys.Ed.56-57. Swimming with Technique. Description of strokes, methods of teaching, practice in teaching and life saving.
- Phys.Ed.58-59. Advanced Folk Dancing with Technique. The racial characteristics of peoples are studied in order to approximate the spirit of their folk dances. The presentation of folk dances and the elements of pageantry are also developed. Practice twice a week, lecture once a week.
- Phys.Ed.60-61. Minor Sports with Technique. Soccer, volley ball, track, archery. Description and methods of teaching, one hour; practical work, two hours.
- Phys.Ed.63-64-65. Hockey, Basket-Ball, Baseball with Technique. One hour technique and methods; two hours practice.
- Phys.Ed.66-67-68. Interpretive Dancing. An art and a phase of physical education designed to develop a sense of beauty and body control through rhythmic movements prompted by the imagination.
- Phys.Ed.69-70-71. Advanced Interpretive Dancing with Technique. Technique and methods of teaching one hour, practical work two hours.
- Phys.Ed.72-73. Gymnastics for Seniors. Gymnastics, marching, apparatus work.
- Phys.Ed.75. History of Physical Education. A historical survey of physical education beginning with that of Greece and including contemporary developments.
- Phys.Ed.76. Physical Diagnosis and Prophylaxis. A consideration of certain diseases and injuries, their causes, symptoms, significance, and prevention. Approached from the standpoint of guidance for the teacher.

- Phys.Ed.80-81. Kinesiology. Lectures and recitations on anatomical mechanism of movements; rôle of joint motion, muscular action, gravity, leverage, inertia, internal resistance in the production and modification of gymnastics and athletic movements and their effects.
- Phys.Ed.82. Physical Examination. Study of all the important anthropometric measurements, and practical application of them in the laboratory.
- Phys.Ed.83. Technique of Gymnastic Teaching. Lectures and quizzes on terminology, and technique of teaching. Practice in teaching within departmental groups.
- Phys.Ed.84. Principles of Gymnastics. A study of the biological and educational aspects of physical training, with reference to its place in education. Principles of progression are studied. The practical work, one period a week, will represent an application of the lecture work.
- Phys.Ed.85-86. Principles of Physical Education. A study of (1) the relation of physical education to education, (2) the relative values of the different phases of physical education, (3) general problems in teaching.
- Phys.Ed.87. Personal and School Hygiene. Study of personal hygiene from standpoint of presenting it to the child, and establishing health habits in him; study of school hygiene and sanitation.
- Phys.Ed.88-89-90. Orthopedic and Remedial Gymnastics. Lectures, demonstrations, individual work with cases. Discussion held relative to the various defects met with and treatment outlined.
- Phys.Ed.91. Principles Underlying Dancing. The dance is studied for the effect on its development of such influence as allied arts, religion, etc. Interpretive dancing taught at this University is analyzed and its place in physical education determined.
- Phys.Ed.92-93-94. Practice Teaching. Practice teaching in gymnastics, major sports, organized games, interpretive dancing, swimming. Technique course in tennis (92). University, University High School, public schools, and municipal playgrounds afford the practice material. All students required to teach on municipal playground during two weeks of summer vacation, preferably after junior year.
- Phys.Ed.97. Organization and Administration. Study of organization of physical education and health departments in city, state, and university; construction and equipment; professional ethics.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

- P.H.50. Public and Personal Health. Discusses the cause of disease 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.
- P.H.53. Elements of Preventive Medicine. Susceptibility, resistance, and immunity to disease; methods of spread and the prevention of communicable and degenerative diseases; importance of heredity and environment; protection of food, water, and milk.

- P.H.58. Maternal and Child Hygiene. The maternal welfare program; importance of breast feeding, origin and conduct of infant welfare clinics in cities and rural communities; consideration of child of pre-school and school age as to malnutrition, physical defects, cardiac and nervous disorders.
- P.H.59. Social Hygiene. Relation to public health. Sex development to age of twelve; adolescence; sex incorrigibility. Methods of education in schools. Responsibility of public health nurse. Prevention and control of venereal disease; clinics; follow-up system.
- P.H.60. The Tuberculosis Problem. 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.
- P.H.61. Mental Hygiene. History of movement, factors underlying mental disease; diagnosis of feeble-mindedness and border-line cases; institutional treatment; insanity, its relation to social work and to the institution; the importance of psychiatric nursing.
- P.H.80. Educational Hygiene. Intended for teachers interested in health education. Consideration of hygiene of physical and mental growth, health supervision of school children, teaching of health subjects, and sanitation of the school plant.

PUBLIC SCHOOL MUSIC

- Mu.Ed.51-52-53. Instrumentation. (Junior, three quarters.) Theoretical study of orchestral and band instruments. Observation of local organizations for timbre and color.
- Mu.Ed.54-55-56. Advanced Instrumentation. (Senior, three quarters.) Examination, revision, and scoring of material suitable for school orchestra of more advanced orchestral organizations. Detailed study of bowing, fingering, score reading, phrasing, and interpretation.
- Mu.Ed.64-65-66. Orchestra Conducting. (Fourth year, three quarters.) Devoted to the theory and practice of general principles of conducting. Technique of the baton and elements of interpretation.
- Mu.Ed.81-82-83. Observing and Teaching. (Senior year, three quarters.) Observation and practice teaching in the high schools, city, and University, under supervision.
- Mu.Ed.29. Grade School Methods. First term. Piano class teaching. Practical methods of teaching piano classes, and theory underlying the methods. Practice teaching with the class and with classes of children. This is also a good course in practical schoolroom teaching.
- Mu.Ed.30. Grade School Methods. Second term. Methods of teaching vocal music in the kindergarten and in the first five grades. Theory and practice of teaching combined in class work. Students required to observe and teach classes in the Minneapolis public schools three hours weekly.

- Mu.Ed.31.** Grade School Methods. Third term. Same as above for grades six, seven, eight, also a short course in voice training for child and adult.
- Mu.Ed.32.** High School Methods. First term. Organization of junior high and high school music. Methods and material used in the chorus, glee clubs, of the modern high school. Pupils will be required to observe in the Minneapolis high schools.
- Mu.Ed.33.** High School Methods. Second term. Students will learn to apply methods of high school music teaching by practical work with the class itself. They will be required to teach in the Minneapolis high schools three hours weekly.
- Mu.Ed.34.** Voice. A practical course in class voice teaching, in the use and care of the child voice, the changing voice, the adult voice. Testing and classification of voices in upper grades and high schools. Voices of all ages will be used for demonstration.
- Mu.Ed.71-72-73.** Class Instrument Teaching. Fall quarter, beginner's classes in violin, viola, cello, and bass; winter quarter, beginner's classes in flute, oboe, clarinet, and bassoon; spring quarter, beginner's classes in all brass and percussion instruments.
- Mu.Ed.74-75-76.** Advanced Class Instrument Teaching. Practical orchestral routine augmenting University High School Orchestra, under baton of the director and members of class in Orchestra Conducting. 64,65,66.

THEORY AND PRACTICE OF TEACHING¹

UNDERGRADUATE COURSES

GENERAL METHODS

- T.15.** Technique of High School Instruction. Types of classroom exercises; preparation of teaching plans; hygiene of instruction; methods of treating individual differences; classroom management; supervised study; marking systems, etc.; observation of high school work.
- T.16.** Practice Teaching. Teaching under supervision in the University High School and in the Minneapolis city schools. The course calls for

¹ For the specific requirements in the theory and practice of teaching in the special subjects, consult the special curricula. Arrangements should be made through the directors listed below:

Agricultural Education.....	A. V. Storm
Art.....	Ruth Raymond
Home Economics.....	Clara Brown
Industrial Education.....	Homer J. Smith
Physical Education for Men.....	G. F. Keller
Physical Education for Women.....	J. Anna Norris
Public School Music.....	T. P. Giddings
Subnormal Education.....	John G. Rockwell

Arrangements for practice teaching should be made before the close of the quarter immediately preceding the quarter in which the practice teaching is to begin.

one period daily at the school where the work is assigned. Registration in this course is limited to, and required of, students taking T.18, T.19, T.20, T.23, T.35, and T.41. Practice teaching in all other academic subjects is combined with Special Methods courses into a one-year Teachers' Course.

- T.17. Practice Teaching of Subnormal Children. Students will have opportunity to observe work with the special classes, and to teach under direction. Conducted in co-operation with the public schools of Minneapolis and St. Paul.

SENIOR HIGH SCHOOL TEACHING

- T.18. Teachers' Course in Animal Biology.
 T.19. Teachers' Course in Botany.
 T.20. Teachers' Course in Chemistry.
 T.23. Teachers' Course in Geography.
 T.35. Teachers' Course in Norwegian.
 T.41. Teachers' Course in Swedish.
 T.47. Field Problems in High School Normal Training Departments. Observation of the organization and management of a training department; the department in relation to administration and supervision; program of studies; projects in the field.

The teachers' courses in methods of teaching and in practice teaching are combined into a one-year course in the following subjects:

- T.52-53-54. English.
 T.56-57-58. Mathematics.
 T.62-63-64. Secondary School Science.
 T.66-67-68. History and Social Science.
 T.70-71-72. German.
 T.73-74-75. Latin.
 T.76-77-78. Romance Languages (French and Spanish).
 T.80-81-82. Commercial Subjects.

JUNIOR HIGH SCHOOL TEACHING

- T.28. Junior High School Mathematics. Mathematics in the junior high school. Lectures, readings, discussions, methods of presentation, assignments, lesson plans, etc.
 T.39. Social Science for Junior High Schools.
 T.51. Teaching of English in the Junior High Schools. Differentiated purposes in reading and literature. Methods of classroom presentation. Group and project method in extensive reading. Illustrative material. Testing.
 T.52. The Teaching of Composition in the Junior High Schools. Importance of classroom presentation in realizing the aims of composition teaching. Project motivation. Group method. The place of grammar, punctuation, and spelling.

ELEMENTARY SCHOOL TEACHING

- T.42. Fundamental Educational Theories Relating to Instruction in the Elementary School. A study of current educational concepts as related to problems in the elementary school.
- T.43. The Teaching of English in the Elementary School. A consideration of the materials and the means for improving instruction in spelling, language and reading processes; emphasis on silent reading technique in Grades 1-6.
- T.44. Children's Literature. A study of the nature and purposes of literature in the elementary school; bases of selecting materials for intensive and extensive reading; critical examination and evaluation of new literary materials for children's use.
- T.45. The Teaching of Geography and History in the Elementary School. The aims and purposes controlling instruction in geography and history in the elementary school; tendencies toward standardization, special emphasis on problem studies.
- T.46. Practice Teaching with Special Methods in Elementary Schools. Teaching under supervision in graded or rural schools in the vicinity of the University; discussion of special methods in their application to actual problems of teaching.

TEACHING OF SPECIAL SUBJECTS

The courses in the theory and practice of teaching in the special subjects will be found in this bulletin as follows:

- Agricultural Education, pages 56 to 58.
 Art Education, 58 to 59.
 Home Economics, page 62.
 Industrial Education, pages 72 to 74.
 Nursery School Education, pages 62 to 63.
 Nursing Education, pages 36 to 37.
 Physical Education for Men, pages 63 to 65.
 Physical Education for Women, pages 65 to 67.
 Public School Music, pages 68 to 69.
 Subnormal Education, page 69.

OPEN TO GRADUATE STUDENTS

SECONDARY TEACHING

- T.110. Educational Diagnosis in Secondary Education. The application of educational measurements to the solution of the problems of high school instruction. Analysis of the specific learning processes involved in the various high school subjects; a critical survey of the means of diagnosing and alleviating high school pupils' learning difficulties; the use of educational measurements in improving high school teaching.
- T.118. Problems in Junior High School English.
- T.193. Foundations of Secondary School Methods. A study of the investigations which form the bases of the technique of high school instruction and the application of their results to high school subject-matter and to high school classroom procedure.

- T.195. Problems of High School English Teaching. An intensive study of various means of adapting subject content to high school pupils; observations; classroom experiments; conferences with classroom teachers; pupil advisory work; submission of proposals of special methods.
- T.222-223-224. Seminar in the Technique of High School Instruction.

ELEMENTARY TEACHING

- T.148. Teachers' and Supervisors' Course in Arithmetic for the Lower Grades. This course emphasizes the history of arithmetic as related to present practices and methods of teaching in the lower grades. Such topics as motivation, games, projects, drill, and the selection and solution of problems are considered in detail.
- T.149. Teachers' and Supervisors' Course in Arithmetic for the Intermediate and Upper Grades and for Junior High School Teaching. This course emphasizes the history of arithmetic as related to present practices and methods of teaching in the intermediate and upper grades and in the junior high school. Special emphasis is placed upon such topics as motivation, projects, the selection and solution of problems, and the mathematics of the junior high school. All topics included in the intermediate and upper grades are considered.
- T.181. Technique of Elementary School Instruction. A course in fundamental and special methods of teaching elementary school subjects.

NORMAL SCHOOL, COLLEGE, AND UNIVERSITY TEACHING

- T.150. Teaching and Administration in Teachers' Colleges. In this course emphasis is placed on the historical development, the present status, and the prospects of future development. An intensive study is made of curricula, departmental organization, and practice teaching. Emphasis is placed also on the supervision of instruction.

See also Ed.228-229-230 under General Courses, page 69.

TEACHING OF SPECIAL SUBJECTS

The graduate courses in the theory and practice of teaching in special subjects will be found in this bulletin in the respective departmental course descriptions. For list of page references see page 71.

TRADE AND INDUSTRIAL EDUCATION

- Ind.10. Methods, Elementary Wood Work. This course is primarily a methods course. A very important part of the course is demonstration work by the students. The course also involves uses and care of tools, tool processes, and uses and care of wood working machinery.
- Ind.11. Special-Class Wood Work. This course is designed for primary grade teachers, teachers of subnormal children, teachers of arts, etc. The course consists of lectures and shop work. The shop work is divided into three parts: flat piece work, assembled and movable parts, and toy furniture.

- Ind.12. Methods, Elementary Electric Wiring. This course consists of bell wiring, elementary inside electrical wiring, fundamental electrical laws, blue print reading and estimating. Methods of presenting this work to a class is a very important part of the work.
- Ind.14. Methods in Mechanical Drawing. The selection and arrangement of course materials, methods of presentation, teaching plans and devices, evaluation of texts, problems of the drawing room, testing, grading, and records. *Not a course in drawing.*
- Ind.20. Industrial History. Lectures, quizzes, and required readings. Evolution of arts, industry, tools, processes, and production to 1800; evolution in economic and social conditions; culmination of the industrial revolution in America—resultant agricultural, industrial, economic, and social problems; twentieth century outlook and opportunities; implications for practical education.
- Ind.25. Literature of Industrial Education. Acquaintance and methods of use. Survey of useful books, reports, periodicals, and special bulletins. Students made familiar with reference facilities. Individual term assignments to teach sources, note taking, organization, and the preparation of papers.
- Ind.30. Graphic Presentation. Study of typical methods of graphic representation of data. The use of simple educational and social materials for drill in the interpretation and statement of facts and conditions.
- Ind.40. Occupational Analysis. Necessity for, and types of, analyses, survey of those available. Individual work upon a chosen occupation—breakups, classification of materials, and their organization for teaching purposes.
- Ind.42. Selection of Related Materials. Makes definite use of occupation analyses prepared in Course Ind.40. Content of related courses determined and arranged. Reference materials collected and application charts prepared.
- Ind.50-51-52. Practice Teaching. Three quarters required. During each quarter the group to meet for not less than four two-hour periods for lectures and the making of lesson plans. Instructor to visit persons enrolled (at their places of employment) to criticize and help and to determine grade of ability. Students not on the part time basis to be assigned to practice work in the University High School, Dunwoody Industrial Institute, or the public schools of the Twin Cities.
- Ind.60. Social Agencies in Education. An evaluation of various social agencies that make educational contributions; their status, aims, achievements, and deficiencies; their relationships and possible fields of cooperation. The special significance of social agencies to vocational education under public support and control.
- Ind.61. Social Significance of Industrial Education. A study of the basic facts of economics and sociology which support efforts in the organization and administration of industrial education. Review of the movements which contributed to its introduction and development. Its social value and results.

- Ind.65. Methods in Non-Vocational Subjects. Details of material and method in civics, industrial history, commercial geography, English, and other branches classified by the Smith-Hughes law as "non-vocational." The needs of groups, and course planning.
- Ind.66. Methods in Related Subjects. Theory, practices, and problems of related instruction; application charts in mathematics, drawing, science, and safety; group study and unit course preparation; usable methods and the means of supervision. Both incidental and scheduled teaching considered.
- Ind.70. Methods in Shop Subjects. Various methods of conducting shop classes, with and without reference to production work; lesson plans, grading, reports, and records; the assigning of jobs and shop management; standards of workmanship.
- Ind.80. General Industrial Training. Organization and supervision of the industrial offering for grades and high school in typical Minnesota towns. Aims of the work, offerings and schedules, teaching fitness, equipment, methods, and management. Consideration of the unifying opportunities within a department and a school.
- Ind.110. Guidance in the Schools. The history of the guidance movement; typical public school means and methods; the presentation of occupational information; the junior wage earning situation; attendance and child labor laws; guidance, placement, and follow-up plans employed with continuation classes.
- Ind.150-151-152. Seminar in Vocational Education. Survey of studies in the field, individual and group investigation, reports, and criticisms. Required of all students writing theses in this special field.
- Ind.171. Administration of Industrial Education—Day Schools. National, state, and local organization and support of day industrial schools; adaptable types, buildings, and equipment, promotion and advertising, co-operative agreements and relationships, supervision of instruction, student placement. General versus unit course organization. Relation to part time and evening instruction.
- Ind.172. Administration of Industrial Education—Evening Schools. Development of the after training of adults; agencies and scope of the movement; state supervision, national and state legislation; qualifications of instructors, problems and difficulties, records and certification, fees and charges; buildings, equipment, and instruction facilities. General versus unit course organization. Costs.
- Ind.173. Administration of Industrial Education—Part Time Classes. A study of the new movement for part time education. Social and economic background, methods of organizing classes, a study of the special student groups, courses of study. Typical schools, comparative state legislation and plans. Minnesota's problems.

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School	21-24		